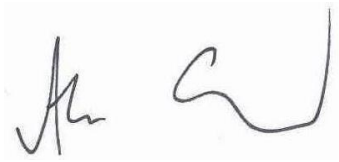
Ministry of Social Development

&

The Treasury

New Zealand

Actuarial valuation of the Benefit System for Working-age Adults as at 30 June 2011



Alan Greenfield
Fellow of the Institute of Actuaries of Australia

Dr Grainne McGuire
Fellow of the Institute of Actuaries of Australia

Dr Hugh Miller
Associate of the Institute of Actuaries of Australia

PROJECT TEAM

The analysis to support this actuarial valuation has been carried out by the following team of actuaries and analysts from Taylor Fry Consulting Actuaries.

Team Leader:	**Alan Greenfield**
Senior Actuary:	**Dr Grainne McGuire**
Principal Analyst:	**Dr Hugh Miller**
Senior Analysts:	**Dr Jonathan Cohen**
	Graham Taylor
Analyst:	**Jessica Egan**
Expert Advisor:	**Dr Richard Brookes**
Peer Review:	**Adrian Gould**

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PART A

EXECUTIVE SUMMARY

1 EXECUTIVE SUMMARY

1.1 Background

The Welfare Working Group ("WWG") was established by Cabinet in April 2010. The arms-length group was asked to conduct a fundamental review of the welfare system and develop options to reduce long-term dependency with a focus on:

- improving work outcomes for sole parents and for people with disabilities and ill health;
- how welfare should be funded and any lessons from the insurance industry and ACC in managing forward liability; and
- whether the structure of the benefit system contributes to long-term dependency.

The WWG presented a comprehensive set of 43 recommendations to the Government on 22 February 2011 in its report titled "Reducing Long-Term Benefit Dependency" (the "WWG Report"). At a high level, the WWG recommended a work-focused welfare system, with a cross-government emphasis on preventing the need for welfare use, with targets and accountability mechanisms to reduce future payments.

A key theme from the report is the recommendation to take a long term view:

"The welfare system needs to recognise the value of investing early to reduce the long-term social, economic and fiscal costs of welfare dependency. Adopting an actuarial approach to measuring the forward liability will therefore be an important feature of any reform." (from page 2 of the WWG Report)

Recommendation 31 of the WWG Report states that "the new work-focused welfare system should manage the performance of the system using a regularly estimated actuarial calculation of the forward liability".

In June 2011 Taylor Fry Consulting Actuaries ("Taylor Fry") was asked to provide advice to the Ministry of Social Development ("MSD") and The Treasury in relation to:

- the feasibility of adopting a long-term investment approach to achieving better employment, social and financial outcomes through the welfare system; and
- how an aggregate liability for future payments in the welfare context could be calculated.

That advice is contained in our "Feasibility report" titled "Actuarial advice of feasibility: A long-term investment approach to improving employment, social and financial outcomes from welfare benefits and services" dated 27 October 2011 and authored by Alan Greenfield.

The feasibility report found that an investment approach in the welfare context based on an actuarial valuation of lifetime costs for benefit recipients was novel, but feasible using best practice from social insurance and the insurance industry.

In November 2011, the Government announced reforms to the New Zealand welfare system staged over three years, and taking a long-term investment approach to getting people off welfare and into work. A description of the reforms can be found at:

http://www.msd.govt.nz/about-msd-and-our-work/newsroom/media-releases/2011/welfare-reform.html

Following the production of the Feasibility report, and the Government's announcement that it would move forward with the investment approach, Taylor Fry was commissioned to undertake the first actuarial valuation of the NZ benefit system as a baseline prior to welfare reform. This report documents that valuation.

1.2 Purpose of the valuation

In the insurance context valuations of outstanding claims liabilities are required to ensure the financial solvency of the insurer or scheme. They are also carried out as a means of analysing the underlying cost of the insurance to inform the pricing and ongoing management of the portfolio.

In the context of the New Zealand benefit system while there is no requirement to ensure solvency it is in line with the principle of fiscal responsibility under the Public Finance Act to be prudent about spending in future years. Furthermore, the other applications noted above have strong relevance in the welfare context. In particular an actuarial valuation will bring a long-term perspective to the financial management of the benefit system by providing a detailed understanding of:

- The future cost of the system;
- The life-time cost of segments in the system (e.g. those entering at age 16 and 17);
- The long-term financial effects of changes to the system, e.g.
  - Policy reform;
  - Operational changes;
  - Demographic changes; and
  - Economic changes; and
- Key drivers which affect the future costs of the system, e.g. duration on benefits, age, etc.

This detailed understanding can be used to bring a long-term perspective to managing the system, for example:

- Investment decisions (based on cost-benefit analyses) in relation to return to work measures for particular segments of the system can be carried out with an understanding of the long-term cost;
- Costings of policy reforms can consider the long-term financial impact;
- The valuation can inform an internal framework for accountability;
- Monitoring of actual experience to forecasts from the valuation can alert managers to first signs of changing costs and assist in developing appropriate responses;

Note that this first actuarial valuation of the benefit system in New Zealand (as at 30 June 2011) is a baseline valuation and makes no attempt to factor in future known reforms.

Thus, future valuations will be able to estimate the impact of major reforms such as those beginning from August 2012.

1.3 Definition of liability

This valuation is, to our knowledge, the first time a full actuarial valuation of a social welfare system has been carried out. Given that there are some similarities between welfare and accident compensation insurance (i.e. income support for those unable to work) it seems natural to proceed in the same manner as an outstanding claims liability valuation for an accident compensation scheme. However, there is an important distinction between the two systems, in terms of defining liability. The liability for outstanding claims in an insurance context is well defined, i.e. a liability arises out of the occurrence of an incident that will give rise to a claim and there is a contract between the insured and the insurer which defines the amounts to be paid.

In the case of the New Zealand benefit system, legislation sets the entitlements governments must provide to citizens in circumstances defined in the *Social Services Act* (e.g. single parents, invalids, unemployed etc.). However, there are no accepted rules or standards which define exactly what amounts should be considered a "liability" at a point in time. For example, does a liability arise at the point when someone first receives an unemployment benefit? Is there still a liability for that person once they have been off benefits for a week, a month, a year, 10 years? Does the liability include only payments made for the current spell of unemployment? Should it include lifetime benefit payments under other benefit types (e.g. invalid's benefit)?

Given the lack of an existing standard definition of liability it has been necessary to define the concept in the context of the benefit system. Several alternatives for the definition of liability have been discussed with MSD and The Treasury. The definition agreed to best capture the policy intent of the long-term investment approach is:

All future lifetime costs of benefit payments and associated expenses for working-age clients who received a benefit payment in the 12 months up to and including the effective date of the valuation.

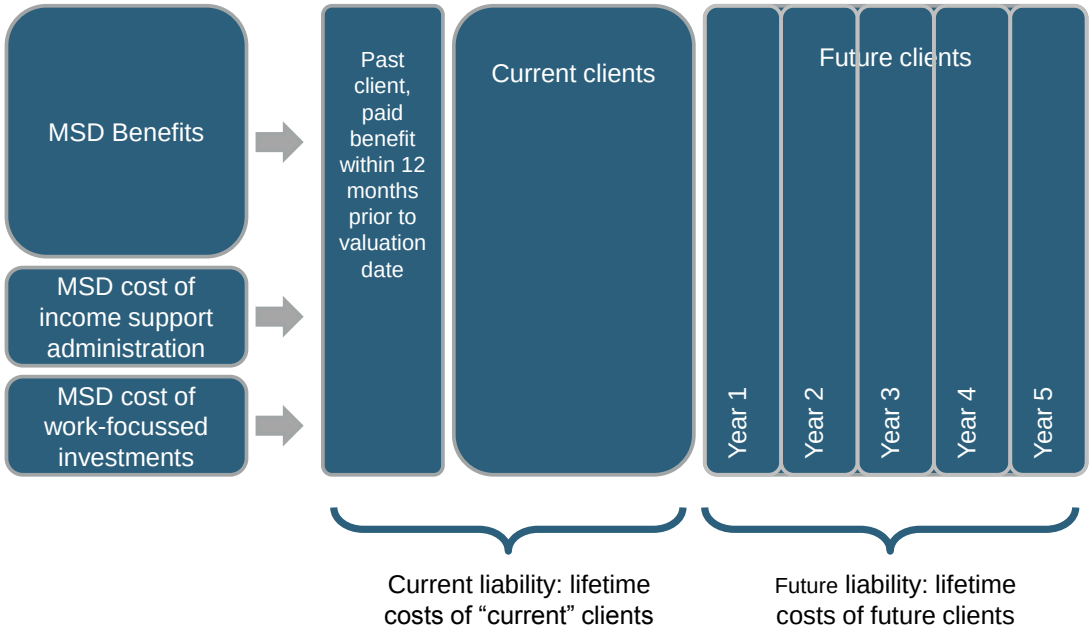
This is referred to in this report as the "current client liability": the life-time cost of current clients. We have also carried out valuations of the additional liability under the same definition arising in each of the 5 years following the date of the valuation which we have termed "future client liability": the life-time cost of future clients. That is:

The future client liability is comprised of all future benefit payments and associated expenses for working-age clients who enter the benefit system in the next five years either:

- **For the first time; or**
- **After being off benefit for more than 1 year.**

These definitions are represented graphically below in Figure 2.1, which shows the types of costs on the left (benefit payments and MSD expenditure), and current client liability and additional future client liability across the diagram.

Figure 1.1 **Definition of liability**



1.4 Scope of this valuation

1.4.1 Benefits in scope

The valuation is intended to inform MSD's implementation of the investment approach and, in particular, assist with the prevention of long-term benefit receipt through employment outcomes where possible. New Zealand Superannuation has been excluded from scope as have all other benefits paid to people over the age of 65 including supplementary assistance and Veterans' Pensions. Student Loans and Student Allowances, as well as Unemployment Benefit Student Hardship have also been excluded, as have some benefits that fall outside of Vote Social Development, in particular Working for Families.

The following benefit groupings have been used in the valuation:

- Tier 1:
  - UB: Unemployment Benefit and related benefits, including Independent Youth Benefit (IYB);
  - IB: Invalid's Benefit;
  - SB: Sickness Benefit and related benefits;
  - DPB: Domestic Purposes Benefit – Sole parent and Emergency Maintenance Allowance (EMA);
  - DPB-CSI: Domestic Purposes Benefit – Care of Sick and Infirm;
  - EB: Emergency Benefit;
  - ORP: Unsupported Child and Orphan Benefit; and
  - WA/WB: Widow's Benefit and Domestic Purposes Benefit – Woman Alone.

- Tier 2:
  - AS: Accommodation Supplement and related assistance;
  - DA: Disability Allowance and related assistance;
  - CDA: Child Disability Allowance; and
  - CCS: Childcare Subsidy including OSCAR payments to clients.

- Tier 3:
  - EI: Employment Interventions such as training costs provided as supplementary assistance; and
  - HS: Non-recoverable Hardship Assistance, including Temporary Additional Support (TAS).

1.4.2 Net loans cost

For the purposes of this valuation all debts to MSD are termed "loans":

Loans arise for the following reasons:

- **Overpayments:** Where a client is paid more than their entitlement, on discovery this gives rise to an amount to be recovered by repayment or deductions from benefits;

- **Overpayments due to fraud:** Where there are overpayments and there is sufficient proof to refer clients for prosecution for fraud this gives rise to an amount to be recovered by repayment or deductions from benefits;

- **Benefit advances:** Where a client is advanced a benefit for reasons such as hardship, which is later recovered by deductions from benefits, or repayment if the client no longer receives benefits.

- **Recoverable assistance:** income-tested, recoverable financial assistance to client and non-beneficiaries for defined needs.

In this valuation the various subcomponents relating to type of loan and recovery have been valued separately (see Section 4.6). For completeness we should also mention underpayments which occur when MSD pays less to a client than their entitlement. When this is discovered the client is paid in full. Underpayments are not valued separately as the data supplied has been corrected for all known past underpayments.

As the various components listed above are relatively small and related by way of their recoverable nature, the net cost of loans and recoveries is shown as a single item in results: "Net Loans Cost"

Results for all loan subcomponents are discussed in Section 27.

1.4.3 MSD expenditure

MSD expenses included within the scope of the valuation are those required to administer the benefits for working-age adults in the valuation, and to help clients prepare for and return to work. The scope agreed with the Ministry and the Treasury is detailed further in Section 28 and Appendix D and includes the following components:

- Income support administration
  - Benefit processing ("income" share of Tailored Sets of Services to Help People into Work or Achieve Independence appropriation)
  - Integrity services
  - Collections
  - Temporary measures (e.g. Canterbury earthquake)

- Work focussed investments
  - OSCAR (Out of School Care and Recreation subsidy to providers)
  - Training and employment support (includes Employment Assistance, Vocational Skills Training, Mainstream Supported Employment Programme, Youth Transition Services)
  - Work-focussed case management (includes "work" share of Tailored Sets of Services appropriation; e.g. Job Connect, employment coordinators, work brokerage)

1.4.4 Inflation and discount basis

Under accounting and actuarial standards for insurance and accident compensation, liabilities must be estimated allowing for future inflation and the impact of investment return (i.e. discounting the estimated future cash flows to allow for the "time value of money"). It is important to estimate liabilities allowing for both future inflation and the time value of money so that investment decisions can be made on a like-for-like basis. E.g. An investment of $100 now to save $150 in 10 years' time would result in a different decision than an investment of $100 now to save $150 next year. Note that such a basis is required whether there is a fund of assets supporting the liability or not.

Following discussion of various alternatives with MSD and the Treasury it was decided to use the Treasury forecasts for Consumer Price Index (CPI) inflation and Government interest rates for inflation and discounting of the benefit system liability. Details of the assumptions used are provided in Section 5.

1.5 Results

1.5.1 Current client liability: lifetime cost of benefits for current clients

The inflated and discounted estimate of the current client liability is **$78.1b**. By inflated and discounted we mean that this is sum of the actual projected payments, including future CPI increases to benefit rates, and discounted at Treasury bond rates to allow for the time value of money.

This liability can be subdivided into payments by benefit type and is shown in Table 1.1. We note that the four key benefits (Unemployment, Sickness, Invalid's Benefits and Domestic Purposes Benefit: Sole Parent) plus their associated Accommodation Supplement payments comprise about three quarters of the current client liability.

Table 1.1 **Current client liability subdivided by benefit type**

Component		Inflated and discounted liability ($b)
Tier 1:	Domestic Purposes Benefit	17.78
	Invalid's Benefit	19.05
	Sickness Benefit	7.22
	Unemployment Benefit	4.04
	DPB-Care of the sick and infirm	1.78
	Emergency Benefit	0.32
	Orphans and unsupported children	2.06
	Woman Alone / Widows Benefit	0.94
	Tier 1 subtotal	**53.20**
Tier 2:	Accommodation Supplement	10.21
	Disability Allowance	1.87
	Child Disability Allowance	0.82
	Childcare Subsidy	0.74
	Tier 2 subtotal	**13.64**
Tier 3:	Employment Interventions	0.20
	Hardship Assistance: Non-recoverable	3.79
	Tier 3 subtotal	**3.99**
Other components:	MSD Expenses	6.82
	Net loans cost	0.45
	Other components subtotal	**7.26**
	Grand total	**78.10**[1]

The liability may be subdivided by client age. Figure 1.2 shows the average liability per client in different age bands, based on their age at 30 June 2011. Firstly the cohort under age 18 has significantly higher average liability, suggesting they are at high risk of remaining on benefits for an extended period. In contrast, the liability per client is relatively stable across ages 18 to 39. This stability for ages 18 to 39 probably reflects the competing influences that younger clients are on average less likely to stay on benefits but have the possibility of staying on longer to age 65 than older clients. For those 40 and above the average liability starts decreasing, as would be expected due to the decrease in future years to age 65 that are counted towards the liability.

[1] Throughout the report totals may not add due to rounding.

Figure 1.2 **Average liability per client by age at 30 June 2011**

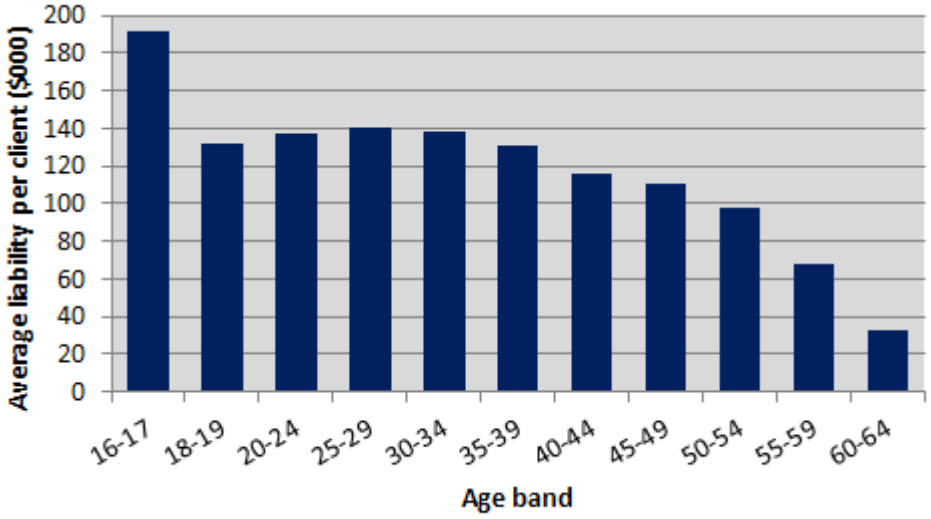
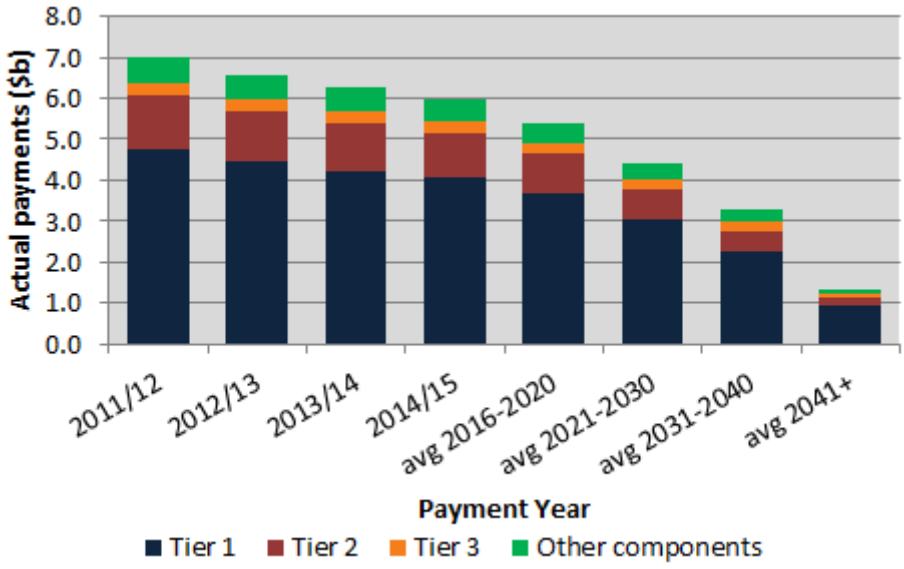


Figure 1.3 shows the projected future benefit payments included in the current client liability over time. The downward trend is due to a combination of:

- Current clients moving off benefits due to retirement (reaching age 65);
- Current clients moving off benefits due to reasons other than retirement (including finding work); and
- A slight offsetting increase due to benefit rate inflation.

Figure 1.3 **Forecast annual cash flows (undiscounted) attributed to the current client liability**



Total payments attributable to the current client liability (that is, payments to those clients who received benefits in 2010/11) are expected to fall by about 5% per annum till about

2020, then decay linearly to zero in the year 2060, when all current clients are no longer of working-age.

Figure 1.4 **Average key benefit liability based on client duration**

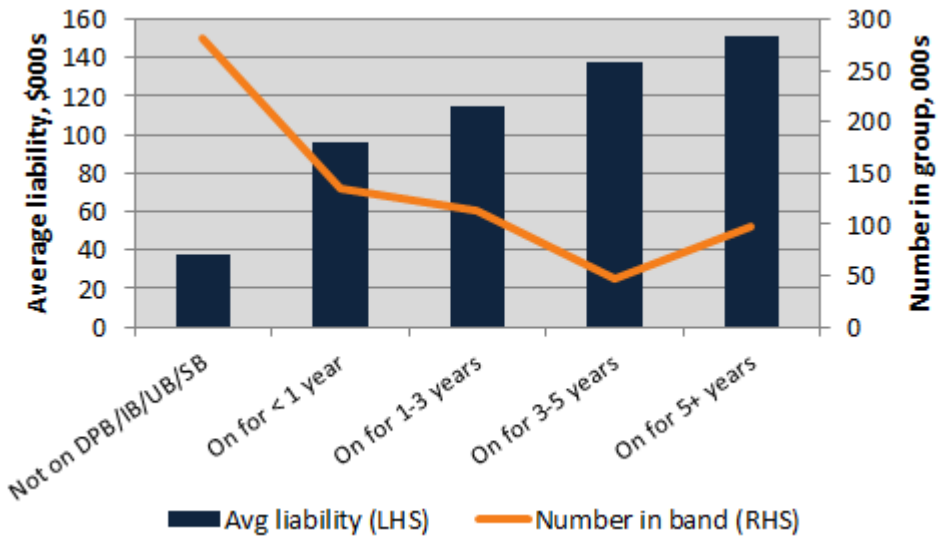


Figure 1.4 shows the average key benefit liability (DPB/IB/SB/UB and their associated AS/DA payments) according to duration. An increasing trend is clear, with clients who have received benefits for at least five years having an average liability 60% higher than those in their first year.

The Government has introduced a target to reduce long-term welfare dependence. Specifically, the target is to reduce by 30% the number of people receiving the working-age benefits that will become the new Job Seeker Support (JSS) continuously for more than 12 months by June 2017. Under planned changes through Welfare Reform, from July 2013 the JSS will include all those on Unemployment Related Benefits, Sickness Benefit, Domestic Purpose Benefit (DPB) Sole Parents whose youngest children are over 14, Widows with youngest children over 14 or no children and DPB Women Alone

We have separately identified the **approximate** liability relating to clients who have received benefits included in the proposed "jobseeker" benefit for more than a year. However, due to our modelling approach we have ignored the contribution from WA/WB which could not be easily estimated. Our results indicate that the split of **key benefit liability** is:

- 14% for jobseekers who have received benefits for a year or longer;
- 45% for those with duration greater than 1 year but who are not jobseekers; and
- 41% for the remainder (including jobseekers who have received benefits for less than a year and all WA/WB).

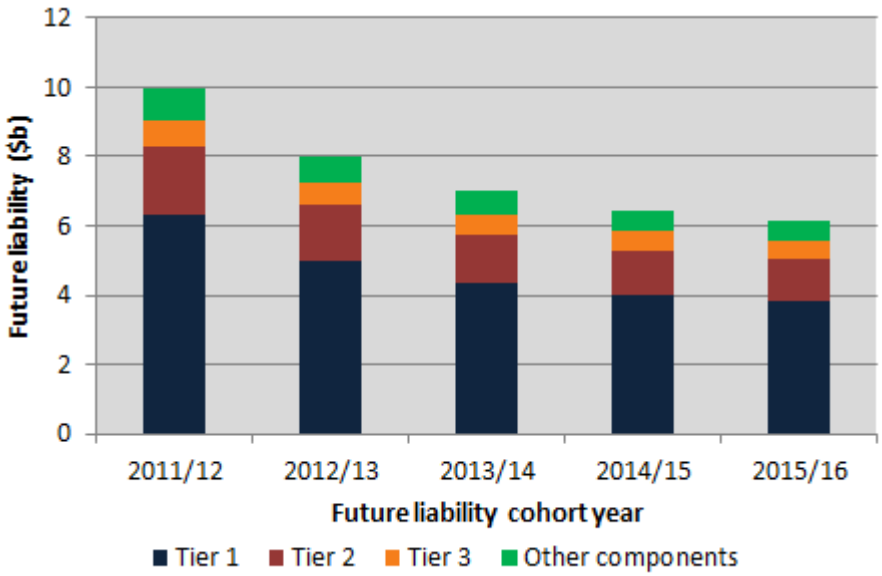
1.5.2 Future client liability: lifetime cost of benefits for future clients

Future client liability estimates represent the amounts that would need to be contributed each year to allow for the lifetime cost of new entrants into the benefit system. The future client liability for each of the next five years is given in Table 1.2 and Figure 1.5.

Table 1.2 **Future client liability estimates, inflated and discounted to 31 December each year**

Component	Future client liability ($b) corresponding to financial year:				
	2011/12	2012/13	2013/14	2014/15	2015/16
Tier 1					
DPB	2.12	1.65	1.44	1.33	1.28
IB	1.43	1.17	1.04	0.96	0.92
SB	1.12	0.88	0.76	0.70	0.66
UB	0.89	0.65	0.54	0.48	0.45
DPB-CSI	0.24	0.20	0.18	0.17	0.16
EB	0.13	0.11	0.09	0.09	0.08
ORP	0.28	0.24	0.22	0.20	0.19
WA/WB	0.10	0.09	0.08	0.08	0.08
Tier 1 subtotal	**6.30**	**4.99**	**4.35**	**4.00**	**3.81**
Tier 2					
AS	1.64	1.32	1.16	1.07	1.02
DA	0.16	0.13	0.12	0.11	0.10
CDA	0.05	0.04	0.04	0.03	0.03
CCS	0.12	0.11	0.10	0.09	0.09
Tier 2 subtotal	**1.97**	**1.60**	**1.41**	**1.30**	**1.25**
Tier 3					
EI	0.05	0.04	0.03	0.03	0.03
HS	0.71	0.61	0.56	0.52	0.49
Tier 3 subtotal	**0.76**	**0.65**	**0.59**	**0.55**	**0.51**
Other components					
Expenses	0.87	0.69	0.61	0.56	0.53
Net Loans Cost	0.07	0.06	0.05	0.05	0.04
Other subtotal	**0.94**	**0.75**	**0.66**	**0.60**	**0.57**
Grand total	**9.97**	**7.99**	**7.00**	**6.45**	**6.14**

Figure 1.5 **Future client liability for clients entering system over the next five years**



One feature readily apparent in the results is that there is a significant decrease in the size of the future client liability corresponding to each year. It would be wrong to conclude that this indicates a projected strong decrease in welfare use. Rather, this is a natural consequence of the definition.

To understand why, observe that the beneficiaries whose benefits form the future client liabilities come from two groups:

- Those clients that are entering the system for the very first time; and
- Those clients who have had benefits in the past, but not in the twelve months prior to the valuation date.

The first group makes a relatively stable contribution to each year's future client liability. However the future client liability associated with the second group reduces progressively over time, for two reasons:

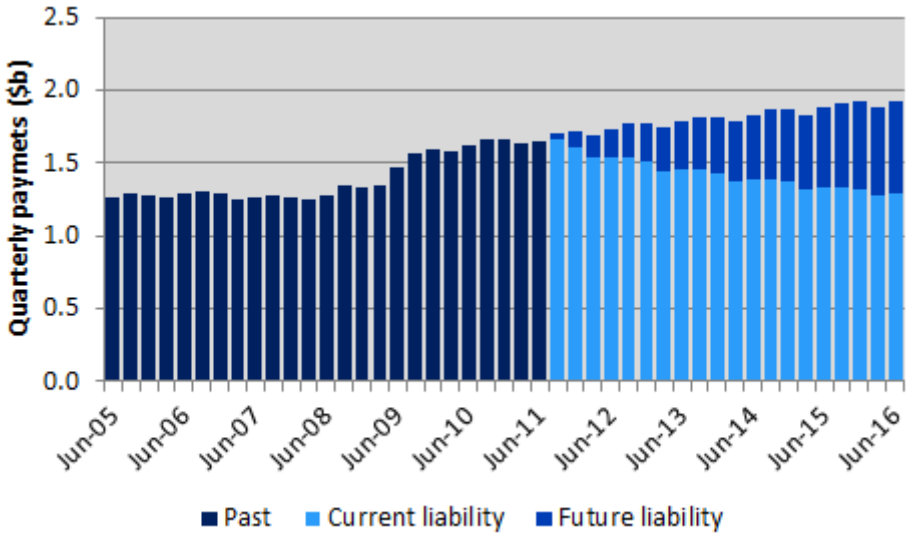
- The group of former clients who have been off benefits for more than 12 months is a fixed pool, so those beneficiaries counted in the first year's future client liability are excluded from subsequent years, decreasing the size of the pool and resulting in a natural decrease; and
- The longer a former client is off benefits, the less likely they are to re-enter the system. Thus this group of people are more likely to resume benefits in earlier future client liability years than in later years.

For this reason the quantum of the future client liabilities is not a good way of judging the overall trends in the welfare system; rather looking at the numbers of beneficiaries and level of payments when current and future client liability components are combined, as is shown in Figure 1.6, is a better gauge.

Note that the 2011/12 future client liability is about 13% of the current client liability. Thus new entrants in each year represent a small but significant portion of total liabilities.

1.5.3 Forecast total cash flows 2011/12 to 2015/16

Figure 1.6 **Total cash flows, actual values, excluding expenses and recoveries**



The cash flows arising from the current and future client liabilities can be combined to give a complete picture of forecast payments over the next five years. These payments are shown in Figure 1.6.

The rising trend is due principally to CPI inflation of benefits with a small amount due to forecast trends in some of the benefit types. The increase in total payments due to the global financial crisis at the end of 2008 can also be observed in the chart.

1.5.4 Breakdown of MSD expenses

While benefit spend is entitlement-driven, expenses are set each year by Cabinet through the Budget process, typically at a relatively constant level. Expenses included within the scope of the valuation are those required to administer the benefits for working-age adults in the valuation, and to help clients prepare for and return to work. The scope is detailed further in Section 28 and Appendix D.

Current and future client liabilities for MSD expenses may be allocated to categories as shown in Table 1.3.

Table 1.3 **Liabilities for MSD Expenses by category**

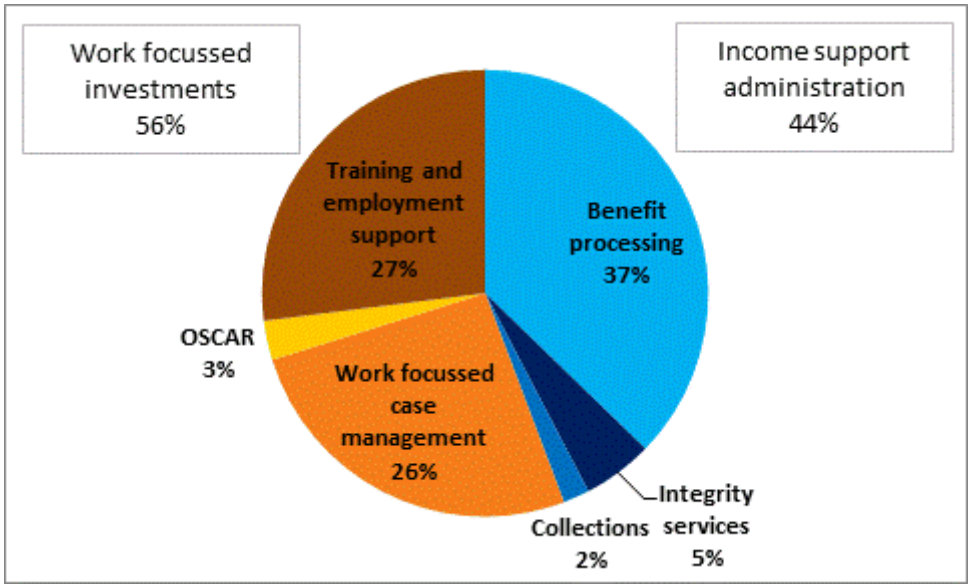
Expense category	Current client liability ($m)	Future client liability 2011/12 ($m)	Future client liability 2012/13 ($m)	Future client liability 2013/14 ($m)	Future client liability 2014/15 ($m)	Future client liability 2015/16 ($m)
Income support administration						
Benefit processing	2,539	323	258	226	208	197
Integrity services	347	44	35	31	28	27
Collections	130	17	13	12	11	10
Temporary measures[2]	0	0	0	0	0	0
Sub- total	**3,016**	**383**	**307**	**268**	**247**	**234**
Work-focussed investments						
Work focussed case management	1,768	225	180	157	145	137
OSCAR	194	25	20	17	16	15
Training and employment support:						
Employment Assistance	1,123	143	114	100	92	87
Vocational skills training	551	70	56	49	45	43
Youth transition services	128	16	13	11	10	10
Mainstream supported employment program	36	5	4	3	3	3
Job support scheme[3]	0	0	0	0	0	0
Life skills training[4]	0	0	0	0	0	0
Sub-total Training and employment support	*1,838*	*234*	*187*	*163*	*150*	*143*
Sub-total	**3,800**	**483**	**386**	**338**	**311**	**295**
MSD Expenses total	**6,816**	**866**	**693**	**606**	**557**	**530**

As noted in Section 1.4.3 Tailored Sets of Services has been apportioned by MSD between income support administration and work focussed investments on the basis of time survey data. It is expected that this apportionment will be refined over time.

Figure 1.7 shows the current client liability for expenses apportioned by category.

[2] Temporary measures include payments related to special events such as the Canterbury Earthquake. No forecast of such future events has been attempted. Hence the liability is estimated as nil.
[3] Job support scheme and life skills training expenditure occurred in several of the 5 years of history used to apportion expenses between categories. However, in the most recent year, 2010/11, expenditure on both items was nil. It has been assumed that this will continue.
[4] See note above.

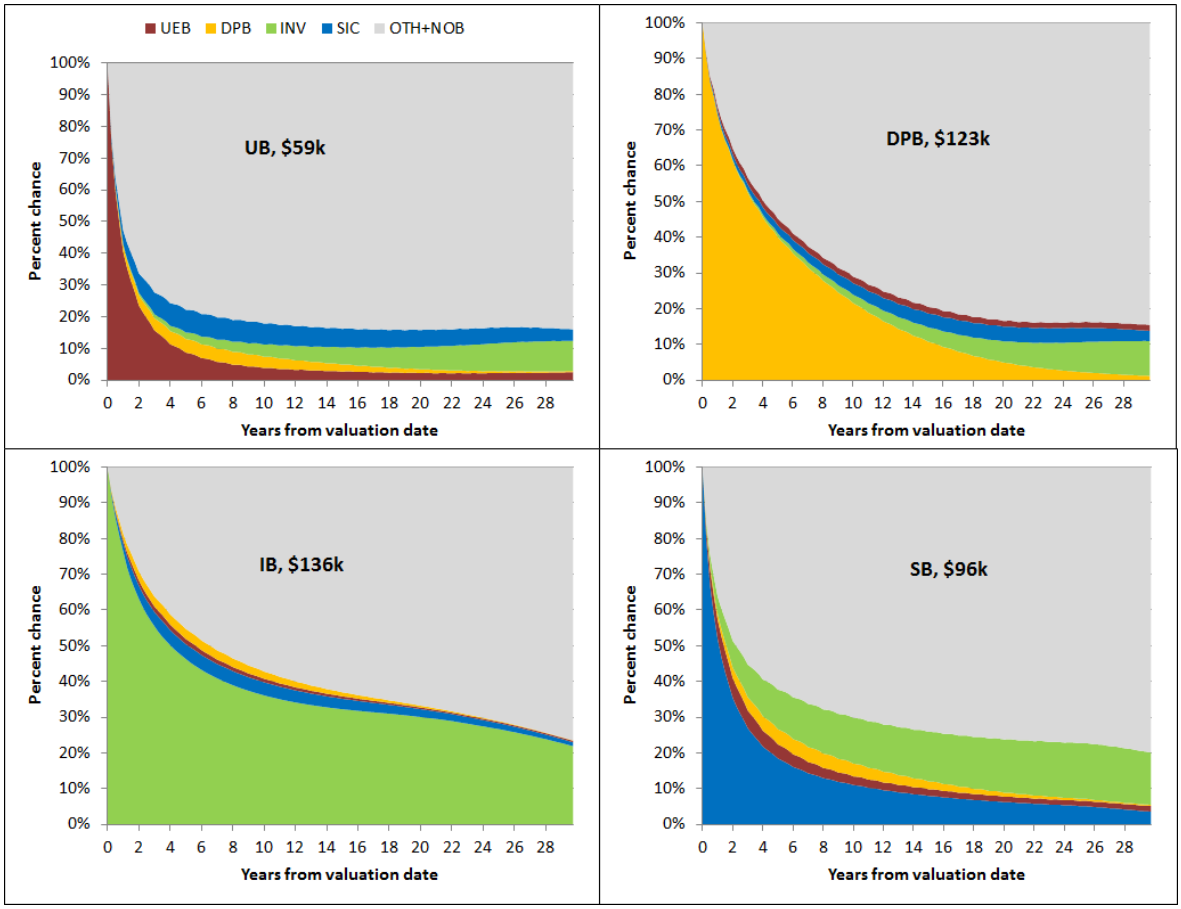
Figure 1.7 **Current client liability: MSD Expenses by category**



1.5.5 One person projections

Another way of examining the results is to look at how the projection applies to individual clients; the key benefit liability for an individual person can be calculated by adding a single client into the projection module, specifying their characteristics (age, duration etc.) and then calculating the projected future states and the cash flows attributable to that client. Figure 1.8 shows the distribution of the liability attributable to a 35 year old client starting on each of the main benefits.

Figure 1.8 **Probability of future states for person currently on key benefit, age 35 and duration one year. Average key liability is also shown on chart. Starting state, clockwise from top left, is UB, DPB, SB and IB.**



1.6 Uncertainty, key risks and sensitivity

1.6.1 Uncertainty

The estimation of future client liabilities is subject to influences whose effect cannot be determined with complete accuracy. Consequently, it is a virtual certainty that the ultimate liability will turn out to differ from any estimate, but the extent of this difference is subject to uncertainty.

Sources of uncertainty include:

- **Independent (non-systemic) risk**: This represents those risks arising due to statistical random variability in the number and amount of benefit payments;
- **Systemic risk**: This includes risks that, potentially, are common across more than one benefit type.

Of these, the uncertainty due to systemic risk is much the greater and arises from a number of sources including:

- **Model mis-specification:** the uncertainty relating to the extent that the models and valuation process as a whole deviate from a perfect representation of the benefits payments process, which is a complex, real-life system; and

- **Risks external to the model:** This uncertainty reflects the fact that, even if our valuation models were perfectly correct, future legislative, policy, behavioural, demographic or economic changes may result in actual experience differing from our projections.

1.6.2 Key risks

The key risks to the liability estimates come from the following sources:

Economic risk

The state of the economy affects the liability valuation in a number of ways:

- Unemployment rate[5]: The number of clients receiving benefits depends heavily on the state of the economy. We have found the unemployment rate to be the best single indicator of this dependence, which applies to many benefit types, not just the Unemployment Benefit. A material future increase in the unemployment rate would have an adverse effect on liability.

- Inflation: The benefits increase in line with CPI. Therefore, an increase in CPI would lead to higher future cash flows.

- Real interest rates: For the inflated and discounted liability, it is the difference between discount rates and inflation that is critical rather than the individual rates. If the gap between these rates decreases, or even becomes negative (so that inflation rates exceed the discount rates), then this would lead to a higher inflated and discounted liability.

Policy change

This represents the uncertainty arising either directly or indirectly from current and future government initiatives and actions. Some examples would include:

- Changing rules for eligibility of benefits and rates paid;
- Job creation initiatives; and
- Changing polices regarding the processing of current and new clients.

Policy change includes the unknown impact of ongoing and planned reforms such as the Future Focus changes and upcoming changes to the benefit system through Welfare Reform. In general, changing the environment in which the social welfare scheme operates is likely to have a material impact on the liability.

[5] Unemployment rate as published by Statistics NZ in its Household Labour Force Survey.

1.6.3 Sensitivity

Table 1.4 gives the sensitivities of the total current client liability to changes in the inflation and discount rates. Observe that changes of +/- 1% in these rates have a material impact on the liability.

Table 1.4 **Sensitivity of the total current client liability to changes in the inflation and discount rates**

Scenario	Liability ($B)	Change ($B)	Change (%)
Base	78.1		
Inflation + 1%	86.2	8.1	10.4%
Inflation - 1%	70.8	-7.3	-9.4%
Discount rate + 1%	71.2	-6.9	-8.8%
Discount rate - 1%	86.3	8.2	10.5%

Table 1.5 provides the sensitivities of the key Tier 1 current client liability (inflated and discounted) to changes in the unemployment rates. As expected, the proportionate impact is strongest for the Unemployment Benefit.

Table 1.5 **Sensitivity of key Tier 1 current inflated and discounted liability to future unemployment rates**

Change in unemployment rate	Domestic Purposes Benefit – Sole Parent	Invalid's Benefit	Sickness Benefit	Unemploy-ment Benefit	Total
+1%	+5.5%	+1.7%	+5.5%	+26.6%	+5.7%
-1%	-5.6%	-2.3%	-5.2%	-20.8%	-5.5%

Table 1.5 provides the sensitivities of the key Tier 1 current client liability (inflated and discounted) to changes in the probability of moving off the current benefit. For example, if the probability of moving off benefit decreases by 5% for all key Tier 1 benefits the liability for those benefits increases by 3.1%. Note that a reduction in in the probability of moving off one benefit type implies that there will be more clients remaining on that benefit but also that there will be fewer transitioning to other benefits.

Table 1.6 **Sensitivity of key Tier 1 current inflated and discounted liability to changes in the probability of moving off the current benefit**

Probability changed	Change in probability of moving off/onto benefit	
	5% decrease	5% increase
All key tier 1	+3.1%	-2.9%
Off DPB	+1.3%	-1.2%
Off IB	+0.7%	-0.7%
Off SB	+0.7%	-0.6%
Off UB	+0.5%	-0.4%
Onto benefits (=off NOB)	-2.1%	+2.1%

1.7 Approach

The methodology for the estimation of the liability for future benefit payments consists of:

- Predicting the **future number of working-age clients** receiving benefits in all future quarters and **the average benefit payments** received by these clients, starting in the September 2011 quarter;
- The payments are initially estimated in 30 June 2011 dollar values but are subsequently increased to allow for **inflation** from that date to the date of payment;
- The liability is estimated by:
  - Discounting these forecast inflated benefit payments to allow for **investment return at risk free rates;** and
  - Including components for the Net Cost of Loans and MSD expenses.

The liability is separately identified for each of the components which are modelled separately and from which predictions are generated.

1.7.1 Current client liability: lifetime cost of benefits for current clients

Key benefits

The four key benefits (Unemployment, Invalid's, Sickness and Domestic Purposes – Sole Parent and their associated Accommodation Supplement and Disability Allowance) are modelled as follows:

- A whole system view is taken, allowing for clients moving between the four key benefit types as well as two additional states (other Tier 1/Tier 2 benefits and off benefit) for all future quarters. From these models, the numbers on each key benefit in each future quarter may be estimated;

- Average benefit payments for each of the four key benefits and their associated Accommodation Supplement and Disability Allowance are calculated. From these, the future average payments in each quarter are projected; and

- The projected numbers and average payments are combined to give the projected payments in each future quarter.

Other benefits and assistance

All benefits other than the four key Tier 1 benefits (and their attached AS and DA payments) are modelled as independent payment streams. Note that the term benefit is used here generally to apply to both benefit and assistance payments.

The liability for each of these benefits is estimated from two models:

- The probability of receiving the benefit in the quarter given the beneficiary is in the current client liability cohort as at the valuation date; and

- The average benefit payments per client receiving benefit.

These models are then combined with the number of beneficiaries included under the current client liability definition to give the liability at each future quarter.

1.7.2 Future client liability: lifetime cost of benefits for future clients

Key benefits

The projected future numbers entering key benefits over the next five years are drawn from two sources:

- Those who have been on benefit previously but have been off benefit for between 1 and 10 years at the valuation date. Their numbers are estimated by using the transition models developed for the current client liability to project the numbers of these returning to benefits in the next five years;

- Those new to the system or returning after being off benefit for more than 10 years. Their numbers are estimated by considering the time series of numbers of these entrants over recent history and projecting.

Once the cohorts of numbers of clients on benefit for each future year are calculated, the liability is projected in the same manner as for the current client liability.

Other benefits and assistance

The future client liability for all other benefits and assistance may be estimated by applying the probability and average benefit payments models from Section 1.7.1 to the number of beneficiaries that form the future client liability. To estimate this number, two models were built, one each for:

- Those people entering the system for the very first time; and

- Those former clients who re-enter the system after a spell off benefits.

1.7.3 Net cost of loans

An estimate is required for the net cost of loans related to overpayments, fraud, benefit advances and recoverable assistance. Several models dealing with various subcomponents of the amounts loaned and the subsequent recoveries have been derived. They are described in detail in Section 4.6 and Section 27.

1.7.4 MSD expenses

Our model for future expenses assumes that total expenses, including income support administration and work focussed investments are **fixed in real terms**. They are proportionally allocated to:

- Beneficiaries in the current client liability;
- Beneficiaries in the future client liability; and
- Beneficiaries outside the scope of this report.

The expense components attributable to current and future client liabilities can then be calculated.

1.8 Reliances and limitations

In preparing this report we have relied on historical data and other quantitative information provided by MSD without audit or independent verification, though we have carried out internal consistency checks and some checks of the data against external sources for reasonableness in aggregate. Any material discrepancies in the data should be reported to us to enable us to consider whether this report should be amended accordingly.

There is an inherent limitation on the accuracy of liability estimates in this report caused by the fundamental uncertainty of attempting to predict the future. In our opinion, we have used techniques and assumptions which are appropriate, and the conclusions presented in this report are reasonable, given the information currently available. However, it should be recognised that the ultimate costs for the current and future client liability cohorts can be expected to differ, probably materially, from our estimates of those costs.

It's also worth noting that this is the first time that a formal actuarial valuation of the NZ Social Welfare liabilities has been carried out. The benefits and data are complex, and inevitably more uncertainty arises than if there was an existing valuation framework and projections requiring only incremental re-calibration. Over time as more valuations are carried out this aspect of uncertainty will reduce.

PART B

GENERAL

2 INTRODUCTION AND BACKGROUND

2.1 Introduction

The Welfare Working Group ("WWG") was established by Cabinet in April 2010. The arms-length group was asked to conduct a fundamental review of the welfare system and develop options to reduce long-term dependency with a focus on:

- improving work outcomes for sole parents and for people with disabilities and ill health;
- how welfare should be funded and any lessons from the insurance industry and ACC in managing forward liability; and
- whether the structure of the benefit system contributes to long-term dependency.

In August 2010, the WWG released an issues paper finding that the benefit system had failed to keep pace with changing expectations about paid work. The WWG also found that there are only weak signals about the value of investing early to prevent long-term benefit use, and that the economic and social costs of the current system are high and unsustainable.

The WWG presented a comprehensive set of 43 recommendations to the Government on 22 February 2011 in its report titled "Reducing Long-Term Benefit Dependency" (the "WWG Report"). At a high level, the WWG recommended a work-focused welfare system, with a cross-government emphasis on preventing the need for welfare use, with targets and accountability mechanisms to reduce future payments.

A key theme from the report is the recommendation to take a long term view:

"The welfare system needs to recognise the value of investing early to reduce the long-term social, economic and fiscal costs of welfare dependency. Adopting an actuarial approach to measuring the forward liability will therefore be an important feature of any reform." (from page 2 of the WWG Report)

Recommendation 31 of the WWG Report states that "the new work-focused welfare system should manage the performance of the system using a regularly estimated actuarial calculation of the forward liability".

In June 2011 Taylor Fry Consulting Actuaries ("Taylor Fry") was asked to provide advice to the Ministry of Social Development ("MSD") and The Treasury in relation to:

- the feasibility of adopting a long-term investment approach to achieving better employment, social and financial outcomes through the welfare system; and
- how an aggregate liability for future payments in the welfare context could be calculated.

That advice is contained in our "Feasibility report" titled "Actuarial advice of feasibility: A long-term approach to improving employment, social and financial outcomes from welfare benefits and services" dated 27 October 2011 and authored by Alan Greenfield.

The feasibility report found that an investment approach in the welfare context based on an actuarial valuation of lifetime costs for benefit recipients was novel, but feasible using best practice from social insurance and the insurance industry.

In November 2011, the Government announced reforms to the New Zealand welfare system staged over three years, and taking a long-term investment approach to getting people off welfare and into work. A description of the reforms can be found at:

http://www.msd.govt.nz/about-msd-and-our-work/newsroom/media-releases/2011/welfare-reform.html

Following the production of the Feasibility report, and the Government's announcement that it would move forward with the investment approach Taylor Fry was commissioned to undertake the first actuarial valuation of the NZ Social Welfare system. This report documents that valuation.

2.2 Purpose of the valuation

In the insurance context valuations of outstanding claims liabilities are required to ensure the financial solvency of the insurer or scheme. They are also carried out as a means of analysing the underlying cost of the insurance to inform the pricing and ongoing management of the portfolio.

In the context of the New Zealand benefit system there is no requirement to ensure solvency. However, the other applications noted above have relevance in the welfare context. In particular an actuarial valuation will bring a long-term perspective to the financial management of the benefit system by providing a detailed understanding of:

- The future cost of the system;
- The lifetime cost of segments in the system (e.g. those entering at age 16 and 17);
- The long-term financial effects of changes to the system, e.g.
  - Policy reform;
  - Operational changes;
  - Demographic changes; and
  - Economic changes; and
- Key drivers which affect the future costs of the system, e.g. duration on benefits, age, etc.

This detailed understanding can be used to bring a long-term perspective to managing the system, for example:

- Investment decisions (based on cost-benefit analyses) in relation to return to work measures for particular segments of the system can be carried out with an understanding of the long-term cost;
- Costings of policy reforms can consider the long-term financial impact;
- The valuation can inform an internal framework for accountability;

- Monitoring of actual experience to forecasts from the valuation can alert managers to first signs of changing costs and assist in developing appropriate responses;

Note that this first valuation of the benefit system in New Zealand (as at 30 June 2011) is a baseline valuation and makes no attempt to factor in future known reforms. Thus, future valuations will be able to estimate the impact of major reforms such as those beginning from August 2012.

2.3 Definition of liability

This valuation is, to our knowledge, the first time a full actuarial valuation of a social welfare system has been carried out. Given the similarity of social welfare to accident compensation insurance (i.e. income support for those unable to work) it seems natural to proceed in the same manner as an outstanding claims liability valuation for an accident compensation scheme. However, there is an important distinction between the two systems. The liability for outstanding claims in an insurance context is well defined, i.e. a liability arises out of the occurrence of an incident that will give rise to a claim and there is a contract between the insured and the insurer which defines the amounts to be paid.

In the case of the New Zealand benefit system, legislation sets the entitlements governments must provide to citizens in circumstances defined in the *Social Services Act* (e.g. single parents, invalids, unemployed etc.). However, there are no accepted rules or standards which define exactly what amounts should be considered a "liability" at a point in time. For example, does a liability arise at the point when someone first receives an unemployment benefit? Is there still a liability for that person once they have been off benefits for a week, a month, a year, 10 years? Does the liability include only payments made for the current spell of unemployment? Should it include lifetime benefit payments under other benefit types (e.g. invalid's benefit)?

Given the lack of an existing standard definition of liability, it has been necessary to define the concept in the context of social welfare. Several alternatives for the definition of liability have been discussed with MSD and The Treasury. The following dates on which a liability arises have been considered:

- Birth of a NZ citizen or immigration to NZ;
- Attainment of a minimum age for eligibility of welfare benefits (e.g. age 16);
- Receipt of a first benefit payment;
- Receipt of a benefit in the recent past (e.g. the last 12 months);
- Currently in receipt of a benefit (i.e. as at the effective date of the valuation).

We have also discussed and considered which costs to include in the liability:

- Benefit payments only for the current spell on welfare;
- Lifetime benefits only for the current benefit type;
- Lifetime benefits for all benefit types.

The definition of liability agreed in consultation with the Ministry and the Treasury that best captures the policy intent of the long-term investment approach is:

The estimated future lifetime costs of all benefit payments and associated expenses for working-age clients who received a benefit payment in the 12 months up to and including the effective date of the valuation.

One of the main purposes of the valuation is to provide information to MSD to allow investment decisions to prevent long-term benefit receipt. A definition encompassing lifetime costs on all benefits best reflects this objective.

The decision to estimate the liability for all clients in receipt of a benefit in the year prior to the valuation was a compromise between the obvious choice of those on benefits at the date of the valuation and dealing with problems related to such a choice including seasonal effects and the fact that clients who recently ceased benefits have a very high chance of returning to benefits within 12 months. This is discussed further in Section 4.2.2.

Also note that benefits payable to the youth (aged 16-17) such as the Independent Youth Benefit ("IYB") and Emergency Maintenance Allowance ("EMA") have been included within the definition of working-age. Understanding the transitions and lifetime costs of clients entering the benefit system at a very young age provides important insight into the management of their liabilities.

2.4 Scope of this valuation

2.4.1 "Current" & "future" liability

The definition of liability provided in Section 2.2 as applied to those clients who had received a benefit in the 12 months up to 30 June 2011 has been termed the "current client liability": the life-time cost of current clients. We have also carried out valuations of the additional liability under the same definition arising in each of the 5 years following the date of the valuation which we have termed "future client liability": the life-time cost of future clients. Thus we have:

Current client liability: the lifetime cost of current clients

The current client liability is comprised of all future lifetime costs of benefit payments and associated expenses for working-age clients who had received a benefit payment in the 12 months up to and including the effective date of the valuation.

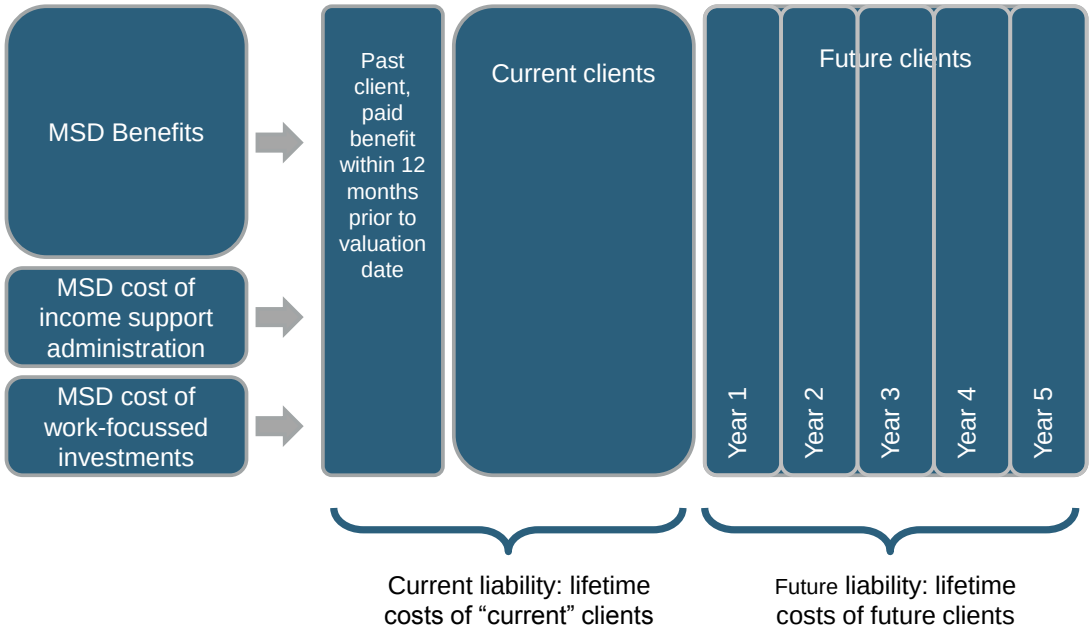
Future client liability: the lifetime cost of future clients

The future client liability is comprised of all future benefit payments and associated expenses for working-age clients who enter the benefit system in the next five years either:

- For the first time; or
- After being off benefit for more than 1 year at the valuation date.

These definitions are represented graphically below in Figure 2.1, which shows the types of costs on the left (benefit payments and MSD expenditure), and current client liability and additional future client liability across the diagram.

Figure 2.1 **Definition of liability**



2.4.2 Benefits in scope

The following benefit categories have been created for use in the valuation:

- Tier 1:
  - UB: Unemployment Benefit and related benefits, including Independent Youth Benefit;
  - IB: Invalid's Benefit;
  - SB: Sickness Benefit and related benefits;
  - DPB: Domestic Purposes Benefit – Sole parent and Emergency Maintenance Allowance;
  - DPB-CSI: Domestic Purposes Benefit – Care of Sick and Infirm;
  - EB: Emergency Benefit;
  - ORP: Unsupported Child and Orphan Benefit; and
  - WA/WB: Widow's Benefit and Domestic Purposes Benefit – Woman Alone.

- Tier 2:
  - AS: Accommodation Supplement and related assistance;
  - DA: Disability Allowance and related assistance;
  - CDA: Child Disability Allowance; and
  - CCS: Childcare Subsidy including OSCAR payments to clients.

- Tier 3:
  - EI: Employment Interventions such as training costs provided as supplementary assistance; and
  - HS: Non-recoverable Hardship Assistance, including Temporary Additional Support.

Note that most of these categories combine several benefit types from MSD's data. For example, UB combines all unemployment related benefits including Independent Youth Benefit, Unemployment Benefit Training and Unemployment Hardship benefits. Also note that benefits payable to the youth (aged 16-17) such as the Independent Youth Benefit ("IYB") and Emergency Maintenance Allowance ("EMA") have been included within scope. Understanding the transitions and lifetime costs of clients entering the benefit system at a very young age provides important insight into the management of their liabilities. The detailed listing of benefits included within each category can be found in the relevant Sections in Part D.

A complete listing of benefits within from scope can be found in Appendix D.

2.4.3 Benefits excluded from scope

Some benefits have been **excluded** from scope:

- All benefits payable to clients over the age of 65, including New Zealand Superannuation, Veterans' Pensions and supplementary assistance for clients over age 65;
- Student Loans and Allowances;
- Unemployment Benefit Student Hardship (see reasoning in Section 4.2.2)
- Some other benefits that fall outside of Vote Social Development, in particular Working for Families.

The rationale to exclude benefit payments over age 65 and student benefits principally reflects the purpose of the valuation as a tool to assist in achieving **employment** outcomes for current clients.

2.4.4 Net loans cost

There are a number of ways in which clients become indebted to MSD. For the purposes of this valuation all debts to MSD are termed "loans":

Loans arise for the following reasons:

- **Overpayments:** Where a client is paid more than their entitlement, on discovery this gives rise to an amount to be recovered by repayment or deductions from benefits;

- **Overpayments due to fraud:** Where there are overpayments and there is sufficient proof to refer clients for prosecution for fraud this gives rise to an amount to be recovered by repayment or deductions from benefits;

- **Benefit advances:** Where a client is advanced a benefit for reasons such as hardship, which is later recovered by deductions from benefits, or repayment if the client no longer receives benefits.

- **Recoverable assistance:** income-tested, interest-free recoverable financial assistance to clients and non-beneficiaries for defined needs.

In this valuation the various subcomponents relating to type of loan and recovery have been valued separately. The sections below detail the approach taken to each, noting that we have combined overpayments and fraud to form one category "overpayments" and combined benefit advances and recoverable assistance to form a second category "recoverable assistance".

For completeness we should also mention underpayments which occur when MSD pays less to a client than their entitlement. When this is discovered the client is paid in full. Underpayments are not valued separately as the data supplied has been corrected for all known past underpayments.

2.4.5 MSD Expenditure

The definition of liability given in Section 2.2 includes the phrase "costs of benefit payments and associated expenses". Consistent with liability valuations in insurance which include the costs of managing claims, the expenses of running the benefit system have been included in the estimated liability.

MSD expenses included within the scope of the valuation are those required to administer the benefits for working-age adults in the valuation, and to help clients prepare for and return to work. The scope agreed with the Ministry and the Treasury is detailed further in Section 28 and Appendix D. Expenditure has been analysed and categorised under the following headings.

- Income support administration
  - Benefit processing ("income" share of Tailored Sets of Services to Help People into Work or Achieve Independence appropriation)
  - Integrity services
  - Collections
  - Temporary measures (e.g. Canterbury earthquake)

- Work focussed investments
  - OSCAR (Out of School Care and Recreation subsidy to providers)
  - Training and employment support (includes Employment Assistance, Vocational Skills Training, Mainstream Supported Employment Programme, Youth Transition Services)
  - Work-focussed case management (includes "work" share of Tailored Sets of Services appropriation; e.g. Job Connect, employment coordinators, work brokerage)

Note that Tailored Sets of Services were apportioned by MSD between income support administration and work focussed investments on the basis of time survey data.

2.4.6 Inflation and discount basis

Under accounting and actuarial standards for insurance and accident compensation, liabilities must be estimated allowing for future inflation and the effect of investment

return (i.e. discounting the estimated future cash flows to allow for the "time value of money").

However, as there are no required standards for the valuation of social welfare benefits (see Section 2.5), several options were discussed. It was considered whether liabilities should be estimated:

- In dollar values as at the date of the valuation (i.e. ignoring the impacts of future inflation and investment return).
- In inflated and discounted values using assumptions that are:
  - Constant, i.e. that do not change over time, perhaps based on the long term average; OR
  - Variable based on The Treasury forecasts used by other agencies for the valuation of liabilities for Crown accounts.

It is considered important to estimate liabilities allowing for both future inflation and the time value of money so that investment decisions can be made on a like-for-like basis. E.g. An investment of $100 now to save $150 in 10 years' time would result in a different decision than an investment of $100 now to save $150 next year. Note that such a basis is required whether there is a fund of assets supporting the liability or not.

Hence, it was decided to estimate the liabilities in inflated and discounted values. The latter option using The Treasury forecasts for CPI inflation and Government interest rates was agreed on to be consistent with Crown accounts. Details of the assumptions used are provided in Section 5.

2.4.7 Tax basis: gross v net

Consideration was given as to whether liabilities should be estimated gross or net of tax. Based on advice from MSD and the Treasury liabilities have been estimated gross of tax to be consistent with Crown accounts. It should be noted that this reflects the liability from MSD's perspective, but over-states the liability from a whole-of-government perspective.

2.5 Compliance with actuarial and accounting standards

There are currently no accounting or actuarial professional standards strictly applicable to the valuation of social welfare liabilities. However, in general we carried out the valuation in accordance with standards applicable to the valuation of accident compensation liabilities.

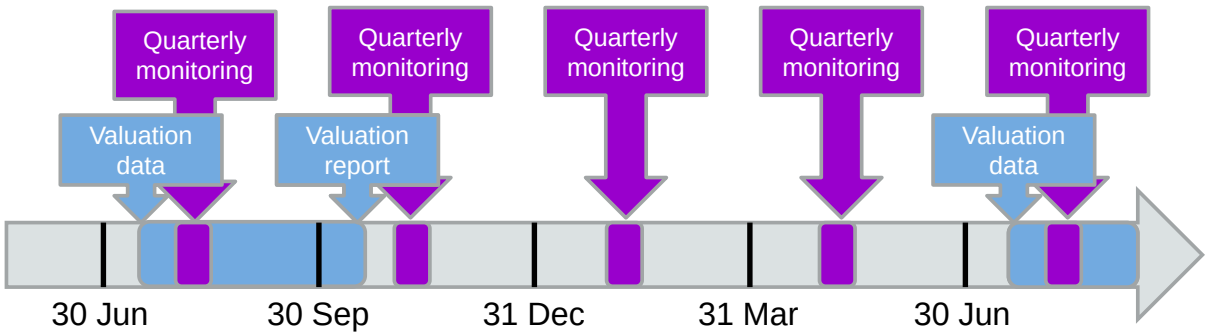
That is, we have complied generally with the New Zealand Society of Actuaries Professional Standard No. 41 entitled "Valuations of general insurance claims". We have also attempted to comply with International Financial Reporting Standards ("IFRS"). Specifically, estimates of liability incorporate an allowance for future inflation, investment return and administration expenses on a basis specified by the Standards.

However, we have not estimated nor incorporated a prudential margin as is sometimes required by such standards. In our opinion this seems unwarranted given the use to which the valuation will be put.

2.6 Valuation process and timing

This is the first time that a full actuarial valuation of the New Zealand social welfare system has been carried out. It has been proposed that valuations are undertaken on an annual basis as at each 30 June. In the year between valuations it is envisaged that quarterly monitoring of experience against forecasts arising from the previous valuation would also be carried out. Figure 2.2 shows the intended timetable for future valuations.

Figure 2.2 **Proposed valuation and monitoring timetable**



Note that this timetable is slightly amended from previous versions presented to MSD. In those previous versions quarterly monitoring was to be carried out immediately following the end of each quarter. The revised timetable shown above has a one month delay from the end of each quarter to allow sufficient time for all new benefit recipients to be entered into the system, and for data to mature (e.g. payment adjustments due to abatement against earned income). It has become apparent that this is necessary in our analysis for the first quarterly monitoring report which is currently underway.

2.7 Documentation

This report summarises our analysis and estimation of the liability, both current and future as at 30 June 2011. The report consists of the following parts.

PART A: Executive Summary

Section 1

PART B: General

Sections 2 to 5: Covering Scope, Data, Valuation Approach, Economic Assumptions.

Part C: Results

Sections 6 to 9: Presentation of summarised and more detailed results and comparisons.

Part D: Valuation by benefit type

Sections 10 to 28: Description and summary of all the models and forecasts by benefit type.

Part E: Reliances & Limitations

Section 29.

2.8 Glossary

The following tables give definitions for common acronyms and terms used in this report.

Table 2.1 **Acronyms for benefit types**

Term	Definition
AS	Accommodation supplement (and related assistance)
CCS	Childcare subsidy (including OSCAR payments to clients)
CDA	Child disability allowance
DA	Disability allowance (and related assistance)
DPB	Domestic purpose benefit – sole parent (including Emergency Maintenance Allowance)
DPB-CSI	Domestic purposes benefit – care of sick and infirm
EB	Emergency benefit
EI	Supplementary Assistance: Employment interventions (including training provided as supplementary assistance)
EMA	Emergency maintenance allowance (combined with DPB in this valuation)
HS	Non-recoverable hardship assistance
IB	Invalid's benefit
IYB	Independent youth benefit (combined with UB in this valuation)
NOB	Not on benefits (in a given calendar quarter)
ORP	Orphan and unsupported child benefits
OTH	Other benefit, referring to those clients not on a key benefit, includes supplementary assistance, but not including UBSH, CCS, EI and HS.

Term	Definition
SB	Sickness benefit
UBSH	Unemployment Benefit Student Hardship (excluded from scope)
UB	Unemployment benefit (and related benefits)
WA/WB	Domestic purposes benefit – women alone and widow's benefit

Table 2.2 **Terms used for "Loans"**

Term	Definition
Loans	Loans covers all cases where a client can become indebted to MSD, i.e. via overpayments of benefits or assistance (inadvertently or through fraud) or via recoverable assistance (including both benefit advances and other recoverable assistance).
Net loans cost	The liability for the cost of loans after allowance for recoveries
Overpayments	Payments (benefit or assistance) where a client is inadvertently paid more than their entitlement. In the valuation overpayments include those due to fraud.
Recoverable assistance	In this report recoverable assistance includes benefit advances and recoverable assistance.
Recoveries	Repayments of overpayments and recoverable assistance to MSD
Underpayments	Payments (benefit or assistance) where a client is inadvertently paid less than their entitlement. These do not appear in the valuation because payment data is automatically adjusted when an underpayment is discovered, and clients are repaid the amount of the underpayment.

Table 2.3 **Terms used for MSD expenses**

Term	Definition
Benefit processing	Expenses related to benefit processing, defined as the ("income" share of Tailored Sets of Services to Help People into Work or Achieve Independence appropriation)
Collections	Services to manage the collection of overpayments and recoverable assistance loans from former clients and other balances owed (for working-age benefits included in the scope of the valuation)
Income support administration	Expenses are analysed under two main categories, Income support administration is the category related to delivering benefits to clients
Integrity services	Services to minimise errors, fraud and abuse of the benefit system
OSCAR	Out of School Care and Recreation subsidy to providers
Temporary measures	Time-limited expenses, such as administering extra support due to the Canterbury earthquake
Training and employment support	Includes Employment Assistance, Vocational Skills Training, Mainstream Supported Employment Programme, and Youth Transition Services
Work focussed case management	Includes "work" share of Tailored Sets of Services appropriation; e.g. Job Connect, employment coordinators, work brokerage
Work focussed investments	Expenses are analysed under two main categories, Work focussed investments is the category related to helping clients prepare for and return to work.

Table 2.4 **Other common terms and acronyms used in report**

Term	Definition
ABP	Average benefit paid per quarter to clients in receipt of a benefit that quarter.
Key benefits	Refers to the four main benefits paid by MSD – DPB, IB, SB and UB

Term	Definition
Other benefits and assistance	Refers to all benefits and assistance valued in this report apart from the four key benefits. There are ten in all – EB, DPB-CSI, WA/WB, ORP, AS, DA, CCS, CDA, EI and HS
Qualifying recipient	A client recognized as part of the current client liability as having received a qualifying benefit in the 12 months up to the valuation date. With a small abuse of terminology, the term can also be applied to the future client liability, where it means those beneficiaries who are not currently qualifying but will receive a qualifying benefit in the near future.
Qualifying benefit	Benefit types for defining a client to be "in the system" and requiring valuation. This includes DPB, IB, SB, UB, EB, DPB-CSI, WA/WB, ORP, IYB, AS, DA and CDA. Notable exclusions are UBSH, CCS, EI and HS (in the absence of other benefits payable to the same client). Explanation of this is provided in section 4.2. The practical outcome of this definition is that the full future lifetime cost for CCS, EI and HS where there is an underlying Tier 1 or Tier 2 benefit / assistance are valued. However, where there is no underlying Tier 1 or Tier 2 benefit we have only valued the liability related to each of CCS, EI and HS. i.e. we have not valued any costs of other benefits (e.g. UB, DPB etc.) for those clients only one or more of these three types of benefits in the year prior to the valuation.
Relative exposure	This term is used on figures throughout the report. Depending on the context it refers to the number of beneficiaries (transition and payment model figures) or the number of potential beneficiaries (*other benefits and assistance* probability models)
System/benefit system	Refers to the NZ benefit system as administered by MSD. Implicitly applied only to those benefits within scope of the liability – i.e. the main benefits and supplementary/hardship assistance listed above.

3 DATA

3.1 Privacy

To protect the privacy of individuals, original social welfare numbers (SWN's) were not supplied in the datasets described below. The client identification numbers used for matching datasets were separately created by MSD. Other personal information such as names and addresses were not supplied.

3.2 Data supplied

SAS datasets

The following eight SAS datasets supplied by MSD were used to conduct the valuation:

1. **rate_period_31jul11.sas7bdat:** Rate file with one record per client and benefit **s**pell that contains:
   - Client identification number;
   - Benefit type code (plus codes for supplementary benefits);
   - Gross and net payment amounts for primary benefit;
   - Payment amounts for any supplementary benefits; and
   - Spell date start and end.

   The dataset covered spells from March 1993 through to 31 July 2011, past the 30 June valuation date;

2. **ahpy_lumpsum1_30jun11.sas7bdat:** Lump sum file which covers those payment types recorded on system in a lump sum fashion (single date, rather than spell start and end dates). Fields include:
   - Client identification number;
   - Benefit type code;
   - Gross and net payment amounts; and
   - Input and effect dates;

3. **ahpy_ccs_31jul11.sas7bdat:** Similar to the ahpy_lumpsum1 file, except specific to the child care subsidy benefit, which was not included on the original lump sum file;

4. **rate_cda_31jul11.sas7bdat:** Similar to the rate_period file, but specific to the child disability allowance benefit, which was not included on the original rate_period file;

5. **Spel1108.sas7bdat:** File with one row per spell per client, containing a variety of fields related to the spell. In particular, the "oldcomdt" field contained the first payment date for the spell, which was used to overwrite spell commencement dates before the 1993 system change;

6. **swn1108.sas7bdat:** File with one row per client, with a range of static variables. This dataset was used to determine date of birth for each client;

7. **swns_not_on_bdd.sas7bdat:** File with one row per client, containing client ID and date of birth for those not included in the swn1108 file; and

8. **chd1108.sas7bdat:** File containing one record for every "child spell" per spell per client. This effectively provides child records to attach to all benefit spells which depend on the age and number of children. Child date of birth is also included.

Alternate date datasets

Datasets covering spell and payment information can change with time as issues such as overpayment corrections, computer system corrections and other retrospective changes are made. As part of our assessment of the most appropriate data to use for the valuation we were also provided with the same datasets, but created at different dates:

- Main spell file: was provided for Jun-10, Sep-10, Dec-10, Feb-11, Jun-11, Sep-11 and Nov-11;
- Lump sum file: was provided for Sep-11, Nov-11;
- CDA rate file: was provided for Jun-11, Sep-11, Nov-11; and
- CCS lump sum file: was provide for Jun-11, Sep-11, Nov-11.

Loan data

Data on client loans in the form of recoverable assistance was provided in two csv files **Final_result_1_NEWID.csv** and **final_result_2_NEWID.csv.** Fields include:

- Client identification number;
- Debt number (a unique number for each debt);
- Breach type (Overpayment, Fraud, or Recoverable Assistance);
- Year and quarter;
- Debt established;
- Total recoverable for debt and quarter;
- Total adjustment for debt and quarter;
- Total write-off for debt and quarter.

There is an entry for every client who had a debt balance at 1 July 2007, plus one entry per client per change to their debt status (e.g. repayment made or debt issued) from 1 July 2007 to 30 June 2011. Pre-1 July 2007 data is not split by breach type.

The file **XdebtJun11prem+note_excludeNAP.xlsx** was also provided. It is a spreadsheet giving the outstanding provision for debts owed to MSD as at 30 June 2011. It contains one row per client, their aggregated debt plus a range of other static variables.

Benefit rates

Our analysis requires the conversion of historical payments to "current values". A series of pdf documents **BenefitRateSummary_1999-04-01.pdf**, **BenefitRateSummary_2000-04-01.pdf** etc. were provided showing all benefit rates whenever they were updated (typically

1 April, and occasionally 1 September, each year). A spreadsheet **Benefit Rates pre 1999.XLS** was provided with values applicable before 1999.

Historical and forecast economic variables

- **PREFU 2011 macroeconomic forecasts.xlsx**: Excel spreadsheet containing historical quarterly values as well as Treasury forecasts for the next 5 years for each of:
  - GDP (real and seasonally adjusted);
  - Headline Consumer Price Index (CPI), as well as CPI excluding tobacco;
  - Labour force – employed, unemployed, total, participation rate and unemployment rate (real and seasonally adjusted);
  - Average weekly ordinary time earnings; and
  - 90 day bank bill rate.

- **PREFU 2011 major working-age benefit generator.xlsx**: Excel spreadsheet containing 50 years of annual projections for:
  - GDP related variables;
  - Labour market variables, including the unemployment rate; and
  - Numbers and expenditure on selected welfare benefits.

- **disc-rates-mar12.xls**: Excel spreadsheet containing Treasury assumptions for government accounts for future discount and inflation rates for each quarter from June 2010 to Mar 2012.

Miscellaneous files

A number of other files were supplied that aided investigation and interpretation, but do not directly feed into the valuation:

- **revwt.sas7bdat**: SAS dataset key containing identifiers for codes related to reasons why people leave benefit;
- **benefit_codes.sas7bdat**: SAS dataset with identifiers for different benefit codes;
- **district_codes.sas7bdat**: SAS dataset identifying district codes and corresponding regions;
- **20111123 - BDD intro for Taylor Fry.PPT**: Slide presentation entitled "The Benefit Dynamics Data Set," describing some of the key data files;
- **bendyn.doc**: Document entitled "Benefit Dynamics Data Set documentation," containing a description of the BDD data files, dated February 2011;
- **Benefits 101#2.doc**: Document entitled "Benefits 101: An overview of social assistance benefits in New Zealand," giving a broad description of the social welfare system;
- **CSRE Combined Work Programmes for PIF March.doc**: Document containing brief descriptions of recent work programmes for beneficiaries.

Various other summary files, file descriptors and overviews were also provided on an ad hoc basis.

3.3 Investigations regarding reliability of data

The following checks and reconciliations were performed on the supplied data.

Checks on internal consistency of rate files

This included, amongst other checks:

- Checks that clients are on at most one spell at any time;
- Checks for duplicate spells and payments;
- Checks for presence and consistency in spell start and end dates;
- Checks that payment amounts are reasonable given the spell length;
- Checks that ratios between gross and net payment levels are plausible; and
- Checks for missing or clearly inappropriate entries in each field.

Consistency across provided files

This included, amongst other checks:

- Checks that client IDs matched properly across files and appeared consistent;
- Checks that payments went to appropriately aged clients (i.e. at least age 16);
- Checks on plausibility of child and parent ages, for child related benefits; and
- Checks on number of benefit days and payment amounts by benefit type for rate files provided at different snapshot dates.

Consistency with external sources

This included, amongst other checks:

- Comparison of aggregate payments provided compared to those in the report *Vote social development Forecasts of Demand Driven Crown Expenses for Budget Economic and Fiscal Update 2010*. Trends and patterns in the number of clients were also compared, although exact numbers did not match ours for definitional reasons;
- Checks that payment codes to benefit type keys were consistent with typical MSD groupings; and
- Checks that large movements in observed benefit rates or utilisation can be attributed to some event or MSD policy change.

Conclusions

Based on our checks and reviews we believe the datasets are sufficiently accurate, consistent and coherent and are satisfied that they appropriately represent benefit payments made by MSD. This conclusion is subject to the following limitations:

- There appears to be some evidence of retrospective changes to payment levels. MSD has confirmed that backdated benefit grants do exist and can change; for some benefit types, total payments can fall by about 1% compared to the earliest available dataset. This has led us to conclude that a one month lag should be allowed before using data for the liability valuation; this will allow most of the payment changes to

be made while not unduly delaying the valuation. This has some implications for future quarterly monitoring results;

- A small but non-trivial number of clients have start dates that do not reconcile between the provided spell and rate files. Responses from MSD suggest this is either a consequence of retrospective data amendments or the cleaning process applied to the spell data. Where this has occurred we have used the rate file start date. We do not believe this has a material impact on the valuation results.

Note that while we make significant efforts to check the quality of data used in our analysis, we do not take ultimate responsibility for the accuracy and completeness of the data. Section 29.2 also discusses our reliance on the data provided.

3.4 Data adjustments

No direct adjustments were needed for the provided datasets, although some allowance for retrospective payment changes may need to be made for future quarterly monitoring. However we note here, to prevent later confusion that some aspects of our approach may be different to that typically seen at MSD:

- Numbers on benefit per quarter in this report means the number who receive **any** benefit payment in a quarter, rather than number receiving at the end of a quarter;

- Some benefit type definitions have been broadened to include small payments that may sometimes be considered separately. For instance, the following payment types have all been classed under the Unemployment Benefit:
  - Unemployment Benefit Hardship;
  - Unemployment Benefit Hardship Training;
  - Unemployment Benefit Training;
  - Unemployment Benefit;
  - Independent Youth Benefit;
  - Young Job Seekers Allowance; and
  - 55+ BENEFIT.

  These groupings have been described in the sections related to individual benefit types (see Sections 10 to 25).

- All modelling of average benefits paid per quarter has been done in current (30 June 2011) values. This means older payments have been increased in line with historical CPI inflation. This is done so that attention can be concentrated on detecting shifts in payment levels apart from the standard CPI increase.

4 VALUATION APPROACH

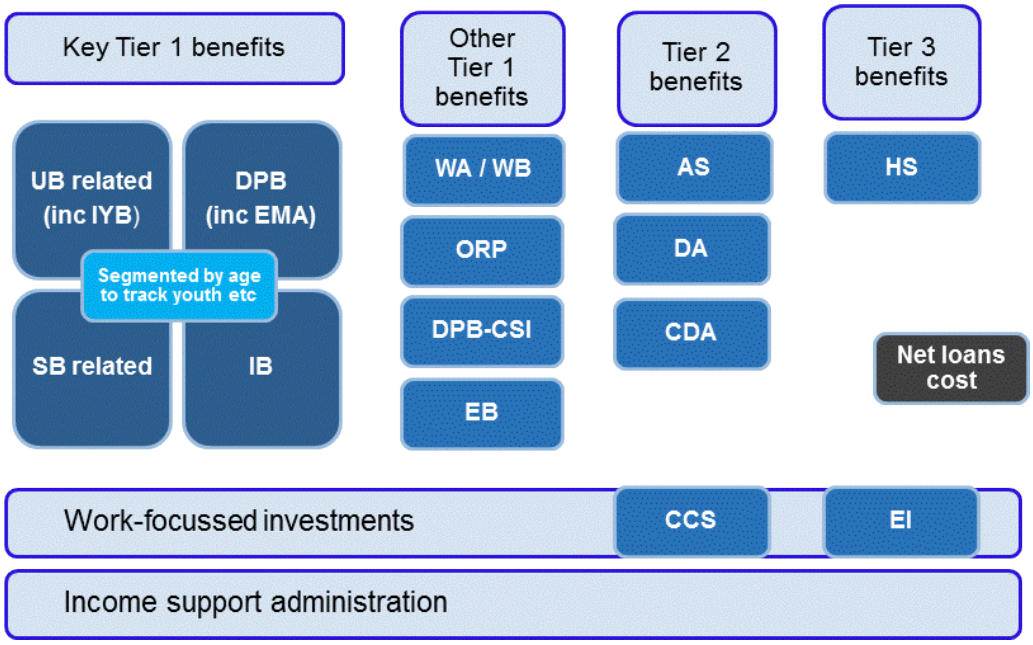
4.1 Structure of the valuation model: overview

In its broadest outline, the methodology for the estimation of the liability for future benefit payments consists of:

- Predicting the **future number of working-age clients** receiving benefits in all future quarters and **the payments** received by these clients, starting in the September 2011 quarter.
    - Note that in this report clients are restricted to those who have received a benefit in the last year or those who are expected to receive a benefit in the next five years**.**
- The payments are initially estimated in 30 June 2011 dollar values but are subsequently increased to allow for **inflation** from that date to the date of payment.
- The liability is estimated by:
    - Discounting these inflated claim payments to allow for **investment return;**
    - Adding components for loan recoveries and MSD expenses.

The liability is estimated separately for each of the various components which are shown in Figure 4.1.

Figure 4.1 **Overview of valuation structure**



Section 4.2 discusses the definition of the liability and some of its implications in further detail.

The key Tier 1 benefits (Unemployment Benefit, Domestic Purposes Benefit, Sickness Benefit and Invalid's Benefit) make up the bulk of the liability. Each benefit is modelled separately as described in Section 4.3 below. The remaining Tier 1 benefits are discussed in Section 4.5.

Accommodation and disability related Tier 2 payments that accompany the key Tier 1 benefits are modelled separately from those that do not, as described in Section 4.4.

Finally the modelling of all *"other benefits and assistance"* (i.e. the remainder of Tier 1, Tier 2 and Tier 3) is discussed in Section 4.5, net loans cost in Section 4.6 and expenses relating to MSD operations in Section 4.7.

4.2 Definition of the liability

Section 2.3 introduced the concept of the liability. This is divided into the following components:

- **Current client liability:** All future lifetime costs of benefit payments and associated expenses for working-age clients who received a benefit payment in the 12 months up to and including the effective date of the valuation; and

- **Future client liability years 1, 2, 3, 4 and 5:** All future benefit payments and associated expenses for working-age clients who enter the benefit system in the next five years either for the first time, or after being off benefit for more than 1 year.

4.2.1 Benefit groups

The liability has been calculated for the following benefit groups. Translation to specific groups of payment codes is provided in the individual sections relating to each:

- Tier 1 benefits include:
  - Unemployment Benefit (UB);
  - Invalid's Benefit (IB);
  - Sickness Benefit (SB);
  - Domestic Purposes Benefit – Sole parent (DPB);
  - Domestic Purposes Benefit – Care of Sick and Infirm (DPB-CSI);
  - Emergency Benefit (EB);
  - Unsupported Child and Orphan Benefit (ORP); and
  - Widow's Benefit (WB) and Domestic Purposes Benefit – Woman Alone (WA).

- Tier 2 benefits include:
  - Accommodation Supplement (AS);
  - Disability Allowance (DA);
  - Child Disability Allowance (CDA); and
  - Childcare Subsidy (CCS).

- Tier 3 benefits include:
  - Employment Interventions (EI); and
  - Hardship Assistance (HS).

4.2.2 Further discussion of the definition

Inclusion of recent recipients in current client liability

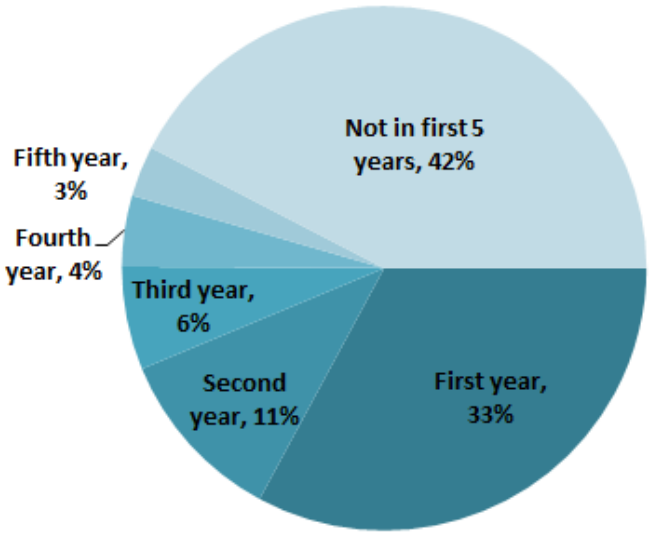
The current client liability includes those recipients who are currently receiving benefits as well as those who are not currently receiving but have received benefits sometime in the previous 12 months. We believe this choice is appropriate for the following reasons:

- **Reducing spell definition issues:** Defining those people on benefit at a specific point in time can cause complications. For instance, some benefits are provided in lump sum form so the spell duration is not obvious and some benefits can have small breaks in spells. These factors have the potential to bias the liability upwards or downwards;

- **Recently off benefit clients have a higher probability of returning to benefits:** We calculate that a former client has about a 33% chance of returning to a benefit within 12 months of leaving the system; see Figure 4.2. This high percentage means it is appropriate to still consider them at risk. By contrast, only 11% of clients resume on a benefit in their second year after leaving the system and 6% in their third; and

- **Reducing the potential for seasonal impacts:** The particular choice of the valuation date has relevance as there are many benefits that show seasonal effects, with differing numbers on various benefits on each quarter due to annual cycles in the economy. The 12 month rule helps mitigate this seasonality.

Figure 4.2 **Probability of returning to benefit by duration off benefit**



Working-age beneficiary assumption

The definition only includes those recipients of working-age; at least 16 and less than 65. We recognise that a small but not insignificant amount of benefits go to people beyond age 65, but have not valued this because:

- These payments are highly interrelated with New Zealand Superannuation, which is outside the scope of this valuation;
- MSD intends to manage the liability by achieving better employment outcomes amongst current recipients. This objective has less relevance amongst clients over age 65; and
- Limiting attention to ages below 65 significantly simplifies the analysis and reporting of the liability.

Also note that benefits payable to the youth (aged 16-17) such as the Independent Youth Benefit ("IYB") and Emergency Maintenance Allowance ("EMA") have been included within the definition of working-age. Understanding the transitions and lifetime costs of clients entering the benefit system at a very young age provides important insight into the management of their liabilities.

Treatment of partners

Some benefits depend on relationship status and there are cases where both partners are on benefit. In theory it would be possible to value couples as a unit as their future lifetime cost are likely to be dependent. However, in the valuation we have treated all clients individually which is unlikely to make a material difference.

Future benefits different to those currently received

The definition above includes benefits payable in the future of a different type to those currently being received. For instance, a person who is currently receiving Unemployment Benefit only may in the future receive Invalid's Benefit; these cash flows have been included. The purpose of incorporating all future cash flows regardless of benefit type is to provide a basis for understanding long term benefit dependency and to provide a framework for investment decisions to reduce such dependency.

We recognise that this property can cause a "gearing" effect in the valuation, in that distant liabilities that MSD may have little current control over are included or excluded from the liability depending on current circumstances. For instance, suppose it is expected that a person will come onto the Invalid's Benefit in 20 years' time:

- If the person has not been on a benefit during the last 12 months, these cash flows are excluded from the liability; however,
- If the person is currently or has been during the last 12 months on a different benefit (Unemployment Benefit say), these future cash flows are included.

Thus, helping an Unemployment Benefit recipient off benefits today would have a compound effect of removing both their Unemployment Benefit payments and other

benefits from the current client liability as measured at a future valuation one year from now, even if those later benefits will still occur.

Some alternative liability definitions exist that would not be subject to this effect. For example, the liability could be defined as payments until a client is off benefits for 12 months. While we recognise some advantages to alternative definitions, we believe the current one is to be preferred for the following reasons:

- **Clients who are "in the social welfare system" are more likely to make use of other benefits:** For instance, in the example above an Unemployment Benefit recipient is more likely to make use of the Invalid's Benefit in the future than someone who has never been in the system. Thus it is important to capture these effects to be able to manage long term dependency

- **Robustness:** The current definition is likely to be applicable under possible MSD policy and system changes, whereas this may be more difficult under more complex definitions;

- **Given the level of switching between benefits, it encourages a holistic view of client liability**: Under the current definition the key means of reducing the liability is to encourage people to leave the system entirely, rather than simply leaving their current benefit. We believe this most closely ties in with MSD's philosophy of encouraging long-term employment outcomes; and

- **Simplicity**: More complex definitions would be harder to communicate effectively and reconcile from year to year.

Decreasing size of future client liabilities

One feature readily apparent in the results is that there is a significant decrease in the size of the future client liability corresponding to each year. It would be wrong to conclude that this indicates a projected strong decrease in welfare use. Rather, this is a natural consequence of the definition. To understand why, observe that the clients that form the future client liabilities come from two groups:

- Those clients that are entering the system for the very first time; and

- Those clients who have had benefits in the past, but not in the twelve months prior to the valuation date.

The first group makes a relatively stable contribution to each year's future client liability. However the future client liability associated with the second group reduces progressively over time, for two reasons:

- The group of former clients who have been off benefits for more than 12 months is a fixed pool, so those beneficiaries counted in the first year's future client liability are excluded from subsequent years, decreasing the size of the pool and resulting in a natural decrease; and

- The longer a former client is off benefits, the less likely they are to re-enter the system. Thus this group of people are more likely to resume benefits in earlier future client liability years than in later years.

For this reason the quantum of the future client liabilities is not a good way of judging the overall trends in the welfare system; rather looking at the numbers of benefit recipients and level of payments when current and future client liability components are combined is a better gauge.

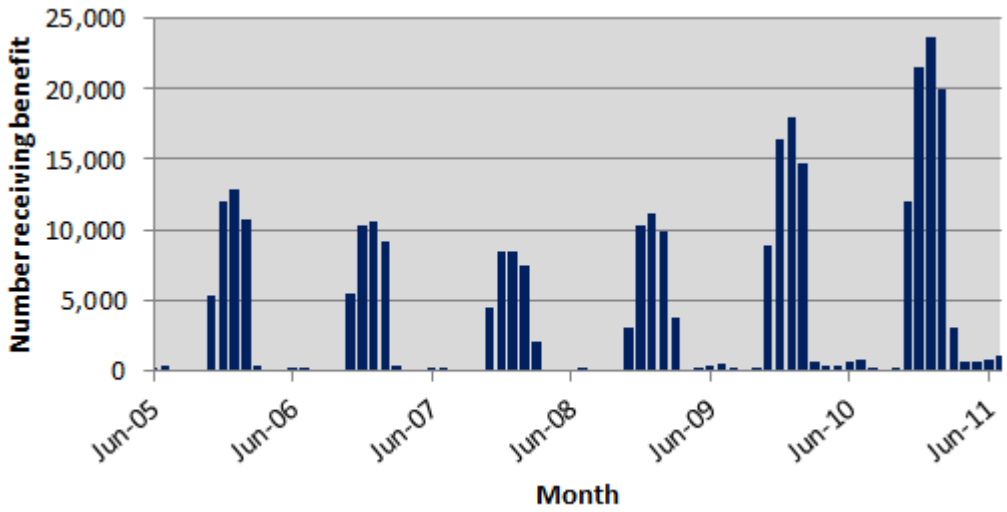
Exclusion of Unemployment Benefit – Student Hardship

It was judged that the Unemployment Benefit – Student Hardship was not an appropriate benefit type to include in the valuation for the following reasons:

- All other financial assistance provided to students is excluded;
- The benefit is highly seasonal - students only receive the benefit if they cannot find employment in the summer holidays. See Figure 4.3. This pattern is less amenable to management, as the concept of a long term beneficiary is not applicable; and
- The relationship between this benefit and other key benefits is fairly uncertain and has the possibility of skewing the main valuation transition models.

Therefore client spells on this benefit have been ignored, both in terms of projecting cash flows and determining qualifying clients to include in the cohort to be valued.

Figure 4.3 **Monthly numbers receiving Unemployment Benefit -** Student Hardship



Valuation of CCS, EI and HS components

The estimation of liabilities for Childcare Subsidy (CCS), Employment Interventions (EI) and Hardship Assistance (HS) was treated somewhat differently as it was considered that clients receiving these benefits should only be judged as being in the benefit system if they were also receiving another benefit. For CCS, there were three main reasons behind this decision, both theoretical and practical:

- (Theoretical) The receipt of CCS only is not a strong indicator of a greater chance of receiving the main benefits;

- (Practical) It is useful to separate those receiving CCS only from those receiving CCS in conjunction with another benefit. For example MSD might want to reduce overall benefits being paid by increasing the number receiving CCS; and

- (Practical) The data for CCS is in an ad hoc file with no spell information.

Similar points apply to the two (groups of) Tier 3 liabilities. Additionally, HS and EI benefits cover a range of payment codes whose relationship to the other Tier 1 and 2 benefits varies. For this reason it was judged simplest to exclude them from the definition of being in the system for the purpose of liability.

Thus, when estimating the CCS, HS and EI liabilities, each was split into two classes of clients for modelling and forecasting purposes:

- Qualifying clients, being those who were receiving some other Tier 1 or Tier 2 benefit in the previous 12 months; and

- Non-qualifying clients, being those who received the CCS, HS or EI benefit only sometime in the previous 12 months.

Each class had its own probability of receiving the benefit in a quarter model and average benefit payment model, meaning that four models, in total, were constructed for each of the three benefits. To be completely explicit the following table sets out the treatment of the different types of CCS, IE and HS future cash flows.

Table 4.1 **Treatment of future CCS/HS/EI payments with respect to the valuation**

CCS/EI/HS payment category	Valued?	Comment
Payments to qualifying beneficiaries (in current client liability due to another benefit)	Yes	Included in the current client liability
Payments to beneficiaries that are part of the future client liability due to receiving another benefit	Yes	Included in the future client liability
Payments to clients who have received CCS/HS/EI in the twelve months to 30-Jun-11, but not qualifying	Yes	Separate valuations outside the main current and future client liabilities. Does not include their possible payments under other benefit types.
Payments to clients not currently receiving any benefits and will only receive CCS/HS/EI in the future	No	

It can be seen from the results sections that items falling outside the current and future client liabilities are relatively minor. The results for CCS, EI and HS are discussed in Sections 23, 24 and 25 respectively.

4.3 Key Tier 1 Benefits

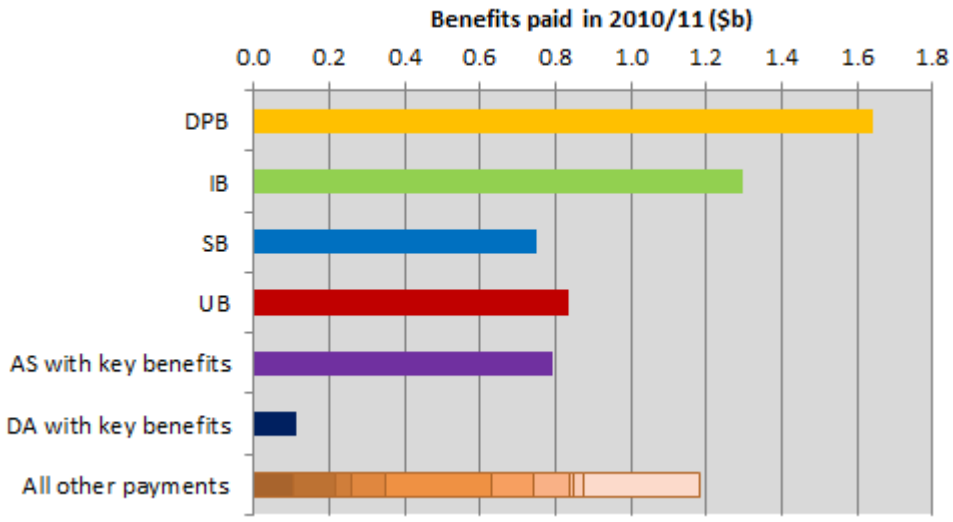
4.3.1 Overview of Key Tier 1 Methodology

The four key Tier 1 benefits are:

- Domestic Purposes Benefit (DPB);
- Invalid's Benefit (IB);
- Sickness Benefit (SB); and
- Unemployment Benefit (UB).

We have selected these as key benefits due to their relative size compared to all other benefits. Figure 4.4 shows the actual payments in 2010/11; nearly 70% of all payments go to these four benefit categories, and this number rises to over 80% once their corresponding Accommodation Supplement (AS) and Disability Allowance (DA) payments are included.

Figure 4.4 **Payments by benefit type in 2010/11**



Due to their relative importance, these key benefits (plus their associated AS and DA benefits) were modelled using a system wide view which enables a better understanding of lifetime patterns of benefit receipt, durations in the benefit system and benefit dependency. We track the number in each benefit via a state based quarterly transition model. All people in the benefits system may be viewed as being in one of 6 states in each quarter:

- In receipt of one of the four key Tier 1 benefits (**DPB**/**IB**/**SB**/**UB**);

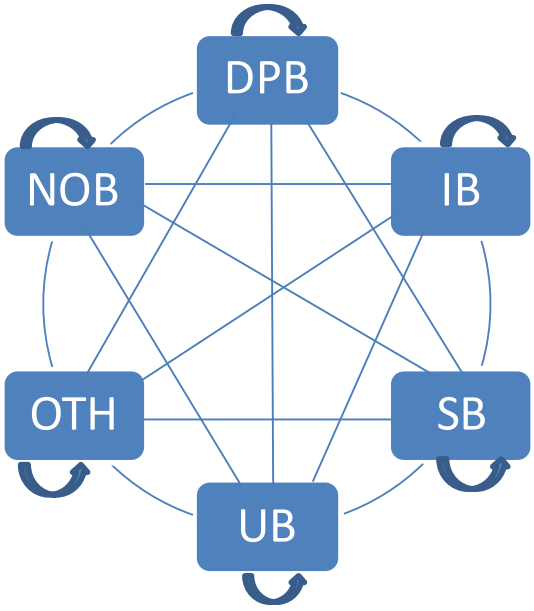
- In receipt of a qualifying benefit other than a key Tier 1 benefit (referred to as "**OTH**" below); or
- Not receiving a qualifying benefit (referred to as "**NOB**" below).

For each subsequent quarter we calculate the probabilities that a client moves from their current state to each of six possibilities, including remaining on the same benefit, based on their age and benefit history characteristics, represented diagrammatically in Figure 4.5. This gives a projection of future numbers in each state as clients move through the system. To derive the liability these numbers are combined with models of the average benefit payment for each benefit type. Thus, the forecast payments in a future quarter q are given by:

Forecast payments = forecast number on benefit xyz
x
average benefit payments for benefit type xyz

Note that, with some abuse of notation, in the rest of Section 4.3 we refer to OTH and NOB as benefit types.

Figure 4.5 **Transition probabilities**



4.3.2 Further Definitions for Key Tier 1 valuation

One assumption imposed by the key benefit transition model is that each client can be on just one benefit per quarter. This is clearly a simplifying assumption, because in reality:

- Unless someone transitions to a new benefit on the last day of the quarter, any transition would involve more than one actual state in the quarter; and
- There are quite often gaps in spells, meaning that NOB in conjunction with another benefit is common.

The key advantage of the assumption is that the sum of the number of clients in each state equals the number of clients being modelled, reducing difficulties related to double counting. The average benefit payment models are fitted to balance out the impact of multiple payment types in the one quarter.

Given the one state assumption, an obvious question is how that state is assigned when more than one is present in a quarter. We have chosen the following basis:

- If the client receives any DPB, IB, SB or UB, then assign to that state. If more than one of these is received, then allocate to the benefit that has the greater number of days in its spell during the quarter;
- Otherwise if the client receives any other qualifying benefit, assign to OTH; and
- Otherwise assign to NOB.

Three implications of this formulation are:

- The sum of numbers of clients in DPB, IB, SB and UB gives the number of people who receive any key benefit in a given quarter;
- The sum of numbers in DPB, IB, SB, UB and OTH gives the number of people who receive any qualifying benefit in a given quarter; and
- The numbers in NOB are genuinely those who receive no (qualifying) benefit. One further implication of this is that anyone who has been in the NOB state for all of the four quarters to 30 June 2011 is not part of the current client liability definition.

These properties, particularly the last, mean that the definition of benefit states aligns well with the definition of the liability.

4.3.3 Modelling the transition probabilities

The transition probabilities – 36 in total – are shown graphically in Figure 4.5. They include transitions between each of the four key Tier 1 benefits as well as between the OTH and NOB states.

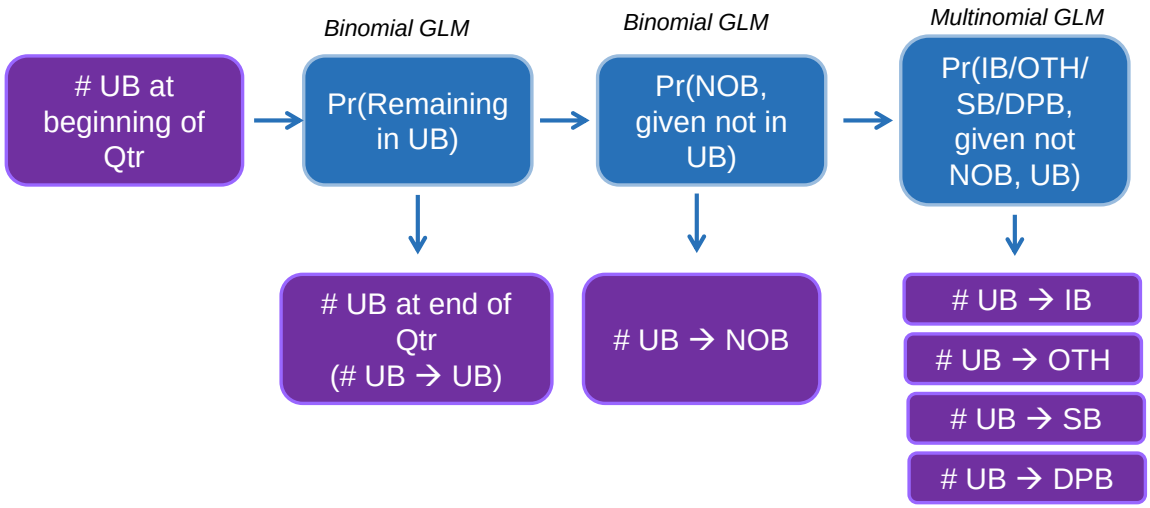
There are six possible transitions from any state for which probabilities must be estimated: 5 transitions to a different benefit type and one transition leading to no change. Rather than modelling each transition separately, the transitions have been split into three groups for modelling purposes:

- **Transition (TRA) model:** The probability of remaining in the same state rather than transitioning to a different state. A binomial generalised linear model ("GLM") is used;
- **Move to no benefit (NOB) model:** The probability of transitioning off any benefit (i.e. moving to the NOB state), conditional on the client changing benefit. A binomial GLM is used. Note also that the NOB benefit type does not have a NOB model as this is covered by the TRA model; and

- **Multivariate (MUL) model:** the probability of moving to the remaining states given that the client changes benefit and does not move to NOB. A multinomial logistic regression is used here. For all benefit types apart from NOB there are four possible states or transitions. For NOB, the MUL model has five end states (DPB, IB, SB, OTH and UB).

An illustration of these models being applied to the number of people starting in UB is shown in Figure 4.6.

Figure 4.6 **Transition models for key Tier 1**



The models depend on a number of variables including:

- Calendar quarter;
- Age of client;
- Duration of current benefit spell;
- Whether the client had previously received any other benefits (a binary flag for each state); and
- The unemployment rate (where appropriate).

The DPB TRA and NOB models also depend on the client's children due to the importance of children in receiving the benefit. Therefore, these models also include the number of children and the age of the youngest child as additional predictor variables. This inclusion requires a number of other child-related models:

- The distribution of the age of youngest child when a person first receives DPB;
- The distribution of the number of registered children when a person first received DPB;
- The probability that the youngest child linked to the beneficiary changes in a quarter;
- The distribution of the youngest child age, conditional on the youngest linked child changing; and
- The distribution of the number of linked children, conditional on the number in the previous quarter and whether a new youngest child is added.

The third model in the bullet list was modelled as a binomial GLM, fitted using the same variables as the other binomial models. For the remaining bullets, simpler distributions were estimated using recent history and a smaller number of relevant variables (particularly client age).

Note that additional detail on the use of child variables in DPB liability forecasting is given in Section 4.3.9.

4.3.4 Calculating transition probabilities from the models

Once all models have been constructed, the set of all transition probabilities (see Figure 4.5) must be calculated. Figure 4.6 gives an overview of how they may be constructed for UB. In general, the process is set out below.

Let:

- B_1_TRA be the probability that a beneficiary stays in benefit B_1;
- B_1_NOB be the probability that a beneficiary moves to NOB given that they do not stay in benefit B_1;
- B_1_MUL_B_2 be the probability that a beneficiary moves to benefit B_2 where B_2 is not equal to B_1 given that they move off benefit B_1 and do not move to NOB.

Then, letting $Pr(B_1 \rightarrow B_2)$ represent the probability that a beneficiary moves from benefit B_1 to benefit B_2, the various transition probabilities may be calculated as follows:

- $Pr(B_1 \rightarrow B_1) = B_1$_TRA;
- $Pr(B_1 \rightarrow$ NOB$) = (1-B_1$_TRA) x B_1_NOB;
- $Pr(B_1 \rightarrow B_2) = (1-B_1$_TRA) x $(1-B_1$_NOB) x B_1_MUL_B_2 where B_2 is not equal to B_1 or NOB.

Note that for B_1 = NOB, the transition probabilities are calculated a little differently due to the absence of the NOB model:

- Pr(NOB → NOB) = NOB_TRA;
- Pr(NOB → B_2) = (1-NOB_TRA) x NOB_MUL_B_2 where B_2 is not equal to NOB.

4.3.5 Retirements

Recall that the definition of the liability only includes payments to working-age recipients. The age of individual clients, in quarter years, is tracked throughout the projection and increased each quarter. This allows us to remove clients from the liability when they turn 65. Thus, when someone is aged 64.75, all transition probabilities other than the transition to retirement are set to zero, meaning that the probability of retiring is one. When a client is younger than 64.75, the probability of retiring from the system is zero.

Additionally, we have allowed for the change in the retirement age from 60 to 65 in the historical data modelling; to not do so would bias upwards the probability of moving to the NOB state in ages 60-65.

4.3.6 Average benefit payment models

For each of the key Tier 1 benefit types, a model was fitted to the average payments per beneficiary, taking account of the same variables as those listed in Section 4.3.3. In each case, a GLM was used with a Gamma (or variant) error structure and a log link. These models vary the predicted level of payment per quarter to allow for effects including:

- The varying probabilities of receiving a full quarter's benefit;
- Trends in the makeup of different benefit subtypes, for example single versus married, which can receive different weekly amounts; and
- The impact of policy changes on benefit rates and benefit utilisation.

4.3.7 Projection of current client liability

The projection cohort

The projection of the current client liability commences with the June 2011 current client liability cohort: this consists of those who have received a benefit in the previous 12 months. For each of the recipients, the following is recorded:

- Age (in quarter years) – 196 possible levels ranging from 16 to 64.75;
- Duration on current benefit – 196 possible levels;
- Flags indicating which benefits were received in the past – 6 flags for the 6 benefit types (DPB/IB/SB/UB/OTH/NOB), 2 possible values for each (yes or no);
- (DPB only) Number of children and age of youngest child – 30 possible levels; see Section 4.3.9 for more details.

For each future quarter, the transition probabilities are calculated and then applied to the cohort at the start of the quarter.

Simulated versus exact projection

A key choice in projection design was between calculating an exact liability and using a simulation approach:

- **Exact:** tracks every possible outcome for each client for every future quarter and its associated probability. This process has a heavy computational load due to the many possible outcomes;
- **Simulated:** follows each person through time, using the transition probabilities to simulate their path. This process is then repeated many times. This is also computationally intensive, though less so than the exact approach unless a very large number of simulations are run.

We believe that the exact approach is preferable for the valuation despite the computational burden for the following reasons:

- Simulations would lead to some uncertainty over what the true mean is, since the mean is approximated by averaging a number of random runs; and
- The exact approach gives better estimates for rarer events, such as estimating the number of clients who have been on a particular benefit for a very long time.

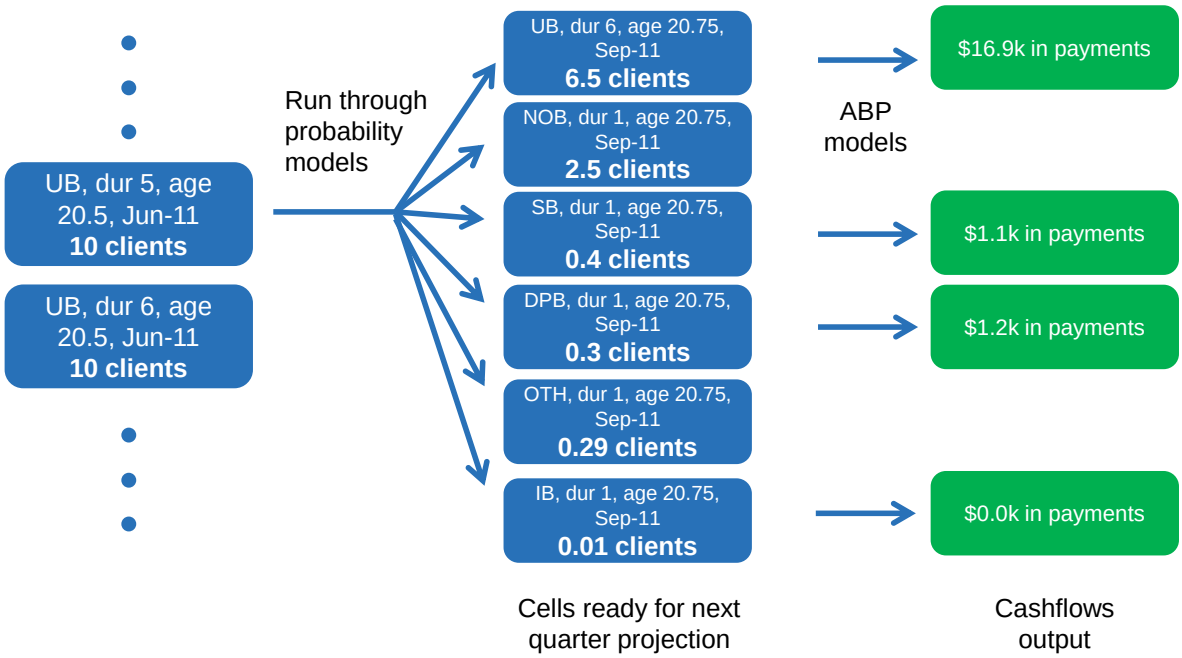
Following the exact approach means that, for example, one beneficiary at June 2011 gets apportioned over 6 different outcomes for the Sep 11 quarter with an estimated probability for each. Subsequently, dynamic variables such as age, duration and flags are updated before the projection is carried out for the next quarter.

Further details on computational aspects of the projection are included in the electronic appendices.

A detailed example

A worked example for some UB clients is given in Figure 4.7 and the subsequent description below. Note this example is for illustrative purposes only and the transition probabilities used in the example are not indicative of actual results.

Figure 4.7 **Illustration of projection process**



Suppose, as at the valuation date (30 June 2011), there are 10 clients aged 20.5, each in receipt of UB for the last 5 quarters. Furthermore, suppose that these clients have identical indicators of past benefit history – essentially this means that they have all received the same types of benefit in the past (for example they may all only have received UB and never spent time off benefit or they may all have had some spells off benefit in-between spells on UB). They correspond to the first box on the left-hand side of Figure 4.7 and may be projected as a single group.

Applying the probability models to project payments and numbers for the next quarter is as follows:

- Transition probabilities are applied to project the numbers entering the six possible benefit states:
  - With probability, Pr(UB →UB) = 0.65, they stay in UB. So 6.5 of the 10 clients stay in UB. Their age becomes 20.75 and duration on UB becomes 6;
  - With probability, Pr(UB →NOB) = 0.25, they transition off benefit (i.e. to NOB) in the September 11 quarter. So 2.5 of the 10 clients move off benefit. Their age becomes 20.75 and duration on NOB becomes 1;
  - With probability, Pr(UB →SB) = 0.04, they transition to SB in the September 11 quarter. Thus 0.4 of the 10 clients move to SB. Their age becomes 20.75 and duration on SB becomes 1;
  - With probability, Pr(UB →DPB) = 0.03, they transition to DPB in the September 11 quarter. Thus 0.3 of the 10 clients move to DPB. Their age becomes 20.75 and duration on DPB becomes 1;
  - With probability, Pr(UB →OTH) = 0.029, they transition to OTH in the September 11 quarter. Thus 0.29 of the 10 clients move to OTH. Their age becomes 20.75 and duration on OTH becomes 1; and
  - With probability, Pr(UB →IB) = 0.001, they transition to IB in the September 11 quarter. Thus 0.01 of the 10 clients move to IB. Their age becomes 20.75 and duration on IB becomes 1;

- The total number of beneficiaries across all possible outcomes at the end of September 2011 is 10, but is now spread over all six benefit states.

- For each of the key Tier 1 benefits (UB, DPB, SB and IB), the payments are projected from the average benefit payments ("ABP") models. Note there are no payments attached to the OTH and NOB states. The total payments in the September 2011 quarter is given by the product of the number of clients in each key Tier 1 benefit and the average benefit payment for a client aged 20.75 with duration 6 (UB) or duration 1 (DPB, SB, IB).

- For the December 11 quarter, the September 11 cohort is taken as the starting point.

The same projection process is used for all alternative combinations of client age, benefits, durations and history flags. Some additional steps are required for DPB due to the presence of child variables – see Section 4.3.9 for more details.

The total current client liability for key Tier 1 benefits in June 2011 dollar values is given by the sum, across all future quarters, of the payments for all clients. The inflated and discounted liability may be obtained by firstly applying benefit rate inflation and discount rates before summing across all payment quarters.

As indicated above, this process is computationally intensive. A discussion of the computational burden and steps taken to keep it manageable is given in the electronic appendices.

4.3.8 Projection of future client liability for key Tier 1 benefits

In principle, the future client liability projection works in the same manner as the current client liability, i.e.:

- Firstly, identify the cohort entering the benefits system for each quarter of the next five years (twenty quarters in total);
- Secondly, project the key Tier 1 benefit liability for each of these cohorts using the method outlined in Section 4.3.7 above.

The future client liability is defined as comprising those cohorts who receive benefits in the next five years who are either new to the system or have been off benefits for more than 12 months at the valuation date (Section 2.4.1). This cohort is modelled in two groups to better estimate their numbers and profile (age and benefit received):

- Those off benefit for between 1 year and 10 years at the time of the valuation; and
- Those new to the benefit system plus those who have been off benefits for more than 10 years.

The theoretical reason for this split is the observation that the profile of those who have received benefits at some point in recent years are different to the population profile of people who could enter the benefits system and therefore, are better considered separately. However, the longer a client spends off benefit, the more likely they are to be similar to the population profile of those who may enter the benefit system for the first time.

Thus, a pragmatic decision was made to consider those who last received a benefit more than 10 years ago as at the valuation date in the same way as clients who are completely new to the benefit system.

Each of these cohorts is considered separately. Related results are presented in Section 26.1.

Off benefits for more than 12 months, but not more than 10 years at the valuation date

This cohort consists of beneficiaries who have been off benefit for between one year and 10 years. In other words, as at June 2011, their benefit is NOB with duration (in quarters) between 5 and 40. The process to estimate the future client liability cohort for each quarter in the next five years is to:

- Project forward one quarter;
- Take the subset that transition from NOB to one of the other five benefits – this is the future client liability cohort for that quarter;
- Project those that stay on NOB for the second quarter;
- Again those that transition off NOB form the future client liability cohort for the second quarter; then

- Repeat this process for 20 quarters, yielding the cohort of those off benefits for at least 12 months at 30 June 2011 that are expected to resume benefits in the 5 years after the valuation date.

Once each of the 20 cohorts is estimated, their liability may be projected for all future quarters using the methodology outlined in Section 4.3.7.

A slight adjustment to the ABP estimate was needed in the quarter that people transitioned from NOB to a key benefit. This is because these clients receive only half a quarter's benefit on average, as they enter part way through the quarter. These factors were estimated empirically, by comparing ABP levels for those people entering benefits for the very first time, compared to ABP levels for those moving from one benefit to another.

New to the system / Off benefits for more than 10 years as at the valuation date

The estimation of the cohort of newcomers to the system (including those off benefits for more than 10 years as at the valuation date) proceeds as follows:

- A time series was constructed for each of the five benefit types (DPB, IB, SB, UB and OTH – NOB is excluded) of the number of newcomers to the benefit system for each quarter over the last 9 years. Newcomers were defined as those new to the system in that quarter or those who had previously been off benefits (i.e. NOB state) for more than 10 years;

- For each series, the next 20 quarters (5 years) from the valuation date were estimated taking the current levels of the series and recent trends into account. This yielded an initial estimate of the number of newcomers in each quarter;

- A correction is then made to the numbers for all future quarters bar the first to remove any double counting of future clients between the newcomers' cohort and those off benefit for between 1 and 10 years as at 30 June 2011;

- Finally the number of new clients is distributed over all ages from 16 to 64 based on the distribution over age of those first on benefit in the most recent two to three years.

Once each of the 20 cohorts is estimated, their liability may be projected for all future quarters using the methodology outlined in Section 4.3.7.

Total future client liability

This is obtained by summing the liability from those off benefits for more than twelve months and the newcomers. In practice the 20 cohorts are projected as five annual cohorts to give the liability for each of the next 5 years.

4.3.9 Incorporating children data variables for DPB recipients

Due to the nature of DPB, information on the recipient's children is important in predicting whether the recipient will stay on DPB or transition to another benefit type. Thus the TRA and NOB binomial models for DPB included the number of children and the age of the youngest child as variables.

The use of the children variables introduces a number of issues:

- People not currently on DPB do not necessarily have any child related information recorded;

- There will be changes to the children of a DPB beneficiary going forward in time (new children being born, children becoming older than 18 and therefore becoming independent, children living with a different carer etc.);

- Adding children variables greatly increases the computational burden of the projection.

Consequently, a number of pragmatic decisions have been made to deal with children, striking the balance between retaining useful information for modelling and projecting and keeping computation at manageable levels. These are:

- The two children variables used are **number of children** and **age of youngest child**. There are three possible values for number of children: 1, 2 or 3 and higher. The age of the youngest child is grouped into 9 two-year levels between ages 0 and 17.75 plus an additional band for those greater than 18;

- Children variables are only defined for DPB. When a beneficiary transitions off DPB, their children variables are not retained;

- When a group of clients transition onto DPB, they are apportioned to the various possibilities for number of children and the age of the youngest child, based on the historical distribution for clients of their age entering DPB. Note that this means that each person forecast to transition into DPB is potentially distributed over 30 children states (number of children [3 levels] times age of youngest child [10 levels]);

- Before projecting the TRA, NOB and MUL models for a DPB recipient, it is first necessary to forecast changes in the number of children and the age of the youngest child:
    - Estimate the probability of a new youngest child using the fitted probability model.
    - A proportion of each DPB client is then allocated to these two states – new youngest child or no new youngest child.
    - For those with a new youngest child, the new number of children and the age of the new youngest child are selected from historical distributions. The change in number of children depends on the age of the client, the current number of children and the age of the current youngest child. The age of the new youngest child depends on the beneficiary age;
    - Where there is no new youngest child, the age of the youngest child may still change – due to ageing. With age being banded in two year groups, it is assumed that in each quarter 1/8 of the youngest children move up to the next age band. Note, however, that those in the 18 and higher age band are not subject to this ageing assumption;
    - The TRA and NOB binomial models are then forecast using the updated children variables for TRA and NOB.

4.4 Tier 2 Benefits with Key Tier 1 Benefits

Both Accommodation Supplement (AS) and Disability Allowance (DA) may be present with a Key Tier 1 benefit (DPB, IB, SB and UB). In fact, this comprises the bulk of AS and DA payments; 75% of AS and nearly 90% of DA are attached to a key Tier 1 benefit. As such, these portions of AS and DA have been modelled in such a way that they may be projected as part of the main Key Tier 1 benefit projection. There are a number of benefits to this approach:

- It allows the benefits to be modelled more accurately as the amounts paid are highly correlated with the numbers of clients on key Tier 1 benefits; and
- It allows some subdivision of AS and DA (the largest Tier 2 benefits) according to the attached key Tier 1 benefit giving further insight into the nature of the liability.

The model structure for the AS and DA payment models was exactly the same as the key Tier 1 average benefit payments models, i.e. one AS and DA ABP model was constructed for each of the four key Tier 1 benefits.

The forecast AS and DA payments with key Tier 1 benefit are given by

Forecast number on key Tier 1 benefit type xyz
X
Average benefit for vw per client receiving xyz

where vw = AS or DA.

One possible variant on the above approach would be to include an additional model to forecast the proportion of key benefit recipients utilising AS and DA benefits. The ABP model could then be calculated purely on those recipients. This would have an advantage of tracking the numbers receiving these Tier 2 benefits in addition to the amount of payments. We decided that this advantage was relatively minor, considering the additional modelling involved.

4.5 Other Benefits and Assistance

4.5.1 Overview

All benefits and assistance other than the four key Tier 1 benefits (and their attached AS and DA payments) are modelled as independent payment streams. We collectively refer to these as "*other benefits and assistance*". These payments are listed below in Table 4.2.

Table 4.2 Other benefits

Tier 1	Tier 2	Tier 3
Carer Benefit (DPB-CSI)	Accommodation supplement (AS) without key Tier 1	Hardship (HS)
Widow/Woman alone (WB/WA)	Disability allowance (DA) without key Tier 1	Employment intervention (EI)
Orphan (ORP)	Child disability allowance (CDA)	
Emergency benefit (EB)	Child care subsidy (CCS)	

The liability for each of these benefits is estimated from two models:

- The probability of receiving the benefit in the quarter given the client is qualifying at the valuation date; and
- The average benefit payments (ABP) per client receiving benefit.

The liability at each future quarter is forecast as:

Number of beneficiaries qualifying under current client liability definition
X
Probability of receiving benefit type xyz in quarter
X
ABP for xyz per client receiving benefit

4.5.2 Construction of the probability models

The probability of receiving each type of benefit was calculated using the following predictors:

- Client age;
- Calendar quarter;
- Number of quarters since the client's first benefit (of any type); and
- Quarter client was judged qualifying ("pseudo-valuation date").

The last of these predictors warrants further explanation. The model projection is performed conditional on the fact that a client was in receipt of some benefit in the 12 months prior to the valuation date. To allow for this condition correctly, we pick earlier pseudo-valuation dates in the history then restrict attention to clients qualifying at that date and then model the probability that they receive the benefit after that date. Thus generating the modelling dataset involved:

- For each historical calendar quarter, calculating the number of clients receiving a qualifying benefit in the previous 12 months, subdivided by age and time since first benefit. Set this as the pseudo-valuation date; then
- For each quarter after the pseudo-valuation date, calculate the proportion of those clients who receive that benefit type.

4.5.3 Construction of the ABP models

The average benefit paid in a quarter was modelled by calculating the total paid divided by number of clients for each combination of:

- Client age;
- Calendar quarter; and
- Number of quarters since the client's first benefit.

In contrast to the probability model, it was found that conditioning on when a client was in receipt of a benefit had little impact on the ABP, so no pseudo-valuation date variable was required.

4.5.4 Child care subsidy and Tier 3 benefits

Section 4.2.2 discusses the need for the division of CCS, HS and EI projected benefits into subtypes due to the definition of the liability. Those benefits attributable to clients qualifying under the definition (because they receive another benefit type) are modelled exactly as described in the previous two sections. The portion of these payments not part of the main liability was valued on a similar basis, except that the probability model depended only on:

- Client age;
- Calendar quarter; and
- Number of quarters since pseudo-valuation date.

Thus time since first benefit and duration effects were largely ignored.

4.5.5 Future client liability

Using the equation in Section 4.5.1, the future client liability may be estimated by directly applying the probability and ABP models to the total number of beneficiaries who form part of the future client liability. However the numbers of newly qualifying clients must be forecast. Two models were built to forecast this, reflecting the two groups of newly qualifying clients:

- Those people entering the system for the very first time; and
- Those former clients who become qualifying after a spell off benefits.

The first of these models forecast the number of people entering the system for the first time. It was built on historical data, using the following predictor variables:

- The number of people entering in the previous quarter;
- The unemployment rate;
- The change in the unemployment rate from a year earlier; and
- Seasonality factors.

The second model estimated the probability of someone re-entering the benefit system. It too was based on historical data and had a structure very similar to the probability models discussed in Section 4.5.2. Additional scaling factors were estimated for the probability of receiving *other benefits and assistance* for those who reactivate. These were needed to

reflect the differing benefit dynamics; for instance, CDA tends to be a stable benefit, leading to fewer reactivations, while EB tends to be overrepresented in reactivations. These scaling factors were estimated based on the observed rates of reactivations in the year to June 2011.

Another slight adjustment made to reactivations was that the ABP estimate calculated for the quarter that a reactivation took place assumed a duration of one, so the ABP was comparable to that used for people entering the system for the first time. This adjustment was needed because people re-entering do not typically receive a full quarter of benefits, as most enter part way through the quarter.

These models and their results are discussed further in Section 27.

4.6 Net loans cost

There are a number of ways in which clients become indebted to MSD. For the purposes of this valuation all debts to MSD are termed "loans":

Loans arise for the following reasons:

- **Overpayments:** Where a client is paid more than their entitlement, on discovery this gives rise to an amount to be recovered by repayment or deductions from benefits;
- **Overpayments due to fraud:** Where there are overpayments and there is sufficient proof to refer clients for prosecution for fraud this gives rise to an amount to be recovered by repayment or deductions from benefits;
- **Benefit advances:** Where a client is advanced a benefit for reasons such as hardship, which is later recovered by deductions from benefits, or repayment if the client no longer receives benefits.
- **Recoverable assistance:** income-tested, interest-free recoverable financial assistance to clients and non-beneficiaries for defined needs.

In this valuation the various subcomponents relating to type of loan and recovery have been valued separately. The sections below detail the approach taken to each, noting that we have combined overpayments and fraud to form one category "overpayments" and combined benefit advances and recoverable assistance to form a second category "recoverable assistance".

For completeness we should also mention underpayments which occur when MSD pays less to a client than their entitlement. When this is discovered the client is paid in full. Underpayments are not valued separately as the data supplied has been corrected for all known past underpayments.

Results for all loan subcomponents are discussed in Section 27. Summary results in Section 7 present the combined total of all subcomponents as a "net loans cost".

4.6.1 Overpayments

The rate file data provided is net of the first two items listed in section 4.6 – overpayment and fraud are corrected when MSD is made aware of them. If recoveries were made immediately and in full then there would be no need to value these components as part of the liability. However,

- Not all overpayments and fraud debts are fully recovered; and
- It can take a number of quarters to collect amounts that are recovered. Since no interest is charged on these amounts, this lag represents a cost to MSD due to the time value of money.

For this reason we have constructed models for combined overpayments and fraud combined. These models involve:

- Estimating the level of overpayments/fraud as a percentage of total welfare payments;
- Estimating quarterly factors for the growth in total debts raised for clients who have nonzero outstanding debt. That is, modelling how raised debts can continue to increase;
- Estimating the proportion of outstanding debts that is either recovered or written off, given the number of quarters since the original debt was raised; and
- Estimating the allocation of this last amount to recoveries and write-offs.

These models can then be applied to both the outstanding balances at the valuation and the projected future welfare payments, giving four distinct components related to overpayments and fraud:

- Further overpayments/fraud on existing debtors;
- Recoveries on overpayments/fraud on existing debtors;
- Overpayments/fraud related to future payments on new debtors; and
- Recoveries on overpayments/fraud related to future payments on new debtors.

4.6.2 Recoverable assistance

As noted above we have used the term “recoverable assistance” to include all types of benefits and assistance that are recoverable (excluding overpayments and fraud). Thus recoverable assistance includes both benefit advances and recoverable Special Needs Grants (SNGs), as well as a few very minor related payments. In the provided data the payments related to recoverable assistance are included under specific benefit codes, and recoveries are included in the loan datasets. As with overpayments/fraud, the costs associated with recoverable assistance relate to the non-recoverability of some assistance as well as any associated time lags.

The following methodology has been used for recoverable assistance:

- The payments have been estimated in the same fashion as the *other benefits and assistance*; and
- The recoveries have been estimated as a simple percentage of recoverable assistance payments.

The amount of recoveries related to recoverable assistance has been relatively stable over the past few years when compared to recoverable assistance payments. For this reason we believe that a simple percentage adjustment to the liability for loan recoveries is appropriate. This is discussed further in Section 27.

4.6.3 Limitations to the loans methodology

Although we believe our valuation of the net loans cost is a plausible forecast of future cash flows, there are a number of significant limitations to the approach:

- Consider that the amount of fraud and overpayments recovered is comprised of the following 3 components:
  - The total amount of fraud and overpayments and as a percentage of total benefit payments in the system;
  - The percentage of total fraud and overpayments detected; and
  - The percentage of detected fraud and overpayments recovered.

- The valuation provides an assessment of the last component listed but neither of first two. In our opinion, the first two items are at least as important if not more so than the last. Hence, for complete financial control of the fraud and overpayments in the system an expanded framework compared to what is possible within this valuation is required. Also note that caution needs to be exercised when using results from the valuation in relation to this component. Without knowing whether the total amount of fraud and overpayments in the system is stable it would be difficult to draw definitive conclusions about performance in recoveries. For example, reduced recoveries may not be indicative of deteriorating performance in detection but a sign of an overall reduction in fraud and overpayments.

- Data for debts raised prior to June 2007 are not available. This makes modelling the behaviour of "old" debts very difficult – the extrapolations carry extra uncertainty. Furthermore, outstanding debts raised before this date are not classified according to overpayment/fraud/recoverable assistance, so this split must be approximated;

- There was some uncertainty as to whether the main rate files were net of loan adjustments (e.g. when it is realised that an overpayment was actually correct). Adjustments represent about 7% of total recoveries;

- A small proportion (about 9%) of both existing and new debts relate to clients outside the scope of the valuation, i.e. to clients over age 65. Removal of these debts would be difficult due to the format of the data. In any case, the overall impact of their inclusion is negligible in the context of the valuation; and

- The assumption that Recoverable Assistance recoveries are a straight proportion of corresponding payments assumes the dynamics of this loan type are stable. For instance, it ignores the amount of Recoverable Assistance debt outstanding at any given point in time, even though changes in this could well impact the size of recoveries.

We believe a more detailed analysis of loans is possible that better captures the dynamics of loans and recoveries, as well as giving some insight into the total level of overpayments

and fraud, not just the detected level. However, such an analysis is beyond the scope of the current valuation.

4.7 MSD Expenses

MSD incurs expenses in delivering benefits, services and programmes in addition to the cost of the benefit payments. These can be broadly categorised into:

- Administration costs, such as costs related to processing benefits for working-age adults; and
- Programme costs, such as those services provided to help clients prepare for, and return to work, which prevent or reduce the duration of benefit receipt.

These costs, to the extent they are attributable to the current and future client liability cohorts, are added to the liability estimates. The detailed scope of expenses included within the valuation can be found in Appendix D.

Unlike demand-driven benefit receipt, the level of expenditure is determined each year through the budget process, and tends to remain relatively stable. Annual expenses as well as 2011/12 budget expenses have been provided to us. Our methodology for determining the liability for administration and programs is:

- To assume the total expense costs are **fixed in real terms**;
- Allocate expense costs to either current client liability, future client liability, or clients outside the scope of this valuation; then
- Proportionally allocate these expenses into the various categories listed below.

The categories used for allocation of expenses are:

- Income support administration
  - Benefit processing ("income" share of Tailored Sets of Services to Help People into Work or Achieve Independence appropriation)
  - Integrity services
  - Collections
  - Temporary measures (e.g. Canterbury earthquake)

- Work focussed investments
    - OSCAR (Out of School Care and Recreation subsidy to providers)
    - Training and employment support (includes Employment Assistance, Vocational Skills Training, Mainstream Supported Employment Programme, Youth Transition Services)
    - Work-focussed case management (includes "work" share of Tailored Sets of Services appropriation; e.g. Job Connect, employment coordinators, work brokerage)

Note that Tailored Sets of Services were apportioned by MSD between income support administration and work focussed investments on the basis of time survey data. Results for expenses are discussed in Section 28.

5 ECONOMIC ASSUMPTIONS

5.1 Introduction

Section 2.4.6 discussed that the liabilities estimated in this report are on an inflated and discounted basis. Furthermore many of the models described in Section 4 use the level of unemployment as a predictor. Therefore the following economic assumptions are required:

- Future inflation rates;
- Future discount rates (also referred to as rates of investment return); and
- Unemployment rates (as published by Statistics New Zealand in its Household Labour Force Survey).

In order to ensure consistency across valuations reported to the Crown, Treasury releases account assumptions for CPI and discount rates. As agreed with MSD and the Treasury these rates as applicable at 30 June 2011 are used here. Projected unemployment rates have also been provided by Treasury.

Quarterly series of adopted assumptions are included in Appendix A.

5.2 Future benefit (CPI) inflation

The future assumptions for CPI inflation are given in Table 5.1.

Table 5.1 **Future benefit (CPI) inflation**

Year ending 31 March	CPI
	%
2012	3.0
2013 & later	2.5

CPI adjustments to benefit rates are usually made annually on the first of April each year. We have allowed for CPI inflation adjustments on this annual basis.

5.3 Future rates of investment return

Treasury has supplied a schedule of future rates of investment return to be used for discounting liabilities as at 30 June 2011. These are detailed in Table 5.2.

Table 5.2 **Rates of investment return assumed**

Year ending 30 June	Years from valuation date	Forward rate at June	Spot (discount) rate
		%	%
2012	1	2.84	2.84%
2013	2	3.81	3.33%
2014	3	4.65	3.77%
2015	4	5.28	4.14%
2016	5	5.71	4.45%
2017	6	6.00	4.71%
2018	7	6.18	4.92%
2019	8	6.24	5.08%
2020	9	6.24	5.21%
2021	10	6.24	5.32%
2022	11	6.24	5.40%
2023	12	6.24	5.47%
2024	13	6.21	5.53%
2025	14	6.16	5.57%
2026	15	6.11	5.61%
2027	16	6.07	5.64%
2028	17	6.02	5.66%
2029	18	6.00	5.68%
2030	19	6.00	5.69%
2031	20	6.00	5.71%
2032 & later	21	6.00	

5.4 Future real rates of investment return

The estimate of the outstanding claims liability is sensitive to the differences between rates of claims inflation and investment return assumed, rather than to either one of these sets of assumed rates alone. These differences may be referred to as the "gap" or real rates of investment return and are recorded in Table 5.3.

It is important to estimate liabilities allowing for both future inflation and the time value of money so that investment decisions can be made on a like-for-like basis. E.g. An investment of $100 now to save $150 in 10 years' time would result in a different decision than an investment of $100 now to save $150 next year. Note that such a basis is required whether there is a fund of assets supporting the liability or not

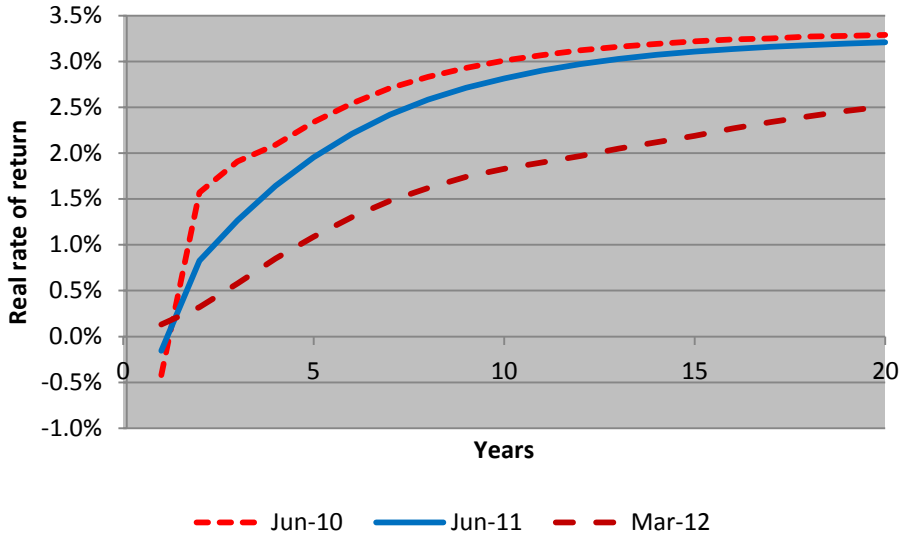
Table 5.3 **Real rates of investment return assumed**

Year ending 30 June	Years from valuation date	Real rate of return
		%
2012	1	-0.31
2013	2	0.65
2014	3	1.11
2015	4	1.51
2016	5	1.84
2017	6	2.12
2018	7	2.34
2019	8	2.53
2020	9	2.67
2021	10	2.78
2022	11	2.87
2023	12	2.94
2024	13	3.01
2025	14	3.06
2026	15	3.09
2027	16	3.13
2028	17	3.15
2029	18	3.17
2030	19	3.19
2031	20	3.20

Note: Real rate of return is defined as the assumed rate of investment return minus benefit rate inflation. Note that the discount rates are for years ending 30 June whereas the assumed inflation rates are for years ending in 31 March.

The real rates of investment return at June 2011 were marginally lower than the equivalent rates at 30 June 2010. However, note that in the year since June 2011, the real rates have fallen substantially due to the turbulent global economic conditions. Figure 5.1 shows the real rates of return at June 2010, June 2011 and March 2012 based on the assumptions provided by Treasury.

Figure 5.1 **Real rates of return**



5.5 Future unemployment rate assumptions

Future unemployment rate assumptions were provided by Treasury and are given in Table 5.4.

Table 5.4 **Future unemployment rate assumptions**

Projection at June	Unemployment rate
	%
2011	6.50
2012	5.60
2013	5.09
2014	4.88
2015	4.68
2016	4.69
2017	4.54
2018 & later	4.50

PART C

RESULTS

6 COMPARISON OF ACTUAL AND FORECAST EXPERIENCE

It is standard practice to compare the results from one actuarial valuation with the previous. However, as this is the first full actuarial valuation of the NZ Benefit system such a comparison is not possible on this occasion.

Once a valuation is in place this section will outline and discuss the benefit system experience in the year since the previous valuation compared to the forecasts from that valuation. The comparison would include an examination of differences between experience and forecasts and a discussion of new or emerging trends.

Such comparisons are a very important part of the proposed framework for monitoring the benefit system as they provide an indication of change in the system and new trends potentially highlighting areas that need further examination and consideration by management.

7 RESULTS

7.1 Estimate of current client liability as at 30 June 2011

The inflated and discounted estimate of the current client liability is **$78.1b**. By inflated and discounted we mean that this is sum of the projected future payments, including CPI increases to benefit rates, and discounted at Treasury rates to allow for the time value of money. This can be thought of as the amount needed to be set aside today to pay for all payments attributable to the current cohort of clients, assuming that amount would earn interest according to Treasury's discount rate schedule.

This liability can be subdivided into payments by benefit type. This is shown in Table 7.1, Figure 7.1 and Figure 7.2.

Table 7.1 **Current client liability subdivided by benefit type**

Component		Inflated and discounted liability ($b)
Tier 1:	Domestic Purposes Benefit	17.78
	Invalid's Benefit	19.05
	Sickness Benefit	7.22
	Unemployment Benefit	4.04
	DPB-Care of the sick and infirm	1.78
	Emergency Benefit	0.32
	Orphans and unsupported children	2.06
	Woman Alone / Widows Benefit	0.94
	Tier 1 subtotal	**53.20**
Tier 2:	Accommodation Supplement	10.21
	Disability Allowance	1.87
	Child Disability Allowance	0.82
	Child Care Subsidy	0.74
	Tier 2 subtotal	**13.64**
Tier 3:	Employment Interventions	0.20
	Hardship payments	3.79
	Tier 3 subtotal	**3.99**
Other components:	MSD Expenses	6.82
	Net loans cost	0.45
	Other components subtotal	**7.26**
	Grand total	**78.10**

Figure 7.1 **Current client liability by benefit type: amount**

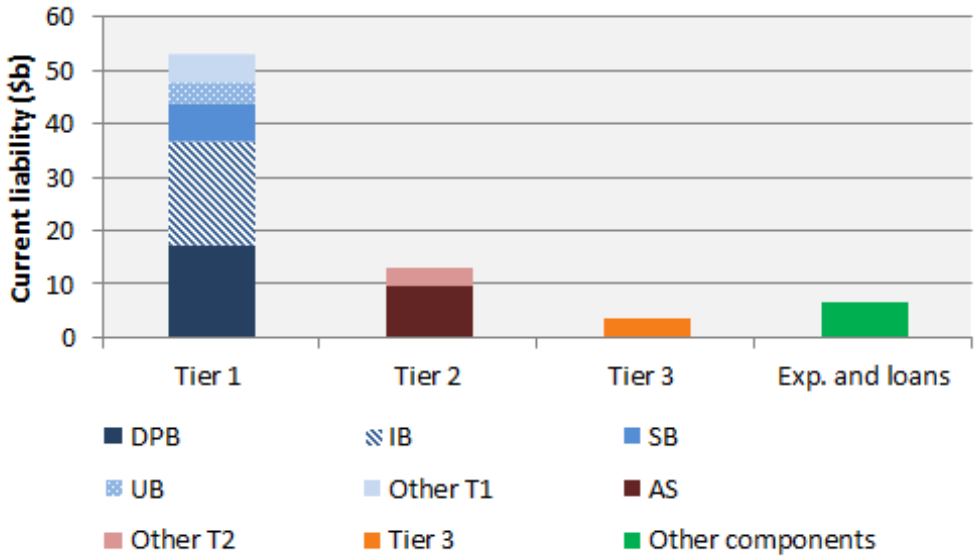
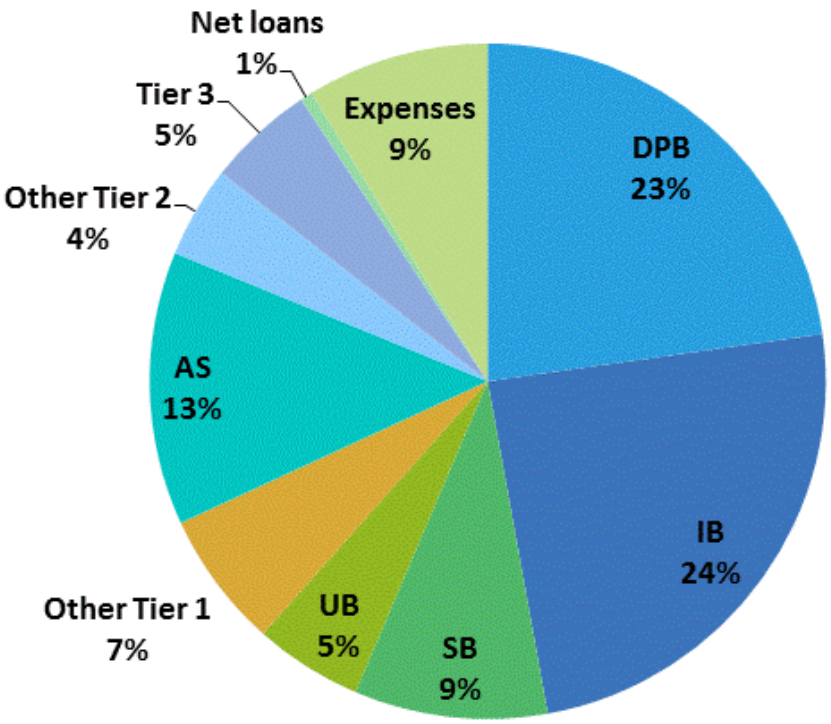


Figure 7.2 **Current client liability by benefit type: proportion**



We make the following comments regarding these benefit type results:

- The average duration on benefit has a large impact on the liability. For instance, in 2010/11 UB payment amounts were 65% of IB payments, yet the IB liability is nearly five times UB. This is because current clients are likely to move off UB much more quickly in the future compared to IB clients; and

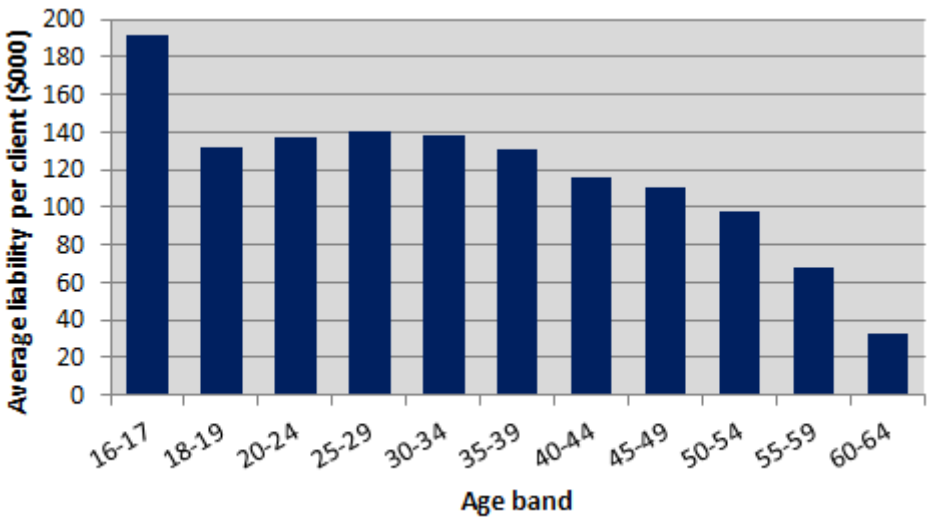
- As reflected in the modelling structure, the key four benefits plus their associated Accommodation Supplement payments make up the bulk of the liability, roughly three quarters;

The liability can also be broken down by current age (as at 30 June 2011) of client. This is shown in Table 7.2. By dividing by the number of clients in each band, it is also possible to determine the average liability per client within each band. This is shown in Figure 7.3.

Table 7.2 **Current client liability by client age at 30 June 2011 (in $b)**

Age band	Tier 1					Tier 2		Tier 3	Other compon-ents	Total
	DPB	IB	SB	UB	Other T1	AS	Other T2			
16-17	0.2	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.8
18-19	1.4	0.7	0.3	0.3	0.1	0.6	0.1	0.2	0.4	4.1
20-24	4.6	2.1	1.0	0.8	0.5	2.0	0.6	0.6	1.3	13.5
25-29	3.6	2.0	0.9	0.6	0.5	1.7	0.6	0.5	1.1	11.5
30-34	2.8	2.0	0.9	0.5	0.6	1.5	0.5	0.6	1.0	10.5
35-39	2.2	2.4	1.0	0.5	0.8	1.4	0.5	0.6	1.0	10.2
40-44	1.5	2.6	0.9	0.4	0.8	1.1	0.4	0.6	0.9	9.1
45-49	0.9	2.6	0.9	0.4	0.7	0.8	0.3	0.4	0.7	7.7
50-54	0.3	2.2	0.7	0.3	0.5	0.5	0.2	0.3	0.5	5.6
55-59	0.1	1.4	0.4	0.2	0.4	0.3	0.1	0.1	0.3	3.3
60-64	0.0	0.7	0.2	0.1	0.2	0.1	0.1	0.0	0.1	1.6
Total	**17.8**	**19.1**	**7.2**	**4.0**	**5.1**	**10.2**	**3.4**	**4.0**	**7.3**	**78.1**

Figure 7.3 **Average liability per client by age at 30 June 2011**



The trends shown in the chart are interesting. Firstly the cohort under age 18 has significantly higher average liability, suggesting they are at high risk of remaining on benefits for an extended period. This difference compared to other ages arises in part due to different eligibility criteria for benefit receipt. i.e. Those under age 18 also need to show

circumstances such as a severe and permanent disability, illness or injury; teen parenthood, or the loss of support from their family.

In contrast, the liability per client is relatively stable across ages 18 to 39. For those 40 and above the average liability starts decreasing, as would be expected due to the decrease in future years to age 65 that are counted towards the liability.

Figure 7.4 **Projected annual cash flows (undiscounted) attributed to the current client liability**

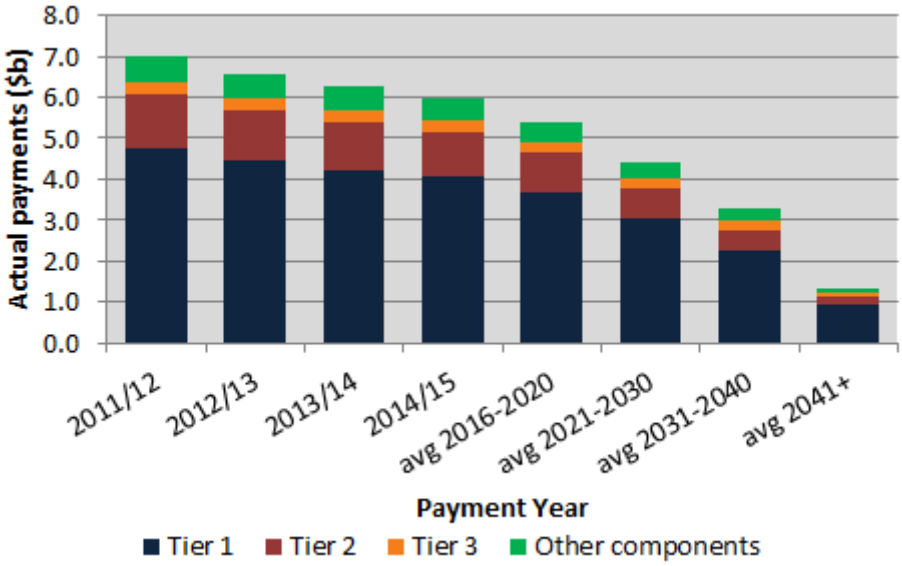


Figure 7.4 shows the evolution of benefit payments in the current client liability over time. Its downward trend is a combination of:

- Current clients moving off benefits due to retirement (age 65);
- Current clients moving off benefits due to reasons other than retirement (including finding work); and
- A slightly offsetting increase due to the increase in benefit rates due to inflation.

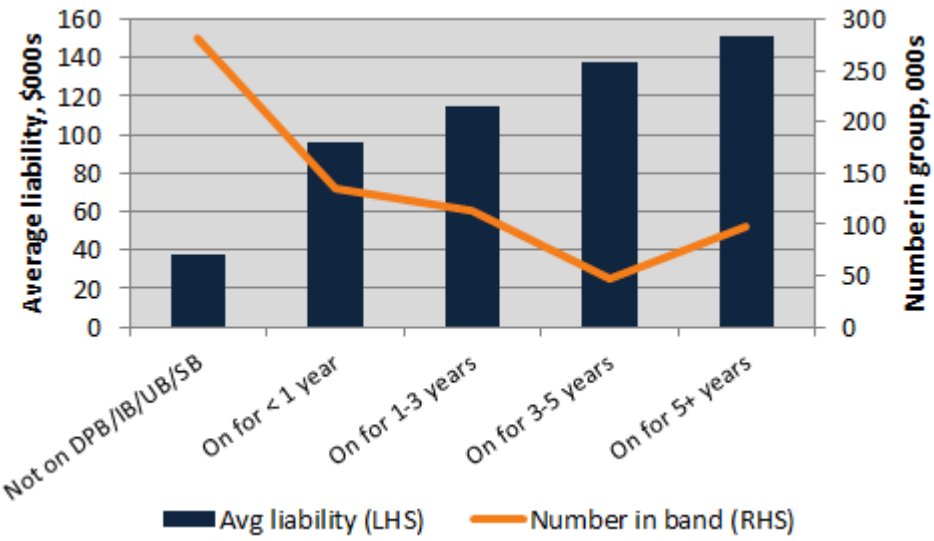
Total payments attributable to the current client liability are expected to fall by about 5% per annum until about 2020, then decay linearly to zero in the year 2060, when all current clients are no longer of working-age.

Another important breakdown of the liability is the allocation amongst clients with different current durations on benefit. This subdivision is directly observable for the key benefit portion of the liability (DPB/IB/SB/UB and their associated AS/DA payments), for which client spells were explicitly modelled.

Figure 7.5 shows the average key benefit liability according to duration. The leftmost group shows the average key benefit (DPB/IB/SB/UB plus associated AS/DA) liability for those qualifying clients who are not currently on a key benefit. Unsurprisingly, this average liability is relatively low but is still significant. This average liability is in respect of qualifying clients who are either not on benefit, or are on a benefit other than a key

benefit. The next four groups show the average liability for those clients who are on key benefits, separated by how long they have received their current benefit. The increasing trend is clear, with clients who have received benefits for at least five years having a liability 60% higher than those in their first year.

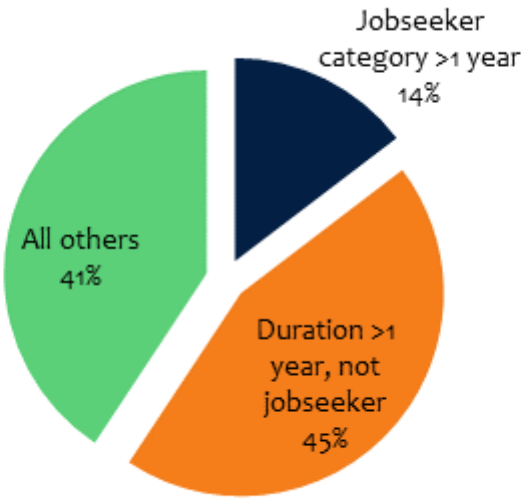
Figure 7.5 **Average key benefit liability based on client duration**



Results by duration are particularly relevant as the Government has introduced a target to reduce long-term welfare dependence. Specifically, the target is to reduce by 30% the number of people receiving the working-age benefits that will become the new Job Seeker Support (JSS) continuously for more than 12 months by June 2017. Under planned changes through Welfare Reform, from July 2013 the JSS will include all those on Unemployment Related Benefits, Sickness Benefit, Domestic Purpose Benefit (DPB) Sole Parents whose youngest children are over 14, Widows with youngest children over 14 or no children and DPB Women Alone

We have separately identified the **approximate** liability relating to clients who have received benefits included in the proposed "jobseeker" benefit for more than a year. However, due to our modelling approach we have ignored the contribution from WA/WB which could not be easily estimated. Figure 7.6 shows the results

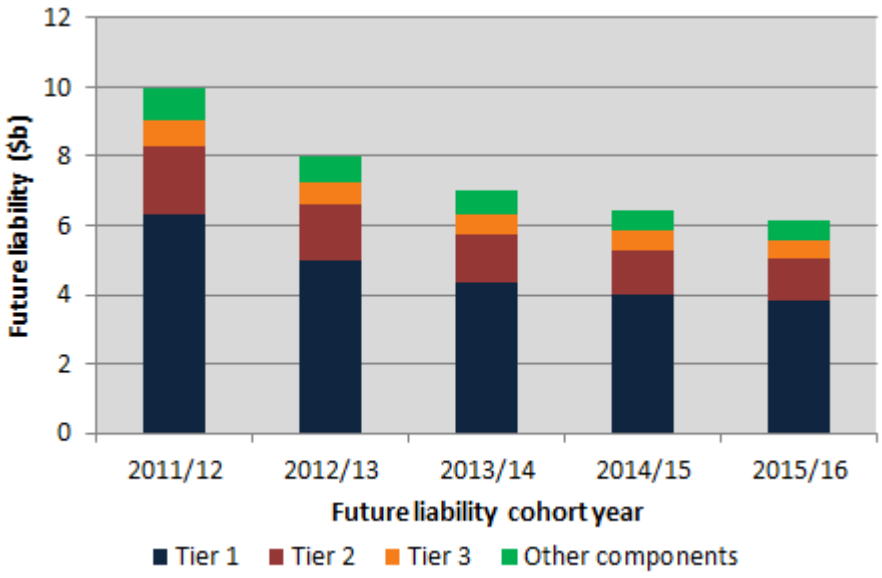
Figure 7.6 **Relative significance of jobseeker cohort in key benefit liability**



7.2 Estimates of future client liability 2011/12 to 2015/16

The future client liability estimates are shown in the figure and table below. These amounts are inflated and discounted, with the discount date being 31 December of the corresponding financial year. Thus these figures can be thought of the as the amount needed to be set aside each year in the future to meet the future costs of people entering the system.

Figure 7.7 **Future client liability for beneficiaries entering system over the next five years**



We make the following comments:

- The decreasing amounts of the future client liabilities is mainly attributable to the way the current and future components are defined; this was discussed in Section 4.2.2;

- Broadly speaking, future client liability components are in similar proportions to the current client liability. The main relative differences are:
  - IB comprises 24% of the current client liability, but only about 14% of the future client liability. This is because relatively few people enter the liability each year;
  - In contrast UB (9%) and SB (11%) are relatively larger than their share of the current client liability (5% and 9%, respectively). This is because they make up a greater share of clients newly entering the benefit system each year; and
  - DPBs represent 21%, just slightly less than their 23% share of current client liability.

- The 2011/12 future client liability is about 13% of the current client liability. Thus the future client liabilities represent a significant portion of total liabilities.

Table 7.3 **Future client liability estimates, inflated and discounted to 31 December each year**

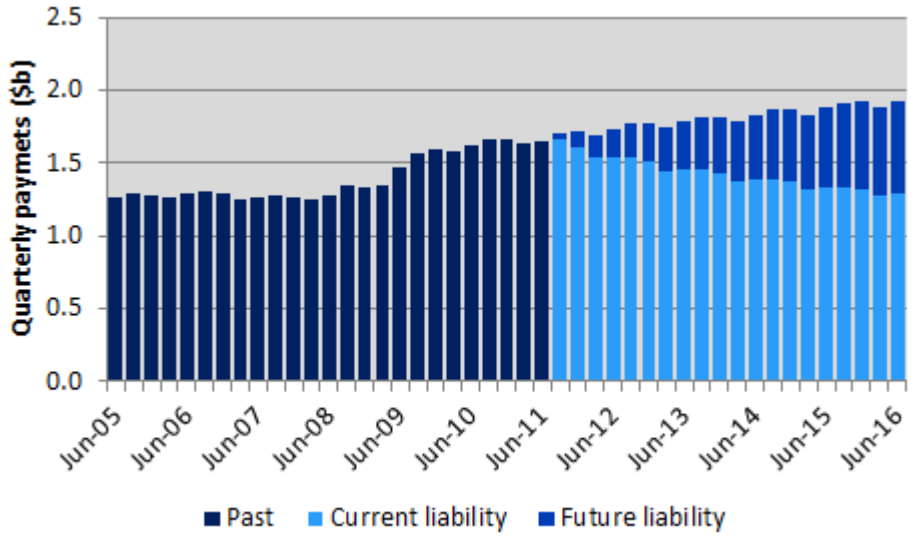
Component	Future client liability ($b) corresponding to financial year:				
	2011/12	2012/13	2013/14	2014/15	2015/16
Tier 1					
DPB	2.12	1.65	1.44	1.33	1.28
IB	1.43	1.17	1.04	0.96	0.92
SB	1.12	0.88	0.76	0.70	0.66
UB	0.89	0.65	0.54	0.48	0.45
DPB-CSI	0.24	0.20	0.18	0.17	0.16
EB	0.13	0.11	0.09	0.09	0.08
ORP	0.28	0.24	0.22	0.20	0.19
WA/WB	0.10	0.09	0.08	0.08	0.08
Tier 1 subtotal	**6.30**	**4.99**	**4.35**	**4.00**	**3.81**
Tier 2					
AS	1.64	1.32	1.16	1.07	1.02
DA	0.16	0.13	0.12	0.11	0.10
CDA	0.05	0.04	0.04	0.03	0.03
CCS	0.12	0.11	0.10	0.09	0.09
Tier 2 subtotal	**1.97**	**1.60**	**1.41**	**1.30**	**1.25**
Tier 3					
EI	0.05	0.04	0.03	0.03	0.03
HS	0.71	0.61	0.56	0.52	0.49
Tier 3 subtotal	**0.76**	**0.65**	**0.59**	**0.55**	**0.51**
Other components					

Expenses	0.87	0.69	0.61	0.56	0.53
Net loans cost	0.07	0.06	0.05	0.05	0.04
Other subtotal	**0.94**	**0.75**	**0.66**	**0.60**	**0.57**
Grand total	**9.97**	**7.99**	**7.00**	**6.45**	**6.14**

7.3 Forecast total cash flows 2011/12 to 2015/16

The cash flows arising from the current and future client liabilities can be combined to give a complete picture of projected payments over the next five years. These payments are shown in Figure 7.8.

Figure 7.8 **Total cash flows, actual values, excluding expenses and loans**



We make the following comments:

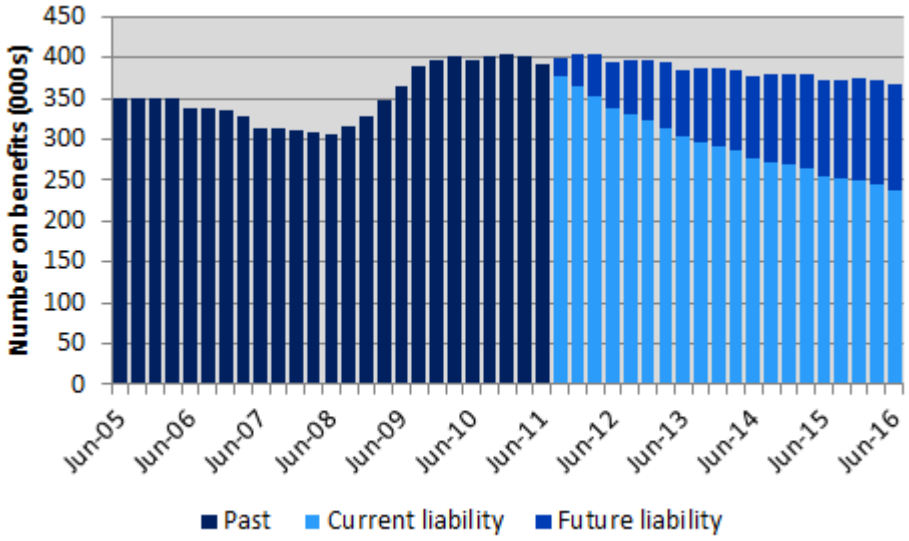
- The increase in total payments due to the global financial crisis at the end of 2008 can be observed in the chart;
- Payments are forecast to increase at 3.2% p.a. over the next 5 years, fractionally higher than the forecast rate of inflation (2.5%). This projected rate of increase in future total payments is due to a combination of:
  - Benefit rate inflation;
  - Changes in the number of people using the welfare system; and
  - Changing mix of clients and benefit rates received;
- The seasonality is observable, with March quarters about 2% lower; and
- The future client liability component grows from virtually nothing to one third of the payments by June 2016.

We can also look at the total number of clients projected to be on key benefits (that is, the number of people projected to receive at least one of DPB/IB/SB/UB in a quarter. This is shown in Figure 7.9. Interestingly this is forecast to decrease slightly. This is largely attributable to the forecast decrease in unemployment (refer Table 5.4), which affects all

key benefit types with the possible exception of IB. The projected cash flow results imply that the decrease in numbers receiving key benefits is more than outweighed by the increase in ABP, both due to inflation and other factors such as an increased probability of clients to receive a full quarter's benefit. Note that forecasts do not include the impact of planned welfare reform changes.

The increase during late 2008 and 2009 following the global financial crisis is even more apparent for the total number of clients on key Tier 1 benefits than for total payments.

Figure 7.9 **Number of clients in receipt of key Tier 1 benefits**



7.4 Other results

7.4.1 Breakdown of expenses

We have made the following allocation of expenses to the various categories:

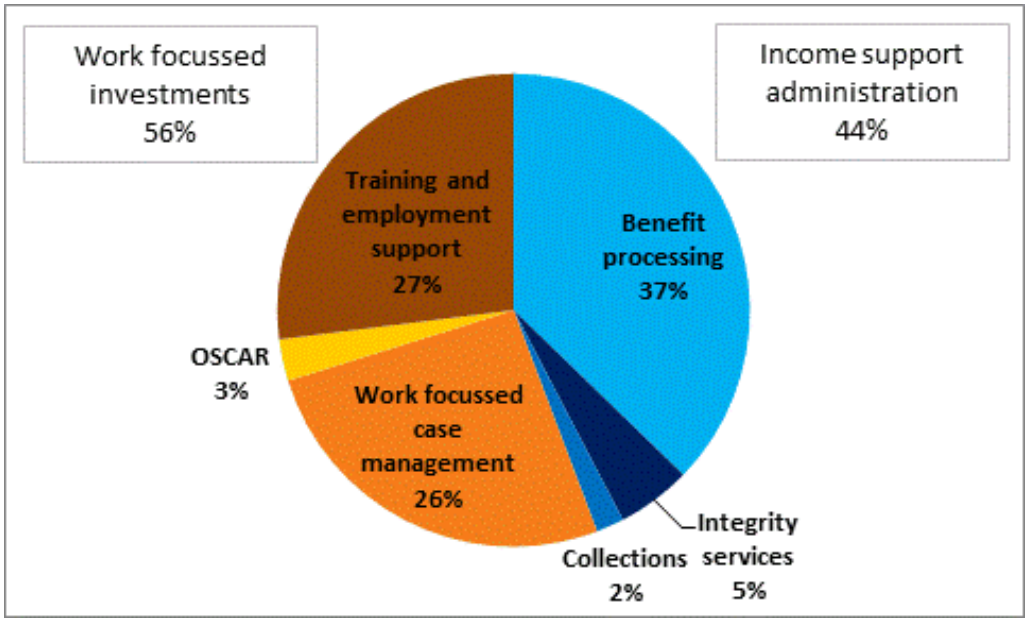
Table 7.4 **Expense category breakdown for current and future client liabilities**

Expense category	Current client liability ($m)	Future client liability 2011/12 ($m)	Future client liability 2012/13 ($m)	Future client liability 2013/14 ($m)	Future client liability 2014/15 ($m)	Future client liability 2015/16 ($m)
Income support administration						
Benefit processing	2,539	323	258	226	208	197
Integrity services	347	44	35	31	28	27
Collections	130	17	13	12	11	10
Temporary measures[6]	0	0	0	0	0	0
Sub- total	**3,016**	**383**	**307**	**268**	**247**	**234**
Work-focussed investments						
Work focussed case management	1,768	225	180	157	145	137
OSCAR	194	25	20	17	16	15
Training and employment support:						
Employment Assistance	1,123	143	114	100	92	87
Vocational skills training	551	70	56	49	45	43
Youth transition services	128	16	13	11	10	10
Mainstream supported employment program	36	5	4	3	3	3
Job support scheme[7]	0	0	0	0	0	0
Life skills training[8]	0	0	0	0	0	0
Sub-total Training and employment support	*1,838*	*234*	*187*	*163*	*150*	*143*
Sub-total	**3,800**	**483**	**386**	**338**	**311**	**295**
MSD Expenses total	**6,816**	**866**	**693**	**606**	**557**	**530**

Figure 7.10 shows the current client liability for expenses apportioned by category.

[6] Temporary measures include payments related to special events such as the Canterbury Earthquake. No forecast of such future events has been attempted. Hence the liability is estimated as nil.
[7] Job support scheme and life skills training expenditure occurred in several of the 5 years of history used to apportion expenses between categories. However, in the most recent year, 2010/11, expenditure on both items was nil. It has been assumed that this will continue.
[8] See note above.

Figure 7.10 **Current client liability: MSD expenses by category**



7.4.2 Breakdown of net loans cost

As described in the methodology, we have valued six separate components related to loans cost separately, which are largely offsetting. These components are shown in Table 7.5. Negative amounts represent recoveries on loans made by MSD.

Table 7.5 **Net loans liability breakdown**

Loans category	Current client liability ($m)	Future client liability 2011/12 ($m)	Future client liability 2012/13 ($m)	Future client liability 2013/14 ($m)	Future client liability 2014/15 ($m)	Future client liability 2015/16 ($m)
Further overpayments/fraud on existing debtors	100	0	0	0	0	0
Recoveries on overpayments/fraud on existing debtors	-181	0	0	0	0	0
Overpayments/fraud related to future payments	2,286	292	234	205	189	180
Recoveries on overpayments/fraud related to future payments	-1,832	-234	-187	-164	-151	-144
Net cost – overpayments/fraud	**373**	**58**	**47**	**41**	**38**	**36**
Recoverable assistance payments	1,479	229	192	170	155	144
Recoveries on recoverable assistance	-1,405	-218	-183	-161	-147	-136
Net cost – recoverable assistance	**74**	**11**	**10**	**8**	**8**	**7**
Total net loans cost	**447**	**69**	**56**	**49**	**45**	**43**

7.4.3 Liabilities falling outside the main definition

Recall that the current client liability for those people receiving CCS, HS or EI and no other qualifying benefit does not fall under the main definition; this was discussed in Section 4.2.2. These additional components have been valued and are shown below:

Table 7.6 **Additional liabilities for those recipients outside main definition**

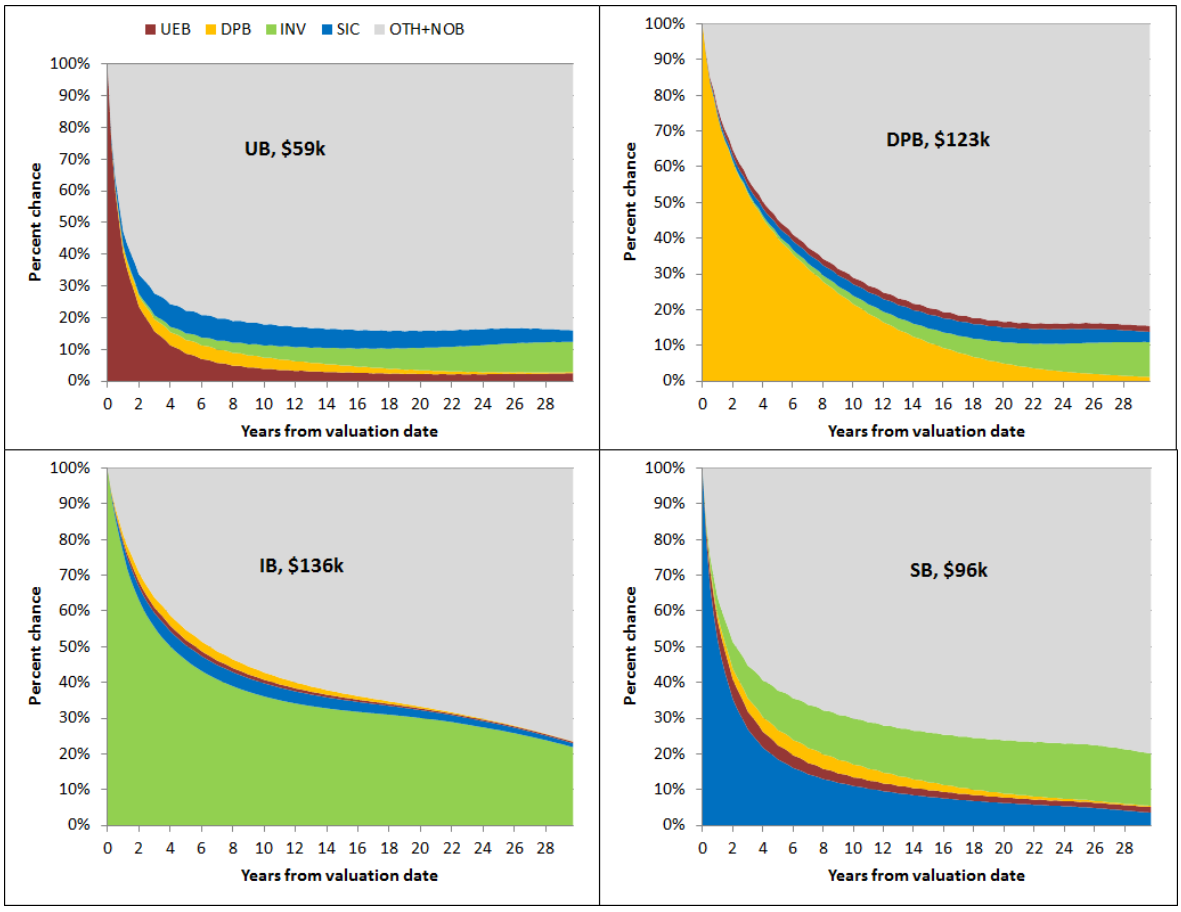
Benefit	Current client liability ($m)
CCS	182
HS	141
EI	5

These amounts are relatively minor compared to the corresponding benefit liability for people receiving another qualifying benefit.

7.5 One person projections

One further way of understanding the projection results is to look at how the projection applies to individual clients; the key benefit liability for an individual person can be calculated by adding a single client into the projection module, specifying their characteristics (age, duration etc.) and then calculating the projected future states and the cash flows attributable to that client. Figure 7.11 shows the distribution of the liability attributable to a 35 year old client starting on each of the main benefits.

Figure 7.11 **Probability of future states for person currently on key benefit, age 35 and duration one year. Average key liability is also shown on chart. Starting state, clockwise from top left, is UB, DPB, SB and IB.**



We make the following observations:

- The long term nature of DPB and IB clients is evident, with higher average liabilities and a high percentage chance of remaining on the same benefit after many years, especially for IB;
- Conversely, the shorter term nature of UB and SB benefits can be seen; someone starting in UB has little likelihood of being there in 10 years' time;
- The high rate of transition from sickness to invalid's benefit is visible; and

- All cases still have a reasonable change of a client being on some key benefit 30 years in the future, with at least a 20% chance in all projections.

The one person projections can also be used to gain insight into the relative importance of age, duration and benefit history in terms of their influence on the life-time costs of clients. These are shown in the three figures below.

Figure 7.12 shows the relative importance of the age of a client in the estimation of their average lifetime cost. The comparison is based on an assumption of 1 year on their current benefit. Clients aged 17 in every category have a far higher average liability than clients aged 25, 35 or 50. This reflects the increased risk factors associated with early entry into the system as well as greater remaining years before turning 65.

For example someone currently on a DPB benefit aged 17 with duration 1 the average lifetime cost would be just over $200,000 whereas someone currently on a UB benefit aged 25 also with duration 1 year would have an average lifetime cost of about $50,000.

Figure 7.12 **Average key benefit liability by current benefit and age. Duration was set to 1 year in each case.**

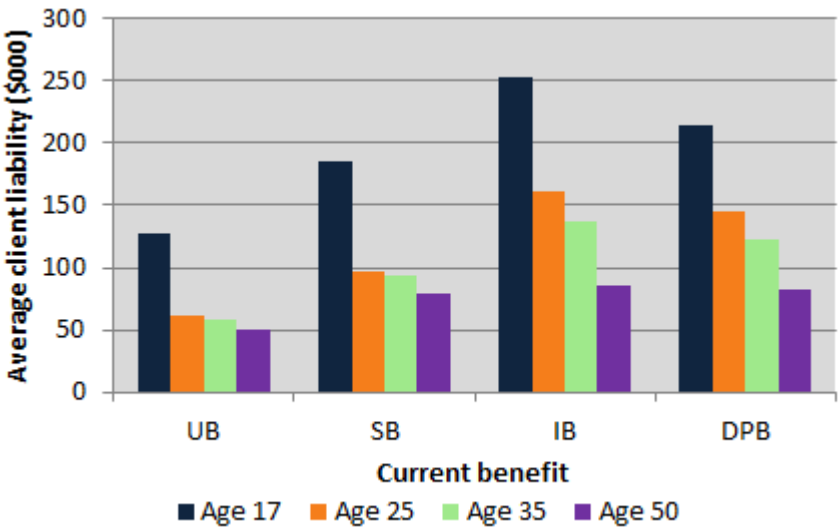
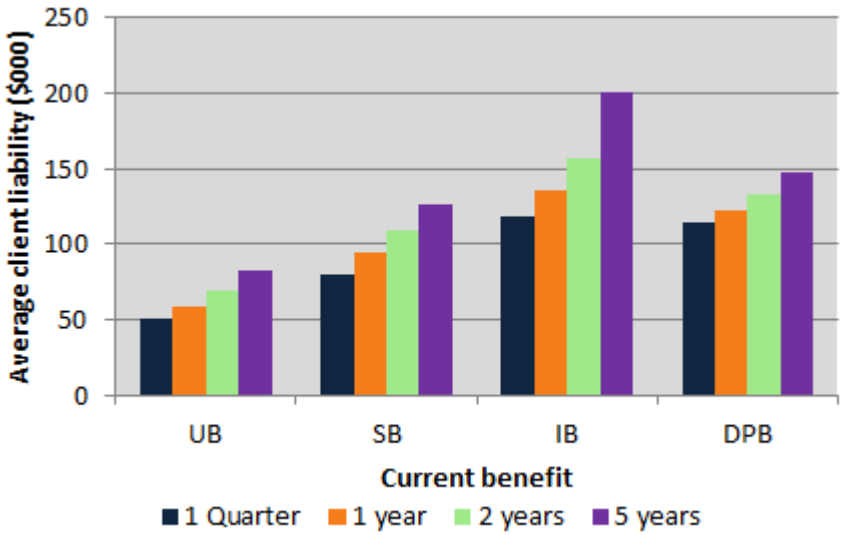


Figure 7.13 shows the relative importance of duration on benefits for clients at age 35. Average liability increases based on the number of years; the liabilities for IB, SB and UB are about 60% higher for a client who has been on benefit for five years compared to newly on benefit, a significant difference. The impact is smaller for current DPB clients.

Figure 7.13 **Average key benefit liability by current benefit and duration. Age was 35 in each case.**

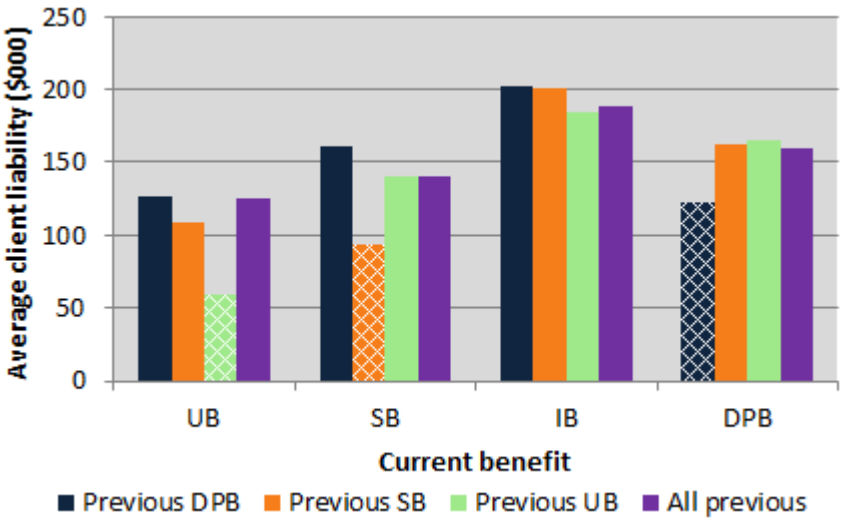


The next graph, Figure 7.14, shows the relative importance of previous receipt of a different benefit. The age of the client (35) and the duration of current benefit (1 year) were held constant to show the difference by benefit type. We make the following observations:

- The effect is most pronounced for UB, where the existence of another benefit type doubles the expected lifetime liability;
- The presence of another benefit increases the liability for someone currently on SB by about 50%; and
- The presence of another benefit increases the liability for someone currently on IB or DPB by about 30%.

These results provide some evidence for the presence of clients who remain in the system moving between the various benefit types which can also be seen in the projections for UB, SB and DPB in Figure 7.11. Note the cross-hatched bars on the Figure 7.14 represent base cases where there is no other benefit in the history besides the current one.

Figure 7.14 **Average key benefit liability by current benefit and previous benefits received. Age was 35, duration 1 year in each case.**



8 CHANGES IN ESTIMATES OF LIABILITY FROM THE PREVIOUS ESTIMATE

From year to year it is possible to measure changes to the estimated liability arising from the following categories:

- Changes consistent with the definition of the liability and valuation forecasts. For example, the forecasts may predict an increased number of people on benefits due to people joining the system, resulting in an increase in the current client liability;
- Changes due to experience differing from projected since the previous valuation. For example, numbers receiving the unemployment benefit may not have developed as expected. Also, economic variables such as inflation and the unemployment rate may have evolved differently to that projected;
- Changes due to updated models. Recent historical behaviour causes changes to model parameters used in projection. For instance, if fewer people leave the sickness benefit than expected, the projected future rate of people leaving is likely to fall in accordance with this.
- Changes due to updates to economic forecasts. Changes to projected inflation, discount rates and unemployment rates will affect the liability estimate.

As this is the first valuation such analysis of change is not possible. However we expect future valuations to contain such a review.

9 UNCERTAINTY, KEY RISKS AND SENSITIVITY ANALYSIS

The estimation of the current client liability and future client liability is subject to influences whose effect cannot be determined with accuracy. Consequently, it is a virtual certainty that the ultimate liabilities will depart from any estimate, but the extent of this departure is subject to uncertainty. If potential outcomes and their relative likelihood were expressed as a probability distribution, we would consider our liability estimates to be the mean of that distribution. In particular, the estimates provided in this reports contain no deliberate bias towards over or under estimation.

We may group the sources of uncertainty into two categories:

- **Independent (non-systemic) risk**: This represents those risks to the accuracy of estimates arising due to random variability in the number and amount of benefit payments;

- **Systemic risk**: This includes risks that, potentially, are common across more than one benefit type.

These are discussed in more detail below.

Independent risk

Independent or non-systemic risk arises from two sources:

- **Parameter error**: Assuming that the model structure is correct, this is the extent to which the randomness associated with the benefit payment process causes the parameters to be estimated incorrectly.

- **Process error**: Assuming that the model structure is correct and the parameters correctly estimated, this is the risk that the future projections still deviate from our projected values due to the volatility in the benefit payments process.

Relative to systemic risk, independent risk is small and therefore, we do not consider it further.

Systemic risk

Systemic risks may be divided into two groups:

- Risks which are internal to the valuation process, which may also be referred to as model specification risk. This risk derives from the uncertainty over to what extent the models and valuation process as a whole deviate from a perfect representation of the benefits payments process, which is a complex, real-life system.

- Risks external to the valuation process which include future changes in the environment. This uncertainty reflects the fact that, even if our valuation model were perfectly correct, future legislative, policy, behavioural, demographic or economic changes may result in actual experience differing from our projections.

Sources of internal and external risks are discussed in more detail below.

9.1 Model specification risk

As indicated above, this is a source of uncertainty internal to the valuation process and represents the uncertainty from the fact that the models are an imperfect representation of a complex real-world process.

Model specification risk may be minimised by following good modelling practices which include:

- Developing a model structure that represents the major drivers of benefit payments in a robust manner; and
- Testing the models thoroughly including actual versus expected analyses and backtesting (taking historical cohorts, projecting them forward in time and comparing the results with actual experience).

However, even after following these steps, the resulting models will still be an imperfect reflection of reality. There is a real risk that future results may deviate materially from projections due to factors not captured in the models.

By its nature, model specification risk is difficult, if not impossible, to quantify. However, we have looked at the sensitivity of the valuation results to one component of the model – the change in the probabilities of changing benefit for those currently in receipt of a key Tier 1 benefit. Table 9.1 presents the results for a 5% change in these probabilities, together with the results for a similar change to the probability of moving onto benefit (either a key Tier 1 or other minor benefit) from a current position of being off benefit, for the current client liability in 30 June 11 dollars.

Table 9.1 **Sensitivity of current client liability valuation results (June 11 dollars) to changes in the probability of moving off the current benefit**

Probability changed	Change in probability of moving off/onto benefit	
	5% decrease	5% increase
All key tier 1	+3.5%	-3.3%
Off DPB	+1.4%	-1.3%
Off IB	+0.9%	-0.9%
Off SB	+0.8%	-0.8%
Off UB	+0.5%	-0.4%
Onto benefit (=off NOB)	-2.6%	+2.6%

If the probabilities of moving off benefit for all four key Tier 1 benefits fall by 5%, then the key Tier 1 liability (in June 11 dollars) would increase by 3.5% since a lower probability of moving means fewer transitions to non-key Tier 1 benefits or going off benefit. Conversely, the key Tier 1 liability would decrease by 3.3% in the wake of a 5% increase in the probability of moving off benefits.

Changes in the probability of going onto benefit from a current position of being off benefit (NOB) also have a somewhat similar impact – a 5% increase in the likelihood of transitioning onto a benefit leads to a 2.6% increase in the key Tier 1 liability.

The effects on the estimate of total current client liability of changes to individual key Tier 1 probabilities only are lower.

9.2 Policy Change

This is an external risk to the estimates and represents the uncertainty arising either directly or indirectly from current and future government initiatives and actions. Some hypothetical examples would include:

- Changing rules around accessing benefits and rates paid;
- Job creation initiatives; and
- Significant operational changes to the service and delivery model.

Policy change extends to include the unknown impact of ongoing and planned reforms such as the Future Focus reforms and upcoming changes to work expectations and benefit categories through Welfare Reform. These changes are discussed below.

9.2.1 Future Focus Reforms

In September 2010, Work and Income implemented a range of policy changes (collectively referred to as Future Focus). Changes included:

- Requiring recipients of a Domestic Purposes Benefit – Sole Parent whose youngest child is aged 6 years or over to meet part-time work obligations;
- Increasing the amount of income recipients of Domestic Purposes Benefits, Widow's Benefit and Invalid's Benefit can earn before their benefit is abated; and
- Requiring clients receiving an Unemployment Benefit to reapply for their benefit every 12 months.
-
- Requiring young people on Independent Youth Benefit to be in work or training
-
- Requiring that repeat applicants for hardship applicants undertake budgeting activities
-
- Introducing a part- time work-test, a 12 monthly review and a new 8 week medical certificate for Sickness Beneficiaries

From May 2011, clients receiving a Sickness Benefit were required to complete a reassessment for their benefit every 12 months. Those recipients who are assessed as being able to work part time may be subject to a part-time work obligation. An additional medical certificate was introduced at the early stages of benefit receipt for this group (generally at about 8 weeks on benefit).

Given that these reforms are very recent relative to the valuation date of 30 June 2011, we have only made an allowance for the changes insofar as they have affected the model fits to data for the last few quarters. It is difficult, and potentially quite misleading, to make a specific allowance for anticipated effects of Future Focus changes at this stage. The experience since these changes were implemented will be more developed at the next valuation and, hence, will have a greater effect on the updated models and projections. The impact on next year's valuation will go part of the way to quantifying the ultimate impact of the reforms. Some further comments on the possible impact on UB are made in Section 13.4.

Nevertheless, the ultimate impact of reforms is subject to individual beneficiaries' behaviours, the incentives that are introduced and the manner in which those incentives are implemented.

It is also important to bear in mind that the impact of any changes cannot be determined by considering the benefit types in isolation. For instance, as we elaborate on in later sections, there is a strong interaction between the Sickness Benefit and the Unemployment Benefit, with a tendency for individuals to move between these benefits. Considered in isolation, one could be tempted to believe that the only impact of the part-time work obligation for Sickness Benefit recipients would be to lower the probability of an individual continuing on the benefit. This would ignore the potential offsetting disincentive for people to transfer from the Unemployment Benefit to the Sickness Benefit, which would change the demographic mix of people on Sickness Benefit.

We also note that due to the staggered implementation of the reforms in the Christchurch region as a result of the February 2011 earthquake, the data to June 2011 is not wholly reflective of the totality of the reforms' impact.

9.2.2 Welfare Reform

The Government has passed legislation changing work expectations for some DPB clients, and has announced its intention to introduce further legislation that will create a new Jobseeker's benefit. Clients on UB, SB, WA/WB and DPB (with youngest child at least 14) will be treated as a single group in terms of benefits and review. There will be work and work preparation expectations for more clients. These changes will undoubtedly affect the liability due to changes in client behaviour affecting their propensity to stay on benefit.

We expect the effects of these changes, including their attribution, will be identifiable with time. However it is difficult to reliably anticipate the effects. This valuation is intended to provide a baseline prior to welfare reform. We expect that future valuations will examine the impacts of welfare reform in increasing detail over time.

9.3 Economic Risks

Economic uncertainty is also an external risk. For this valuation, the uncertainty derives from future unemployment rates as well as future inflation and discount rates.

The unemployment rate is a driver for many benefits, in particular the Unemployment Benefit. All benefits are indexed annually in line with inflation as measured by the CPI index, so changes in the future rates of inflation relative to those assumed in the valuation

will affect the results. Finally the results are discounted to the valuation date to recognise the time value of money; these results will change, perhaps materially, if actual discount rates vary sufficiently from those assumed.

We consider each of these in more detail below.

9.3.1 Unemployment Rate

The unemployment rate features in many of the key Tier 1 models. The dependencies are described below:

- **UB:** Of all key Tier 1 benefits, the unemployment benefit projection has the highest degree of uncertainty, because the overall numbers vary greatly with state of the economy. Obviously the key risk here is a sharp increase in the unemployment rate, which would cause the associated liabilities to be much higher than currently forecast. To illustrate, should all future forecast unemployment rates be increased by adding **1%** to the forecasts, the UB estimated current client liability in June 11 dollars would increase by **30%,** and conversely unemployment rates 1% lower would lead to a **23%** reduction in the UB liability. The corresponding figures for the inflated and discounted valuation are **+27%** (1% increase in rate) and **-21%** (1% decrease).

- **DPB:** Times of recession and high unemployment lead to fewer job opportunities for single parents which then results in greater numbers claiming benefits. Thus a sharp increase in the unemployment rate would be expected to cause the associated future payments to be somewhat higher than currently forecast. For example, a 1% addition to all future unemployment rates would increase the estimated DPB current client liability by **6.8%** (5.5% for ID liability) while a 1% reduction would decrease the liability by a similar amount.

- **IB:** Due to the nature of the Invalid's Benefit, it is not strongly linked to the unemployment rate – an addition of 1% to the future unemployment rates leads to a 2.6% change in the estimated IB current client liability (June 11 dollars).

- **SB:** In a similar way to the Unemployment Benefit and DPB, the Sickness benefit is linked to the state of the economy. A sharp increase in the unemployment rate would likely see a rise in numbers entering, a decrease in numbers leaving and a slight rise in ABP. As an example, an addition of 1% to all future forecast unemployment rates would increase SB current client liability (in June 11 values) by 6.9%.

- **Accommodation Supplement:** The accommodation supplement is a large benefit in its own right. About three quarters of payments are tied to the key Tier 1 benefits, and so the economic risks are inherited from those. Its sensitivity to the unemployment rate is thus in line with these benefits.

- ***Other benefits and assistance*:** The dependence of *other benefits and assistance* on the unemployment risk is of secondary importance for two reasons:
  - The liabilities are significantly smaller than key benefits or Accommodation Supplement; and
  - Most of the *other benefits and assistance* are naturally less sensitive to the unemployment rate, with a few exceptions.

Their sensitivity has not been explicitly tested here.

Table 9.2 displays the sensitivities of the key Tier 1 current client liability to changes of +/- 1% in the future assumed unemployment rates.

Table 9.2 **Sensitivity of estimated key Tier 1 current client liability to future unemployment rates**

Change in unemployment rate	DPB	IB	SB	UB	Total
Change in liability in June 11 dollar values					
+1%	+6.8%	+2.6%	+6.9%	+30.1%	+6.9%
-1%	-6.8%	-3.3%	-6.6%	-22.8%	-6.5%
Change in Inflated and Discounted liability					
+1%	+5.5%	+1.7%	+5.5%	+26.6%	+5.7%
-1%	-5.6%	-2.3%	-5.2%	-20.8%	-5.5%

9.3.2 Inflation

Benefits are indexed annually on 1 April in line with the change in the CPI index in that year. Thus an increase in inflation relative to that assumed in this report will lead to higher cash flows whereas a decrease will have the opposite effect. Table 9.3 gives the results for the sensitivity of the total current client liability to a 1% change in the inflation rate. We note that the impact is quite material.

Table 9.3 **Sensitivity of the total current client liability to changes in the inflation rates**

Scenario	Liability ($B)	Change ($B)	Change (%)
Base	78.1		
Inflation + 1%	86.2	8.1	10.4%
Inflation - 1%	70.8	-7.3	-9.4%

9.3.3 Interest Rate

A change in future interest rates does not affect the future cash flows; rather it affects the value of the liability brought to book after allowing for future investment income. To value the discounted liability, we have used the discount rates provided by Treasury for use in accounting valuations at June 11.

If future discount rates fall by 1% relative to their June 11 values, the total liability would increase by 10%.

Table 9.4 **Sensitivity of the total current client liability to changes in the discount rates**

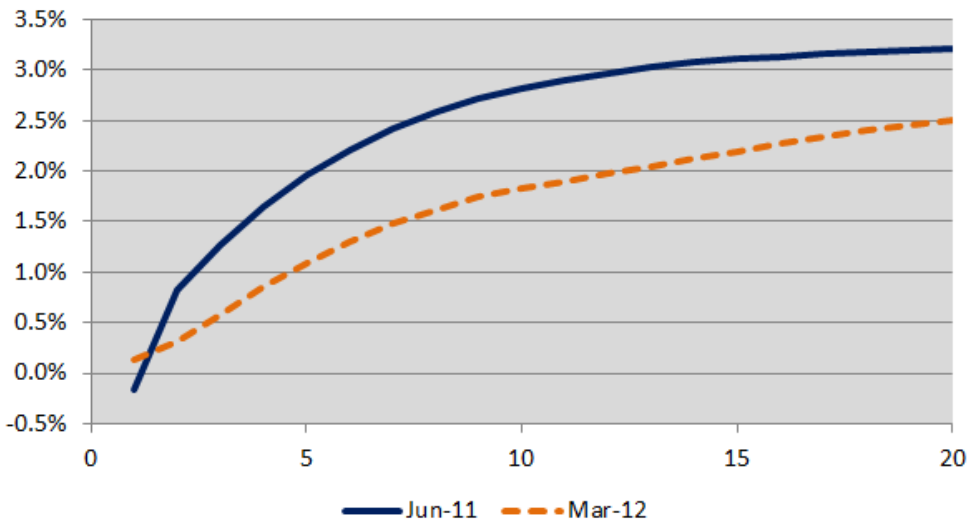
Scenario	Liability ($B)	Change ($B)	Change (%)
Base	78.1		
Discount rate + 1%	71.2	-6.9	-8.8%
Discount rate - 1%	86.3	8.2	10.5%

9.3.4 Real interest rates

While the projected amounts of cash flows are sensitive to the future assumed levels of inflation, the estimate of the inflated and discounted claims liability is sensitive to the differences between rates of claims inflation and investment return assumed (also known as the real rates of return), rather than to either one of these sets of assumed rates alone. Thus, the gains from a 1% upward shift in the discount rate curve are offset by a matching 1% increase in future inflation rates.

To illustrate the impact of changes in the real rates of return, we valued the liability using the real rates of return implied by Treasury March 2012 inflation and discounting assumptions. These rates, together with those at June 2011 are shown in Figure 9.1 and were discussed in Section 5.4. The real rates have fallen considerably since June 2011 due to the on-going global financial instability. Using the March 2012 inflation and discount rates would increase the inflated and discounted liability by **9%** ($6.8b).

Figure 9.1 **Real rates of return at June 11 and March 12**



PART D

VALUATION BY BENEFIT TYPE

PART D.1

TIER 1 BENEFITS

10 DOMESTIC PURPOSES BENEFIT: SOLE PARENT

10.1 Introduction

Domestic Purposes Benefit – Sole Parent is paid to sole parents of dependent children under 18 who are not in a relationship with the other parent and are aged 18 or over or are aged 16 – 17 and were legally married or in a civil union.

The following benefits have been included under the DPB umbrella. Note that codes 613 and 665 are simply old codes that are no longer used.

Benefit Name	Code	% 2010/11 benefit	Comment
Domestic Purposes Benefit	365	97.3%	
Emergency Maintenance Allowance	313	2.7%	
Emergency Maintenance Allowance	613	0.0%	Code not in current use
Domestic Purposes Benefit	665	0.0%	Code not in current use

The great majority of payments are made under the 365 code. The Emergency Maintenance Allowance is strongly linked to the main DPB allowance and provides a benefit to those single parents who do not meet one or more of the main DPB criteria. It is not unusual for beneficiaries to progress from the EMA to the DPB. For example, a sole parent aged 16 – 17 who has never been legally married or in a civil union is eligible to receive the EMA and will transfer to DPB upon reaching 18 years of age. Due to the strongly interlinked nature of these benefits, we have grouped them together for modelling purposes and refer to the combination of both benefit types as "DPB" and "Domestic Purposes Benefit". It should be noted that significant changes have been introduced for youth receiving benefits through welfare reform, which will be reflected in future valuations.

The Domestic Purposes Benefit forms one of the four key benefits discussed in Section 4. This means that the definition of a domestic purposes benefit recipient in a quarter is the presence of a DPB spell, so long as there is not a longer key benefit spell in that quarter.

10.2 Current experience

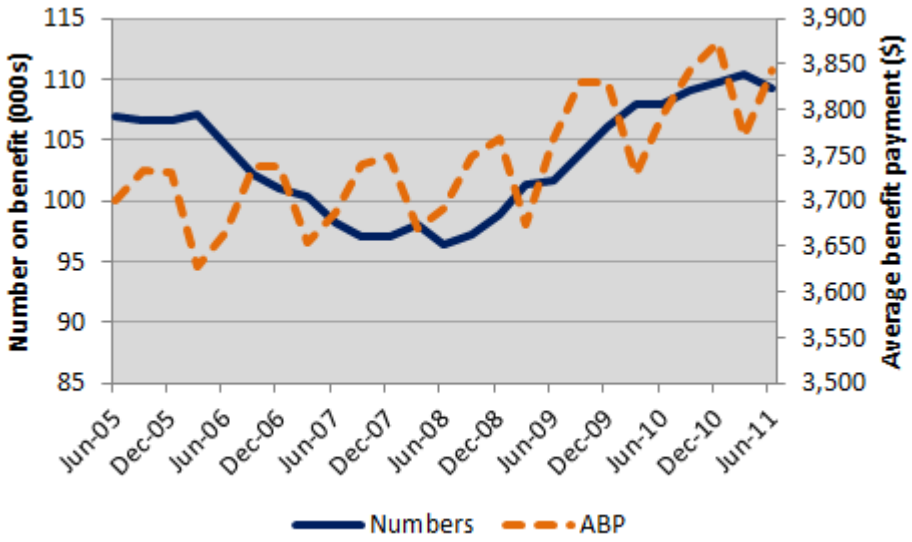
10.2.1 General experience and trends

The following table and graph show the recent experience for the Domestic Purposes Benefit.

Table 10.1 **Recent Domestic Purposes Benefit experience**

Year	Payments ($m)	Average number on benefit	Average quarterly benefit paid (ABP) per client ($)
2007/08	1,378	97,100	3,550
2008/09	1,423	99,800	3,560
2009/10	1,573	106,500	3,690
2010/11	1,644	109,700	3,750

Figure 10.1 **Trends in Domestic Purposes Benefit. ABP in June 2011 values.**



The numbers on DPB fell between June 2006 and June 2007 and remained at this lower level for a further five quarters. From about September 2008, the start of the global financial crisis, the numbers have climbed until the most recent year (2010/11) which has seen numbers stabilise, albeit at a higher level. The global financial crisis and its impacts on the New Zealand economy (recession, directly leading to fewer job opportunities for these in receipt of DPB, and financial stress leading to higher rates of relationship breakdown and therefore more parents eligible for DPB) is likely to be the principal cause of the increase. Demographic changes have possibly also contributed to the rise since 2008 with increasing numbers of females aged 18-20 coinciding with higher fertility rates.

Number of recipients is also informed by considering the number moving on and off the benefit each quarter.

Figure 10.2 **Number of people entering Domestic Purposes Benefit per quarter**

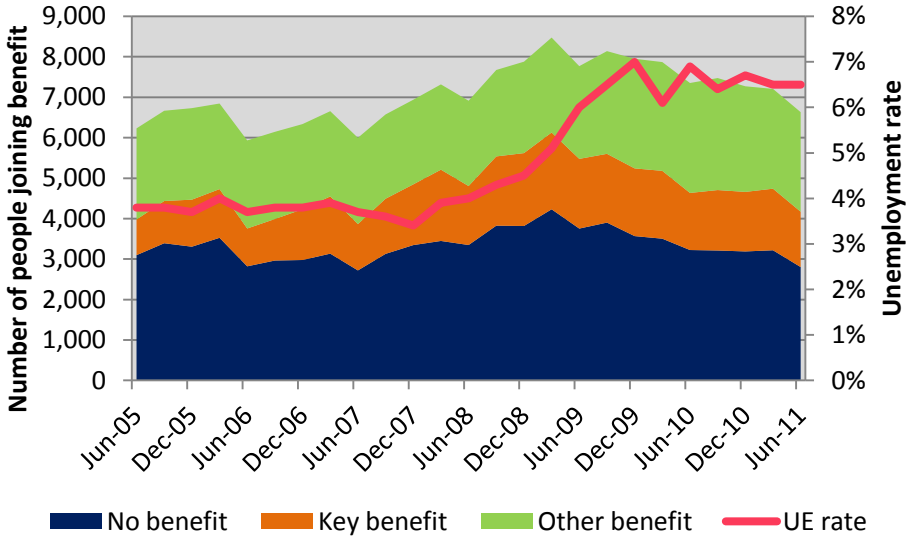
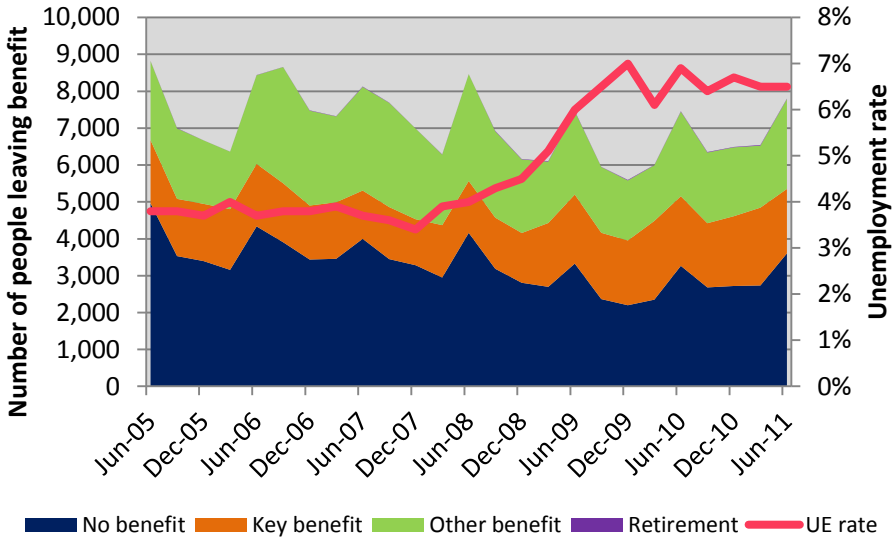


Figure 10.3 **Number of people leaving Domestic Purposes Benefit per quarter**



We can make a number of points concerning these graphs:

- Increased numbers of people entered DPB in 2008 and 2009. By contrast, numbers leaving fell slightly, leading to the overall increase in DPB number during that time as noted above.

- There appears to be a modest correlation between DPB and the state of the economy with new entrants generally increasing and numbers leaving DPB falling as the unemployment rate increased from 2007 to 2009.

- New entrants to DPB were roughly equally likely to have come from another benefit or from being off benefit. When leaving DPB, significant numbers went off benefit,

but more went to another benefit. The relative proportions moving to the various benefit types can be seen in Figure 10.6.

10.2.2 Modelling transitions

There are three models related to the behaviour of clients receiving the Domestic Purposes Benefit:

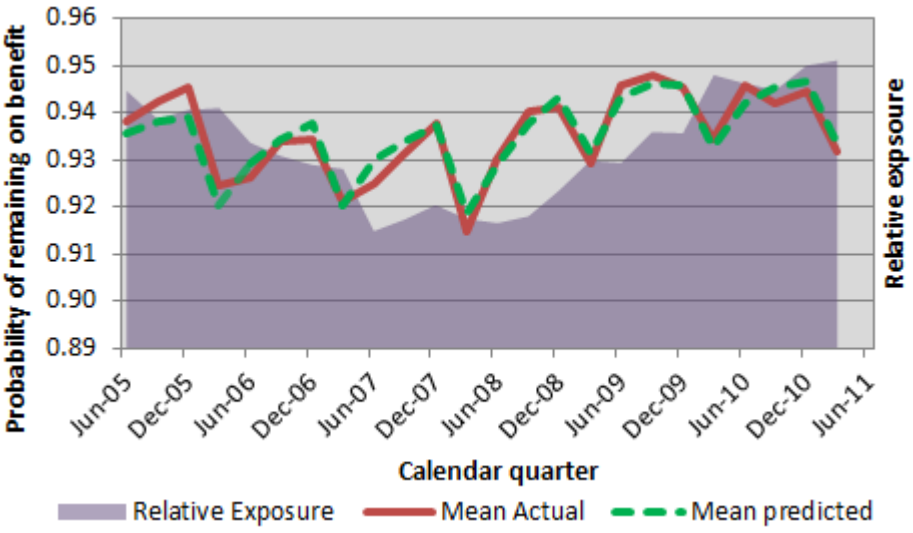
- The probability of remaining on the same benefit;
- The probability of moving to no benefit, given the client does not remain on the same benefit; and
- The (multinomial) probabilities of moving to other key benefit types, given that the client does not remain on the same benefit nor move to no benefit.

These models depend on calendar quarter, age, duration on benefit, indicators of past benefit types, as well as interactions between these variables. Additionally, for Domestic Purposes Benefit, the first two models (remaining on the same benefit and moving to no benefit) also depend on information about the children of each beneficiary. This information is captured in two variables: number of children and age of the youngest child.

This section focuses on the calendar quarter dependency, with some brief comments on the other variables. Readers interested in the other dependencies are referred to the electronic appendices.

The use of the child variables means that we also need additional models for child numbers and ages. These supporting models are described in Section 10.2.4 below.

Figure 10.4 **Probability clients remain on Domestic Purposes Benefit**



The first probability model tracks people remaining on DPB and the actual and model effects are shown in Figure 10.4. The probability varies between approximately 0.915 and 0.95 over the last six years. This rate is high; amongst the key benefits it is second only to IB. There is strong seasonality evident in the model, potentially related to the payment of training benefits at the start of the academic year.

Figure 10.5 shows the probability of a client who leaves DPB (for reasons other than retirement) moving to no benefit. From this we see that approximately 40%-50% of beneficiaries leave the system while the remainder transition to a different benefit type. The chart also indicates that this proportion fell with the increasing unemployment rate in 2007 to 2009 suggesting that one reason why more people stayed on DPB during that time was due to difficulty in finding employment.

Figure 10.5 **Probability clients who leave Domestic Purposes Benefit move off benefits**

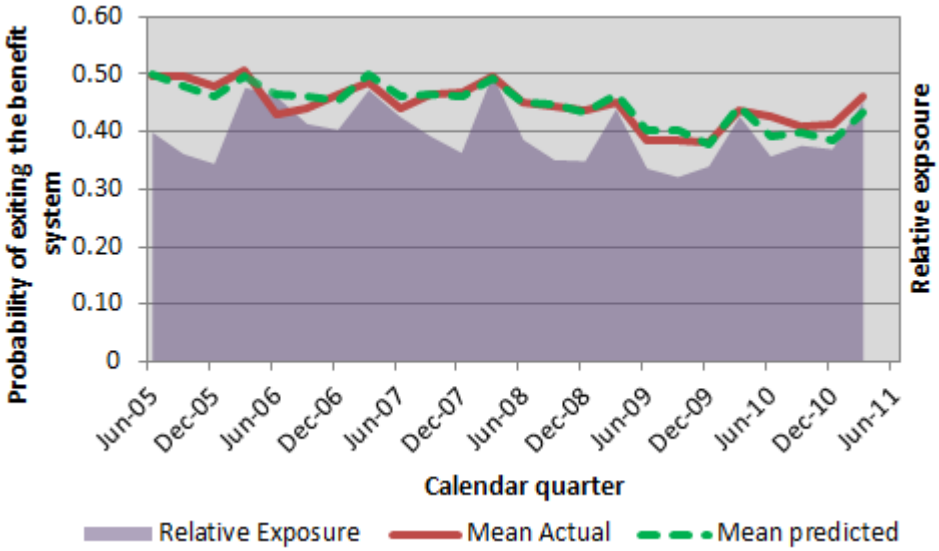
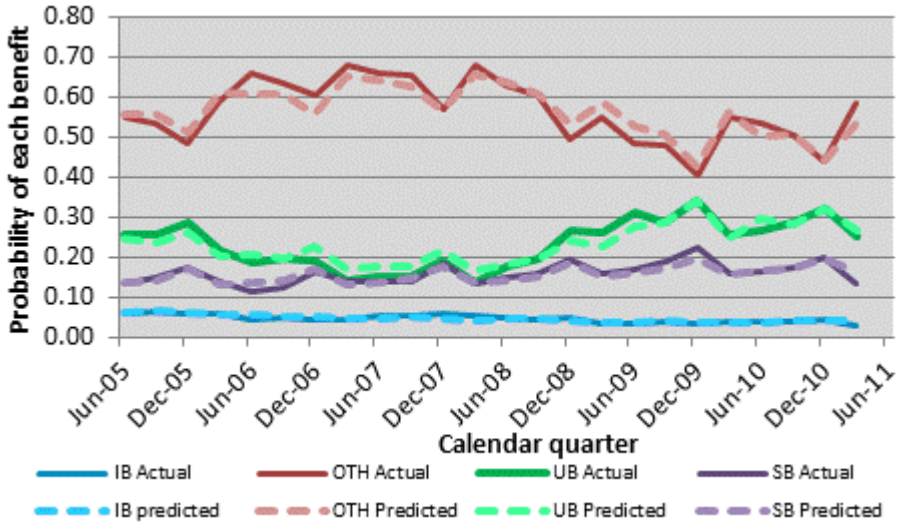


Figure 10.6 **Distribution of clients who move from Domestic Purposes Benefit to other benefits**



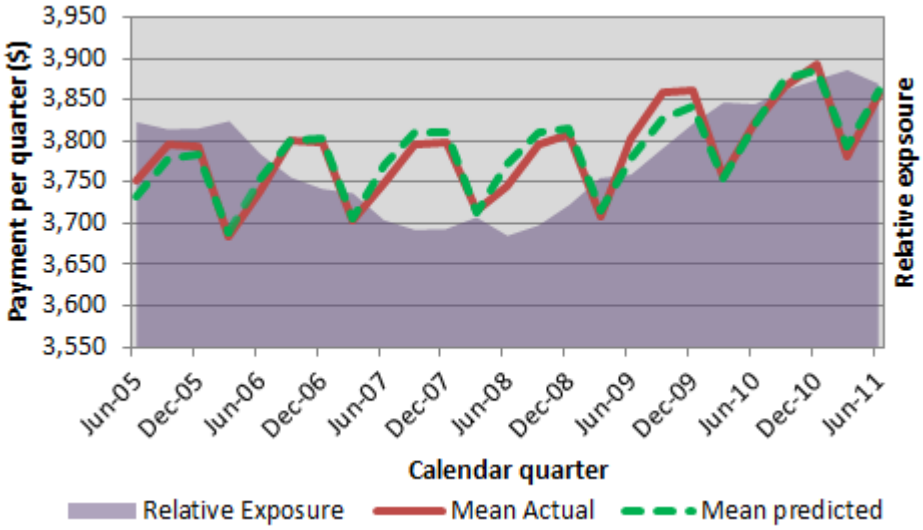
Of those people who do move to a different benefit when they leave the Domestic Purposes Benefit, approximately half move to "other" (typically a supplementary payment like Accommodation Supplement), followed by Unemployment Benefit (approximately 30%) and Sickness Benefit (approximately 16%). The remainder move to Invalid's Benefit (Figure 10.6).

There are a number of important trends related to a recipient's children, as well as the recipient's age and duration on benefit. Further graphs and tables can be found in the electronic models appendix. Some points of note are:

- The probability of remaining on benefit is significantly higher for those people with younger children and greater numbers of children.
- Older people are less likely to move off benefit than the young. Of those that do leave, the very young (<22) and the older (>50) are significantly more likely to move to another benefit rather than leaving the system.
- Although transfers from DPB are always most likely be to other (non-key) benefits (Figure 10.6), people with higher duration on DPB are more likely than those on lower durations to transfer to other key benefits. Additionally, the very young (<22) are significantly more likely to transfer to UB.

10.2.3 Average benefit payments while on benefit

Figure 10.7 **Actual and modelled quarterly payments by calendar quarter**



The shape of the quarterly average benefit payment model bears some similarities to the transition models, as the probability of transition affects the likelihood of someone receiving a full quarter's benefit, thus impacting the ABP. The current model tracks actual experience fairly closely, and has the following additional features:

- The model allows for different experience pre and post June 2005, where payment rates changed considerably; and
- Other factors such as duration, since they have an impact on the probability of receiving a full quarter's benefit, also affect predicted ABP.

10.2.4 Models of children

DPB is unique amongst the key benefits for its dependence on children, and we believe it necessary to allow for this as part of the valuation. There are five child related models used for Domestic Purposes Benefit. These split into two groups as detailed below.

1. Models specifying the distribution of children for clients coming onto DPB:
    a. A model of the number of children; and
    b. A model of the age of the youngest child.

2. Models for the changes to children for those on DPB:
    a. A model for the probability of a new youngest child;
    b. A model for the change in the number of children; and
    c. A model for the age of the new youngest child given that the client has a new youngest child.

These models are now described further.

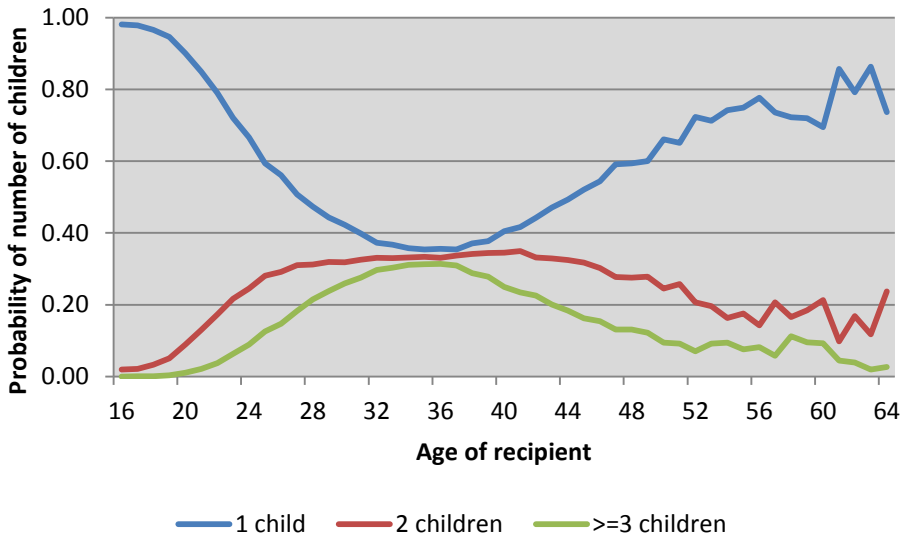
Models for assigning child variables to new entrants

As discussed in Section 4.3.9, to avoid an unmanageable computational burden, child variables are not retained for those receiving benefits other than DPB. Thus, when a client enters DPB, we must assign them child variables.

Model 1a: Distribution of number of children of an entrant to DPB

The model of the number of dependent children for a DPB entrant is a simple one, based on past DPB entrants and depends only on the entrant's age. Figure 10.8 shows this distribution. As might be expected, very young entrants (<20) mostly have one child; those in their late-twenties to mid-forties are more likely to have varying numbers of children while older entrants tend to have fewer numbers of dependent children.

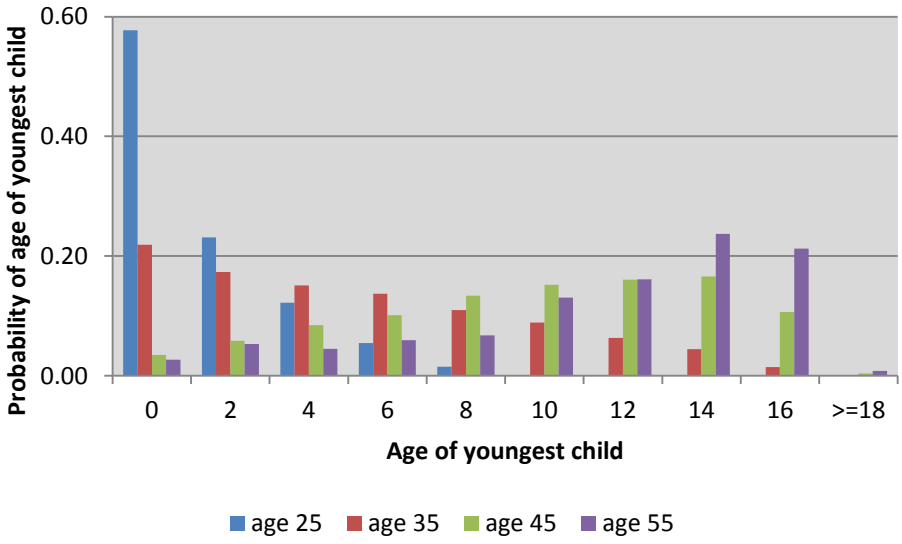
Figure 10.8 **Distribution of number of children of an entrant to DPB**



Model 1b: Distribution of age of youngest child of an entrant to DPB

The model of the age of the youngest child for a DPB entrant is also a simple one and again, depends only on the entrant's age, with a different distribution estimated for each age. Full details may be found in the electronic appendices; Figure 10.9 below shows the distribution for four different entrant ages: 25, 35, 45 and 55.

Figure 10.9 **Distribution of age of youngest child for a DPB entrant**



The age of the youngest child is banded in two year intervals, where 0 represents the band 0 – 2 years (but does not include child age 2), 2 represents the band 2 – 4 years (but does not include child age 4) etc. Not surprisingly, younger people tend to have younger children; older entrants have a wider spread of youngest child ages.

Models for evolution of child variables for on-going DPB recipients

Since numbers of children and the age of the youngest child can change from quarter to quarter for a DPB recipient (due to births, deaths, changes in child custody etc.) we have developed a number of models to capture these changes which include whether there is a new youngest child, the change in the number of children conditional on whether there is a new youngest child and the distribution of the age of a new youngest child.

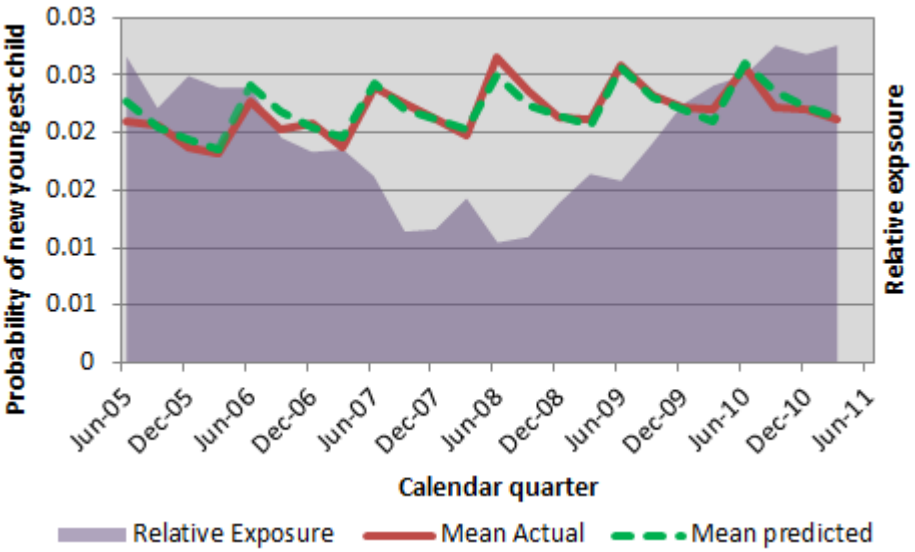
Note that the ageing of children is not captured in an explicit model, but is handled in a more deterministic manner. Since the age of the youngest child is banded in two-year intervals, in any quarter, we assume that 1/8th of DPB recipients have a youngest child that moves into the next age band due to ageing. We further assume that this ageing happens before any change in children numbers.

Model 2a: Probability of a new youngest child

The probability of a new youngest child each quarter is shown in Figure 10.10. The probability varies between approximately 0.02 and 0.025 with some seasonality as well as a slight increase over 2005 to 2008.

The probability of a new youngest child depends on a number of factors including duration on benefits, with people on DPB between 1 and 3 years being more likely to have a new youngest child. This appears plausible in light of child-bearing patterns.

Figure 10.10 **Probability of new youngest child**



Additionally, the age of the current youngest child is also an important factor in the model; for example those with very young children (0-2 years) are considerably less likely to have a new youngest child than those with a current youngest child aged 2-4 years. Further details are available in the electronic appendices.

Model 2b: Change in the number of children

At first glance, modelling the number of children may appear easy – hold constant and increment by one whenever there is a new youngest child (model 2a). However there are a number of other reasons why the number of children may change, including:

- Custody outcomes;
- Eldest children turning 18 and no longer being registered under the benefit; and
- Multiple births.

Due to this, an appropriate distribution for changes in the number of children must be assumed. This model depends on a number of factors:

- Age of the DPB recipient (banded into three age groups: 16-29, 30-44 and 45-64);
- The current number of children;
- The age of the current youngest child; and
- Whether there is a new youngest child (that is, the outcome of model 2a).

Figure 10.11 **Change in number of children for 30-44 year olds – no new youngest child**

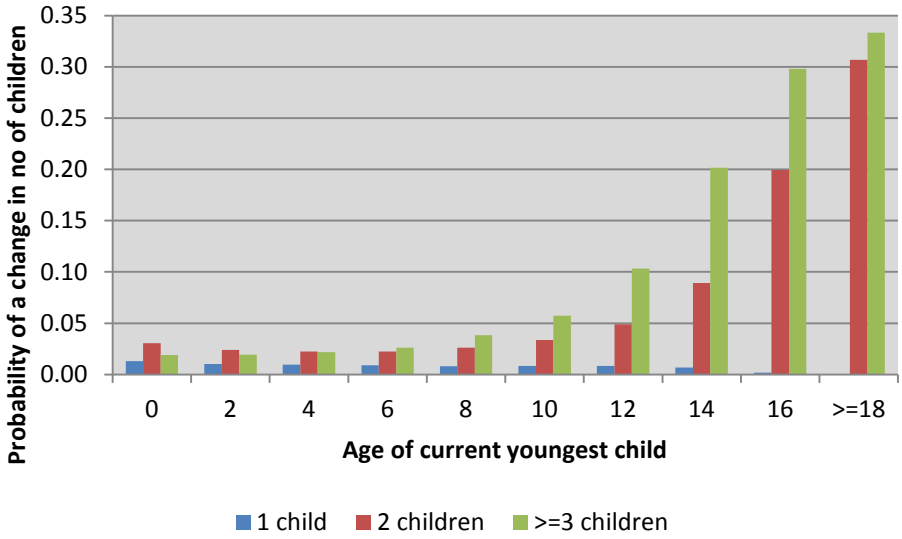
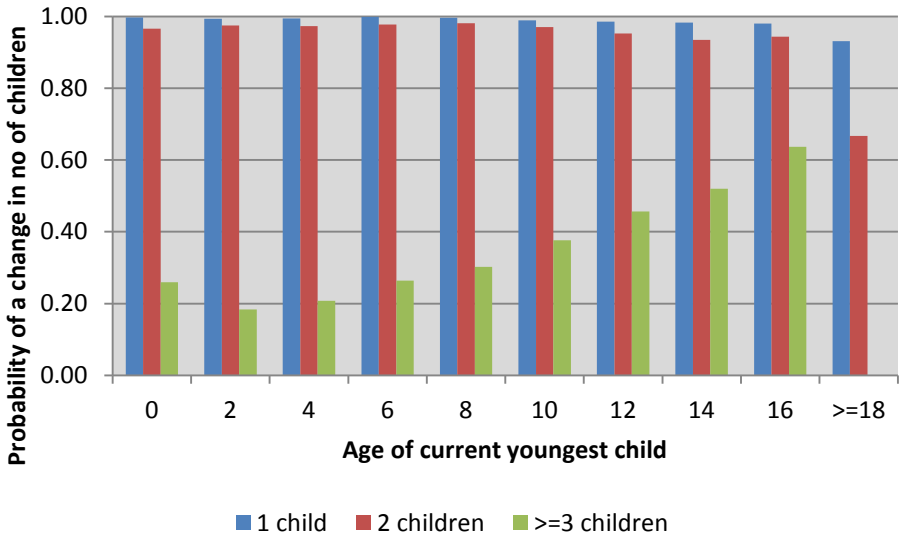


Figure 10.11 and Figure 10.12 display the probability of a change in the number of children for 30-44 year old DPB recipients where there is no new youngest child (Figure 10.11) and where there is a new youngest child (Figure 10.12). When there is no new youngest child the probability of a change in number of dependent children is quite low where the youngest child is aged 10 or lower. For older children, the probability of a change in numbers increases; this is most commonly due to children becoming independent, particularly for the order ages.

Figure 10.12 **Change in number of children for 30-44 year olds - new youngest child**

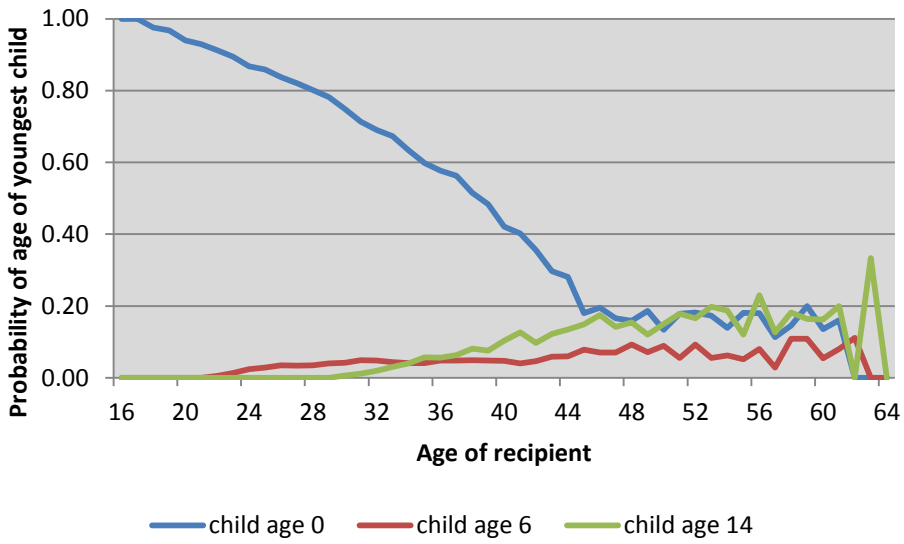


The probability of a change in numbers of children is much higher where there is a new youngest child as might be expected. Note that the probability of a change where the DPB recipient currently has 3 or more children is low relative to those that have 1 or 2 children – this is simply due to the fact that the recipient must have a net loss of dependent children to register as a change.

Model 2c: Distribution of the age of the new youngest child

The final model specifies the distribution of the age of the new youngest child over the ten age bands, for those cases where there is a change (as predicted by model 2a). This model depends on the age of the DPB recipient. Part of the distribution is shown in Figure 10.13 which plots the probabilities for a child aged 0, 6 and 14 for different recipient ages. Up to recipient age 44, a child aged zero is the most likely new youngest child, reflecting the fact that a new youngest child is most likely to arise through the birth of a new child. For older people, the distribution of ages is spread over a wider range, indicating the increased likelihood of other reasons for changes to the age of the new youngest child (loss or gain of a child through change of custody, death etc.).

Figure 10.13 **Distribution of age of new youngest child**



10.3 Summary of forecasts

The following table shows the current and future client liabilities for this benefit. Note the discount dates for future client liabilities are the middle (31 December) of that future year.

The mean term for future client liability is somewhat higher than that of the current client liability; this is due to the age distribution of people entering DPB being skewed younger compared to the current client liability cohort and therefore have more expected years on DPB.

Table 10.2 **Current and future client liabilities for Domestic Purposes Benefit**

Liability	Current values, undiscounted ($m)	Actual values, undiscounted ($m)	Actual values, discounted to "premium" date ($m)	Mean term (yrs)
Current	23,019	30,427	17,779	8.4
2011/12	2,940	4,172	2,120	10.1
2012/13	2,296	3,347	1,652	10.1
2013/14	1,989	2,978	1,439	10.2
2014/15	1,814	2,789	1,328	10.2
2015/16	1,715	2,708	1,276	10.3

Figure 10.14 **Historical and forecast numbers and ABPs (current values)**

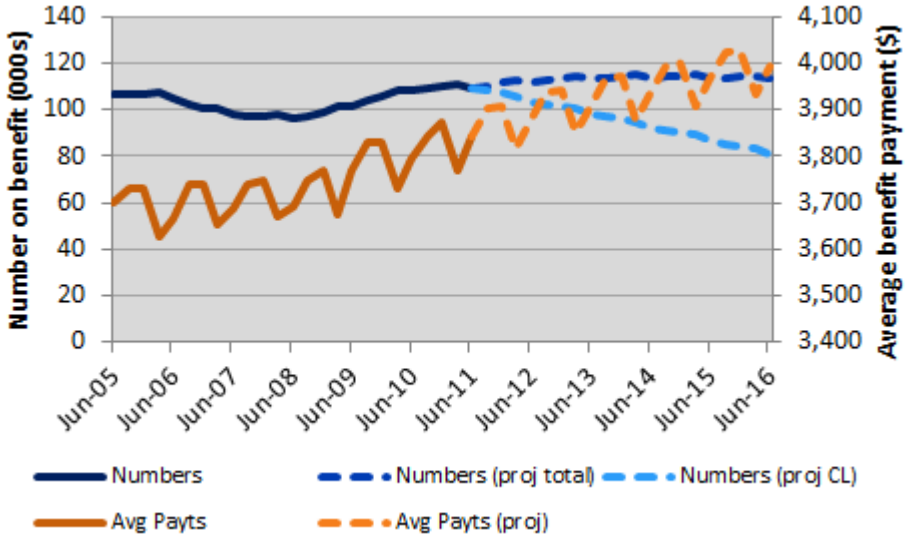


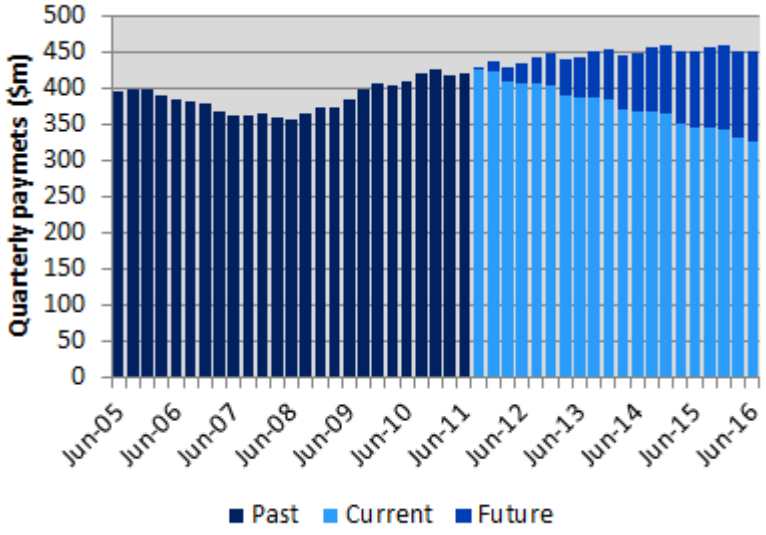
Figure 10.14 shows a number of interesting aspects of the projection:

- Overall numbers on DPB will slowly increase in the first couple of years after the valuation date before levelling off;
- The numbers attributable to the current client liability show a consistent quarter on quarter reduction;
- The current value ABP levels are forecast to rise slowly (that is actual levels are forecast to rise faster than inflation). This is due to a combination of factors:
  - A significant number of future entrants to DPB are in the age group 18-30, who tend to receive higher benefits; and
  - The gradual shift to higher durations of those in the current client liability.

  Note however it is not due to any forecast increase in the scheduled benefit rate other than that related to CPI.

Finally, Figure 10.15 shows the historical and projected payments for DPB, which is the combination of the numbers and ABPs in the previous graph.

Figure 10.15 **Quarterly benefit payments, in current values**



10.4 Key risks

We discuss general risks to the valuation results in Section 9, and add some specific comments regarding DPB here. The risks to DPB are unique due to the combination of the long spells people typically have on benefit plus its sensitivity to the macroeconomic environment. An economic downturn could increase DPB liabilities more than any other benefit.

A key risk for DPB is the unemployment rate, since times of recession and high unemployment lead to fewer job opportunities for single parents which then results in greater numbers claiming benefits. This sensitivity has increased with recent changes regarding working requirement for clients with older children. Thus a sharp increase in the unemployment rate would be expected to cause the associated future payments to be much higher than currently forecast. For example, a 1% increase to all future unemployment rates would increase the DPB current client liability by 5.5% while a 1% reduction would decrease the liability by a similar amount.

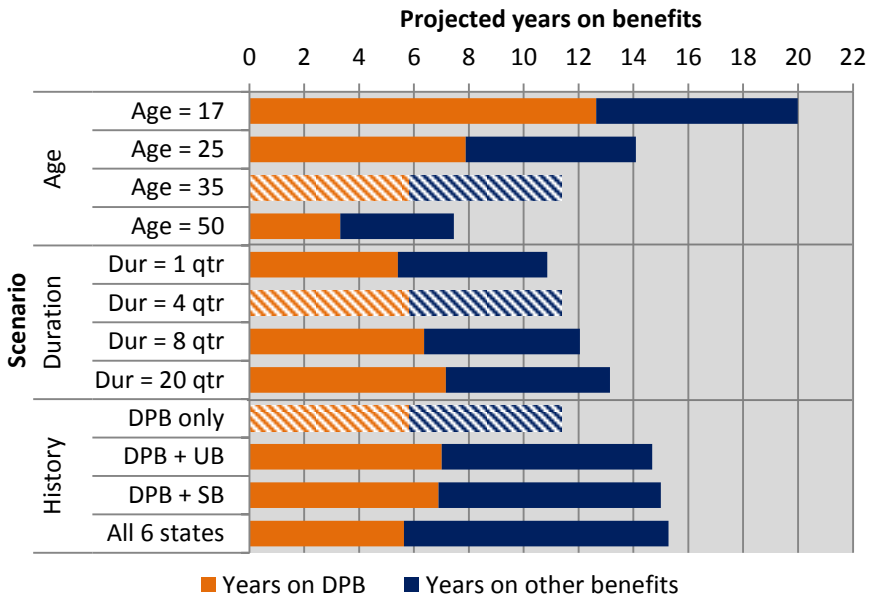
Furthermore, if the rates of transitioning off DPB were to fall by 5%, the current DPB liability would increase by 3.7%.

The composition of the population receiving DPB also has a significant impact on the liability, which can be seen by comparing the different liabilities calculated for individuals currently on DPB. Figure 10.16 shows the average number of years an individual is projected to receive domestic purpose and other benefits. The base scenario is someone aged 35, on benefit for 4 quarters and who has only received DPB before. Such a person would be expected to spend almost six years on DPB in the future, and five and a half years on other benefits (mostly shared between SB, IB and other non-key benefits).

Projected years on DPB is relatively stable for different durations and other benefits previously received – most scenarios only vary by a year or so. Age however, has a large impact on expected time on DPB which is not surprising given the nature of the benefit.

Someone aged 17 is likely to spend almost four times as long (more than twelve years) on DPB than someone aged 50 (approximately three years).

Figure 10.16 **One-person projections for DPB beneficiaries**



Note: shaded bars represent the base scenario (recipient aged 35, duration 4, no other benefits received in past).

We also point out risks associated with recent DPB policy changes, introduced in Section 9.2.1. In September 2010, a number of work obligations were introduced for DPB recipients. These include:

- Part-time work obligations if their youngest dependent child is aged 6–17 years;
- Full-time work obligations if their youngest dependent child is aged 18 years or over; and
- A requirement to meet the obligations of the employment planning process if required by their case manager.

These reforms are quite recent, having been introduced only three quarters prior to the valuation date. As such, their effect is hard to quantify at this point – the experience will be more developed at the next valuation date which will facilitate an assessment. There will almost certainly be an effect on the ABP, particularly when interactions with child age are considered. The impact on numbers is harder to assess as the income derived from part-time work may not be sufficient to rule the applicant out of receiving DPB. This uncertainty is exacerbated by the concurrent increase in the income threshold for DPB recipients. Indeed, the extent to which clients obtain part time work at a level that satisfies the work obligation while still allowing receipt of DPB payments is difficult to estimate.

11 INVALID'S BENEFIT

11.1 Introduction

The Invalid's Benefit is paid by MSD to people who are severely limited in their capacity to work on a permanent basis. The following two benefit codes have been included in this category:

Benefit Name	Code	% 10/11 benefit	Comment
Invalid's Benefit	320	98.1%	
Invalid's Benefit	020	1.9%	

The 020 category is simply an older payment code and the distinction between the two is largely irrelevant. Note that IB paid to NZ citizens living in Australia has been included in the data, analysis and valuation.

The Invalid's Benefit ("IB") forms one of the four key benefits, as discussed in Section 4. This means that the definition of an IB recipient in a quarter is the presence of an invalid's spell, so long as there is not a longer key benefit spell in that quarter.

The number of recipients on IB is largely stable and independent of the state of the economy. Transitions off the benefit are also stable and reasonably predictable.

As might be expected, the Invalid's Benefit also has the lowest churn rate of the four key benefits; a very small proportion of recipients leave the benefit each quarter. It also has a relatively high ABP.

11.2 Current experience

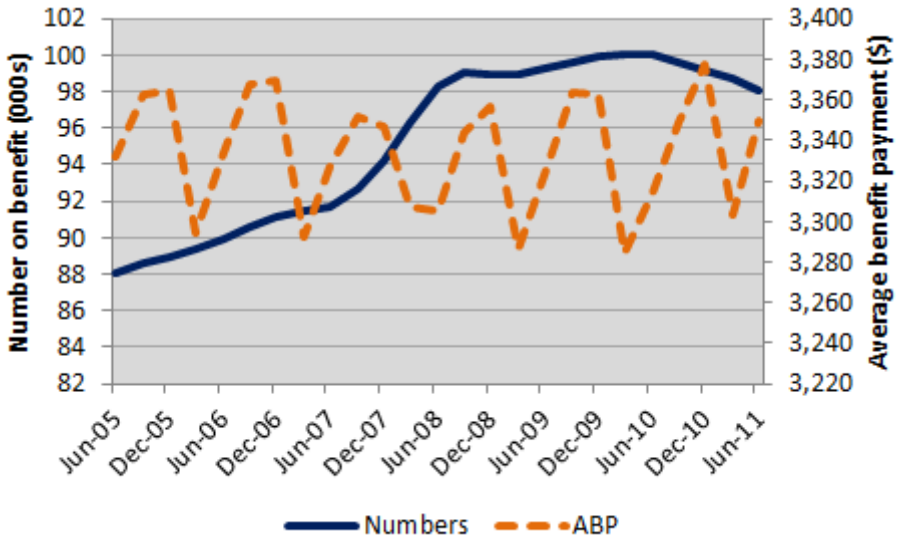
11.2.1 General experience and trends

The following table and graph show the recent experience for the Invalid's Benefit.

Table 11.1 **Recent Invalid's Benefit experience**

Year	Payments ($m)	Average number on benefit	Average quarterly benefit paid (ABP) per client ($)
2007/08	1,213	95,400	3,180
2008/09	1,257	99,100	3,170
2009/10	1,295	99,900	3,240
2010/11	1,294	98,900	3,270

Figure 11.1 **Trends in Invalid's Benefit. ABP in June 2011 values**



The 2007/08 year saw a large increase in the numbers receiving IB. We believe this is largely attributable to the policy changes at the time concerning the IB gateway, which led to a spike in numbers moving into IB, particularly from NOB and SB. Numbers have since largely stabilised. Quarterly payments per IB recipient have been very stable (after allowing for CPI increases), with the small amount of seasonality primarily due to the number of possible benefit days per quarter.

Number of recipients is also informed by considering the number moving on and off the benefit each quarter.

Figure 11.2 **Number of people entering Invalid's Benefit per quarter**

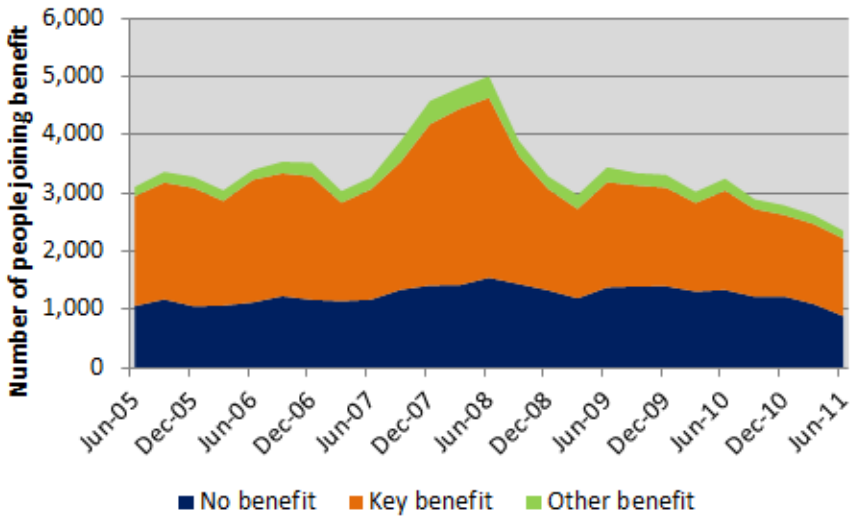
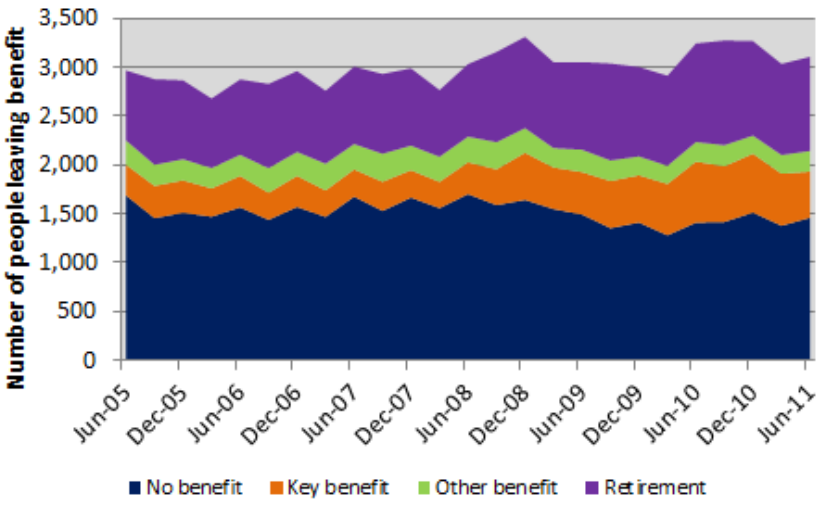


Figure 11.3 **Number of people leaving Invalid's Benefit per quarter**



We can make a number of comments regarding these graphs:

- The spike in 2007/08 in people entering IB, particularly from SB (a key benefit), is clear. This coincides with the introduction of changes to the IB Gateway, affecting how people could qualify for IB. Entries from SB has now stabilised at a lower level.

- The number of people entering and leaving is relatively low compared to the number receiving benefits – around 3% per quarter. This is consistent with a low churn benefit.

- Very few IB recipients transition to a different benefit. They primarily move to NOB (which includes benefit payments stopping due to death), or remain on benefit until they reach age 65. The number of people leaving IB has risen slightly in the past few years, reflecting the increased number of people in the system.

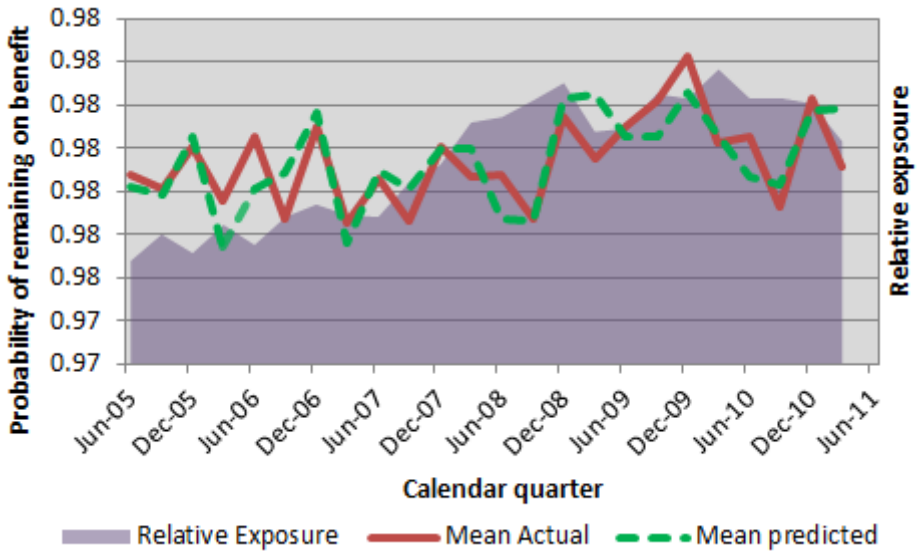
11.2.2 Modelling transitions

Recall that there are three models related to the behaviour of clients receiving the Invalid's Benefit:

- The probability of remaining on the same benefit;
- The probability of moving to no benefit, given the client does not remain on the same benefit; and
- The (multinomial) probabilities of moving to other key benefit types, given that the client does not remain on the same benefit nor move to no benefit.

While these models depend on calendar quarter, age, duration on benefit, indicators of past benefit types, plus their interactions, this section will primarily focus on the calendar quarter dependency, with some brief comments on the other variables. Readers interested in the other dependencies are referred to the electronic appendices.

Figure 11.4 **Probability clients remain on Invalid's Benefit**



The first probability model tracks people remaining on the Invalid's Benefit and the actual and modelled effects are shown in Figure 11.4. Currently just over 2% of IB recipients leave the benefit each quarter (for reasons other than reaching age 65). This rate has remained relatively stable for a number of years, and does not have a strong correlation to the state of the economy.

Figure 11.5 shows the probability of a client who leaves IB (for reasons other than retirement) moving to no benefit. This proportion fell significantly, which coincides with an increase in the proportion moving to SB in Figure 11.6. Thus another result of the IB gateway changes appears to be an increased transition from IB to SB. This is likely to be the result of a more stringent biennial review.

Figure 11.5 **Probability clients who leave Invalid's Benefit move off benefits**

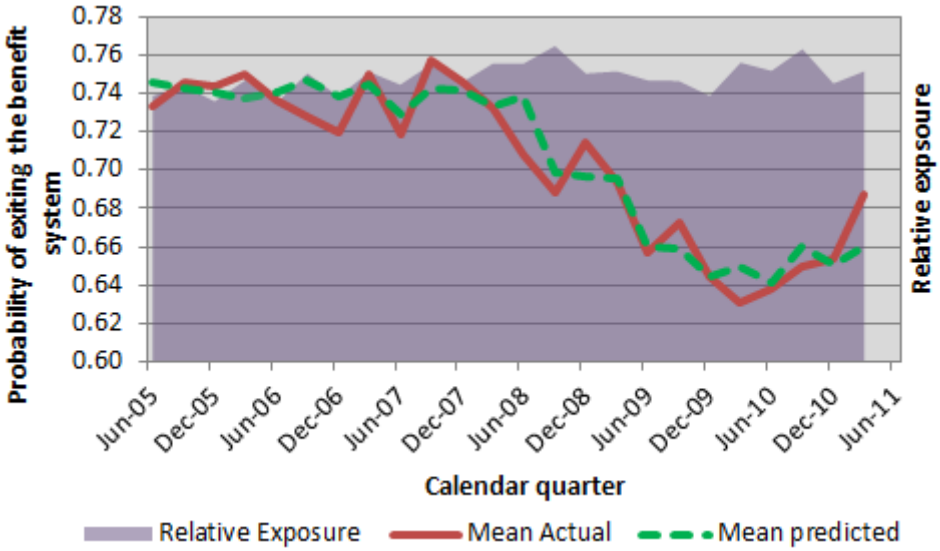
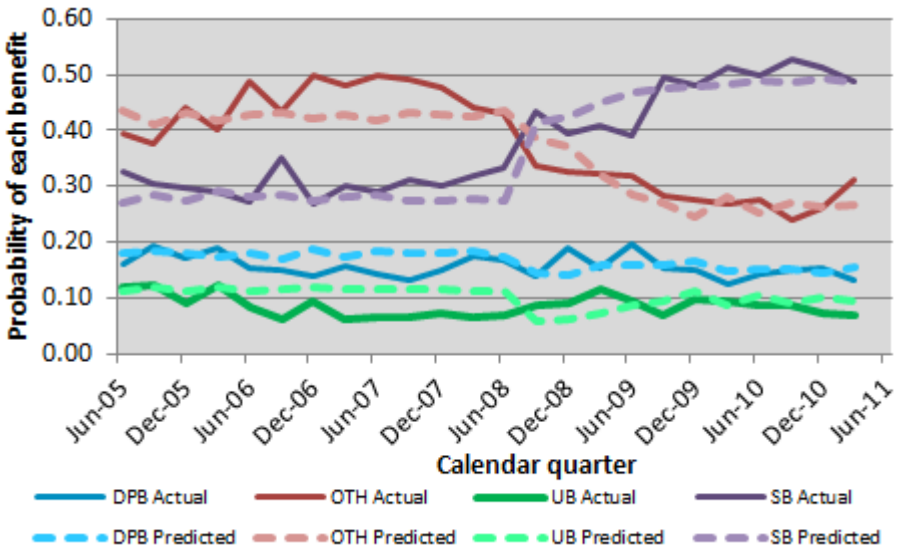


Figure 11.6 **Distribution of clients who move from Invalid's Benefit to other benefits**



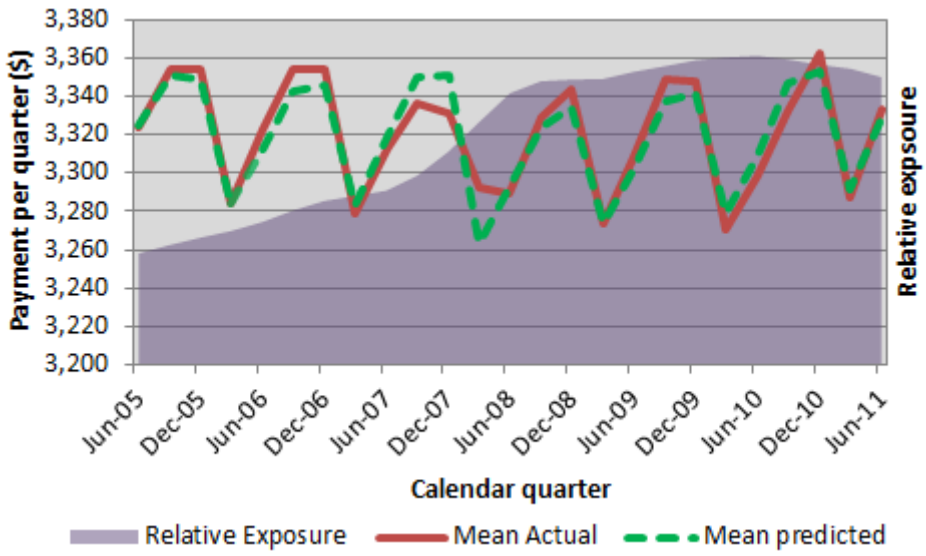
The rise of the proportion moving to SB in Figure 11.6 is offset by corresponding decreases in NOB (Figure 11.5) and other benefits.

There are a number of significant duration and age trends that heavily affect the likelihood of a person's progression in the system. Further graphs and tables can be found in the electronic models appendix. Some of the highlights are:

- The rate of transitioning out of IB (other than retirement) falls to less than 1% for people on benefit for at least ten years;
- Biennial reviews (i.e. at duration 8 quarters, 16 quarters etc.) for a significant proportion of the IB population is a significant feature in modelling the transitions out. This suggests there are a number of people (particularly at lower durations) who are ineligible, but remain on benefit until a review; and
- The proportion that transition to non-key benefits (OTH) is much higher at older ages, while the DPB transition is much more common for ages below 40.

11.2.3 Average benefit payments while on benefit

Figure 11.7 **Actual and modelled quarterly payments by calendar quarter**



The shape of the quarterly average benefit payment model is relatively flat, with seasonally lower payments in the March and June quarters, attributable to the lower number of days in these quarters. We expect this to continue in future years.

11.3 Summary of forecasts

The following table shows the current and future client liabilities for this benefit. Note the discount dates for future client liabilities are the middle (31 December) of that future year.

Table 11.2 **Current and future client liabilities for Invalid's Benefit**

Liability	Current values, undiscounted ($m)	Actual values, undiscounted ($m)	Actual values, discounted to "premium" date ($m)	Mean term (yrs)
Current	28,349	43,211	19,051	11.7
2011/12	2,554	4,579	1,434	2,554
2012/13	2,066	3,783	1,168	2,066
2013/14	1,811	3,400	1,035	1,811
2014/15	1,656	3,190	961	1,656
2015/16	1,560	3,087	921	1,560

The mean term for future client liability is much higher than that of the current client liability; this is due to the age distribution of people entering the IB being skewed younger compared to the current client liability cohort and thus having more expected years on IB.

Figure 11.8 **Historical and forecast numbers and ABPs (current values)**

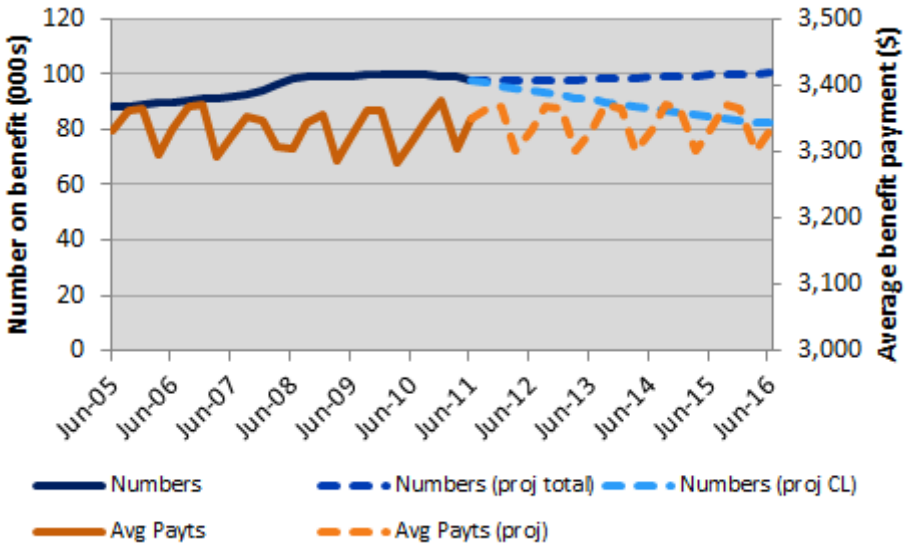


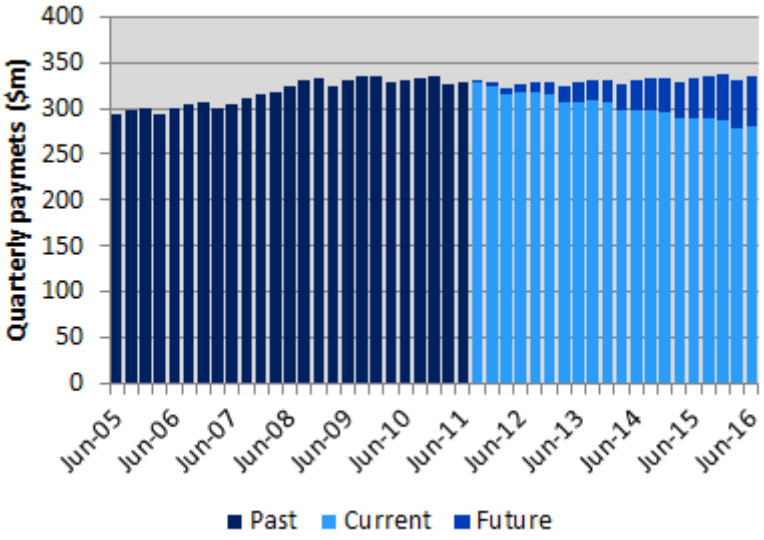
Figure 11.8 shows a number of interesting aspects of the projection:

- Overall numbers on invalid benefit will remain close to current levels, albeit with a slight increase, reflecting the stability of IB and its low dependence on the state of the economy.

- The numbers attributable to the current client liability fall slowly relative to the total numbers, reflecting the low churn rate of IB;

Finally, Figure 11.9 shows the historical and projected payments for the Invalid's Benefit, which is the combination of the numbers and ABPs in the previous figure.

Figure 11.9 **Quarterly benefit payments, in current values**



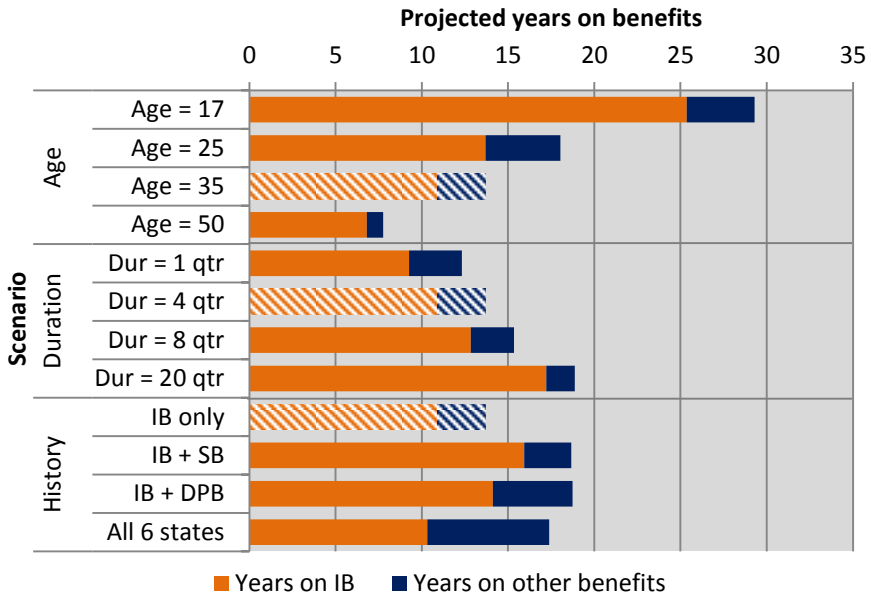
11.4 Key risks

We discuss general risks to the valuation results in Section 9, and add some specific comments regarding IB here. The IB experience is the most predictable of all four key benefit types due to its nature. It is also largely independent of the state of the economy – for example a 1% addition to all future unemployment rates increased the estimate of the current IB liability by less than 2% compared with over 5% for SB and almost 27% for UB.

The biennial review of IB is a significant feature in modelling the transitions out of IB suggesting that at lower durations there are a number of people who are ineligible for IB but remain on benefit until the next review. Were the review process to become less stringent or less frequent, numbers of ineligible recipients may increase.

Due to the long term nature of IB (i.e. typically people on IB stay on this benefit for many years), interest and inflation rate risk affects the liability of this benefit more than others. To illustrate, a 1% decrease in real interest rates (whether by increased inflation or decreased discount rates) increases the IB liability by over 12%, whereas the UB liability only increases by 8%.

Figure 11.10 **One-person projections for IB beneficiaries**



Note: shaded bars represent the base scenario (recipient aged 35, duration 4, no other benefits received in past).

The composition of the population receiving IB also has a significant impact on the liability, which can be seen by comparing the different liabilities calculated for individuals currently on IB. Figure 11.10 shows the average number of years an individual is projected to receive both Invalid's and other benefits. The base scenario is someone aged 35, on benefit for 4 quarters and who has only received IB before. Such a person would be expected to spend nearly eleven years on IB in the future and about three years on other benefits.

Both the low churn and long term nature of IB are evident from this graph. Age is a key driver – younger people entering IB stay on benefit for a long time. For example a 17 year

old is expected to stay on IB for 25 years compared to approximately 7 years for a 50 year old. Duration also has an impact – those with higher durations are expected to stay on benefit for longer, all other things being equal. This is indicative of the review process removing those no longer eligible for IB at the lower durations.

Receiving SB in the past is also indicative of an expectation of more years on IB (16 compared to 11) – this is most likely due to those who transition to IB from SB being less likely to be able to return to work. However the same is also true of those who have received DPB in the past.

12 SICKNESS BENEFIT

12.1 Introduction

The Sickness Benefit is paid by MSD to people who are unable to work due to being sick, injured, in rehabilitation, disabled or pregnant. It is primarily targeted at temporary conditions, with more permanent severe limitations included in the Invalid's Benefit. The following two benefit codes have been included in this category:

Benefit Name	Code	% 10/11 benefit	Comment
Sickness Benefit	600	98.7%	
Sickness Benefit Hardship	601	1.3%	

The great majority of payments are made under the 600 code, the standard Sickness Benefit code.

The Sickness Benefit ("SB") forms one of the four key benefits discussed in Section 4. This means that the definition of an SB recipient in a quarter is the presence of a sickness spell, so long as there is not a longer key benefit spell in that quarter.

The number of recipients on SB varies with the state of the economy, particularly the unemployment rate; however this dependence is not as strong as that for the Unemployment Benefit.

The Sickness Benefit also has the second highest churn rate of the four key benefits; a large number of people move off and on to SB each quarter, with some strong seasonal effects.

12.2 Current experience

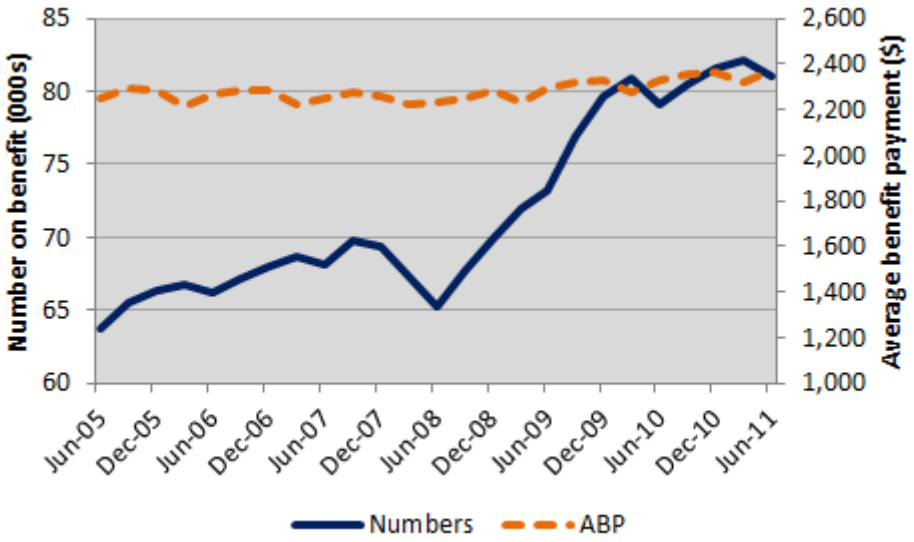
12.2.1 General experience and trends

The following table and graph show the recent experience for the Sickness Benefit.

Table 12.1 **Recent Sickness Benefit experience**

Year	Payments ($m)	Average number on benefit	Average quarterly benefit paid (ABP) per client ($)
2007/08	583	67,900	2,150
2008/09	610	70,700	2,160
2009/10	712	79,100	2,250
2010/11	748	81,300	2,300

Figure 12.1 **Trends in Sickness Benefit. ABP in June 2011 values.**



The 2008/09 and 2009/10 years saw a large increase in the numbers receiving SB, coinciding with the deterioration in the labour force due to the global financial crisis and increased numbers entering from IB (see Section 11). Numbers have largely stabilised, but have yet to trend downwards as is the case for UB. Quarterly payments to Sickness Benefit recipients have largely been stable (after allowing for CPI increases), although there has been a slight rise which may be attributable to the tendency towards longer spells.

Number of recipients is also informed by considering the number moving on and off the benefit each quarter.

Figure 12.2 **Number of people entering Sickness Benefit per quarter**

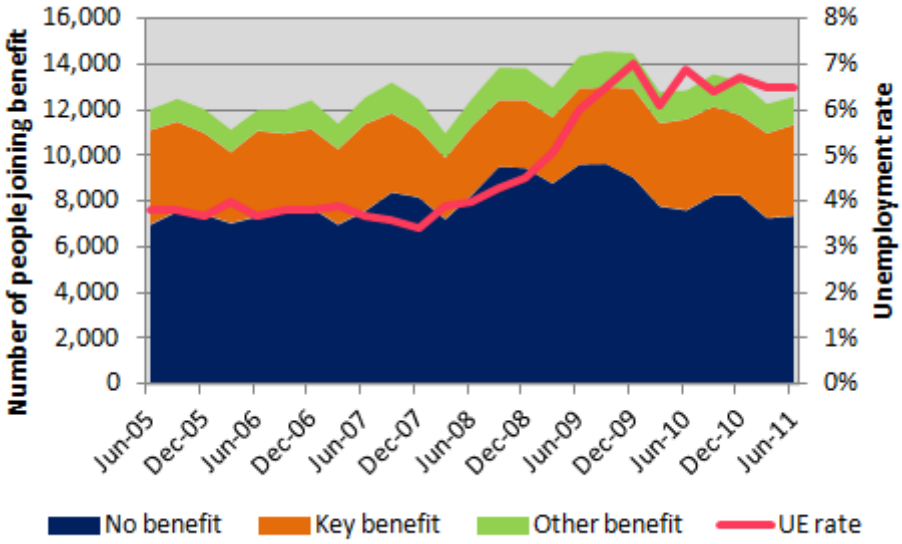
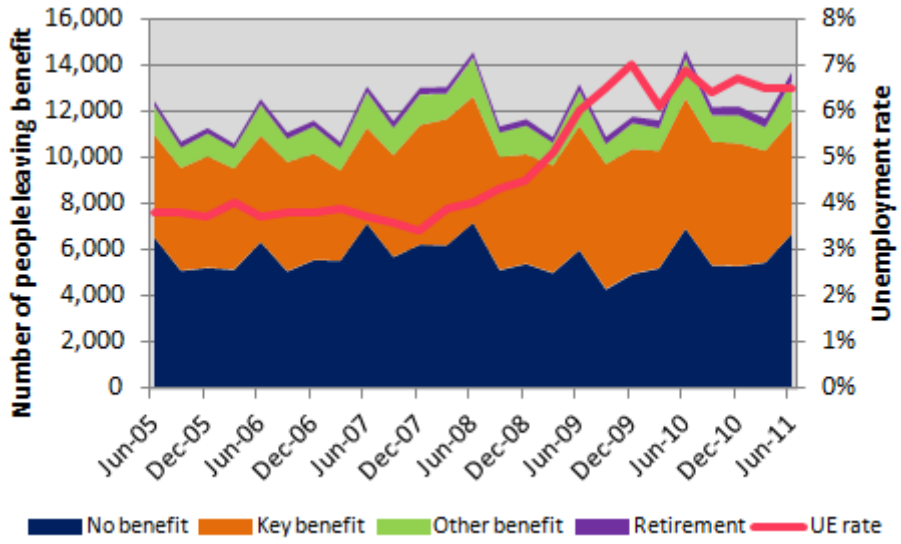


Figure 12.3 **Number of people leaving Sickness Benefit per quarter**



These graphs show that the increase in numbers in 2008/09 and 2009/10 is both due to an increase in the number of people entering the benefit as well as a fall in the number of people leaving. This imbalance has now largely stabilised. While around half of people entering and leaving the benefit are entering or leaving the system (NOB state), there are still some important relationships with other benefits. For instance:

- There is a significant transfer UB to SB and SB to UB each quarter. This suggests SB may be an avenue for UB recipients to temporarily avoid work search requirements;
- There is a significant movement from SB to DPB. This can be partly explained by the fact that late pregnancy can qualify for SB; and

- There is a significant movement from SB to IB, as a condition initially judged temporary is later deemed to be eligible for Invalid's Benefit. The numbers moving from IB to SB has also increased in recent years.

These comments and the multinomial results (Figure 12.6) below show that SB is a very common intermediate benefit for clients moving through the benefit system. This also means that the SB liability is highly sensitive to changes elsewhere in the system.

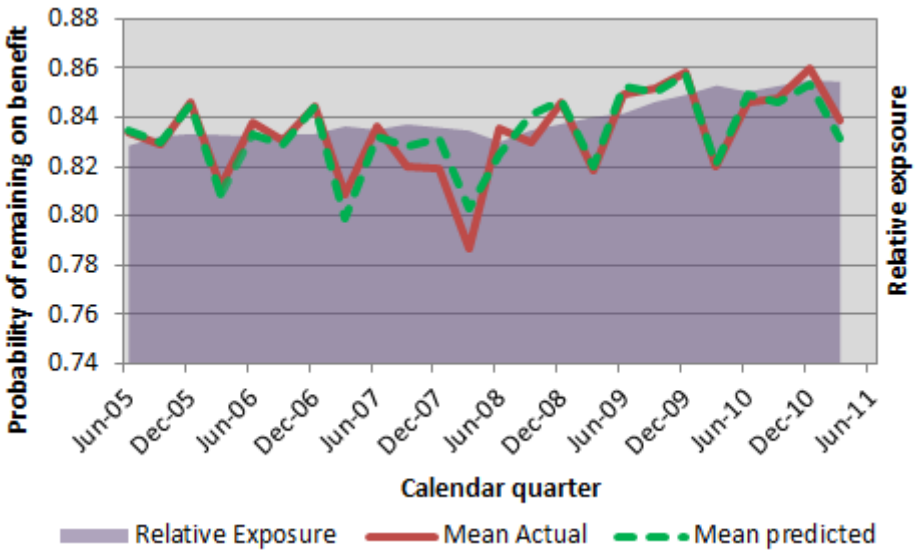
12.2.2 Modelling transitions

Recall that there are three models related to the behaviour of clients receiving the Sickness Benefit:

- The probability of remaining on the same benefit;
- The probability of moving to no benefit, given the client does not remain on the same benefit; and
- The (multinomial) probabilities of moving to other key benefit types, given that the client does not remain on the same benefit nor move to no benefit.

This section contains some brief comments on the models, particularly trends over time. Further detail on these models can be found in the electronic appendices.

Figure 12.4 **Probability clients remain on Sickness Benefit**



The first probability model tracks people remaining on the Sickness Benefit and the actual and modelled effects are shown in Figure 12.4. Currently, about 15% of clients leave the benefit each quarter. This rate has a reasonable correlation with the unemployment rate and the deterioration in the economy has led to a significant increase in the probability of remaining in SB over the past couple of years. However, Treasury forecasts of gradual falls in the unemployment rate leads the model to project a slightly lower probability of remaining on benefit in the future. Significant seasonality is also present; people are much more likely to move off during a March quarter.

Figure 12.5 shows the probability of a client who leaves SB (for reasons other than retirement) moving to no benefit. It shows around 50% of beneficiaries leave the system (either finding work or leaving for another reason), while the rest move to a different benefit type. The rate is lower during periods of higher unemployment (2008/09 for instance), and this dependence has been fitted in the model.

Figure 12.5 **Probability clients who leave Sickness Benefit move off benefits**

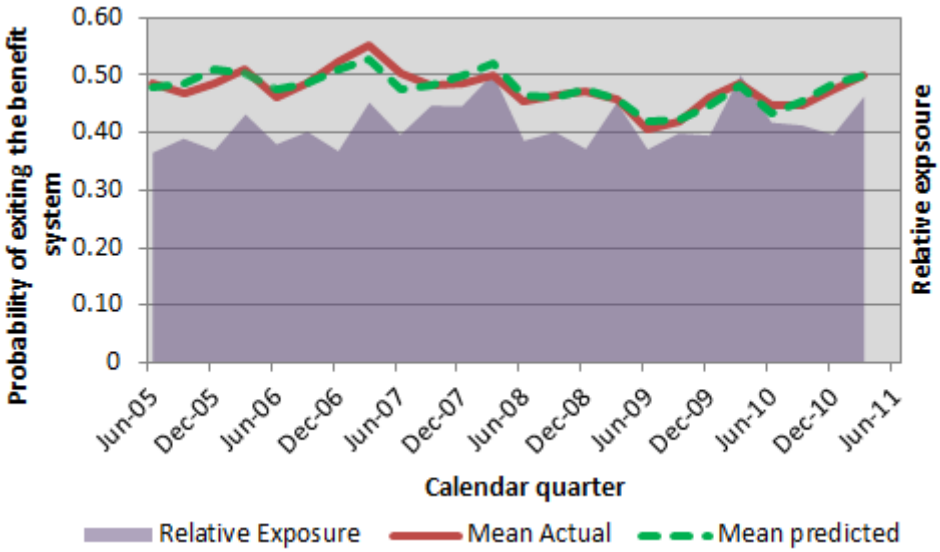
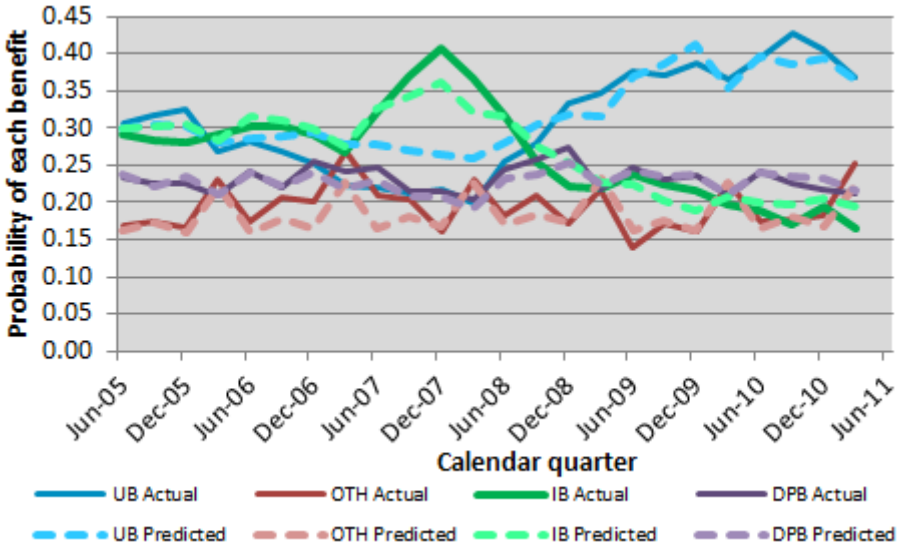


Figure 12.6 **Distribution of clients who move from Sickness Benefit to other benefits**



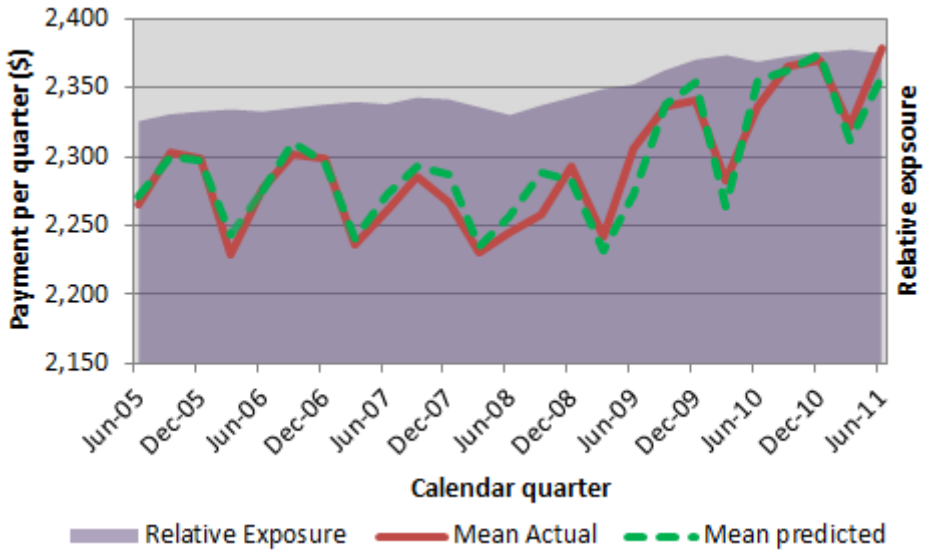
The multivariate probabilities for those moving to other benefits are shown in Figure 12.6. The recent increase in the proportion moving to UB has been modelled via dependence on the unemployment rate, and reflects SB's close relationship to UB. However, all the other benefit states are well represented in the probabilities, with significant numbers moving to each. The spike in IB in December 2007 coincides with the introduction of a single medical certificate for SB and IB in September 2007, with a lower SB to IB transfer rate after that time.

There are a number of important duration and age trends that heavily affect the likelihood of a person's progression in the system. Further graphs and tables can be found in the electronic models appendix. Some of the key features are:

- Older age recipients are much less likely to leave SB; the rate of transition for a 50 year old is half that observed for a 25 year old;
- The transition rate out of SB is more than 20% in the first year, and less than 10% once a client has been on for three or more years; and
- Beneficiaries on SB for longer durations and older ages who do not move to NOB are much more likely to move to IB than any other benefit; for people aged over 55, over 60% of them move to IB. Conversely, a transition to DPB is much more likely at younger ages.

12.2.3 Average benefit payments while on benefit

Figure 12.7 **Actual and modelled quarterly payments by calendar quarter**



The shape of the quarterly average benefit payment model is relatively flat across 2005/06 through 2008/09 but has increased about 3% in real terms since that time. This is largely due to changing composition of the SB cohort rather than any underlying calendar quarter trend. For example, the decreased probability of leaving the benefit increases the chance a recipient receives SB for the full quarter, increasing the ABP. Based on Treasury's unemployment rate forecasts this effect should stabilise and partially reverse in coming years.

12.3 Summary of forecasts

The following table shows the current and future client liabilities for this benefit. Note the discount dates for future client liabilities are the middle (31 December) of that future year.

Table 12.2 **Current and future client liabilities for Sickness Benefit**

Liability	Current values, undiscounted ($m)	Actual values, undiscounted ($m)	Actual values, discounted to "premium" date ($m)	Mean term (yrs)
Current	10,168	14,805	7,221	10.2
2011/12	1,634	2,508	1,123	10.6
2012/13	1,274	2,000	881	10.4
2013/14	1,091	1,756	763	10.3
2014/15	983	1,622	698	10.3
2015/16	917	1,555	663	10.3

The mean term for future client liability is comparable to that of the current client liability.

Figure 12.8 **Historical and forecast numbers and ABPs (current values)**

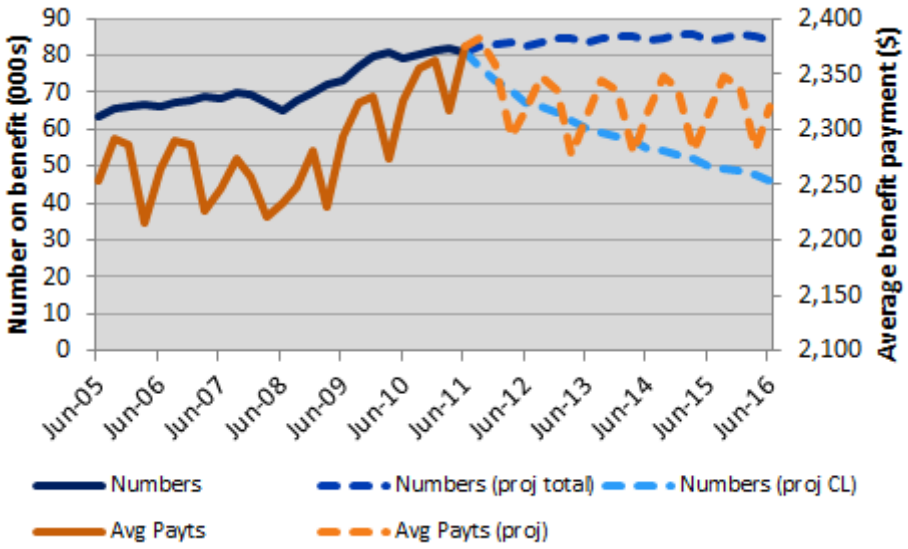
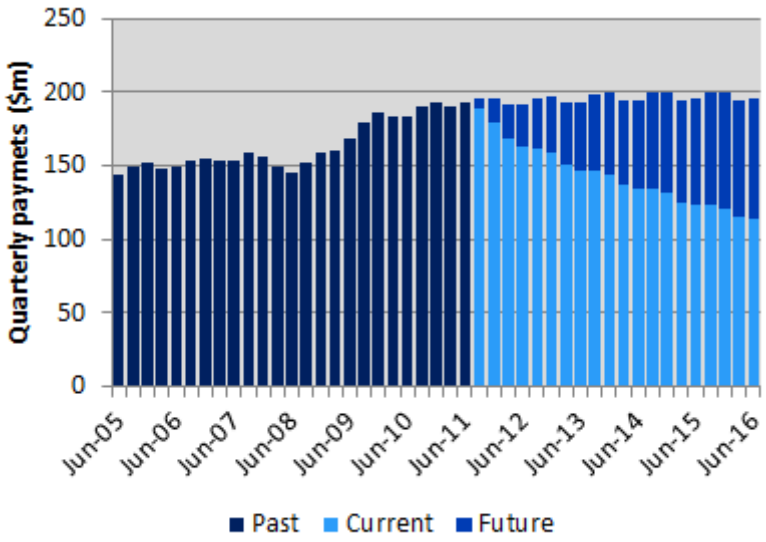


Figure 12.8 shows a number of interesting aspects of the projection:

- Overall numbers on SB will remain relatively high, reflecting the trends seen particularly in the last two years;
- The numbers attributable to the current client liability falls steadily relative to the total numbers, reflecting the short to medium term nature of most sickness spells; and
- The current value ABP levels are forecast to fall slightly (that is, actual levels are forecast to fall before allowing for any inflation increase), towards its historical average. This is largely due to the forecast return of average duration to levels below that seen in 2010 and 2011.

Finally, Figure 12.9 shows the historical and projected payments for the Sickness Benefit, which is the combination of the numbers and ABPs in the previous figure.

Figure 12.9 **Quarterly benefit payments, in current values**



12.4 Key risks

We discuss general risks to the valuation results in Section 9, and add some specific comments regarding SB here. There are a number of significant drivers to the SB liability that add uncertainty over the short to medium term:

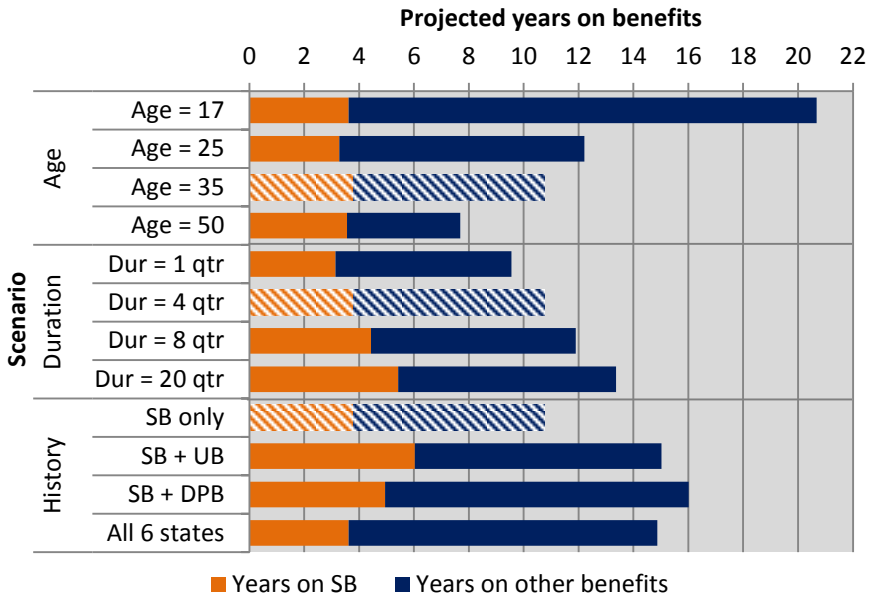
- The dependence of SB on the health of the economy. A sharp increase in the unemployment rate would likely see a rise in numbers entering, a decrease in numbers leaving and a slight rise in ABP. As an example, an addition of 1% to all future forecast unemployment rates would increase SB current client liability by 5.5%;

- The impact of future reforms. The proposed combination of key benefits is likely to alter recipient behaviour. This includes the rate of transition between benefits, particularly pertinent for SB given its high interrelation to other benefit states; and

- If the probability of people leaving SB changes materially then this will impact the SB liability. For example, if the probability falls by 5%, then the current client liability increases by over 6%. Such changes are plausible in light of historical changes.

The composition of the population receiving SB also has a significant impact on the liability, which can be seen by comparing the different liabilities calculated for individuals currently on SB. Figure 12.10 shows the average number of years an individual is projected to receive both sickness and other benefits. The base scenario is someone aged 35, on benefit for 4 quarters and who has only received SB before. Such a person would be expected to spend nearly four years on SB in the future, and seven on other benefits, mostly in IB (almost 4 years) but with significant spells in all other benefit types.

Figure 12.10 **One-person projections for SB beneficiaries**



Note: shaded bars represent the base scenario (recipient aged 35, duration 4, no other benefits received in past).

Interestingly, Figure 12.10 shows that SB liability is relatively stable by age; someone aged 25, 35 and 50 are likely to spend a similar time on SB. However, the same figure also shows that time on other key benefits is highly sensitive to age. A similar effect can be observed for the Unemployment Benefit in Figure 13.11. Duration and other benefits received make a more significant impact. Someone on SB for five years would be expected to have 45% more time on SB while someone who has received only UB on the past, without any time off benefit in between would be expected to spend 60% more time on SB. Interestingly, someone who has received all four key benefits in the past, as well as at least one of the other benefits and spent some time off benefit is expected to spend a similar amount of time on SB though a long spell (over 11 years) on other benefits.

Several major changes were introduced to SB in September 2010 and May 2011:

- (September 2010) SB recipients are obliged to meet the requirements of the Personal Development and Employment planning process if required to by their case managers;
- (May 2011) Those receiving SB are required to complete a reassessment for their benefit every 12 months; and
- (May 2011) SB recipients assessed as being able to work part-time can be subject to part-time work obligations.

Due to the strong interaction between SB and the Unemployment Benefit, the net impact of this reform is difficult to predict. Considered in isolation, one would assume that the part-time work obligation would lead to lower ABP's and that the reassessment process would lead to an altered duration pattern in the probability of transferring out of the benefit. The part-time work requirements may also decrease the incentive to transition between UB and SB.

13 UNEMPLOYMENT BENEFIT

13.1 Introduction

A number of unemployment related benefits are paid by the New Zealand Government. We have grouped the following benefit types under the "unemployment" umbrella and will refer to them collectively as "Unemployment Benefit":

Benefit Name	Code	% 10/11 benefit	Comment
Unemployment Benefit	610	89.0%	
Unemployment Benefit Training	608	7.7%	
Independent Youth Benefit	603	1.9%	Paid to <18 year olds
Unemployment Benefit Hardship	115	1.1%	
Unemployment Benefit Hardship Training	125	0.2%	
Young Job Seekers Allowance	604	0%	Discontinued 1999
55+ BENEFIT	605	0%	Discontinued 1998

The great majority of payments are made under the 610 code, with reasonable amounts paid under the Training and Independent Youth codes. The various codes listed in the table above have been combined for modelling purposes as they are all unemployment benefits of one form or another and therefore the clients on these codes behave in a similar way. Note that IYB has been discontinued from 20 August 2012.

The Unemployment Benefit ("UB") forms one of the four key benefits discussed in Section 4. This means that the definition of an unemployment recipient in a quarter is the presence of an unemployment spell, so long as there is not a longer key benefit spell in that quarter.

It is almost a tautology to say that the number of people on unemployment benefits depends on the official unemployment rate. This rate is a key driver of the models, both in the historical modelling and the projections. As discussed in economic assumptions, unemployment rate forecasts used are those produced by NZ Treasury.

13.2 Current experience

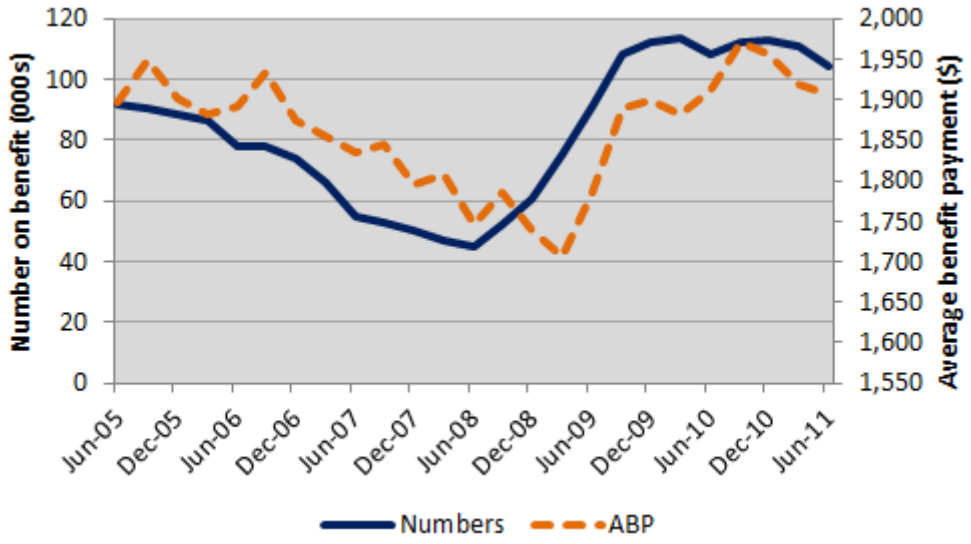
13.2.1 General experience and trends

The following table and graph show the recent experience for the Unemployment Benefit.

Table 13.1 **Recent Unemployment Benefit experience**

Year	Payments ($m)	Average number on benefit	Average quarterly benefit paid (ABP) per client ($)
2007/08	336	48,800	1,720
2008/09	467	69,800	1,670
2009/10	816	110,700	1,840
2010/11	836	110,300	1,890

Figure 13.1 **Trends in Unemployment Benefit. ABP in June 2011 values.**



The recent increase in numbers unemployed is clear, up from the record lows of 2007/08. Average quarterly payments to unemployment recipients has risen slightly too, reflecting the increased tendency for recipients to receive the full quarter of benefit, giving rises beyond the usual CPI increase. Numbers of recipients has stabilised in the past couple of years, and this should gradually reduce with the unemployment rate in the near future.

Number of recipients is also informed by considering the number moving on and off the benefit each quarter.

Figure 13.2 **Number of people entering Unemployment Benefit per quarter**

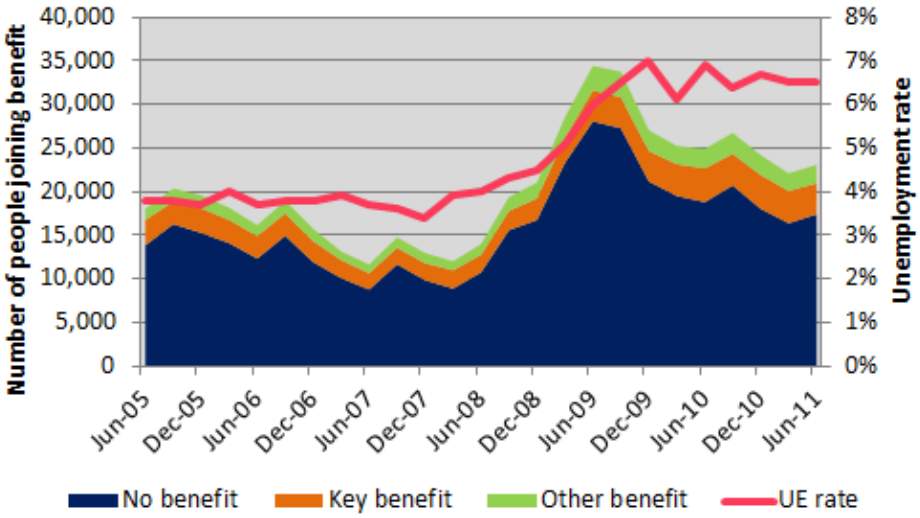
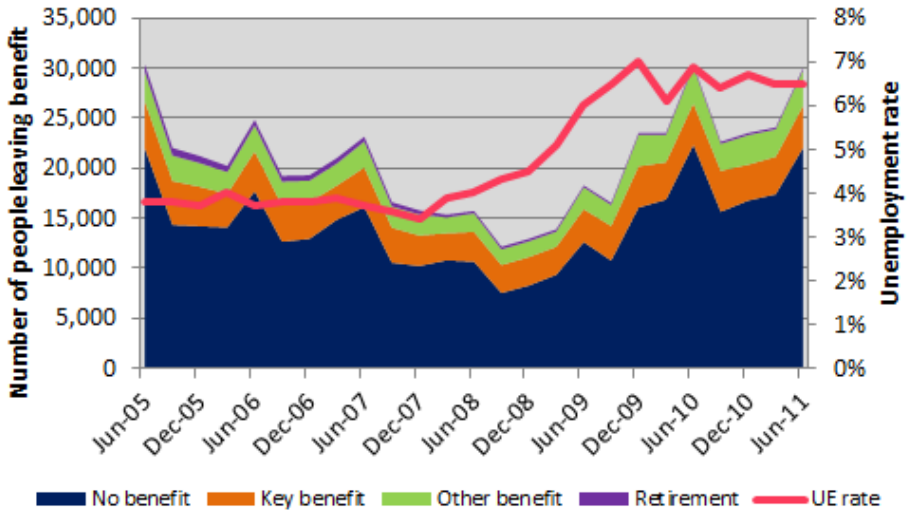


Figure 13.3 **Number of people leaving Unemployment Benefit per quarter**



These graphs show that the increase in numbers in 2008/09 was largely due to a spike in the number of people entering the benefit, with the subsequent stabilisation due to numbers leaving eventually "catching up" to the higher numbers of people entering from December 2009. By far the dominant subset are those people moving in and out from outside the system; that is, they do not have any other benefit going in or coming out.

13.2.2 Modelling transitions

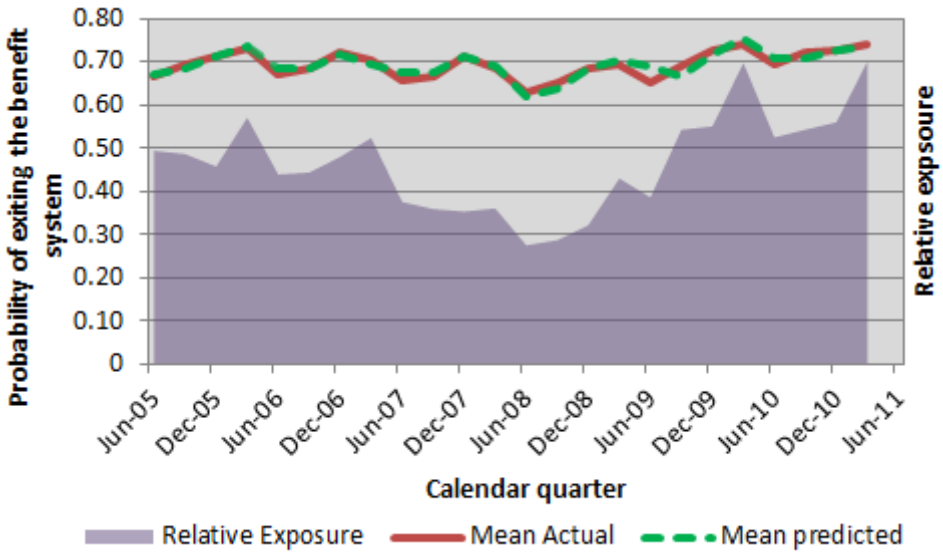
Recall that there are three models related to the behaviour of clients receiving UB:

- The probability of remaining on the same benefit;
- The probability of moving to no benefit, given the client does not remain on the same benefit; and

- The (multinomial) probabilities of moving to other key benefit types, given that the client does not remain on the same benefit nor move to no benefit.

Further information for interested readers can be found in the electronic appendices.

Figure 13.4 **Probability clients remain on Unemployment Benefit**



The first probability model tracks clients remaining on UB and the actual and model effects are shown in Figure 13.4. This is strongly correlated with the unemployment rate and the deterioration in the economy has led to a significant rise in this level over the past couple of years. However, it is projected that this will gradually trend down over the next few years:

- As the economy stabilises and slowly improves; and
- Due to MSD initiatives to help people on benefit for at least 12 months to leave the benefit.

Figure 13.5 shows the probability of a client who leaves UB (for reasons other than retirement) moving to no benefit. Thus around 70% of beneficiaries leave the system (either finding work or leaving for another reason), while 30% move to a different benefit type. The chart reveals this proportion also increases with the unemployment rate. This reflects the greater proportion of short term unemployed clients on benefits, who are less likely to remain on other benefits for a significant period of time. The strong seasonality is also evident. Figure 13.6 shows the proportions moving to other benefits for those that do not remain on UB or move to no benefit.

Figure 13.5 **Probability clients who leave Unemployment Benefit move off benefits**

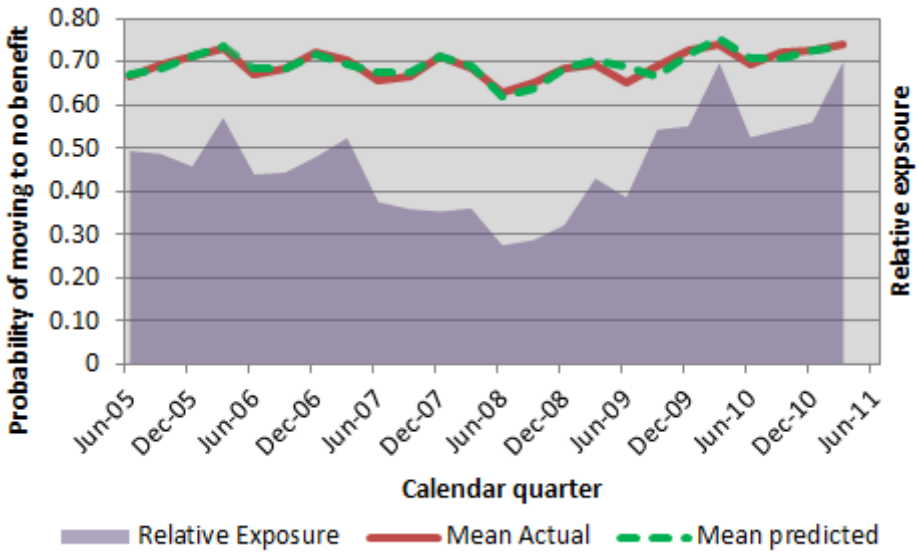
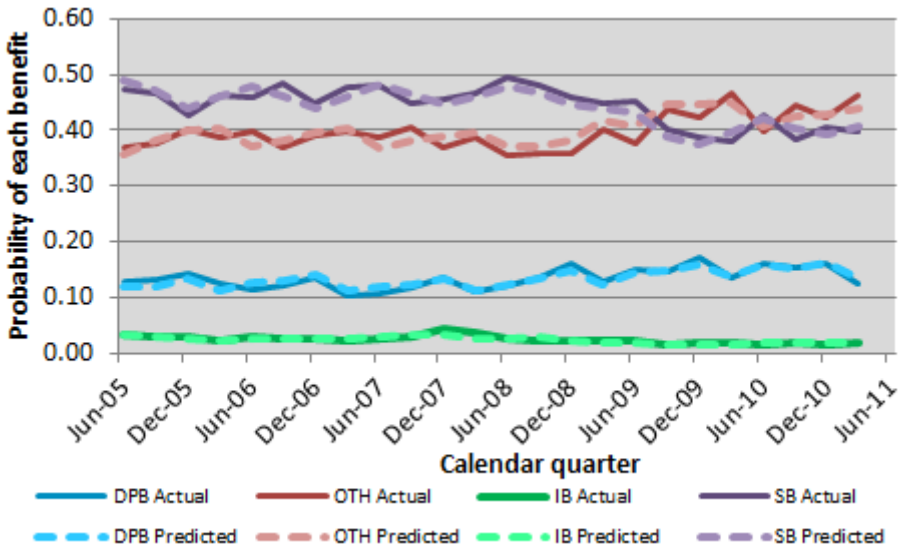


Figure 13.6 **Distribution of clients who move from Unemployment Benefit to other benefits**



Of those people who do move to a different benefit when they leave UB, the majority move to Sickness Benefit or "other" (typically a supplementary payment like Accommodation Supplement). The UB to SB and SB to UB are common transitions amongst long duration recipients. The overall proportions have been relatively stable over time.

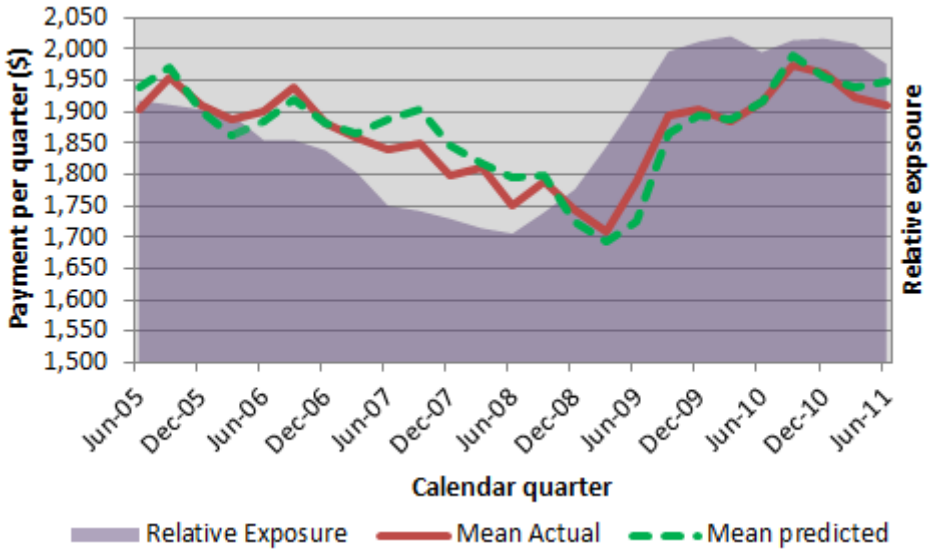
There are a number of important duration and age trends that heavily affect the likelihood of a person's progression in the system. Further graphs and tables can be found in the electronic models appendix. Some of the key features are:

- The quarterly probability of remaining on benefit rises from 75% for people with duration less than 6 quarters to above 90% for those on for over 5 years;

- The very young (<18) and the older (>50) are significantly less likely to move off benefit; and
- The proportions moving to Sickness and Invalid's Benefits increase dramatically with age.

13.2.3 Average benefit payments while on benefit

Figure 13.7 **Actual and modelled quarterly payments by calendar quarter**



The shape of the quarterly average benefit payment model bears some similarities to the transition models, as the probability of transition affects the likelihood of someone receiving a full quarter's benefit (i.e. in times of higher unemployment clients are more likely to spend the entire quarter on benefit), thus affecting the ABP. The current model tracks actual experience fairly closely, and has the following additional features:

- The model allows for the increased payment level at age 25; and
- Other factors such as duration, since they have an impact on the probability of receiving a full quarter's benefit, also affect predicted ABP.

13.3 Summary of forecasts

The following table shows the current and future client liabilities for this benefit. Note the discount dates for future client liabilities are the middle (31 December) of that future year.

Table 13.2 **Current and future client liabilities for unemployment benefit**

Liability	Current values, undiscounted ($m)	Actual values, undiscounted ($m)	Actual values, discounted to "premium" date ($m)	Mean term (yrs)
Current	5,232	7,141	4,042	7.8
2011/12	1,116	1,513	885	6.7
2012/13	820	1,151	647	6.9
2013/14	678	984	537	7.0
2014/15	597	893	478	7.2
2015/16	552	850	450	7.2

Note that the mean term for future client liability is lower than that for the current client liability. This is because the current client liability contains a greater number of long duration customers, raising the projected length of spell for this cohort. Additionally, the decline in future forecast unemployment rates also lowers the mean term of the future client liability.

Figure 13.8 **Historical and forecast numbers and ABPs (current values)**

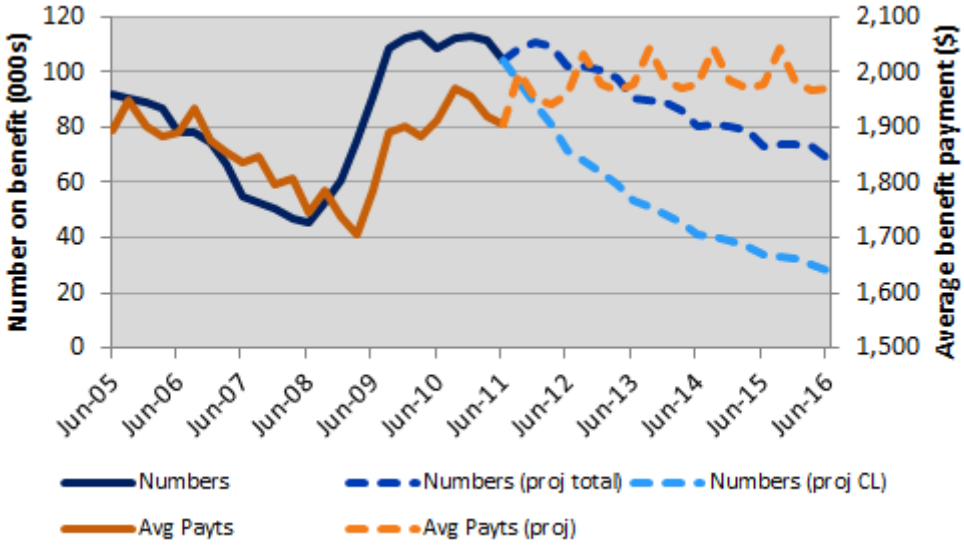
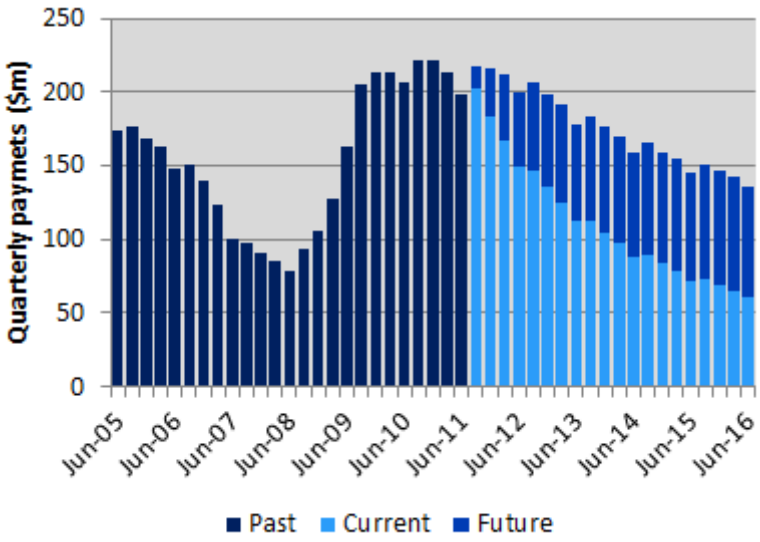


Figure 13.8 shows a number of interesting aspects of the projection:

- Overall numbers on UB will slowly decline, reflecting the forecast fall in the unemployment rate; and
- The numbers attributable to the current client liability fall fairly sharply relative to the total numbers, reflecting the short-term nature of most unemployment spells;

Finally, Figure 13.9 shows the historical and projected payments for the Unemployment Benefit, which is the combination of the numbers and ABPs in the previous graph.

Figure 13.9 **Quarterly benefit payments, in current values**



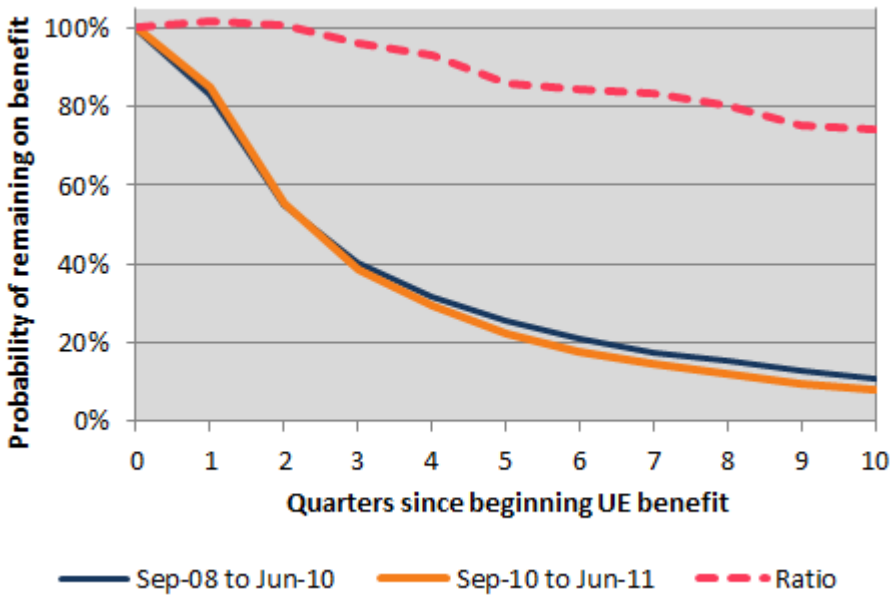
13.4 Key risks

We discuss general risks to the valuation results in Section 9, and add some specific comments regarding UB here. Of all key benefits, the unemployment projection has the highest degree of uncertainty, because the overall numbers vary greatly with state of the economy. Clearly the key risk here is a sharp increase in the unemployment rate, which would cause the associated liabilities to be much higher than currently forecast. To illustrate, should all future forecast unemployment rates be increased by adding 1% to the forecasts, the UB estimated liability would increase by 27% (conversely unemployment rates 1% lower would lead to a 21% reduction in the UB liability).

A second key risk is the impact of future reforms, including the benefit type consolidation discussed in Section 9.2.2. This has the potential to affect both the composition and behaviour of people receiving UB, and developments should be carefully monitored. For example, should any changes lead to a 5% reduction in the probability of leaving UB (all else remaining the same), then the current client liability would increase by 7%.

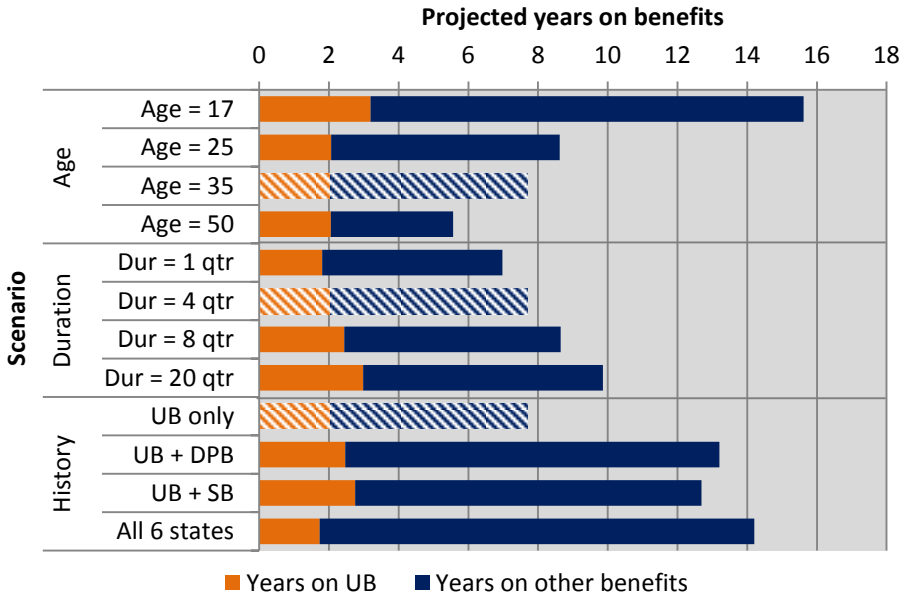
Since September 2010, those receiving UB have been obligated to reapply for their benefit every 12 months. These reforms are quite recent, having been introduced only three quarters prior to the valuation date. As such, the impact is hard to quantify at this point – the experience will be more developed at the next valuation date. However, there is already some evidence of the reviews increasing transitions out of UB. Figure 13.10 shows the estimated "survival" (cumulative probability of remaining on UB) curves for the most recent year compared to the two years previously. The relative proportion on benefit falls significantly at 4 and 5 quarters (where the annual review takes place), with 15% fewer recipients on benefit beyond that time. However, attempting to disentangle policy changes from improvements in economic conditions means it is still difficult to make firm conclusions at this point.

Figure 13.10 **Survival probabilities of UB recipients before and after introduction of Future Focus changes.**



The composition of the population receiving UB also has a significant impact on the liability, which can be seen by comparing the different liabilities calculated for individuals currently on UB. Figure 13.11 shows the average number of years an individual is projected to receive unemployment and other benefits. The base scenario is someone aged 35, on benefit for 4 quarters and who has only received UB before. Such a person would be expected to spend two years on UB in the future, and five and a half years on other benefits (mostly shared between SB, IB and other non-key benefits).

Figure 13.11 **One-person projections for UB beneficiaries**



Note: shaded bars represent the base scenario (recipient aged 35, duration 4, no other benefits received in past).

Interestingly, UB liability is relatively stable with most ages; someone aged 25, 35 and 50 are likely to spend a similar time on UB, although younger clients are expected to spend more time on other benefits. Duration and other benefits received make a more significant impact on time spent on UB. Someone on UB for five years would be expected to have 50% more time on UB, and the presence of prior benefits in a client's history can double their projected time across all benefits.

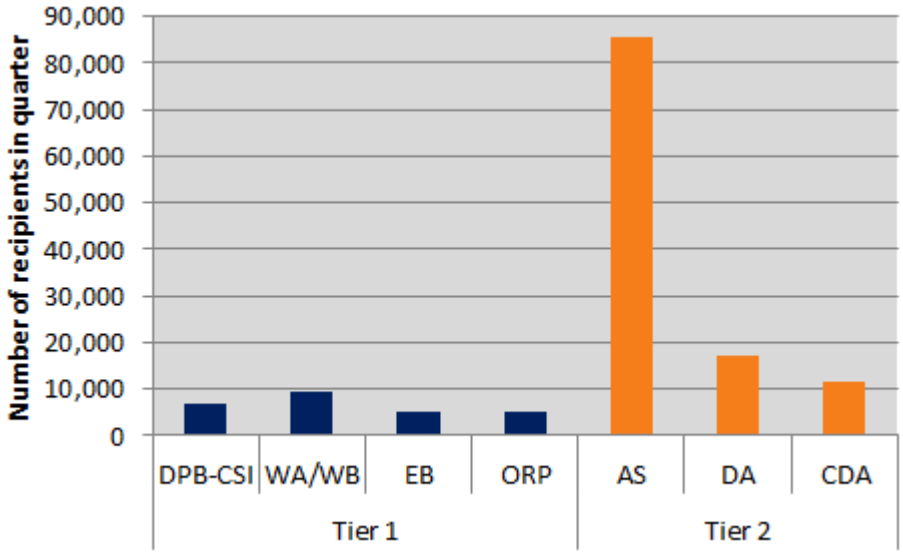
14 OTHER BENEFIT

14.1 Introduction

The "other" benefit (OTH) is the state used in the key benefit transition model to contain all those clients who do not receive a key benefit, but do receive some other benefit falling under the scope of the liability. It is essentially a placeholder; no cash flows are directly projected from the projected numbers in this state, but people in OTH could later move to a key benefit, giving rise to a cash flow to be included in the liability.

Figure 14.1 shows the average breakdown of members of OTH into their underlying benefit type in 2010/11, with Tier 1 benefits taking precedence in the client allocation. The largest component is the group of clients receiving accommodation support and no key Tier 1 benefit, making up over 60% of the numbers.

Figure 14.1 **Breakdown of client benefits classified into OTH in the key benefit transition model for the 2010/11 year**

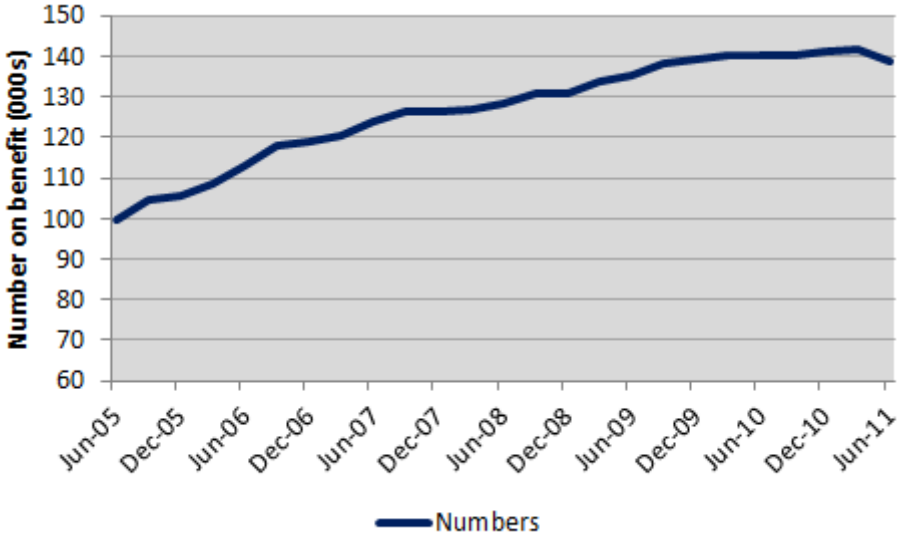


14.2 Current experience

14.2.1 General experience and trends

The following graph shows the recent experience for the OTH state.

Figure 14.2 **Trends in OTH state**



The steady uptrend in numbers in the OTH state is clear, although this has begun to stabilise in the past two years. The growth in people receiving AS (without a corresponding key benefit) is the key driver of this trend.

Number of recipients is also informed by considering the number moving on and off the benefit state each quarter.

Figure 14.3 **Number of people entering OTH state per quarter**

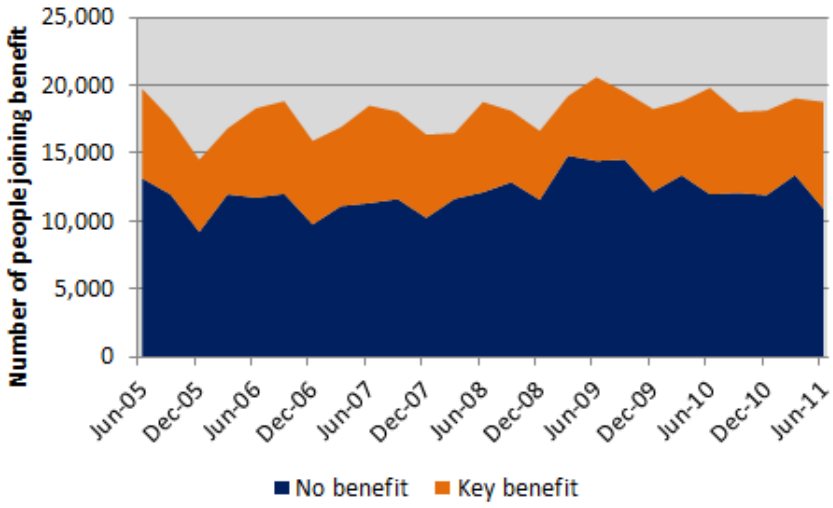
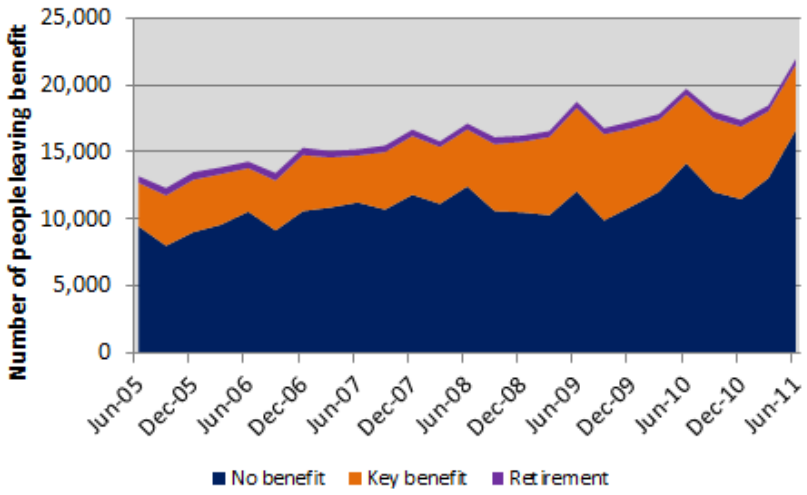


Figure 14.4 **Number of people leaving OTH state per quarter**



These graphs show that the number of people joining the state has been relatively stable over the past six years, but well above the number of people leaving in earlier years. The numbers exiting has grown steadily, and now approximately balances those coming in. The bulk of these are moving to no benefit. Of those moving to key benefits, the numbers are fairly evenly split between UB, SB and DPB, with a smaller portion moving to IB.

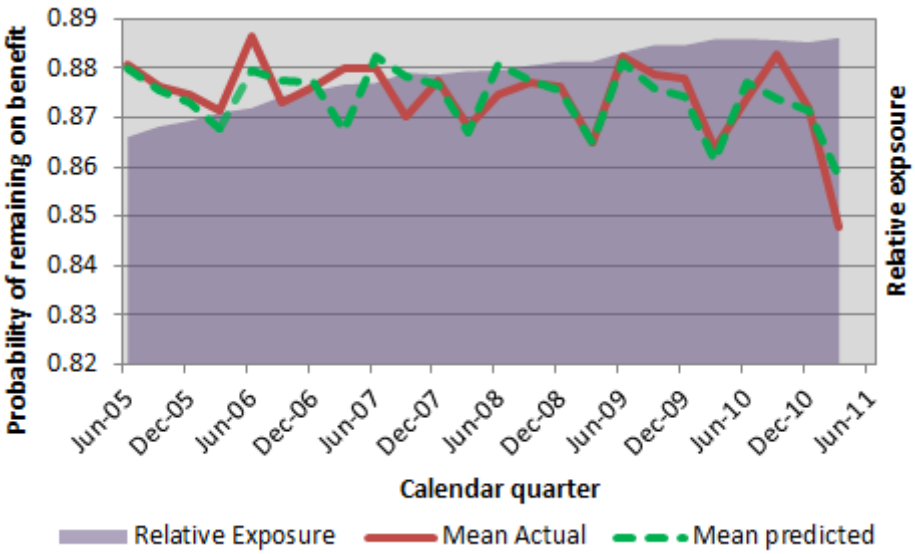
14.2.2 Modelling transitions

Recall that there are three models related to in the behaviour of clients in the OTH state:

- The probability of remaining in OTH;
- The probability of moving to no benefit, given that the client does not remain in OTH; and
- The (multinomial) probabilities of moving to other key benefit types, given that the client does not remain in OTH nor move to no benefit.

Further detail on these models can be found in the electronic appendices.

Figure 14.5 **Probability clients remain in the OTH state**



The first probability model tracks clients remaining in OTH and the actual and model effects are shown in Figure 14.5. This has remained relatively stable in recent years, with some downtrend visible in recent years and a clear seasonality pattern.

Figure 14.6 **Probability clients who leave the OTH state moving off benefits**

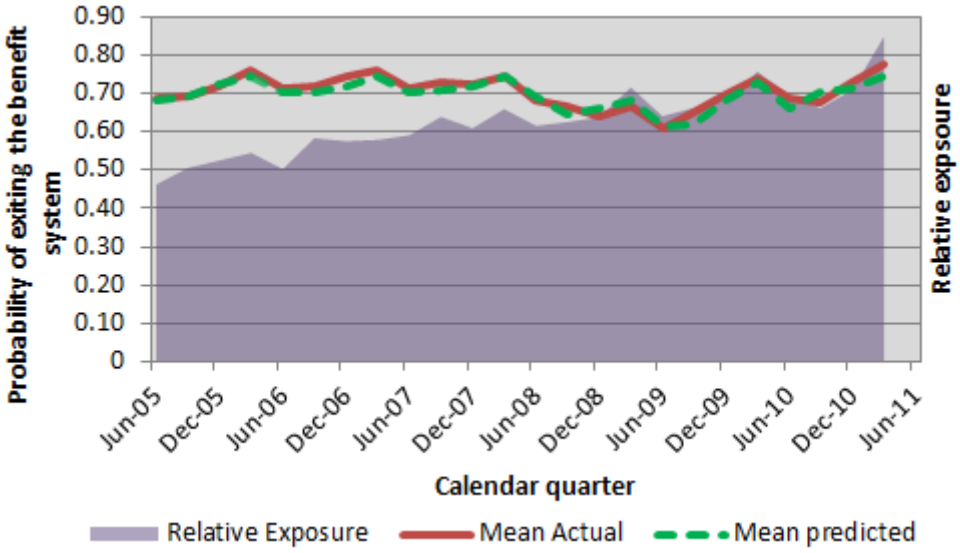
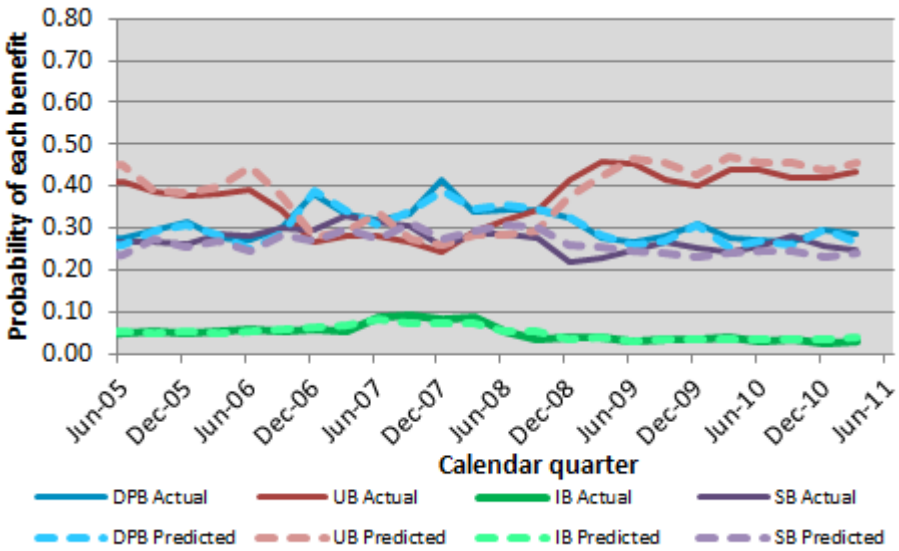


Figure 14.6 shows the probability of a client who leaves OTH (for reasons other than retirement) moving to no benefit. Thus around 70% of beneficiaries leave the system (either finding work or leaving for another reason), while 30% move to a different benefit type. The chart suggests this proportion also increases with the unemployment rate. This reflects the greater proportion of short term unemployed people in the system, who are less likely to remain on other benefits for a significant period of time. The seasonality is also evident.

Figure 14.7 **Distribution of clients who move from the OTH state to other benefits**



Of those people who do move to a different benefit when they leave OTH, the majority move to UB, DPB and SB, in that order. There has been an increase in numbers moving to UB in recent years, corresponding to the increase in the unemployment rate. Otherwise, the overall proportions have been relatively stable over time.

There are a number of important duration and age trends that heavily affect the likelihood of a person's progression in the system. Further graphs and tables can be found in the electronic models appendix. Some of the key features are:

- Younger clients are significantly more likely to leave OTH, although they are more likely to move to a key benefit, particularly UB;
- The proportion of clients moving to IB increases strongly with age; and
- The usual duration pattern of decreasing probability of moving off the benefit with increased duration is present. About 15% of clients leave the benefit state per quarter during their first year, with this falling to less than 5% of those in the state for at least 5 years.

14.3 Summary of forecasts

Figure 14.8 **Historical and forecast numbers for OTH**

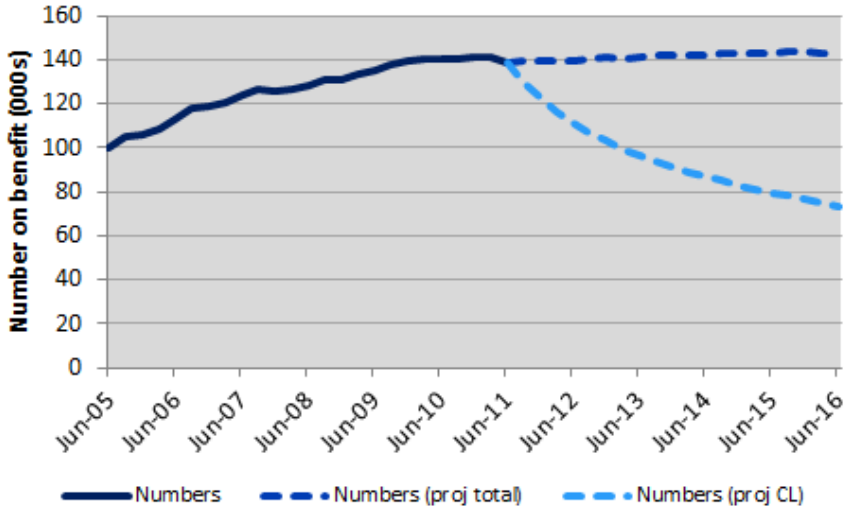


Figure 14.8 shows the projected numbers on the OTH state for the current client liability cohort as well as the total (i.e. including future client liability numbers). Total numbers are projected to increase slowly; this reflects the trends seen in the recent past and the state's relative immunity to the forecast fall in unemployment. The current client liability total falls away relatively quickly; this reflects the relatively high turnover rate seen in this state.

14.4 Key risks

Section 9 discusses risks and uncertainty at a general level. As the benefits covered by the OTH state are valued separately in Sections 16 to 22, the benefit level risks are discussed in these sections.

15 EXITING THE BENEFIT SYSTEM

15.1 Introduction

The purpose of the investment approach is to encourage exits from benefits into work, particularly where it significantly reduces the life-time cost of benefit receipt. This section focuses on the behaviour of beneficiaries who are part of the current client liability (received a benefit or assistance in 2010/11), but have already exited the benefit system at the valuation date or will do so at some point in the future. In particular, we model the likelihood of former clients re-entering the system.

In modelling terms, the "not on benefit" (NOB) group is the state used in the key benefit transition model to contain all those clients who do not receive any benefit in the scope of the liability definition. In some ways, like the "OTH" benefit type, it is a placeholder in our modelling in that no cash flows are directly taken from the projected numbers in this state, but people in the NOB state could later move to a key benefit, giving rise to a cash flow. However, the NOB models provide detailed insight into the characteristics of clients exiting the benefit system and provide valuable information for monitoring purposes.

15.2 Current experience

15.2.1 General experience and trends

Figure 15.1 and Figure 15.2 show the number of people exiting and entering the benefit system each quarter. The increased numbers entering in 2008 and 2009 is visible, which corresponds to the economic downturn that saw many people transition to UB. The alignment with the increase in the unemployment rate is apparent. Numbers exiting the system have increased in 2010 and 2011, as the economy has stabilised.

Figure 15.1 **Number of people exiting the benefit system per quarter**

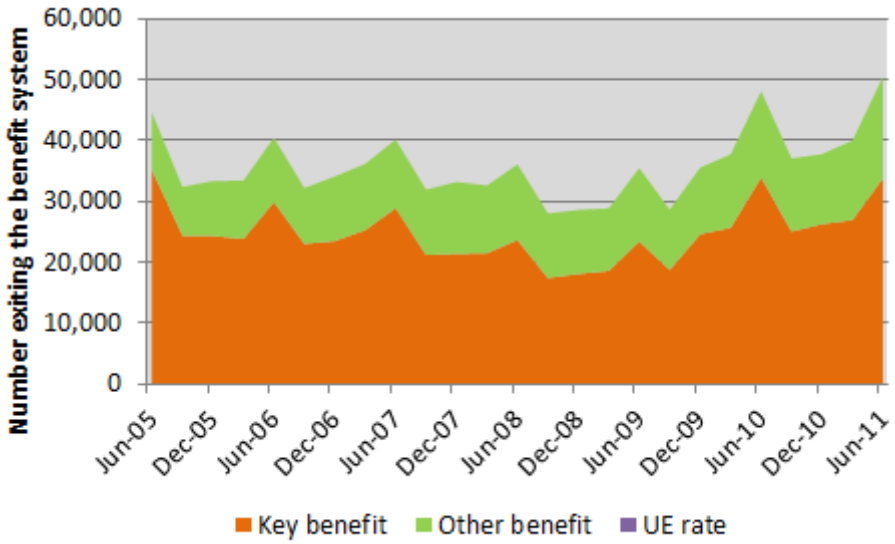
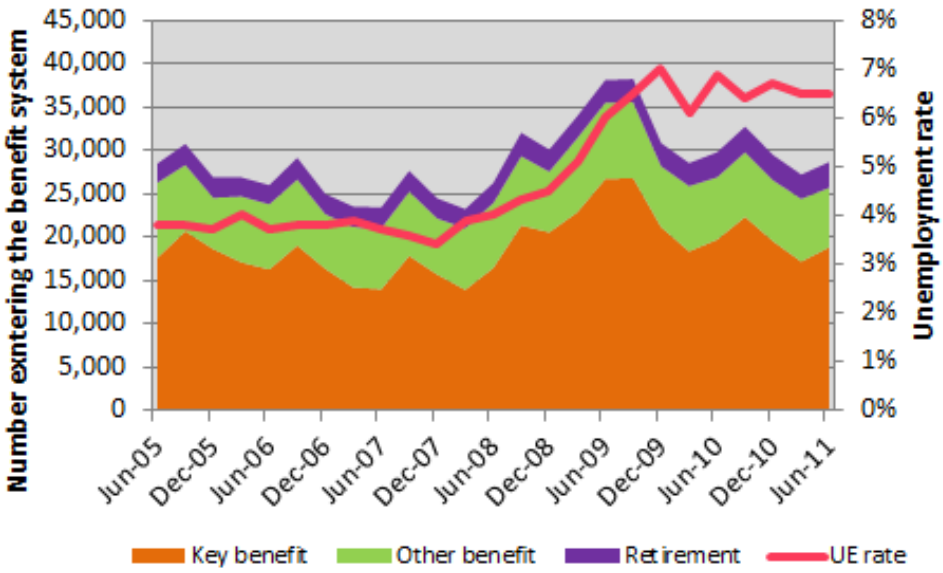


Figure 15.2 **Number of people entering the benefit system per quarter**



Of those who enter the benefit system and move to a benefit, 40% move to UB, 25% to OTH and about 20% move to SB.

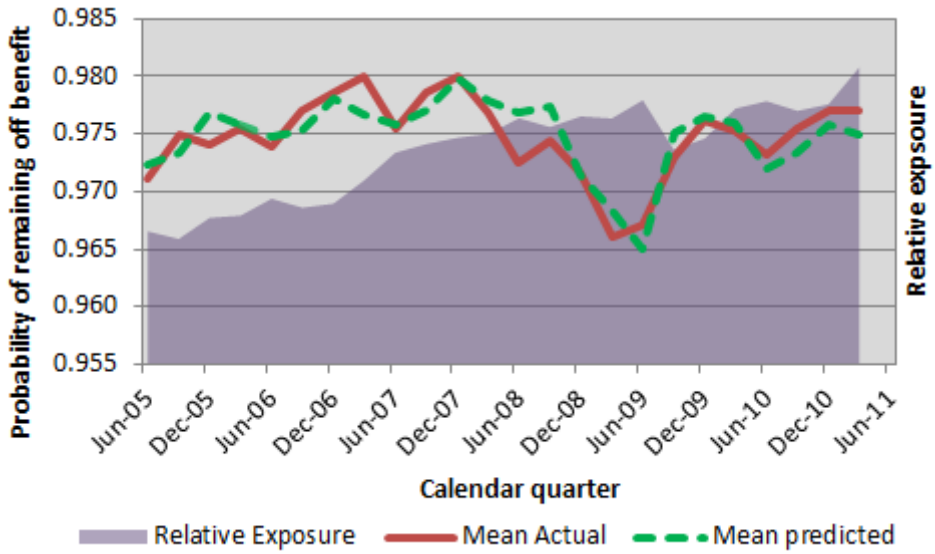
15.2.2 Modelling transitions

There are two models related to the behaviour of clients who are not in benefit system:

- The probability of remaining off benefits; and
- The (multinomial) probabilities of moving to other key benefit types or the OTH state, given that the client does not remain off benefits.

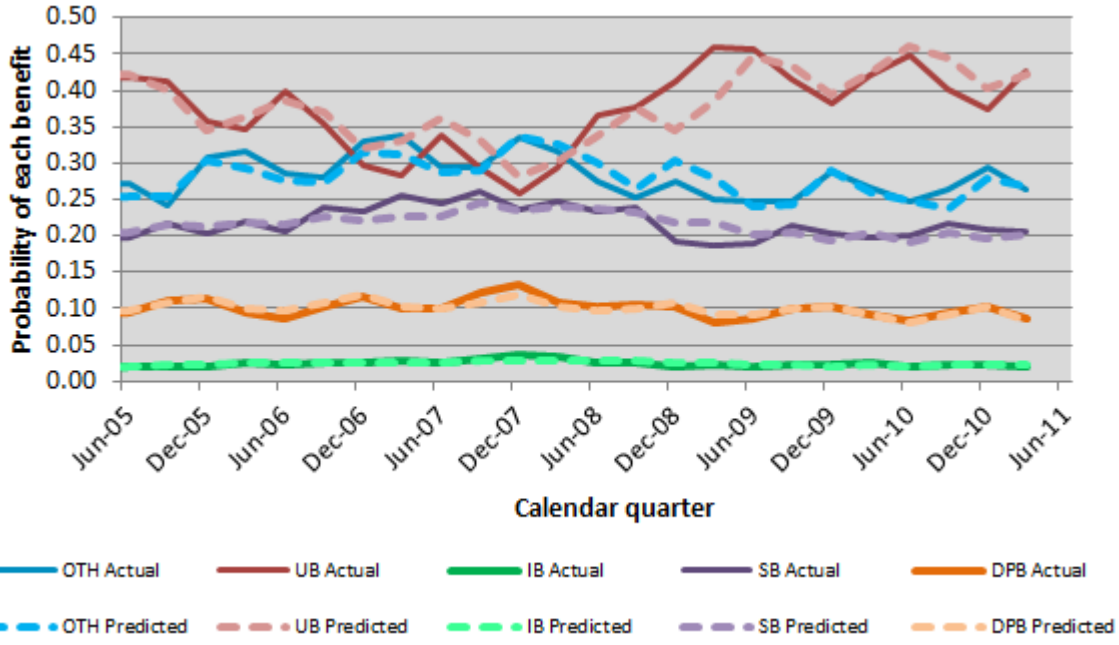
Further detail on these models can be found in the electronic appendices.

Figure 15.3 **Probability clients remain off benefit**



The first probability model tracks clients remaining off benefits and the actual and model effects are shown in Figure 15.3. The overall rate of remaining off benefits is very high; less than 3% of clients enter the benefit system each quarter (although this percentage is applied to a relatively large base). The dip related to the global financial crisis is clearly visible, but the rate has been relatively stable since then.

Figure 15.4 **Distribution of benefit type for clients who enter the benefit system**



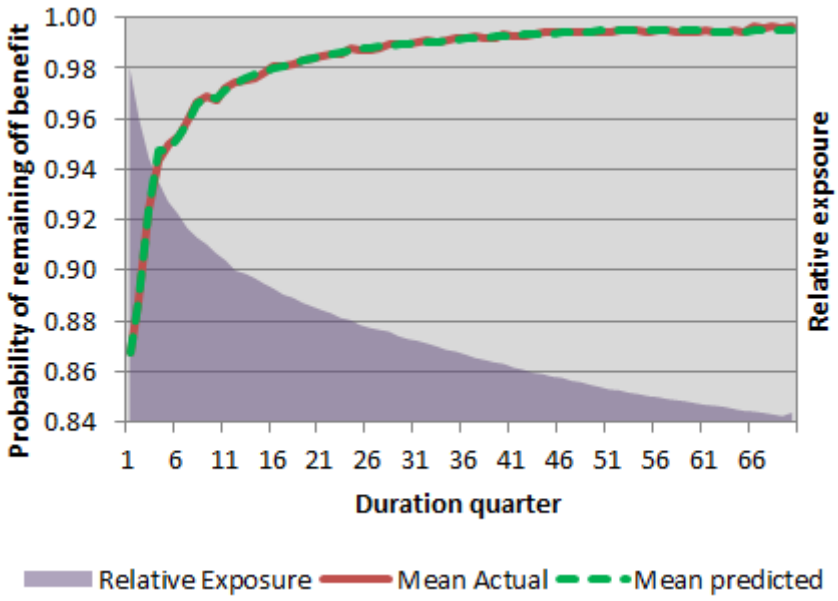
Of those people who do move to a benefit, the majority move to UB, OTH and SB, in that order. The numbers moving to UB is strongly correlated with the unemployment rate, but otherwise the overall proportions have been relatively stable over time.

There are a number of important duration and age trends that heavily affect the likelihood of a person's progression in the system. Further graphs and tables can be found in the electronic models appendix. Some of the key features are:

- Younger clients are significantly more likely to return to the benefit system – a 25 year old is twice as likely to move to benefits compared to a 50 year old. This reflects the higher risk of unemployment experienced by many younger clients; and

- Duration off benefits is highly important, and shown in Figure 15.5. Clients have a 33% chance of returning to benefits in their first year, with this figure halved in their second year off benefits and the annual rate is about 5% once they have been off benefits for at least five years.

Figure 15.5 **Quarterly probability of remaining off benefits by duration**



15.3 Key risks

The main risks specific to this section are those related to former clients re-entering the system:

- The state of the economy is a particular risk, given the large numbers of entries into the system when unemployment spikes; and
- There are a relatively large number of people who have recently left the system as the economy has stabilised. The modelling of duration suggests that these people are at higher risk of returning to the system, and should be monitored; and
- Young people are at a significantly higher risk of re-entering the system. The risk is compounded by the larger than average lifetime liability observed once they do re-enter.

16 DOMESTIC PURPOSES BENEFIT: CARE OF SICK AND INFIRM

16.1 Introduction

New Zealand citizens over 16 years of age are eligible for Domestic Purposes Benefit: Care of Sick and Infirm ("DPB-CSI") if they are caring full time for someone at home who is not their spouse or partner and who would otherwise need to be cared for in a hospital or require, residential disability care. In the provided data this benefit is covered in two Tier 1 benefit codes. These codes represent the same benefit and code 667 has been retired.

Benefit Name	Code	% 10/11 benefit	Comment
Caring for Sick and Infirm Benefit	367	100.0%	
Caring for Sick and Infirm Benefit	667	0.0%	Code not in current use

DPB-CSI is a relatively small Tier 1 benefit, with approximately $100m p.a. current outgo. It has been valued according to the minor benefit methodology.

16.2 Current experience

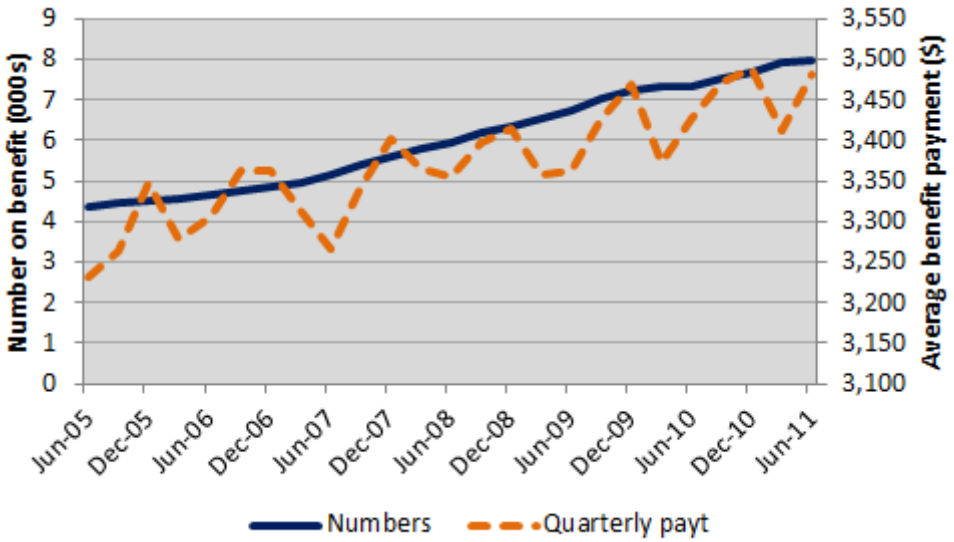
16.2.1 General experience and trends

The following table and graph show the recent experience for DPB-CSI.

Table 16.1 **Recent carers' benefit experience**

Year	Payments ($m)	Average number on benefit	Average quarterly benefit payment (ABP) per client ($)
2007/08	73	5,700	3,220
2008/09	83	6,500	3,200
2009/10	96	7,200	3,350
2010/11	105	7,800	3,380

Figure 16.1 **Trends in carers' benefit. ABP in June 2011 values.**

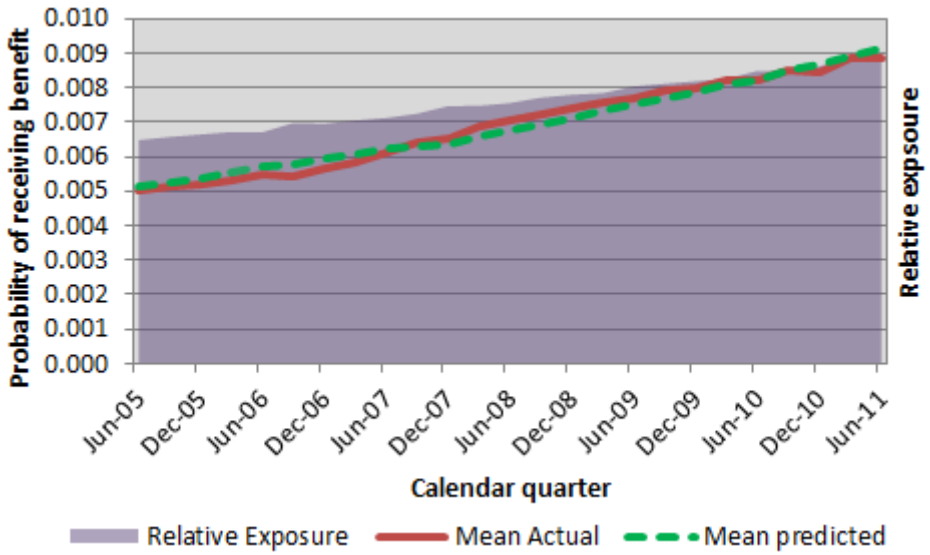


There has been a strong upwards trend in the number of people on DPB-CSI over the past five years. The trend largely reflects recent changes to interpretation of eligibility for this benefit to include caring for one's own child, including adult children. While there has been an increase in the ABP over the period since 2005, it has remained reasonably constant since 2008 though with some seasonality.

16.2.2 Modelling numbers of recipients

Recall that for *other benefits and assistance* including DPB-CSI, the number of recipients is modelled as a proportion of total number of clients in the system. Thus numbers are modelled as a single probability model. The actual and predicted probabilities for this model are shown in Figure 16.2.

Figure 16.2 **Probability that a welfare beneficiary is receiving carers' benefit**



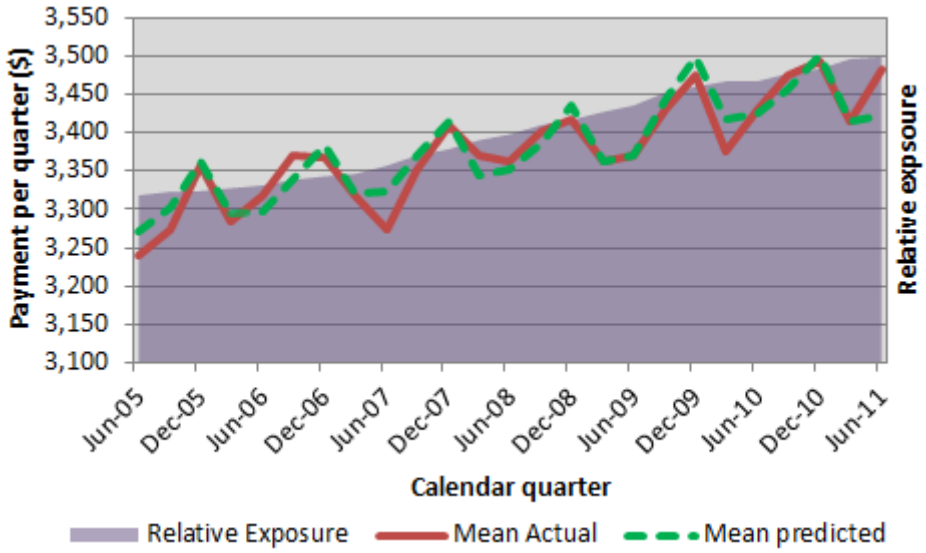
The proportion of clients receiving DPB-CSI has risen sharply over the last five years. This indicates a genuine increase in the probability of receiving the benefit.

There are a number of important duration, starting period and age trends that heavily affect the likelihood of a person receiving this benefit. Some of particular note:

- There is a strong upwards trend from age 30, peaking at around age 54 and decreasing thereafter. Those people aged 54 are three times more likely to receive DPB-CSI than those aged 30, presumably reflecting the likelihood of caring for elderly parents; and
- People who have been in the system for at least 20 years are disproportionately over-represented on this benefit.

16.2.3 Average benefit payments while on benefit

Figure 16.3 **Actual and modelled average quarterly payments by calendar quarter**



As mentioned above, the small increase in ABP from 2007 to 2010 is reflective of Work and Income's recent efforts to ensure that people on DPB-CSI receive the full benefit to which they are entitled. This effect has moderated since 2010 and we have projected it to largely continue at its current level, subject to some seasonality.

16.3 Summary of forecasts

The following table shows the current and future client liabilities for this benefit.

Table 16.2 **Current and future client liabilities for DPB-CSI**

Liability	Current values, undiscounted ($m)	Actual values, undiscounted ($m)	Actual values, discounted to "premium" date ($m)	Mean term (yrs)
Current	2,636	3,911	1,784	11.9
2011/12	361	560	235	12.6
2012/13	307	486	202	12.4
2013/14	272	440	181	12.2
2014/15	247	409	167	12.1
2015/16	226	386	156	12.1

The high mean term of approximately 12 years is congruent with a large proportion of DPB-CSI recipients caring for someone for an extended period of time. The mean term is reasonably stable between the current and future client liabilities, which is indicative of a reasonably stable population demographic.

Figure 16.4 **Historical and forecast numbers and ABPs (current values)**

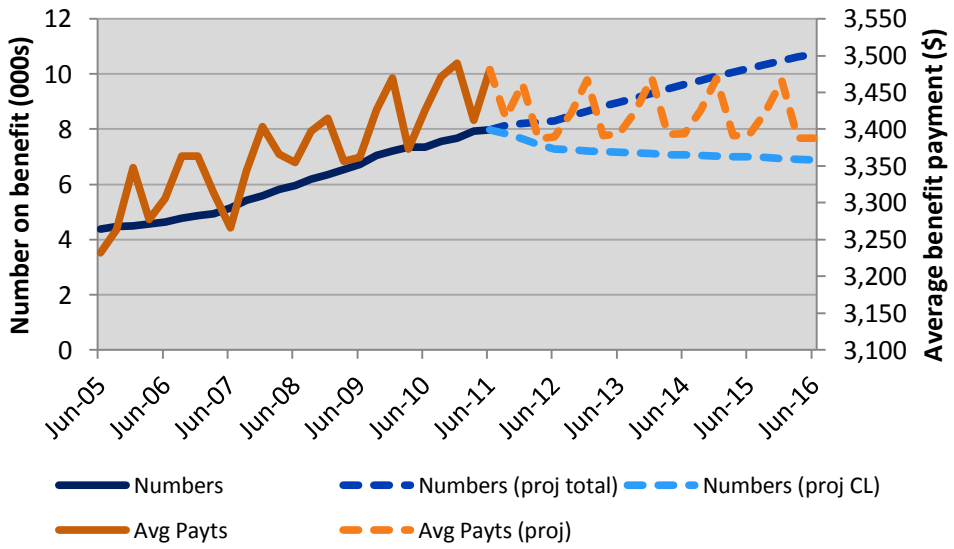
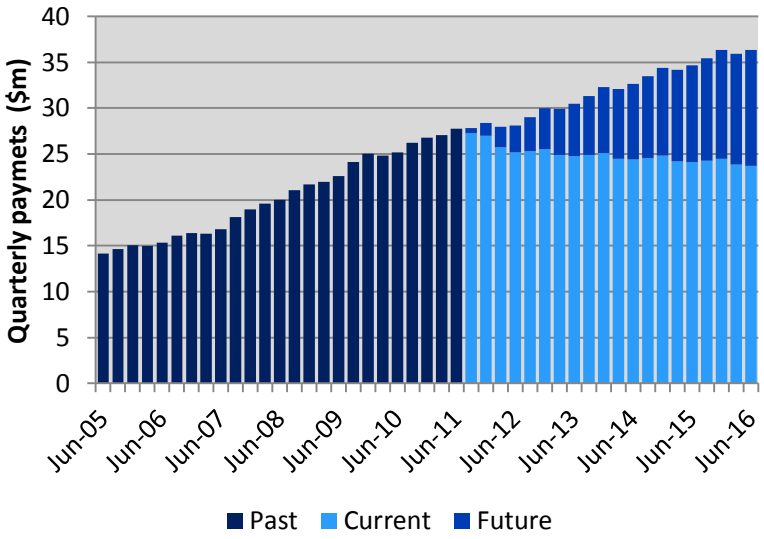


Figure 16.4 shows a number of interesting aspects of the projection:

- Overall numbers on DPB-CSI will continue to rise, reflecting a continuation of recent uptrends in DPB-CSI use;
- The numbers attributable to the current client liability decrease slowly, reflecting the relatively long spell length; and

The current value ABP levels are forecast to remain approximately constant (before CPI inflation is applied).Finally, Figure 16.5 shows the historical and projected payments for the DPB-CSI, which is the combination of the numbers and ABPs in the previous figure.

Figure 16.5 **Quarterly benefit payments, in current values**



16.4 Key risks

In addition to the general risks described in Section 9, there is a relatively large amount of uncertainty in the DPB-CSI due to its recent strong growth in numbers, at about 10% per year. This forces a decision to be made as to the extent that this growth in numbers is projected to continue in the future. We have forecast continued growth on the basis that:

- The trend of carers electing to claim their DPB-CSI entitlements has some distance yet to run; and
- The aging population will place upward pressure on the number of people caring for elderly parents.

However, it is possible that growth rates fall significantly compared to that projected. There are also risks that growth in ABP amounts will resume.

These factors are somewhat mitigated by the relatively small size of the benefit, compared with others in the valuation.

17 EMERGENCY BENEFIT

17.1 Introduction

Emergency benefits are paid to those who can demonstrate a particular need and are unable to earn income or qualify for another benefit. In the provided data this benefit is covered in a single Tier 1 code:

Benefit Name	Code	Comment
Emergency Benefit	611	

The Emergency Benefit ("EB") is a relatively small Tier 1 benefit, with approximately $40m of payments made every year. We also note that of all the benefits, the Emergency Benefit is unique in that a large portion (well over half) of payments goes to people aged over 65 (and thus excluded from this valuation). It is also a relatively short tailed benefit. It has been valued according to the minor benefit methodology.

17.2 Current experience

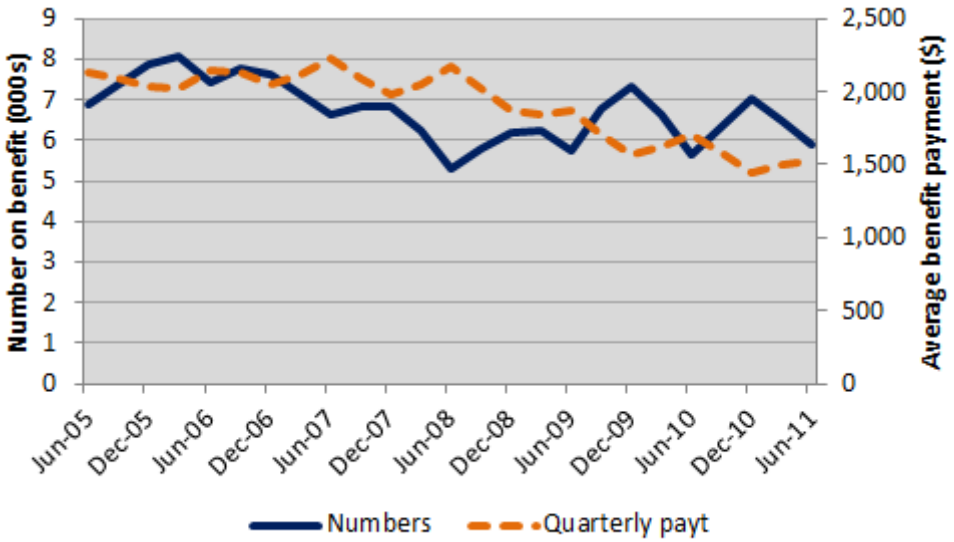
17.2.1 General experience and trends

The following table and graph show the recent experience for the Emergency Benefit.

Table 17.1 **Recent Emergency Benefit experience**

Year	Payments ($m)	Average number on benefit	Average quarterly benefit payment (ABP) per client ($)
2007/08	50	6,300	1,970
2008/09	43	6,000	1,810
2009/10	42	6,600	1,600
2010/11	38	6,400	1,490

Figure 17.1 **Trends in Emergency Benefit. ABP in June 2011 values.**

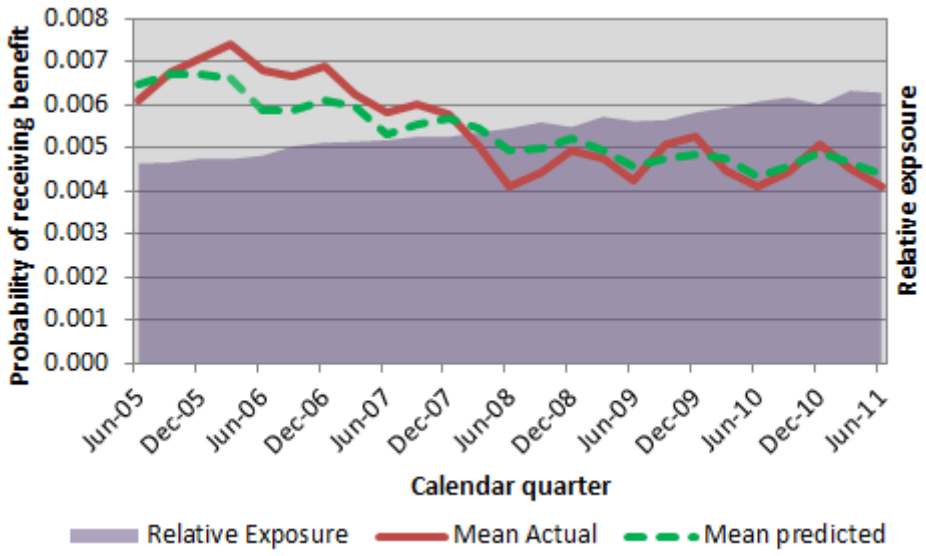


There is a slight uptrend in numbers receiving the benefit in recent years, which may be attributable to the GFC and general economic deterioration. However the ABP for the benefit has been falling, even after allowing for inflation. This suggests a shortening of the average spell for which the benefit is received.

17.2.2 Modelling number of clients on benefit

Recall that for *other benefits and assistance* including EB, the number of recipients is modelled as a proportion of total number of clients in the system. Thus numbers are modelled as a single probability model. The actual and predicted probabilities for this model are shown in Figure 17.2.

Figure 17.2 **Probability a welfare beneficiary is receiving Emergency Benefit**



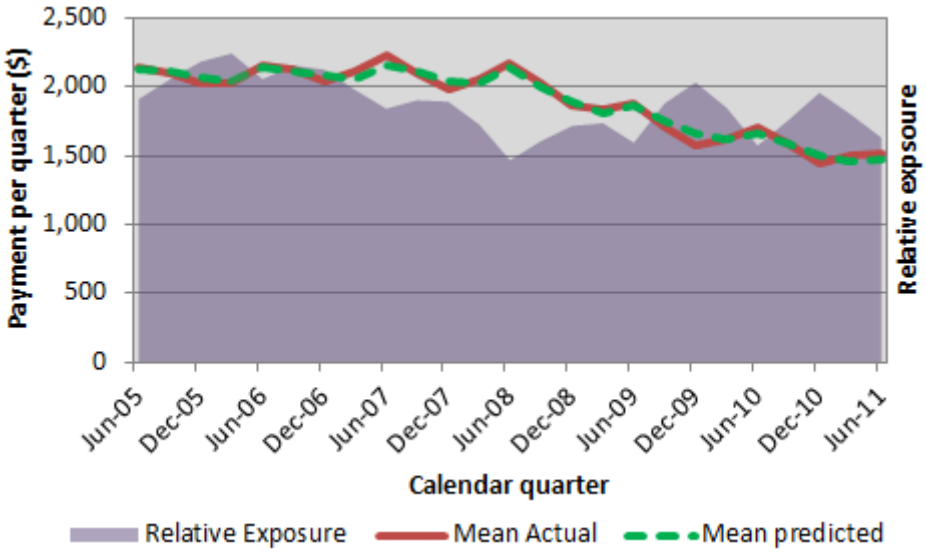
The proportion receiving the benefit has remained very stable for the past four years, so the slight increase in numbers is in line with the general increase in the overall number of MSD beneficiaries.

There are a number of important duration and age trends that heavily affect the likelihood of a person receiving this benefit. Some of particular note:

- The elderly are up to three times more likely to be receiving the benefit compared to younger people in the system; and
- People who have been in the system for at least 20 years are disproportionately over-represented on this benefit.

17.2.3 Average benefit payments while on benefit

Figure 17.3 **Actual and modelled average quarterly payments by calendar quarter**



The decrease in the ABP represents a genuine trend by calendar quarter. However there is some evidence that it is stabilising in recent quarters, and has been projected forward on a flat basis. There are strong uptrends in ABP by age, particularly a step up around age 25 and a steady increase between ages 40 to 50.

17.3 Summary of forecasts

Table 17.2 shows the current and future client liabilities for this benefit.

Table 17.2 **Current and future client liabilities for Emergency Benefit**

Liability	Current values, undiscounted ($m)	Actual values, undiscounted ($m)	Actual values, discounted ($m)	Mean term (yrs)
Current	468	694	323	10.9
2011/12	179	264	127	10.0
2012/13	148	220	106	9.6
2013/14	127	193	94	9.2
2014/15	113	174	85	9.0
2015/16	102	161	79	8.7

Figure 17.4 **Historical and forecast numbers and ABPs (current values)**

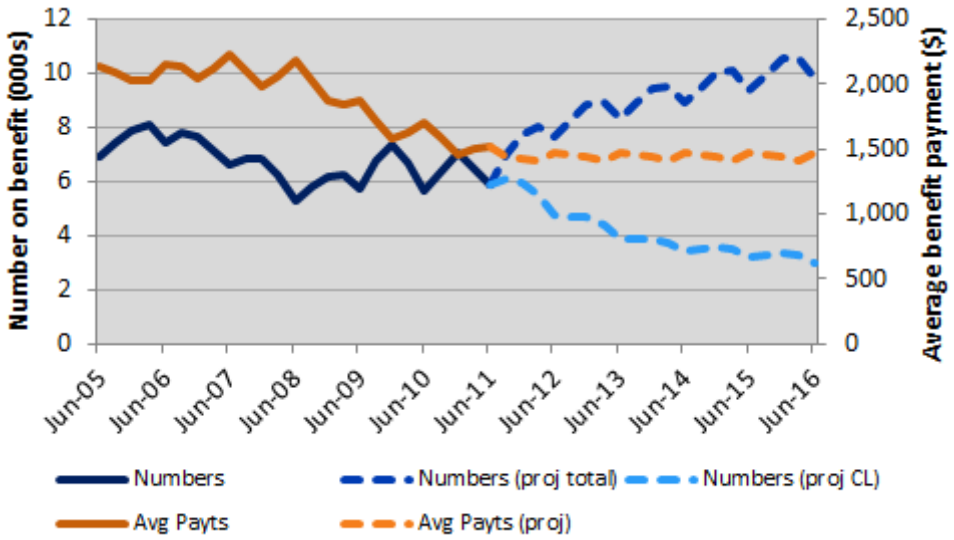
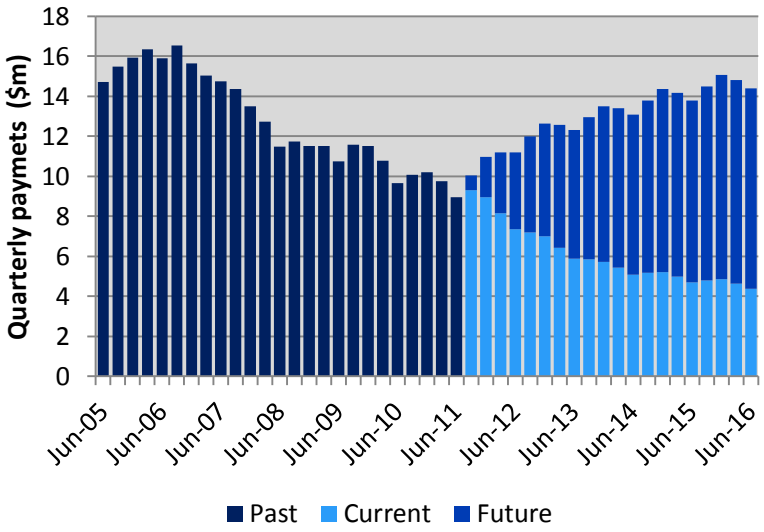


Figure 17.4 shows a number of interesting aspects of the projection:

- Overall numbers on emergency benefit will steadily rise, reflecting the high rate of reactivation for this benefit type. This continues recent trends;
- The numbers attributable to the current client liability falls to about half the total after a few years, reflecting the relatively short average spell length; and
- The current value ABP levels are forecast to remain flat (before CPI inflation is applied).

Finally, Figure 17.5 shows the historical and projected payments for EB, which is the combination of the numbers and ABPs in the previous graph.

Figure 17.5 **Quarterly benefit payments, in current values**



17.4 Key risks

In addition to the general risks described in Section 9, there are some specific EB risks associated with usage of the benefit. Both usage rates and (real) ABP rates have been higher historically, with payment levels in 2006 at least 50% higher than today. We believe that EB use can be significantly affected by effects such as:

- Policy changes making other benefits more difficult to access;
- Changes to immigration policies;
- Operational changes within MSD that increase the use of EB; and
- Changing usage by certain cohorts within the system.

These effects, to the extent that they are not reflected in current overall trends, are largely outside the scope of this analysis.

18 UNSUPPORTED CHILD'S AND ORPHAN'S BENEFIT

18.1 Introduction

Orphan's and Unsupported Child's Benefit ("ORP") provides income support to the caregiver of a child whose parents cannot support them in cases where the caregiver is:

- Aged 18 or older;
- Not the child's natural or adoptive parent;
- Likely to have the child for at least a year; and
- Generally not receiving benefits under another caregiver allowance.

There are two benefits that have been combined for this valuation, with the Unsupported Child's Benefit representing the bulk of the current (and future) payments.

Benefit Name	Code	% 10/11 benefit	Comment
Unsupported Child Benefit	344	96.5%	
Orphans Benefit	340	3.5%	
Unsupported Child Benefit	44	0.0%	Code not in current use
Orphans Benefit	40	0.0%	Code not in current use

ORP is a relatively small Tier 1 benefit, with approximately $90m p.a. current outgo. It has been valued according to the minor benefit methodology.

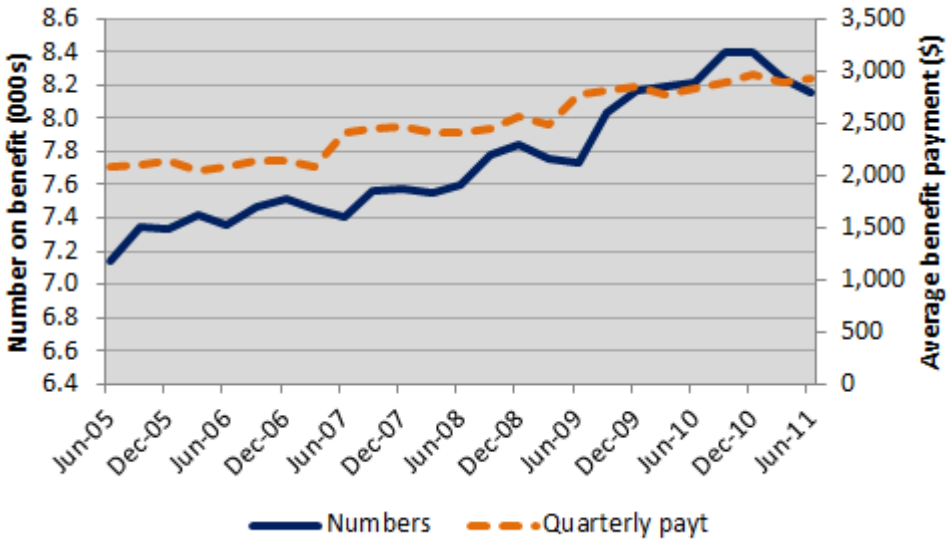
18.2 Current experience

18.2.1 General experience and trends

Table 18.1 **Recent Unsupported Child's and Orphan's Benefit experience**

Year	Payments ($m)	Average number on benefit	Average quarterly benefit payment (ABP) per client ($)
2007/08	70	7,600	2,320
2008/09	76	7,800	2,440
2009/10	89	8,200	2,720
2010/11	95	8,300	2,850

Figure 18.1 **Trends in Unsupported Child's and Orphan's Benefit**

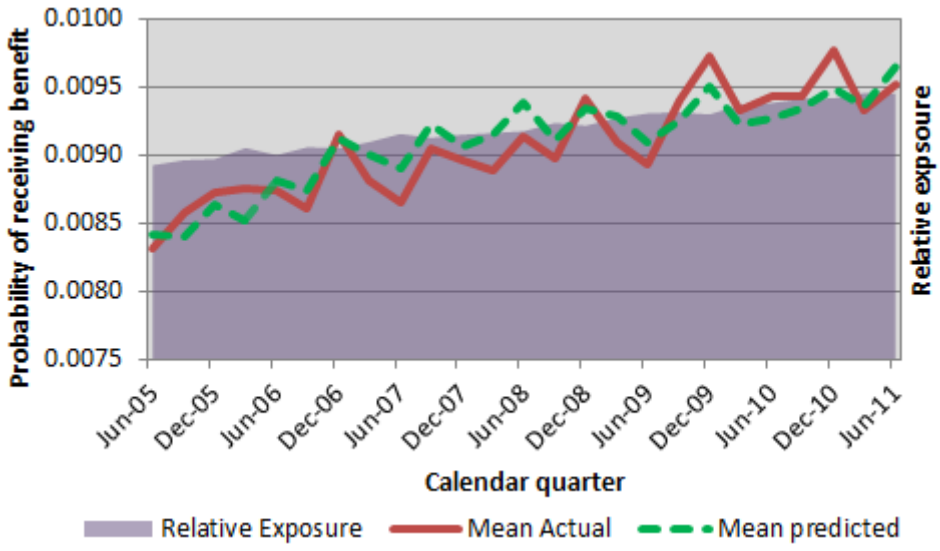


There has been a moderate upwards trend in the number of ORP recipients, though this trend may have stabilised in the past 12 months. Average payments have remained roughly flat, apart from jumps approximately every two years, reflecting increases in the benefit rate over and above CPI inflation.

18.2.2 Modelling number of clients on benefit

Recall that for *other benefits and assistance* including ORP, the number of recipients is modelled as a proportion of total number of clients in the system. Thus numbers are modelled as a single probability model. The actual and predicted probabilities for this model are shown in Figure 18.2.

Figure 18.2 **Probability that a welfare beneficiary is receiving Unsupported Child's and Orphan's Benefit**

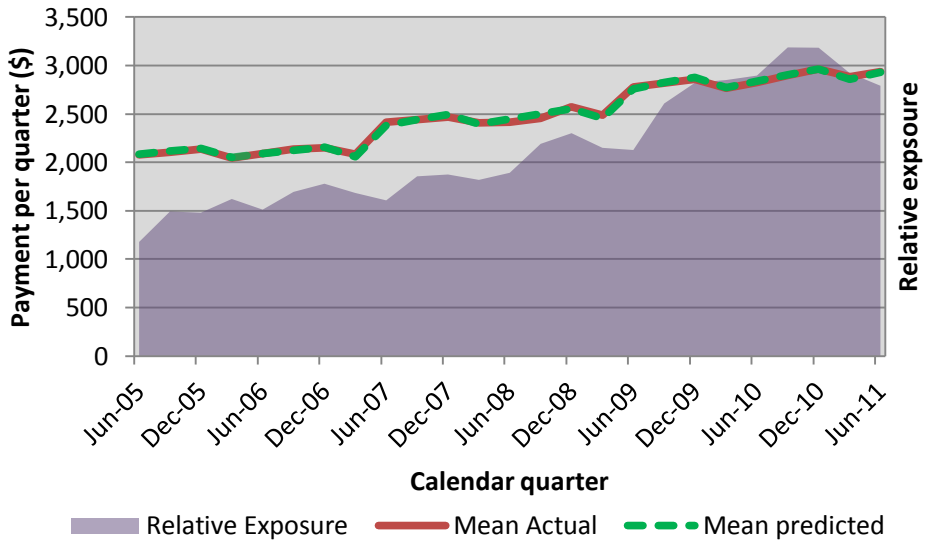


The probability of receiving ORP has risen gradually over the period from 2005 to 2009, reflecting the increasing number of people qualifying for benefits. There are also strong dependencies on the age of the beneficiary, as well as the duration on the benefit. Further graphs and tables can be found in the electronic models appendix. Some points of note are:

- The probability of receiving ORP rises strongly with age – a 52 year old is four times more likely to be receiving ORP compared to a 30 year old; and
- The proportion of people receiving ORP increases with the amount of time that they have been in the system.

18.2.3 Average benefit payments while on benefit

Figure 18.3 **Actual and modelled average quarterly payments by calendar quarter**



As mentioned previously, the biennial increases in the ABP are due to increases in the award rates above CPI inflation.

18.3 Summary of forecasts

Table 18.2 shows the current and future client liabilities for this benefit.

Table 18.2 **Current and future client liabilities for Unsupported Child's and Orphan's Benefit**

Liability	Current values, undiscounted ($m)	Actual values, undiscounted ($m)	Actual values, discounted to "premium" date ($m)	Mean term (yrs)
Current	3,317	5,313	2,061	14.1
2011/12	475	814	278	15.4
2012/13	405	708	239	15.1
2013/14	360	642	216	14.7
2014/15	328	599	200	14.6
2015/16	302	568	188	14.6

The high mean term of 14 or 15 years is consistent with the long-term nature of caring for a child and the significant impact of qualifying clients who are not currently on ORP entering the benefit. The mean term is reasonably stable between the current and future client liabilities.

Figure 18.4 **Historical and forecast numbers and ABPs (current values)**

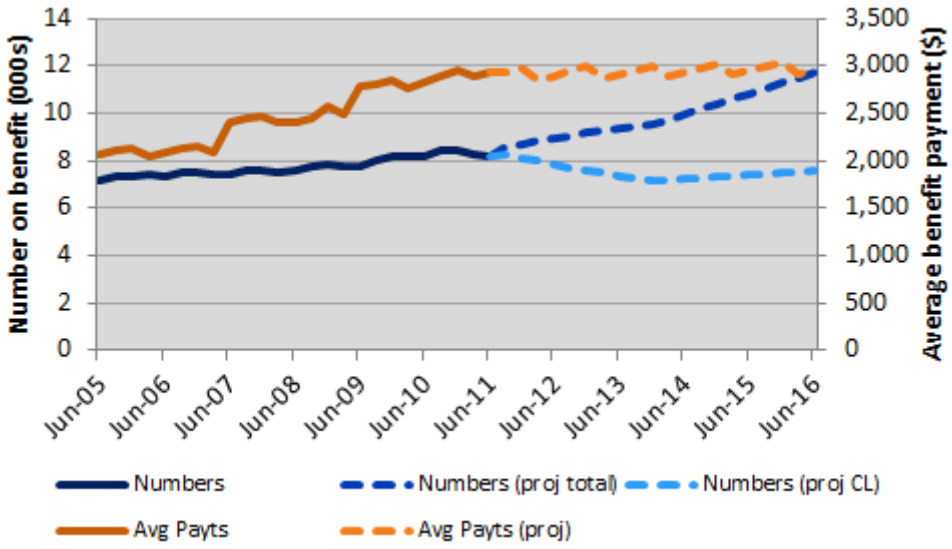
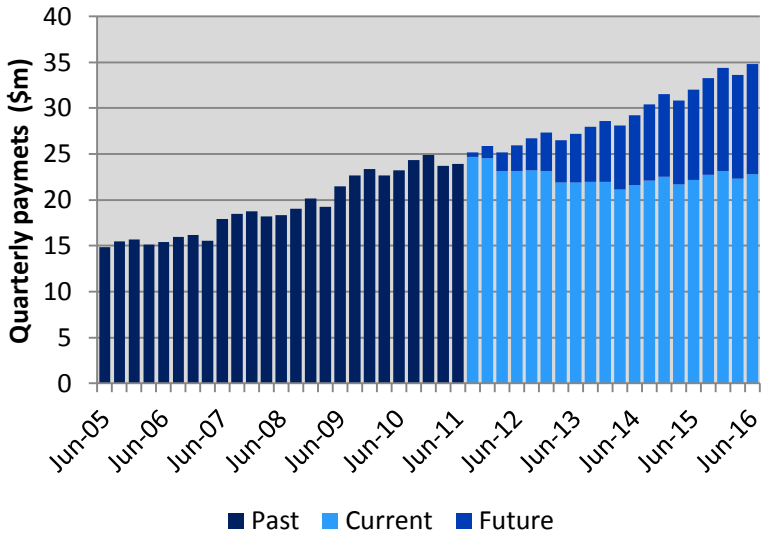


Figure 18.4 shows some interesting aspects of the projection:

- Overall numbers on ORP will steadily rise, reflecting the aging of the cohort. This continues recent trends;
- The numbers attributable to the current client liability falls reasonably slowly, reflecting the long average spell length and other qualifying clients entering ORP; and
- The ABP is projected to stabilise, on the assumption that there will be no further increases to the benefit above the rate of CPI.

Figure 18.5 **Quarterly benefit payments, in current values**



18.4 Key risks

General risks regarding the liability estimate are discussed in Section 9. There are also some specific risks concerning ORP:

- The possible stabilisation of numbers receiving ORP in 2010/11 makes projection somewhat difficult. We have attempted to model growth rates between that seen prior to 2010/11 and that of the past 12 months;
- Much of the growth comes from the aging of the current cohort – clients are much more likely to receive ORP aged 45 and higher. However, it is not automatic that the numbers of children that require care automatically grows in line with the numbers in older age brackets; and
- There have been at least two significant increases in payment rates above CPI. We have not allowed for any future such increases, but if more did occur this would obviously increase future cost.

19 WIDOW'S AND WOMAN ALONE BENEFITS

19.1 Introduction

Domestic Purposes Benefit: Woman Alone ("WA") benefit provides income support for women with no dependent children who have lost the support of their partner or have finished caring for a sick relative or children after turning 50 years old. The Widow's Benefit ("WB") provides income support for a woman whose partner has died, whether or not she has dependent children. Given the similarity of these two benefits, we have considered them together, referring to them jointly as "WA/WB".

Benefit Name	Code	% 10/11 benefit	Comment
Widow's Benefit	330	63.2%	
Woman Alone Benefit	366	36.8%	
Widow's Benefit	030	0.0%	Code not in current use
Woman Alone Benefit	666	0.0%	Code not in current use

The WA/WB group represents a relatively small portion of Tier 1 benefits, with approximately $100m p.a. current outgo combined. It has been valued according to the minor benefit methodology.

19.2 Current experience

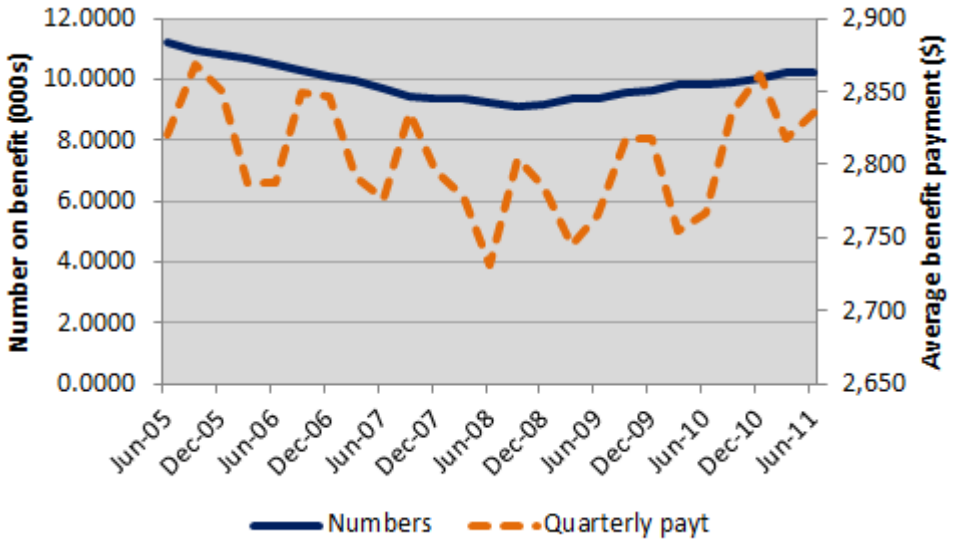
19.2.1 General experience and trends

The following table and graph show the recent experience for WA/WB.

Table 19.1 **Recent Woman Alone and Widow's Benefit experience**

Year	Payments ($m)	Average number on benefit	Average quarterly benefit payment (ABP) per client ($)
2007/08	100	9,400	2,650
2008/09	98	9,300	2,630
2009/10	106	9,700	2,720
2010/11	112	10,100	2,780

Figure 19.1 **Trends in Woman Alone and Widow's Benefit. ABP in June 2011 values.**



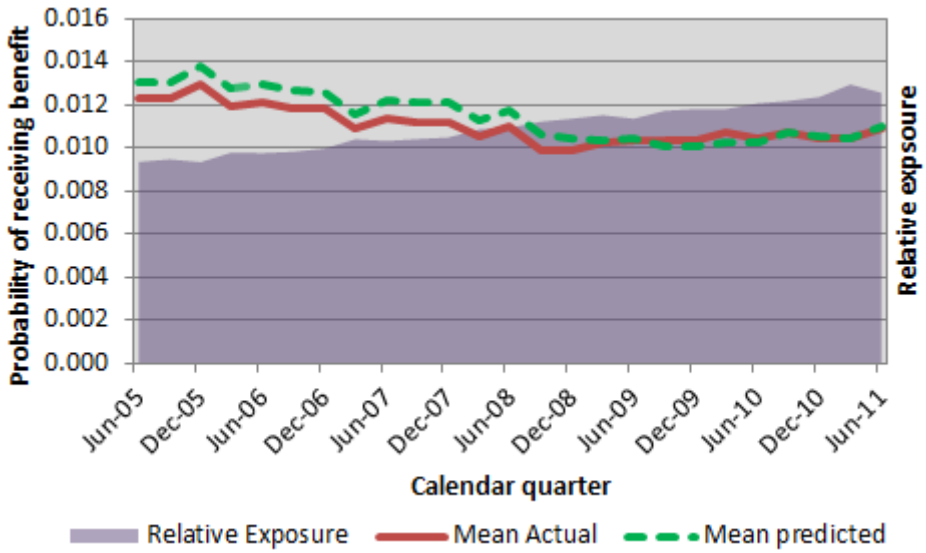
We note the following features of Figure 19.1:

- The number of recipients has been steadily increasing since 2009. Reviewing each of the components separately shows that the numbers on WB have been reasonably stable since 2009 while the numbers on WA have been rising from 2007 to 2011.
- There is seasonality in the ABP with the September and December quarters having the higher ABP than the March and June quarters. This is primarily due to the number of days in each quarter.
- The ABP fell between 2006 and 2009, most likely due to the changing mix of people receiving WA and WB – those on WB with dependent children receive benefits at a higher rate than those on WA.

19.2.2 Modelling numbers on benefit

Recall that for *other benefits and assistance* including WA/WB, the number of recipients is modelled as a proportion of total number of clients in the system. Thus numbers are modelled as a single probability model. The actual and predicted probabilities for this model are shown in Figure 19.2.

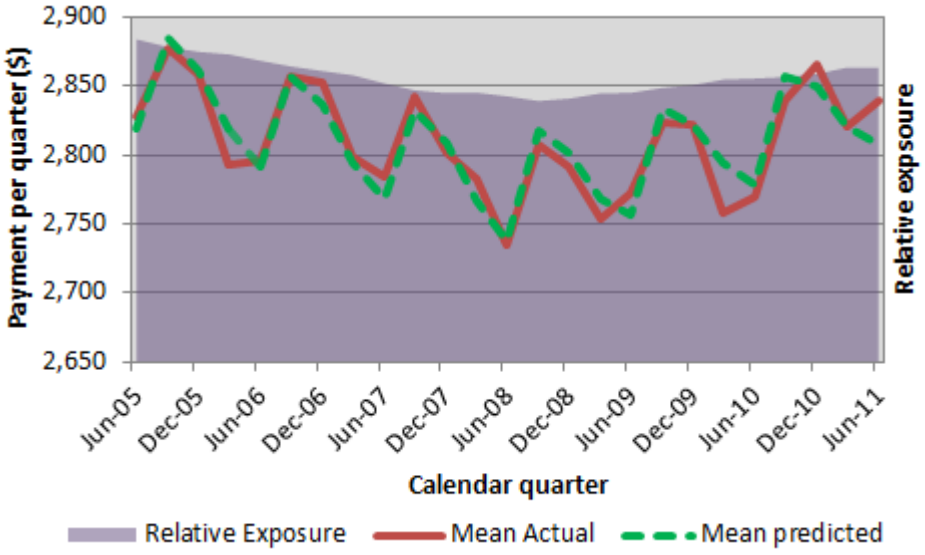
Figure 19.2 **Probability that a welfare beneficiary is receiving Woman Alone or Widow's Benefit**



The probability that a welfare beneficiary received either WA or WB largely mirrors that pattern seen in numbers receiving. However, it does suggest that the increase in recipient numbers since 2009 is mainly due to an increase in overall numbers in the system rather than an increase proportion of clients using WA or WB.

19.2.3 Average benefit payments while on benefit

Figure 19.3 **Actual and modelled average quarterly payments by calendar quarter**



As discussed above in Section 19.2.1, the reduction in ABP from 2005 to 2008 is likely to result from changing proportions of those receiving WA and WB. The ABP tends to be lower for older women and those on longer durations; both of these are consistent with the observation that older women are less likely to have dependent children and therefore

to receive WB at the higher rate. This ABP trend has reversed somewhat over the past two years. The seasonality is explained by considering the number of days in each quarter.

19.3 Summary of forecasts

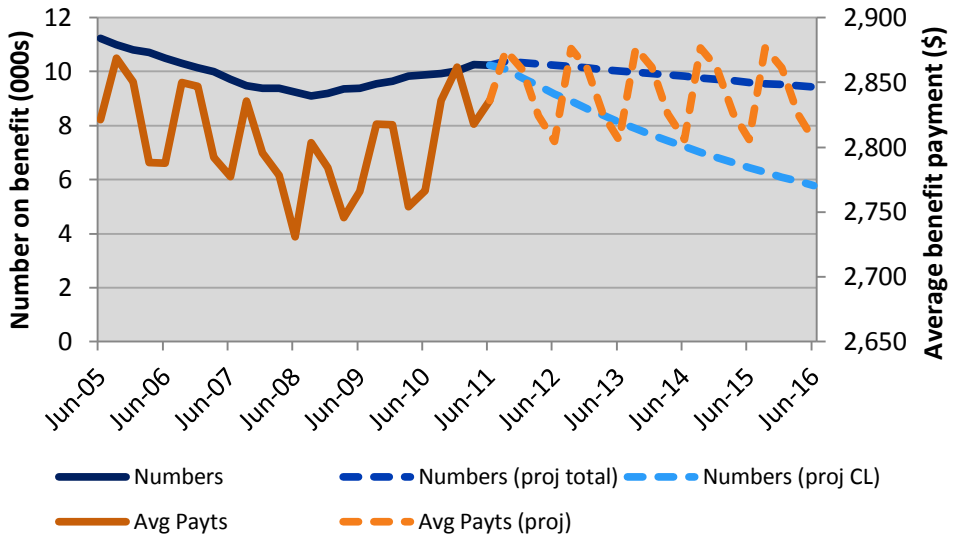
The following table shows the current and future client liabilities for this benefit.

Table 19.2 **Current and future client liabilities for Woman Alone and Widow's Benefit**

Liability	Current values, undiscounted ($m)	Actual values, undiscounted ($m)	Actual values, discounted to "premium" date ($m)	Mean term (yrs)
Current	1,227	1,658	940	8.3
2011/12	132	183	101	8.2
2012/13	118	168	91	8.1
2013/14	109	159	85	8.0
2014/15	103	153	81	8.0
2015/16	98	149	78	8.0

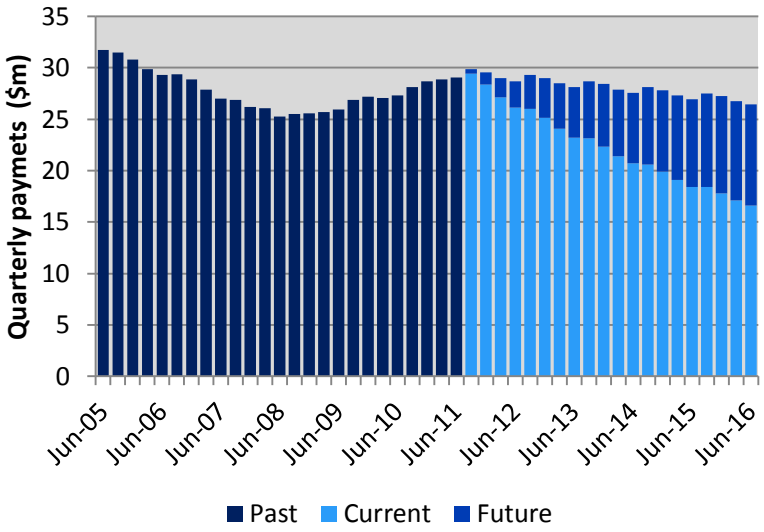
The moderate mean term (8 years approximately) is consistent with an older population on long-term benefits. The mean term is reasonably stable between the current and future client liabilities, which is indicative of a reasonably stable population demographic.

Figure 19.4 **Historical and forecast numbers and ABPs (current values)**



Forecast numbers and APBs are compared to historical results in Figure 19.4. Our forecasts assume that overall numbers on WA/WB slow in their growth and eventually stabilise. We believe this is consistent with current experience. Furthermore, we assume a flat ABP trend, assuming that features such as the relative WA to WB mix remains relatively stable.

Figure 19.5 **Quarterly benefit payments, in current values**



Finally, Figure 19.5 shows the historical and projected payments for the WA/WB benefits, which is the combination of the numbers and ABPs in the previous graph.

19.4 Key risks

General risks are discussed in Section 9. One particular risk highly relevant to WA/WB is the proposed grouping of benefits (Section 9.2.2). It is our understanding that this will bring the treatment of WA/WB recipients more in line with other jobseeker categories. This has the potentially to materially alter the behaviour of clients, both in terms of their likelihood of entering the benefit and their likelihood of leaving it.

PART D.2

TIER 2 SUPPLEMENTARY ASSISTANCE

20 ACCOMMODATION RELATED ASSISTANCE

20.1 Introduction

Accommodation Supplement ("AS") provides assistance towards accommodation costs for beneficiaries and low and middle-income earners. AS is available to non-beneficiaries, which means that increased exits to employment may not reduce the future cost of assistance.

As noted earlier, the valuation excludes supplementary assistance provided to clients over the age of 65.

Benefit Name	Code	% 10/11 benefit	Comment
Accommodation Supplement	471	100.0%	
Accommodation Benefit	470	0.0%	Code not in current use
Tenure Protection Allowance	472	0.0%	Code not in current use
Special Transfer Allowance	473	0.0%	Nil for working-age clients
Away from Home Allowance	474	0.0%	Code not used
Relocation Allowance	832	0.0%	

AS is the largest of the Tier 2 benefits with approximately $1.1b p.a. current outgo.

For the valuation we have broken down claimants receiving AS into the following two groups:

- Those receiving AS in conjunction with a key Tier 1 benefit (DPB, IB, SB and UB); and
- The remainder of those receiving AS.

For the first group we consider the AS average benefit payment per key Tier 1 recipient and thus, the relevant numbers of beneficiaries are those for each of DPB, IB, SB and UB. These numbers are already modelled as part of the key Tier 1 benefit valuation. Refer to Sections 10.2.2, 11.2.2, 12.2.2 and 13.2.2 for more details.

For each of the four subgroups corresponding to the associated key Tier 1 benefit (DPB, IB, SB and UB), we model the average benefit payment in each quarter **per key benefit recipient**. A consequence of this is that the total AS benefits paid to recipients of that particular Tier 1 benefit is spread over *all* people on that benefit, not only those that actually receive AS payments. Therefore, some care is required in interpreting the raw average benefit payment amounts and trends in these. For example, an increase in the modelled average benefit paid could reflect a genuine increase in the amount of AS benefit paid to each AS recipient within that Tier 1 benefit, or it could result from an increase in the number of people receiving that Tier 1 benefit who also receive an AS payment.

The second group of AS claimants (those not receiving a key benefit) have been modelled according to the minor benefit methodology described in Section 4.5.

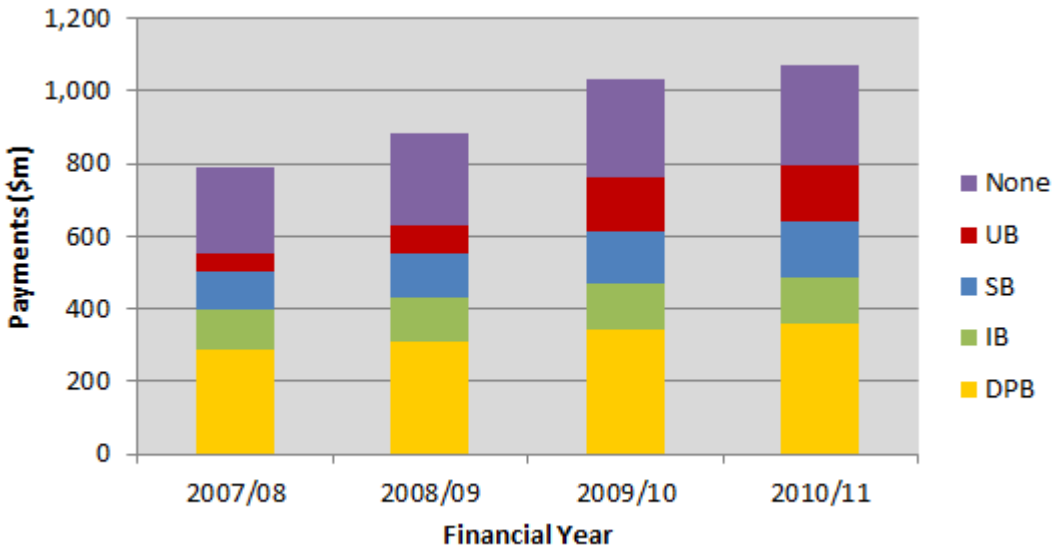
Our discussion of the experience and models in this section splits naturally into five components: one for each key Tier 1 benefit and one for recipients with no associated Tier 1 benefit.

20.2 Current experience

20.2.1 General experience and trends

The graph in Figure 20.1 illustrates recent payment experience for the Accommodation Supplement, split by associated Key Tier 1 benefit.

Figure 20.1 **Recent Accommodation Supplement payment experience, split by associated Tier 1 benefit.**



Regarding recent experience:

- The total amount of AS benefits paid has been increasing, with a particular jump between the 2008/09 and 2009/10 financial years;
- Approximately a third of all AS payments are made to DPB recipients;
- A quarter of AS payments are made to people who do not receive any Tier 1 benefit; and
- The amount of AS benefit paid to Invalid Benefit recipients has remained relatively stable, while payments to all other cohorts have increased, with a particularly noticeable increase in UB, related to the increased numbers receiving UB due to adverse economic conditions.

Table 20.1 illustrates the proportionate contribution of each component to recent experience. As can be seen, there was a qualitative shift in the distribution in 2009/10, with UB accounting for a much larger proportion of payments than previously. Payments

associated with SB have remained proportionately stable, while those with IB and DPB have decreased slightly. The contribution of the group without a key Tier 1 benefit has decreased as a proportion of total payments, reflecting the relatively lower dependence on economic conditions than other groups (particularly UB).

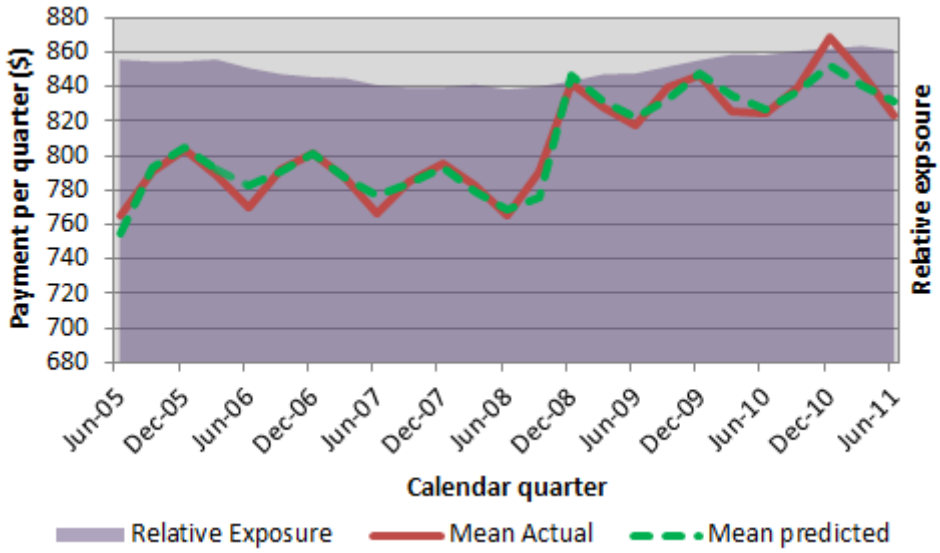
Table 20.1 **Proportion of annual Accommodation Support payments, split by associated Tier 1 benefit**

Year	DPB	IB	SB	UB	None	Total ($m)
2007/08	36%	14%	14%	6%	30%	791
2008/09	35%	14%	14%	9%	29%	882
2009/10	33%	12%	14%	14%	26%	1,032
2010/11	34%	12%	14%	14%	26%	1,071

20.2.2 Modelling AS with key Tier 1

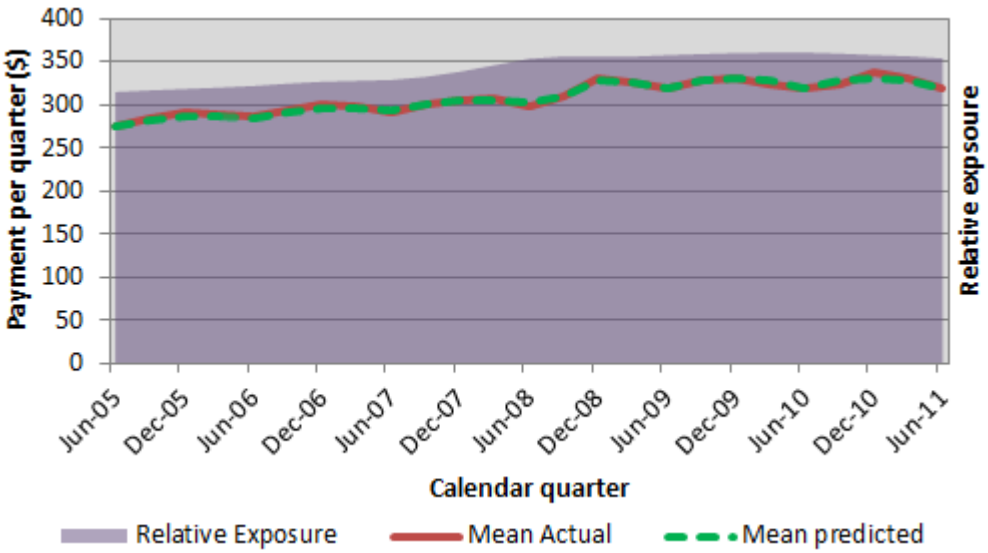
As discussed above, payments of Accommodation Supplement to key Tier 1 beneficiaries are modelled via a single Average Benefit Payment model for each key Tier 1 benefit. We illustrate the actual and predicted amounts for each of these models below.

Figure 20.2 **Actual and modelled average quarterly AS payments by calendar quarter for DPB recipients**



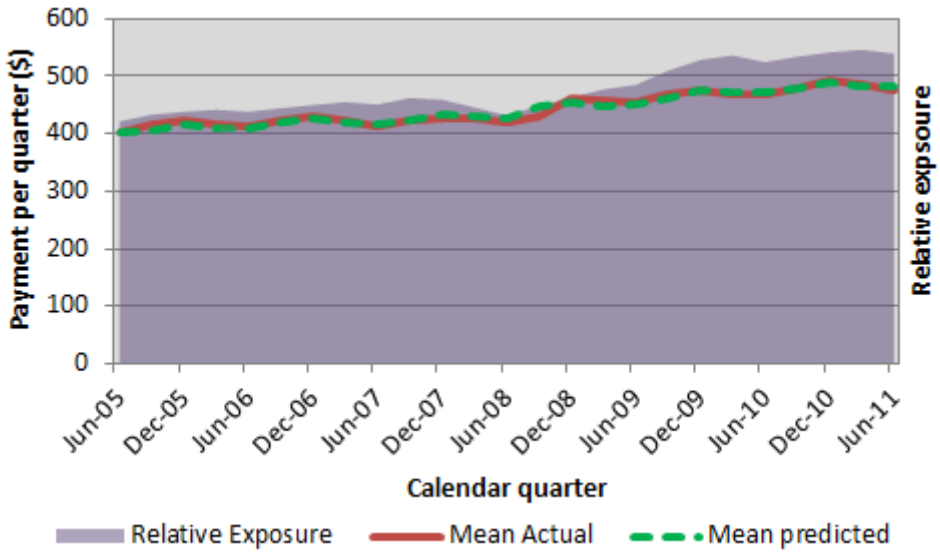
AS payments per DPB recipient is the highest of all the key benefits, suggesting a heavy usage of this supplementary assistance. There is clear seasonality in the amount of Accommodation Supplement paid to DPB recipients, with the troughs in the June quarter each year. The average AS benefit payment for those with a DPB benefit is skewed towards lower durations and lower ages. This is in line with the general demographics of the DPB population itself and reflects the fact that younger sole parents are more likely to be in receipt of an Accommodation Supplement. The modest rise in ABP seen in December 2008 is common to all five AS models.

Figure 20.3 **Actual and modelled average quarterly AS payments by calendar quarter for IB recipients**



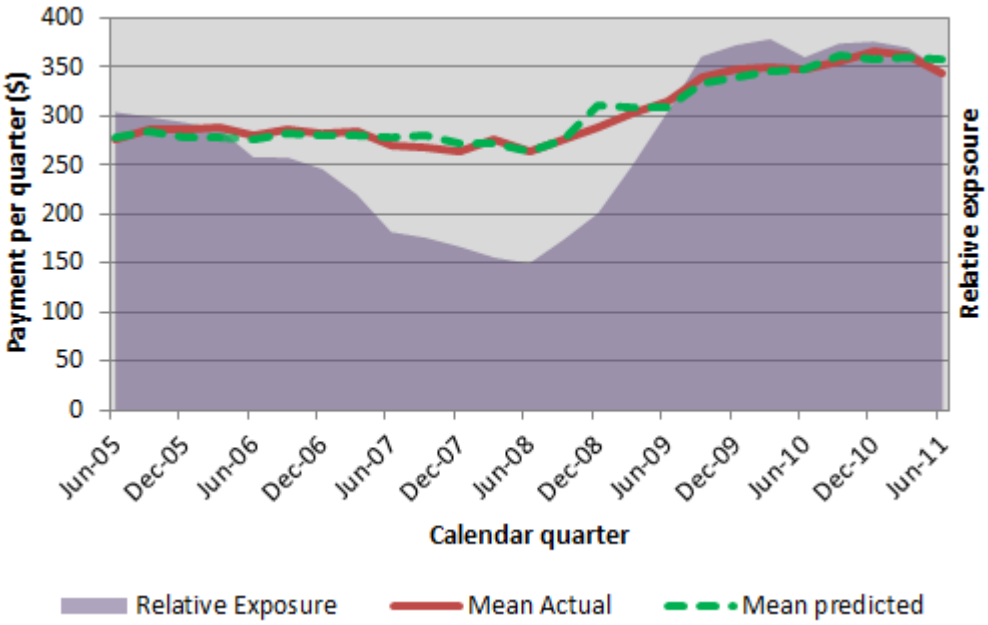
AS payments per IB client is actually the lowest of the AS with key benefit models. There is little seasonality in the amount of AS benefit paid to IB recipients and the average level has remained reasonably stable since 2009.

Figure 20.4 **Actual and modelled average quarterly AS payments by calendar quarter for SB recipients**



There has been an increase in the amount of AS paid to SB recipients since 2008, coinciding with the deterioration in the general economic environment.

Figure 20.5 **Actual and modelled average quarterly AS payments by calendar quarter for UB recipients**



The amount of AS payments to UB does appear to increase with the unemployment rate. There has been a noticeable increase since late 2008, corresponding to the economic recession. All else being equal, the increase reflects a greater proportion of UB recipients requiring an Accommodation Supplement on top of their main UB benefit.

20.2.3 Modelling AS without a key Tier 1 benefit

Accommodation Supplement payments made to people without a key Tier 1 benefit are modelled via two models:

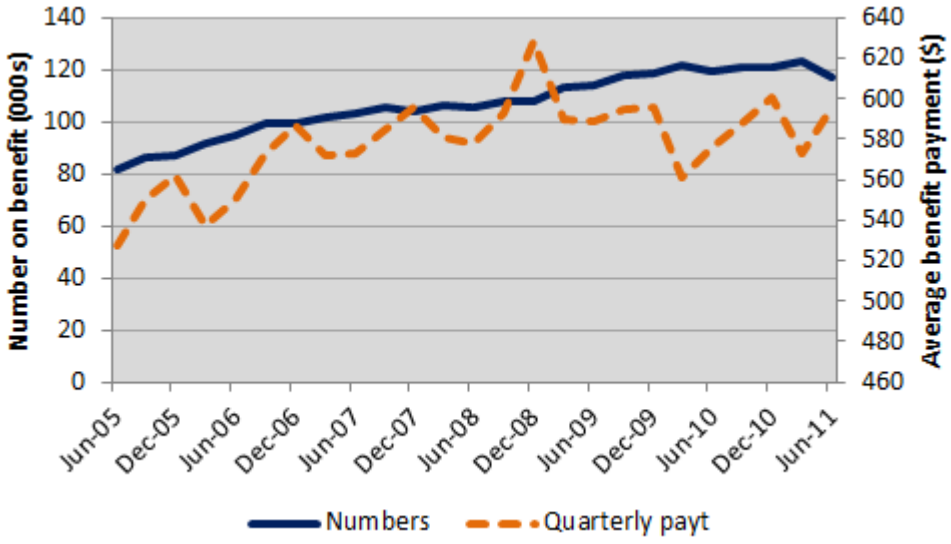
- A model of the proportion of the total number of clients in the system who receive an Accommodation Supplement benefit; and
- A model of the average benefit paid to those receiving an Accommodation Supplement.

Table 20.2 and Figure 20.6 show the recent Accommodation Supplement experience for people without a key Tier 1 benefit.

Table 20.2 **Recent Accommodation Supplement experience (no key Tier 1 benefit)**

Year	Payments ($m)	Average number on benefit	Average quarterly benefit payment (ABP) per client ($)
2007/08	236	105,500	560
2008/09	253	110,800	570
2009/10	271	119,600	570
2010/11	277	120,400	580

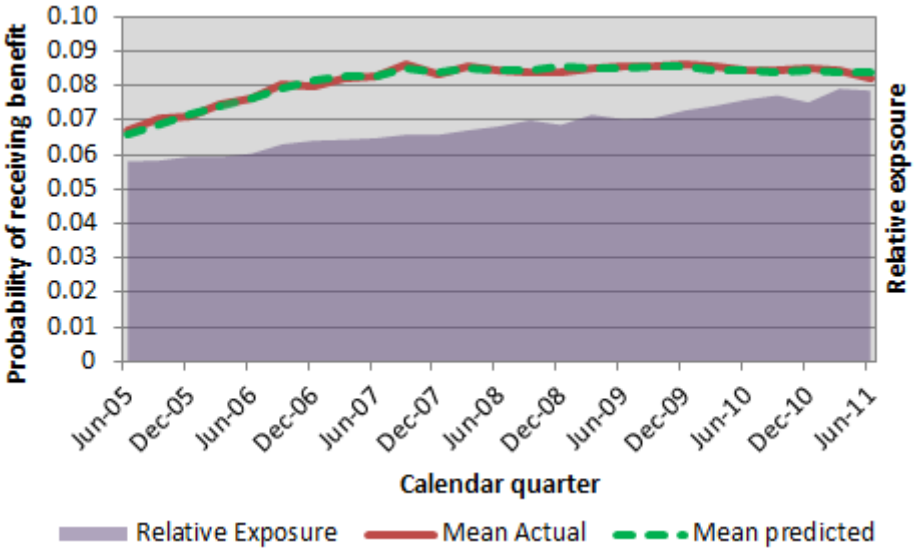
Figure 20.6 **Trends in Accommodation Supplement (no key Tier 1 benefit)**



The numbers receiving AS increased steadily until 2010, with the trend in 2011 less clear. The rate of increase was at its greatest for the period from December 2008 to December 2009, corresponding to the global financial crisis. The ABP increased somewhat until early 2006/07 but has been relatively stable since then.

Figure 20.7 shows the historical actual and predicted probabilities that a welfare beneficiary (who is not receiving a key Tier 1 benefit) receives AS payments.

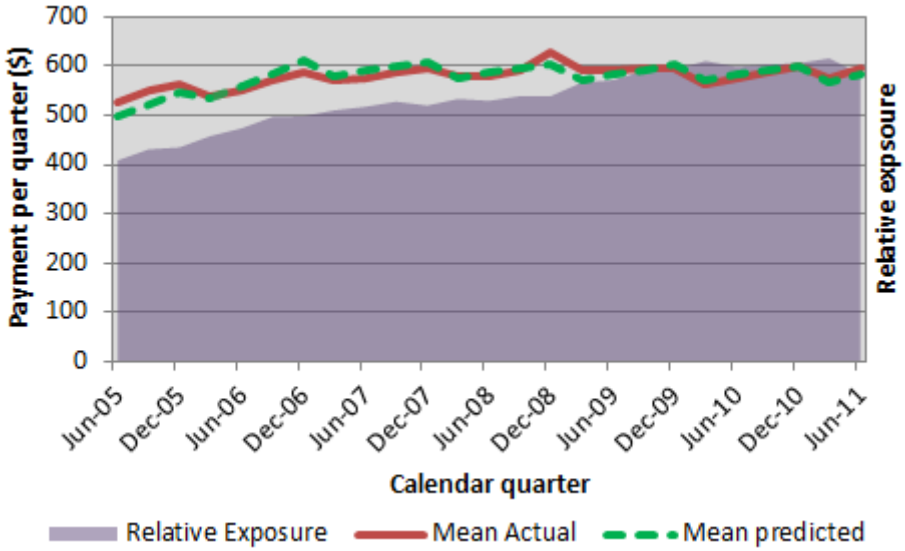
Figure 20.7 **Probability that a welfare beneficiary is receiving Accommodation Supplement given they are not receiving a key Tier 1 benefit**



The probability of receiving AS in the absence of a key Tier 1 benefit rose until the end of 2007 and thereafter has been relatively stable, but with a small drop in recent quarters. The probability was highest for those on low durations (less than two years). The age profile of those receiving AS benefits was broadly consistent with the overall profile of clients in the welfare system.

The historical actual and predicted average benefit payments for Accommodation Supplement beneficiaries without an associated key Tier 1 benefit are shown in Figure 20.8.

Figure 20.8 **Actual and modelled average quarterly payments by calendar quarter for Accommodation Supplement not in conjunction with a key Tier 1 benefit**



Average benefit payments have been reasonably stable over the last few years. There is a general increasing trend by age, from around age 20 to age 44 with a slow decrease after this age. Additionally, those who first received a welfare benefit 13 or more years previously have materially higher payments than shorter duration participants.

Further details on all models can be found in the electronic appendices.

20.3 Summary of forecasts

The following table shows the current and future client liabilities for the Accommodation Supplement benefit. In other words, it incorporates all five groups of welfare participants. As usual, the discount dates for future client liabilities are the middle (31 December) of that future year.

Table 20.3 **Current and future client liabilities for Accommodation Supplement**

Liability	Current values, undiscounted ($m)	Actual values, undiscounted ($m)	Actual values, discounted to "premium" date ($m)	Mean term (yrs)
Current	13,902	19,506	10,212	9.4
2011/12	2,340	3,491	1,638	10.3
2012/13	1,887	2,892	1,321	10.3
2013/14	1,644	2,589	1,160	10.3
2014/15	1,497	2,422	1,070	10.3
2015/16	1,405	2,336	1,021	10.4

Table 20.4 breaks down the current and future client liability by the associated key benefit.

Table 20.4 **Break down of liability in actual values, discounted to "premium" date by associated key benefit ($m)**

Liability	DPB	IB	SB	UB	None	Total
Current	3,692	1,810	1,626	842	2,242	10,212
2011/12	436	149	264	188	601	1,638
2012/13	337	121	210	140	513	1,321
2013/14	291	107	184	119	459	1,160
2014/15	267	100	170	108	426	1,070
2014/15	255	96	163	103	404	1,021

It is worth comparing the relationship between the annual payments and the liabilities for each group. For those with a key Tier 1 benefit, the liability is strongly governed by the mean term of the Tier 1 benefit.

Table 20.5 **Contribution to annual payments and liability by associated key Tier 1 benefit.**

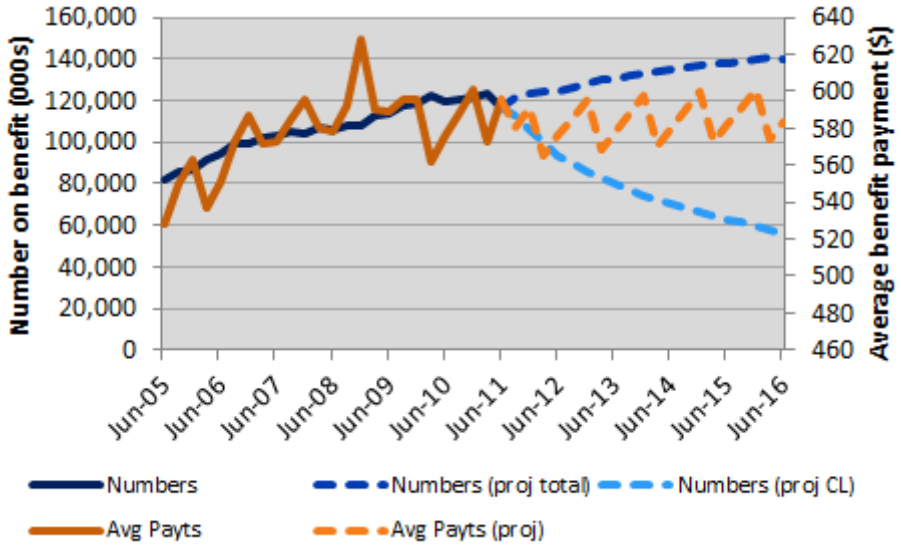
	DPB	IB	SB	UB	None
Percentage of annual payments	34%	12%	14%	14%	26%
Percentage of current client liability	36%	18%	16%	8%	22%

Of particular note are the following:

- IB represents 6% more of the current client liability than it does of the annual payments. This is reflective of the much higher mean term for IB than for any other benefit;
- Conversely, the shorter than average mean term for UB results in a lower contribution to the current client liability; and
- The mean term for those on AS without a key benefit is lower than the average of those with key benefits, and thus represents a smaller portion of the current client liability.

For AS payments to those with key benefits, the forecast number of recipients is precisely the forecast number on each key Tier 1 benefit. For those without a key Tier 1 benefit, the forecast number of AS recipients increases roughly in line with the projected increase in recipients within the welfare system, while the average benefit payment is projected to remain flat, albeit subject to some seasonality. This is illustrated in Figure 20.9.

Figure 20.9 **Historical and forecast numbers and ABPs (current values) for Accommodation Supplement Payments that do not receive a key Tier 1 benefit**



Combining all of the models described in this section, Figure 20.10 shows the historical and projected payments for the Accommodation Supplement, while Figure 20.11 shows the contributions of each of the five groups to the current client liability.

Figure 20.10 **Quarterly benefit payments, in current values**

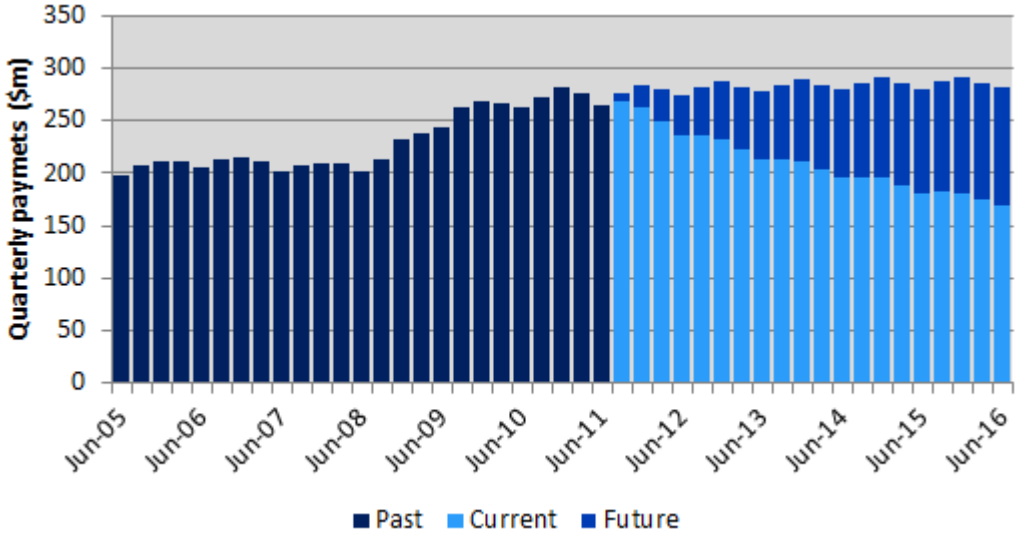
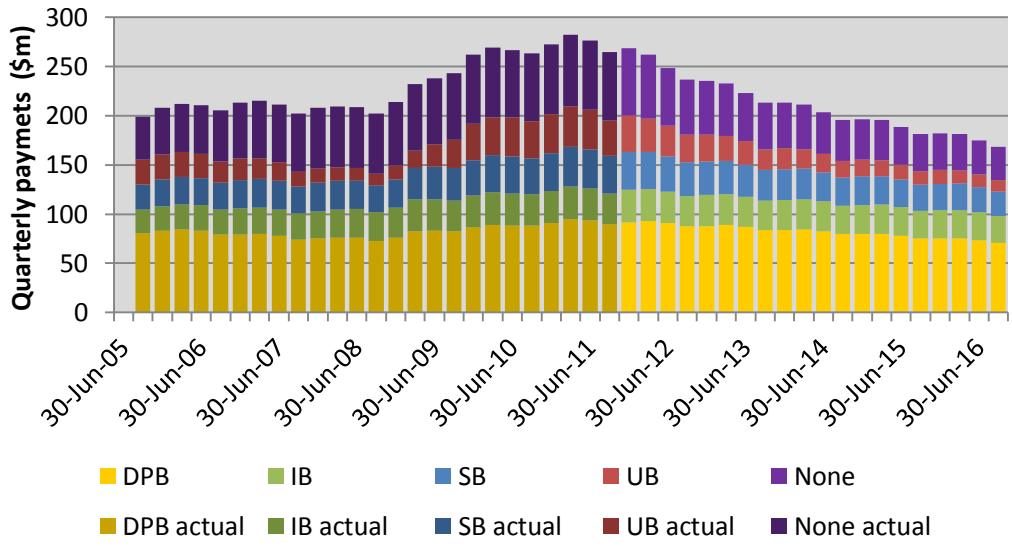


Figure 20.11 **Quarterly benefit payments, in current values, by associated key benefit. Projection contains current client liability component only.**



20.4 Key risks

The risks associated with AS payments to key benefit recipients are largely inherited from those key benefits themselves; for instance an economic deterioration increasing numbers claiming UB is likely to increase attached AS payments by a similar ratio. Readers are referred to the key risk sections for these underlying key benefits.

There are two other areas of significant uncertainty regarding the Accommodation Supplement:

- There has been a significant increase in the popularity of claiming AS as a standalone benefit over the past few years, although this trend may have ceased during 2010/11. This is partly, although probably not wholly, attributable to policy changes making the benefit more accessible in the 2004 Working For Families initiative. This trend may still have some distance to run, and further policy change would have a significant impact on the liability due to the significant size of the AS benefit; and

- The benefit has a region based rate calculator which is regularly reviewed. Future movements in housing costs, particularly cases where some cheaper addresses grow quickly in cost, will impact future payments.

21 DISABILITY ALLOWANCE

21.1 Introduction

The Disability Allowance ("DA") reimburses beneficiaries for many types of costs incurred because of disability that are not covered elsewhere. It is available to people with a disability that is likely to last at least six months and that means that the person needs help with daily living tasks or on-going treatment that is likely to last at least six months which result in an on-going cost to the person. The table below shows the benefit codes used in the historical modelling; all but one code has been retired. DA is available to non-beneficiaries, which means that increased exits to employment may not reduce the future cost of assistance.

As noted earlier, the valuation excludes supplementary assistance provided to clients over the age of 65.

Benefit Name	Code	% 10/11 benefit	Comment
Disability Allowance	425	100.0%	
Blind Subsidy	836	0.0%	
Rest Home Subsidy	837	0.0%	Nil for working-age clients
Special Disability Allowance	838	<0.05%	
Partner in Rest Home	843	0.0%	Nil for working-age clients

DA is a moderately sized Tier 2 benefit, with approximately $120m in annual payments. As with Accommodation Supplement, when considering the number of recipients, we break the claimants into two groups:

- Those receiving DA in conjunction with a key Tier 1 benefit (DPB, IB, SB and UB); and
- The remainder of those receiving DA.

The number of beneficiaries for the first group is already modelled as part of the key Tier 1 benefit valuation. Refer to Sections 10.2.2, 11.2.2, 12.2.2 and 13.2.2 for more details.

For each of the four subgroups corresponding to the associated key Tier 1 benefit (DPB, IB, SB and UB), we model the average benefit payment in each quarter **per key benefit recipient**. A consequence of this is that the total DA benefits paid to recipients of that particular Tier 1 benefit is spread over *all* people on that benefit, not only those that actually receive DA payments. Therefore, some care is required in interpreting the raw average benefit payment amounts and trends in these. For example, an increase in the modelled average benefit paid could reflect a genuine increase in the amount of DA benefit paid to each DA recipient within that Tier 1 benefit, or it could result from an increase in the number of people receiving that Tier 1 benefit who also receive a DA payment.

The second group of DA claimants (those not receiving a key benefit) have been modelled according to the minor benefit methodology described in Section 4.5.

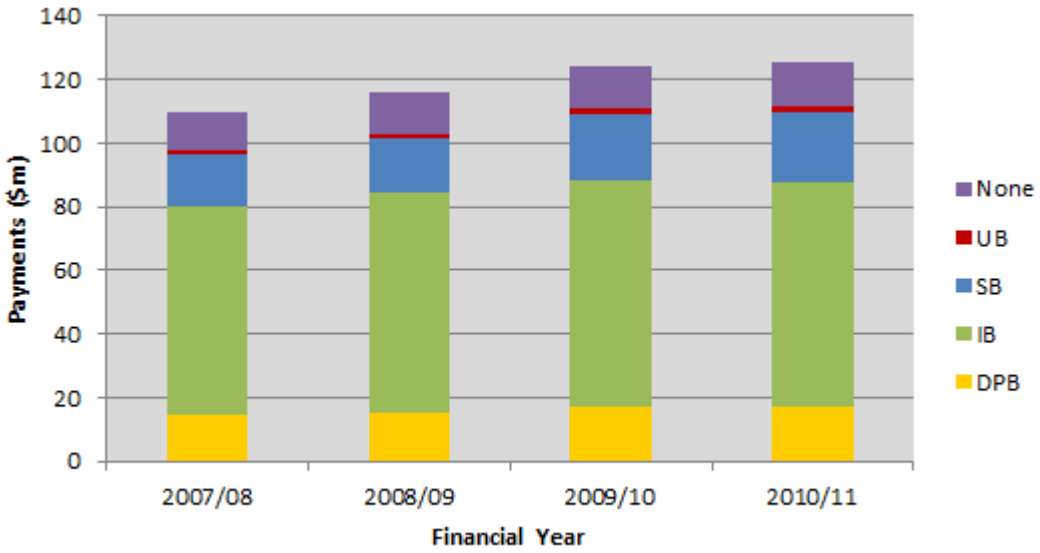
Our discussion of the experience and models in this section splits naturally into five components: one for each key Tier 1 benefit and one for recipients with no associated Tier 1 benefit.

21.2 Current experience

21.2.1 General experience and trends

The graph in Figure 21.1 illustrates recent payment experience for DA, split by associated key Tier 1 benefit.

Figure 21.1 **Recent Disability Allowance payment experience, split by associated key Tier 1 benefit.**



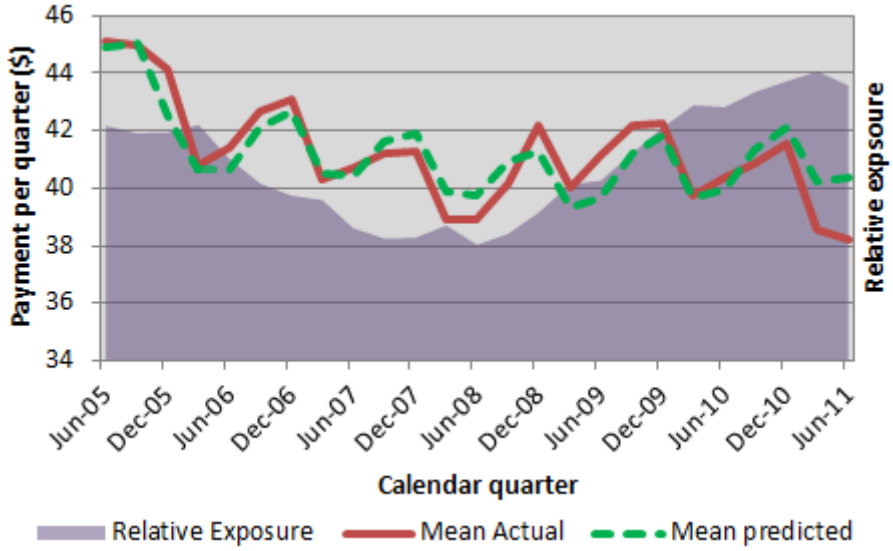
Regarding recent experience:

- The majority of DA payments are to IB beneficiaries, accounting for almost 60% of total annual payments. Payments to SB recipients represent another 15%;
- The total amount of DA benefits paid has been increasing, although this trend has moderated over the last two years;
- The proportionate contribution of each group to the total payments has been relatively stable; and
- Very few UB beneficiaries receive DA payments.

21.2.2 Modelling DA with a key Tier 1 benefit

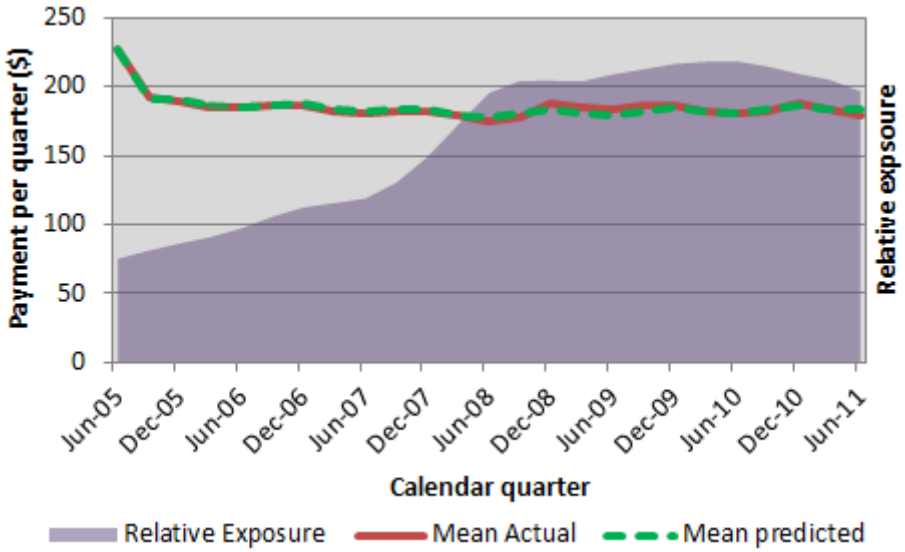
As discussed above, payments of Disability Allowance to key Tier 1 beneficiaries are modelled via a single Average Benefit Payment model for each key Tier 1 benefit. We illustrate the actual and predicted amounts for each of these models below

Figure 21.2 **Actual and modelled average quarterly DA payments by calendar quarter for DPB recipients**



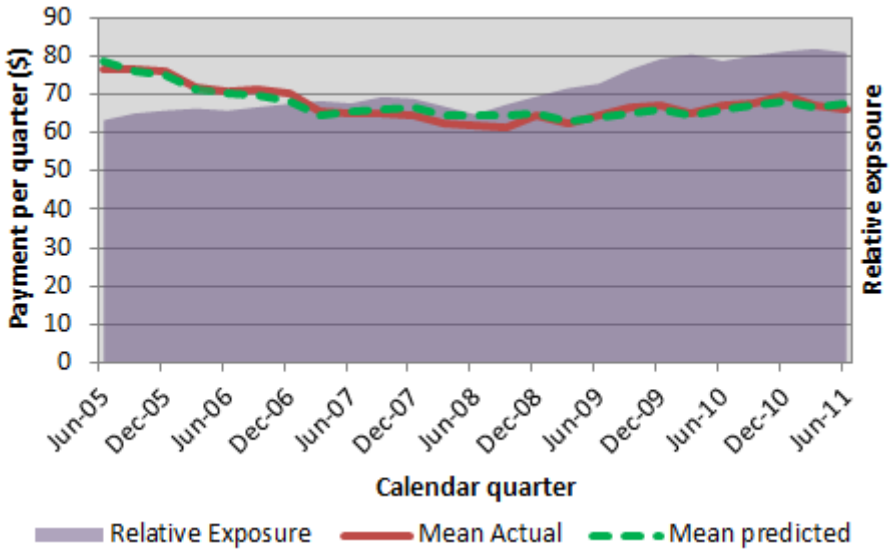
The seasonality in DA payments to DPB recipients largely mirrors that seen in the DPB benefit itself. The average DA benefit paid to DPB recipients has been trending lower until around December 2008. This is in line with the increasing probability of remaining on DPB during this period (see Figure 10.4).The average benefit paid increases with both the age of the DPB recipient, as well as the length of time that they have been receiving DPB.

Figure 21.3 **Actual and modelled average quarterly DA payments by calendar quarter for IB recipients**



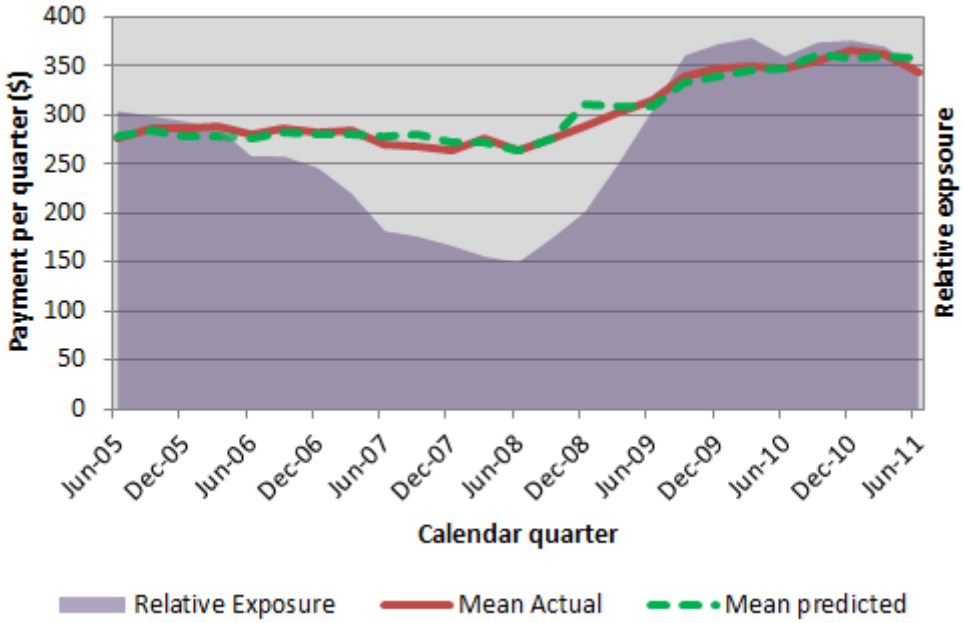
The amount of DA benefits paid to IB recipients has remained stable since December 2005. The ABP increases sharply from ages 16 to 35 and is reasonably stable after this point.

Figure 21.4 **Actual and modelled average quarterly DA payments by calendar quarter for SB recipients**



The average amount of DA benefits paid to SB recipients has remained roughly stable since December 2008, although with a slight increasing trend. The ABP increases sharply up to age 32 and then is stable until age 50 where it slowly decreases again.

Figure 21.5 **Actual and modelled average quarterly DA payments by calendar quarter for UB recipients**



The average amount of DA benefits paid to UB recipients is very low, reflecting the very small proportion of UB recipients who also qualify for DA benefits.

21.2.3 Modelling DA without a key Tier 1 benefit

As discussed above, DA payments made to people without a key Tier 1 benefit are modelled via two models:

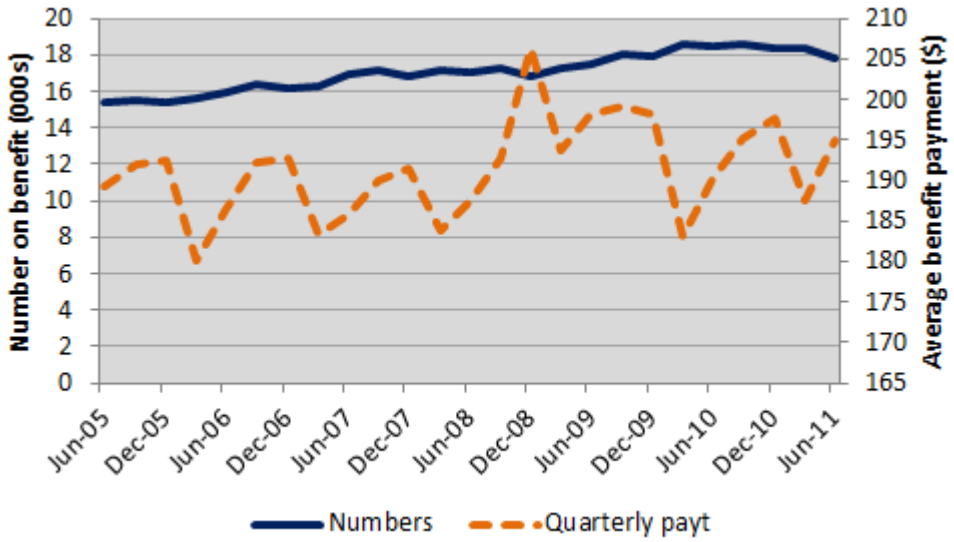
- A model of the proportion of the total number of clients in the system who receive a DA benefit; and
- A model of the average benefit paid to those receiving a DA benefit.

Table 21.1 and Figure 21.6 show the recent experience for DA recipients without a key Tier 1 benefit.

Table 21.1 **Recent Disability Allowance experience (no key Tier 1 benefit)**

Year	Payments ($m)	Average number on benefit	Average quarterly benefit payment (ABP) per client ($)
2007/08	12	17,100	180
2008/09	13	17,200	190
2009/10	14	18,200	190
2010/11	14	18,300	190

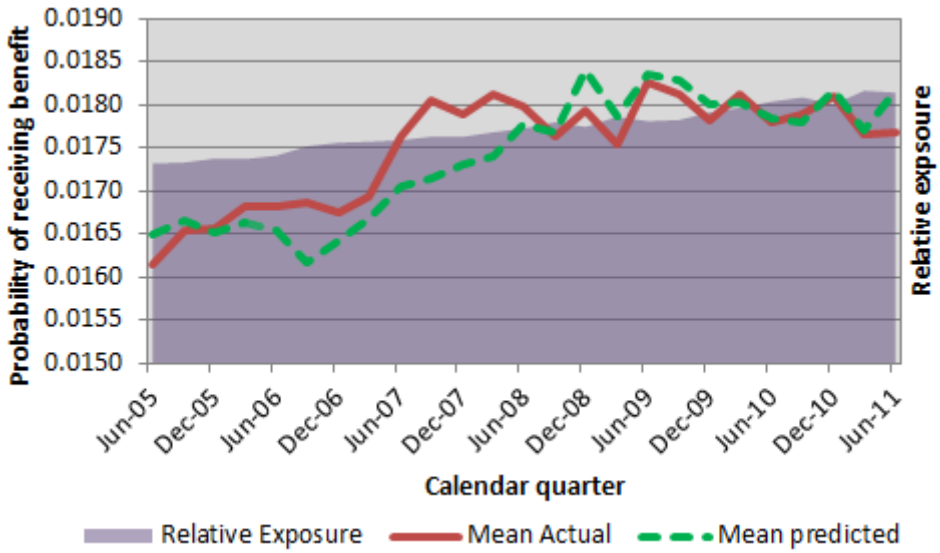
Figure 21.6 **Trends in Disability Allowance (no key Tier 1 benefit)**



The number of people in receipt of DA benefits who do not receive a key Tier 1 benefit increased slowly up to December 2009 and has been reasonably stable thereafter. Average benefit paid has shown strong seasonality around the March quarter, with increased volatility between June 2008 and March 2010.

Figure 21.7 shows the historical actual and predicted probabilities that that a welfare beneficiary who is not receiving a key Tier 1 benefit receives DA payments.

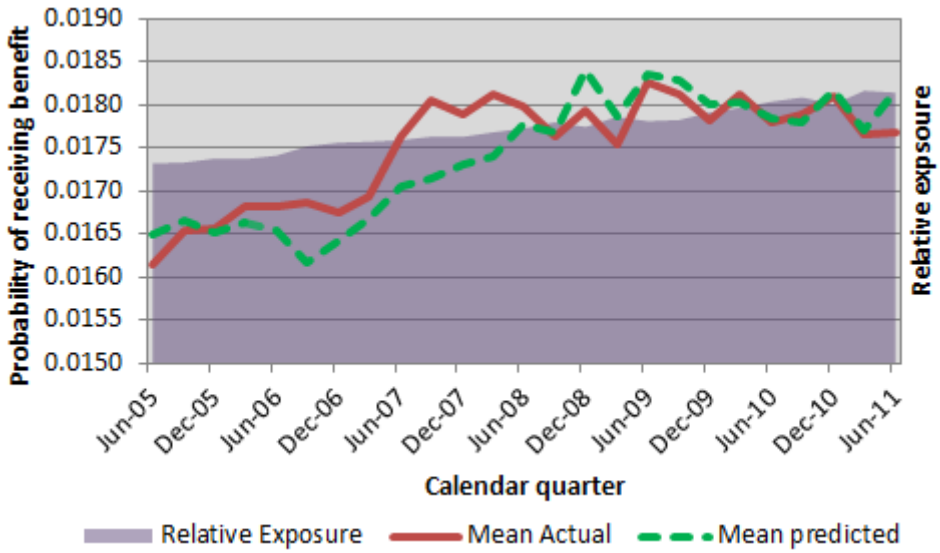
Figure 21.7 **Probability that a welfare beneficiary is receiving Disability Allowance given they are not receiving a key Tier 1 benefit**



The probability of a welfare beneficiary who is not in receipt of a key Tier 1 benefit receiving DA payments has been more or less stable since June 2007. There is a strong dependence on age, with a very sharp increase in probability from around age 50, with a 62 year old (who is not receiving a key Tier 1 benefit) being around three times more likely to be receiving DA payments than a 50 year old.

The historical actual and predicted average benefit payments for DA beneficiaries without an associated key Tier 1 benefit are shown in Figure 21.8.

Figure 21.8 **Actual and modelled average quarterly payments by calendar quarter for Disability Allowance not in conjunction with a key Tier 1 benefit**



Average benefit payments have been reasonable stable over the last several years, albeit with increased volatility during the global financial crisis. The ABP is relatively independent

of the age of a beneficiary, as well as the length of time since they first entered the benefit system.

Further detail on all models can be found in the electronic appendices.

21.3 Summary of forecasts

The following table shows the current and future client liabilities for the DA benefit. In other words, it incorporates all five groups of DA recipients.

Table 21.2 **Current and future client liabilities for Disability Allowance**

Liability	Current values, undiscounted ($m)	Actual values, undiscounted ($m)	Actual values, discounted to "premium" date ($m)	Mean term (yrs)
Current	2,745	4,132	1,866	11.5
2011/12	269	459	162	14.4
2012/13	217	380	131	14.3
2013/14	190	341	115	14.2
2014/15	173	319	106	14.2
2015/16	162	307	101	14.3

Table 21.3 breaks down the current and future client liability by the associated key benefit.

Table 21.3 **Break down of liability in actual values, discounted to "premium" date by associated key benefit ($m)**

Liability	DPB	IB	SB	UB	None	Total
Current	226	1,204	227	14	194	1,866
2011/12	22	76	34	3	27	162
2012/13	17	62	26	2	23	131
2013/14	15	55	23	2	21	115
2014/15	13	51	21	1	19	106
2014/15	12	49	20	1	18	101

DA payments to IB recipients dominate both the current and future client liabilities. This is due to both the long average mean term for IB, as well this group representing the majority of annual DA payments. The relationship between annual payments and current client liability is shown in the table below.

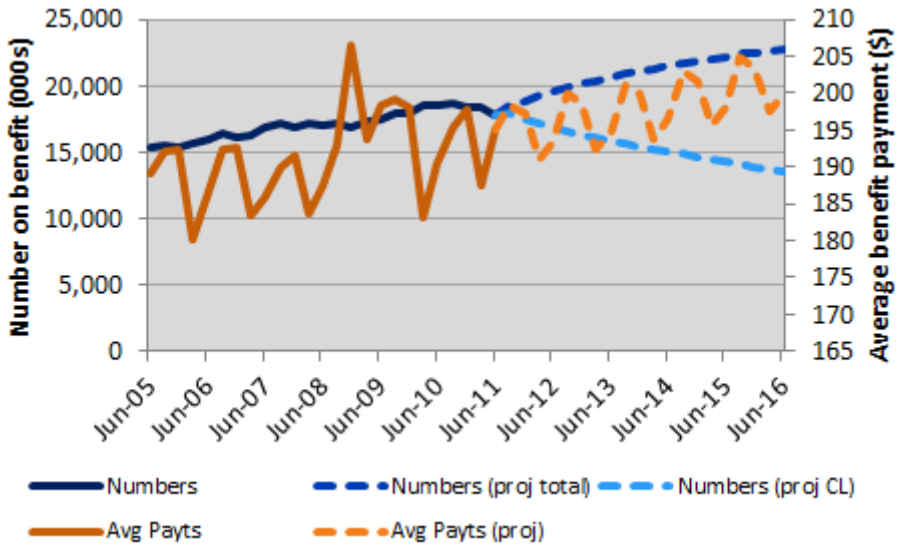
Table 21.4 **Contribution to annual payments and liability by associated key Tier 1 benefit**

	DPB	IB	SB	UB	None
Percentage of annual payments	14%	57%	17%	2%	11%
Percentage of current client liability	12%	65%	12%	1%	10%

Not only do IB recipients receive the bulk of annual DA payments, they also account for an even greater share of the current client liability.

For DA payments to those with key benefits, the forecast number of recipients is precisely the forecast number on each key Tier 1 benefit. For those without a key Tier 1 benefit, the forecast number of recipients increases in line with the projected increase in recipients within the welfare system, while the average benefit payment is projected to increase slowly, along with some seasonality. This trend is most likely related to the ageing current client liability population. These features are illustrated in Figure 21.9.

Figure 21.9 **Historical and forecast numbers and ABPs for DA clients without key Tier 1 benefits (current values)**



Combining all of the models described in this section, Figure 21.10 shows the historical and projected payments for the Disability Allowance, while Figure 21.11 shows the contributions of each of the five groups to the current client liability.

Figure 21.10 **Quarterly benefit payments, in current values**

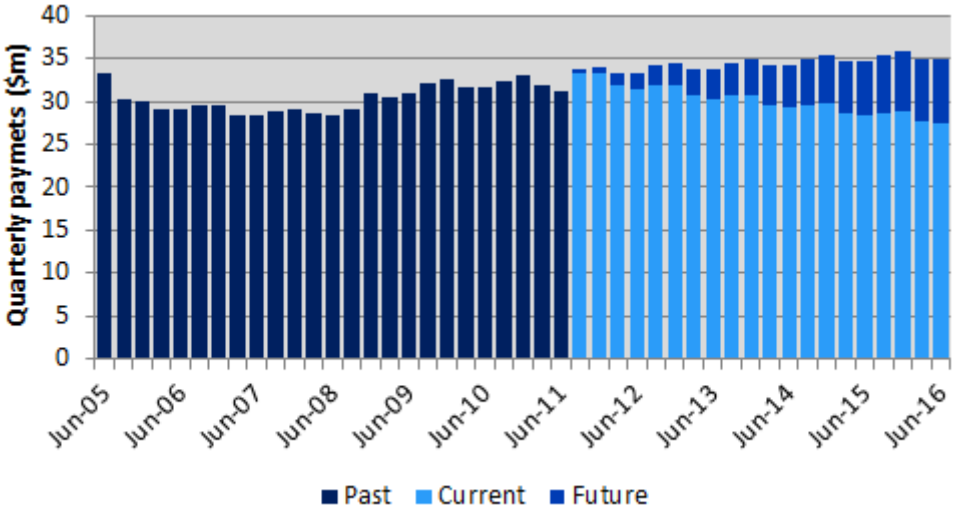
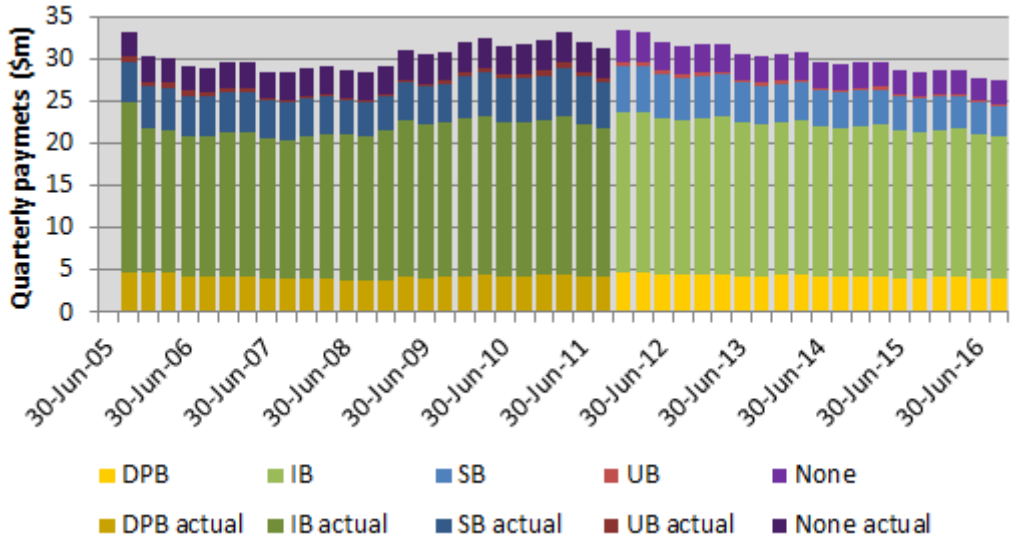


Figure 21.11 **Quarterly benefit payments, in current values, by associated key benefit. Projection contains current client liability component only.**



21.4 Key risks

As a relatively small and stable benefit, DA does not carry risks as large as other benefit types. However,

- Most of the comments regarding risk in Section 9 still apply;
- Cultural acceptance of different types of injury and disability may drive change over the medium to long term; and
- Connections with changes in other schemes such as the NZ accident compensation scheme may have implications for DA payments.

22 CHILD DISABILITY ALLOWANCE

22.1 Introduction

The Child Disability Allowance ("CDA") is a benefit to the principal caregiver of a child who needs constant care and attention for at least twelve months due to a disability. The CDA is not income-tested, which means that the future cost of the benefit is not influenced by a client's return to work.

CDA covers the costs of providing care; direct costs arising from the child's disability are covered by the Disability Allowance. The CDA is recorded under a single benefit code, as shown below.

Benefit Name	Code	% 10/11 benefit	Comment
Child disability allowance	065	100.0%	

CDA is medium-sized Tier 2 benefit with approximately $90m p.a. current outgo. Note that as there is no income test for CDA there is limited scope for MSD to manage liability through employment outcomes. Liability management for this benefit would be limited to policy changes.

22.2 Current experience

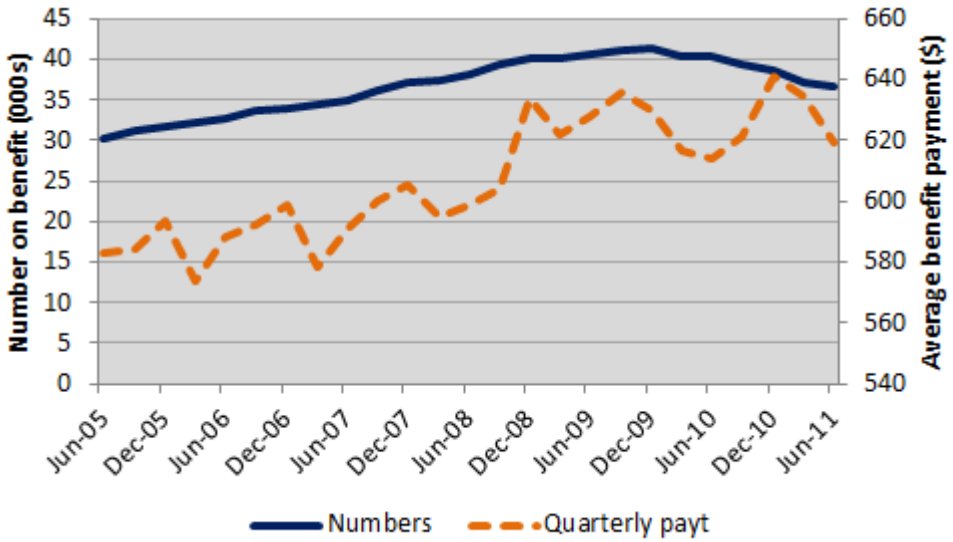
22.2.1 General experience and trends

The following table and graph show the recent experience for CDA.

Table 22.1 **Recent Child Disability Allowance experience**

Year	Payments ($m)	Average number on benefit	Average quarterly benefit payment (ABP) per client ($)
2007/08	85	37,200	570
2008/09	95	40,100	590
2009/10	99	40,800	610
2010/11	93	38,000	610

Figure 22.1 **Trends in Child Disability Allowance. ABP in June 2011 values.**



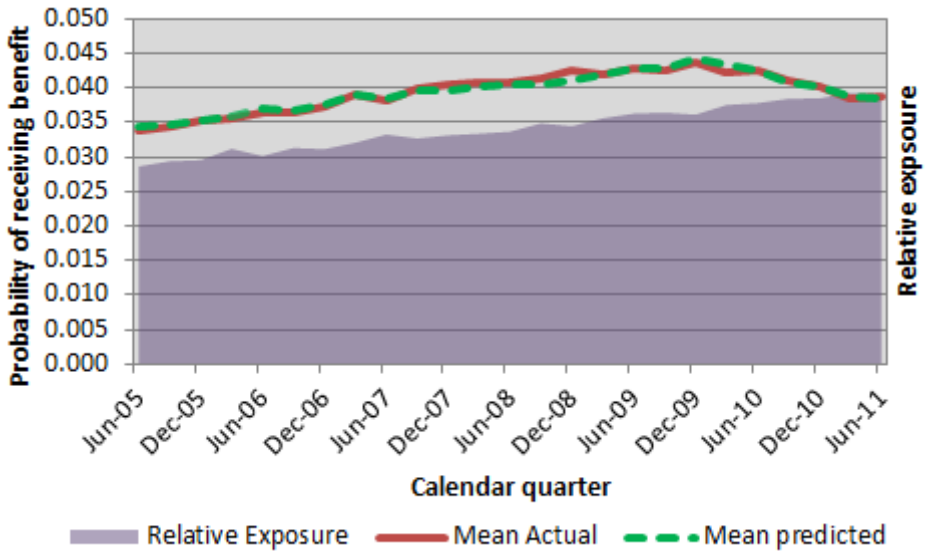
The number of carers receiving the benefit increased until 2008 and then decreased from 2009. The decrease may be due to a reduction of initial grants of CDA following changes to administration procedures in 2008. This meant that case managers had access to fuller medical information and the ability to consult with Regional Health Advisers when making their decisions on eligibility.

The average benefit payment for CDA shows some seasonality as well as a marked increase in the second half of 2008. We are not sure of the cause of this, although it may be partly attributable to operational changes to the treatment of annual reviews (no immediate suspension of payments if information not provided).

22.2.2 Modelling numbers on benefit

Recall that for *other benefits and assistance* including CDA, the number of recipients is modelled as a proportion of total number of clients in the system. Thus numbers are modelled as a single probability model. The actual and predicted probabilities for this model are shown in Figure 22.2.

Figure 22.2 **Probability that a welfare beneficiary is receiving Child Disability Allowance**



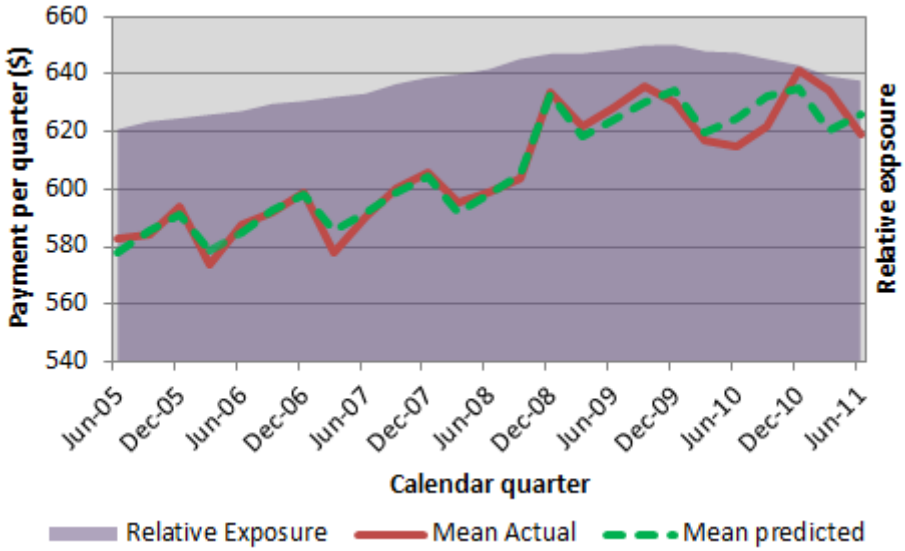
There has been a clear reversal in the trend in the probability of receiving CDA from around December 2009 (see earlier comments). Notwithstanding this, there are additional trends in the probability of receiving CDA relating to both duration and age. In particular:

- The probability of a beneficiary receiving CDA increases strongly with the duration since first benefit receipt, with those at 10 years duration being roughly twice as likely to be receiving CDA as those who have just entered the system;

- Not surprisingly, there is a strong dependence on age correlated to the probability of caring for a child. The probability of a beneficiary receiving CDA increases up to age 40 and then starts to decrease.

22.2.3 Average benefit payments while on benefit

Figure 22.3 **Actual and modelled average quarterly payments by calendar quarter**



The average amount of benefit receipt has remained roughly stable since December 2008, though with some seasonality. We note that there has been a step-change in the ABP around December 2008. As mentioned above, this may be due to operational changes in the administration of the benefit.

22.3 Summary of forecasts

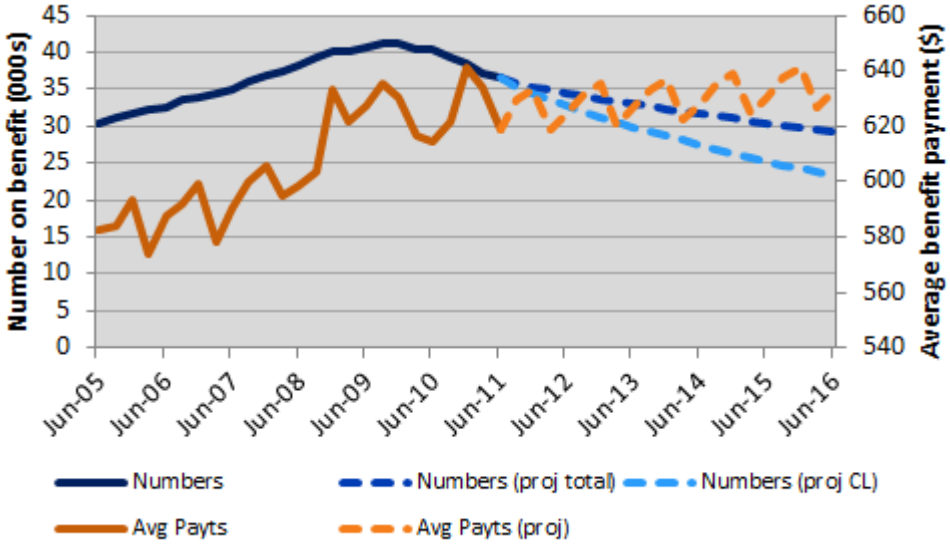
The following table shows the current and future client liabilities for this benefit.

Table 22.2 **Current and future client liabilities for Child Disability Allowance**

Liability	Current values, undiscounted ($m)	Actual values, undiscounted ($m)	Actual values, discounted to "premium" date ($m)	Mean term (yrs)
Current	1,063	1,404	824	8.3
2011/12	63	87	47	9.2
2012/13	54	77	40	9.3
2013/14	48	71	36	9.3
2014/15	45	67	34	9.4
2015/16	42	65	32	9.5

The average mean term is reasonably stable between the current client liability and future client liabilities, reflecting the relatively stable population makeup.

Figure 22.4 **Historical and forecast numbers and ABPs (current values)**

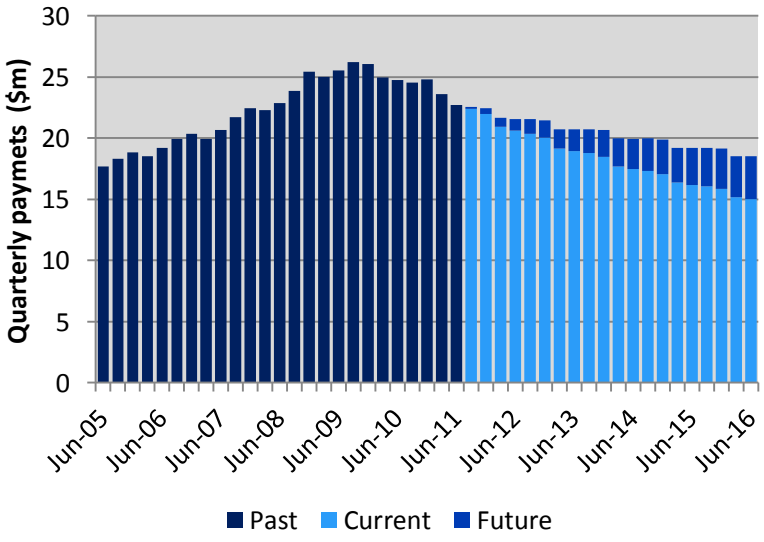


Future numbers on CDA are projected to moderate in their downtrend over the next five years. Thus, the models assume, to some extent, that children ineligible for the benefit have been identified between 2009 and 2011 so no further material reductions in numbers are expected.

Payments are expected to be relatively stable, with a slight trend up reflecting recent experience and the natural change in the mix of recipients as the current cohort ages.

Finally, Figure 22.5 shows the historical and projected payments for CDA, which is the combination of the numbers and ABPs in the previous graph.

Figure 22.5 **Quarterly benefit payments, in current values**



22.4 Key risks

As a relatively small and stable benefit, CDA does not carry risks as large as other benefit types. However, there is some uncertainty surrounding the extent to which recent downtrends will continue in the future, which will require some careful monitoring.

23 CHILDCARE SUBSIDY

23.1 Introduction

The Childcare Subsidy benefit provides support for the costs of pre-school childcare for children faced by working families or those families where one or more children are seriously ill or disabled, or where the parent or caregiver of the child has a disability or serious illness. The Childcare Subsidy is paid directly to the childcare provider.

The childcare subsidy is coded up under a single payment code.

Benefit Name	Code	% 10/11 benefit	Comment
Childcare subsidy	062	100.0%	

CCS is a medium-sized Tier 2 benefit with approximately $185m p.a. current experience.

Recall that our definition of current client liability includes those people who have received a Tier 1 or 2 benefit excluding CCS ("qualifying benefit") in the past 12 months. This was discussed in Section 4.2.2. Therefore there are the following components of the CCS liability:

- The current and future client liability attached to those currently in receipt of a qualifying benefit.
- The current client liability only attached to those who do not receive a qualifying benefit.

We consider, model and value these separately.

23.2 Current experience

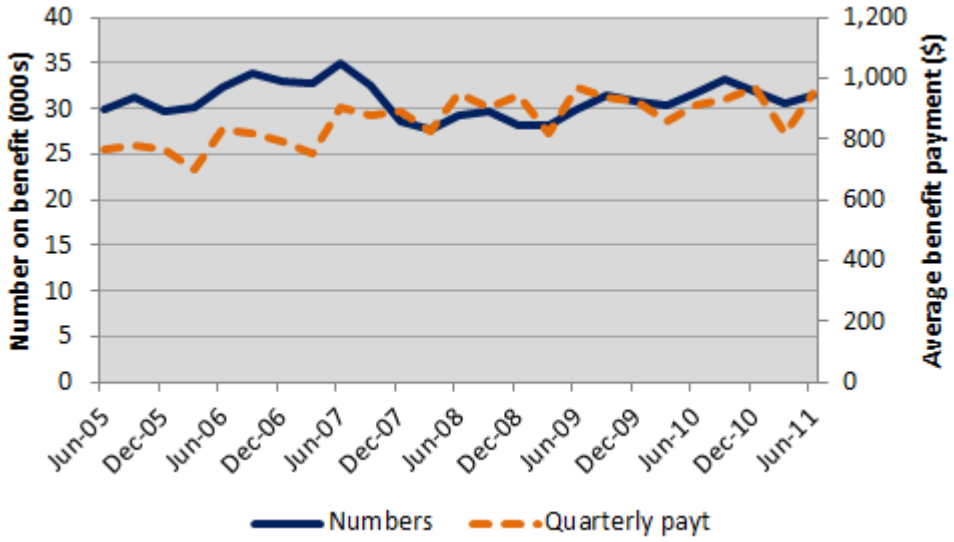
23.2.1 General experience and trends

Table 23.1 and Figure 23.1 present the recent experience for CCS restricted to those who receive CCS in conjunction with another qualifying benefit.

Table 23.1 **Recent Childcare Subsidy experience for beneficiaries with a qualifying benefit**

Year	Payments ($m)	Average number on benefit	Average quarterly benefit payment (ABP) per client ($)
2007/08	100	29,600	850
2008/09	101	29,000	870
2009/10	110	31,100	880
2010/11	114	31,800	900

Figure 23.1 **Trends in Childcare Subsidy for beneficiaries with a qualifying benefit. ABP in June 2011 values.**

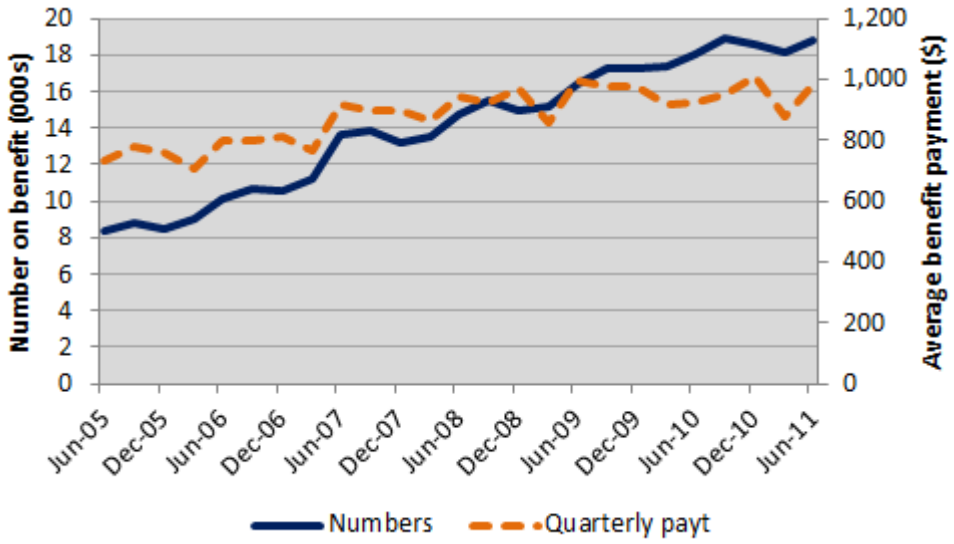


The number of beneficiaries is reasonably flat, apart from a drop in July 2007 related to the introduction of free early childhood education. ABP has remained relatively stable in the last couple of years after an increase in childcare costs from 2005 – 2007, reflecting an increase in childcare costs above CPI inflation.

Table 23.2 **Recent Childcare Subsidy experience for beneficiaries without qualifying benefit**

Year	Payments ($m)	Average number on benefit	Average quarterly benefit payment (ABP) per client ($)
2007/08	48	13,800	860
2008/09	56	15,500	900
2009/10	64	17,500	920
2010/11	70	18,600	930

Figure 23.2 **Trends in Childcare Subsidy for beneficiaries without a qualifying benefit**



In contrast to the recipients with a qualifying benefit, the number without a qualifying benefit has been trending steadily upwards. The trend and amount of ABP is very similar to that seen in Figure 23.1.

23.2.2 Modelling numbers on benefit

Recall that for *other benefits and assistance* including CCS, the number of recipients is modelled as a proportion of total number of clients in the system. Thus numbers are modelled as a single probability model. The actual and predicted probabilities for beneficiaries with a qualifying benefit for this model are shown in Figure 23.3. For those people without a qualifying benefit, the probability is effectively a survival model tracking how long clients will continue to receive CCS after the valuation date. The plot of actual and modelled proportions on benefit by time since the valuation date is shown in Figure 23.4 for these non-qualifying beneficiaries.

The probability of a welfare beneficiary receiving a Childcare Subsidy has remained reasonably stable, albeit with some seasonality. The impact of the introduction of free early childhood education in July 2007 is evident, with a consequent reduction in the probability of receipt of around 5%.

Unsurprisingly, there is a strong dependency on the age of the beneficiary, with the probability of receipt being strongly skewed towards younger (child bearing) ages. The probability of receiving a benefit is also heavily skewed towards lower durations, peaking around 3-5 years since the date of first benefit receipt.

Figure 23.3 **Probability that a welfare beneficiary is receiving Childcare Subsidy for beneficiaries with a qualifying benefit**

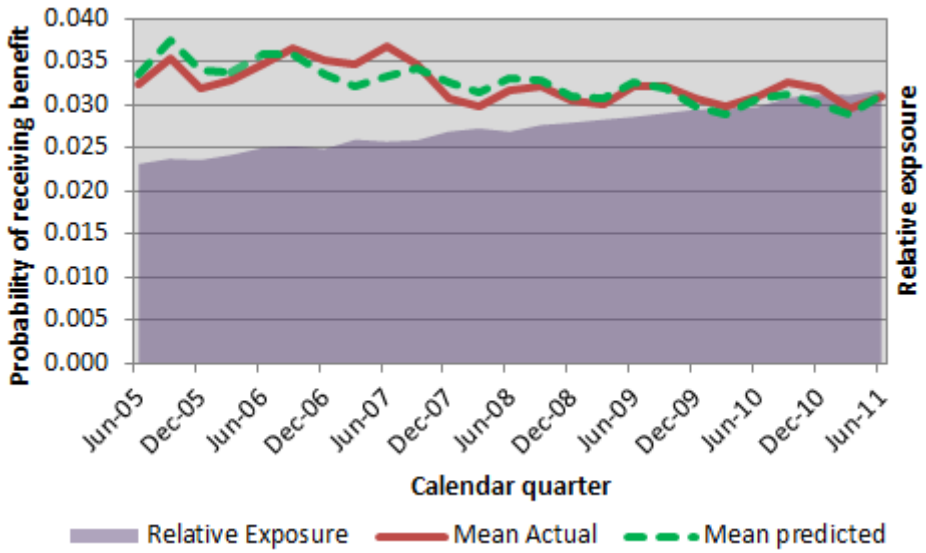
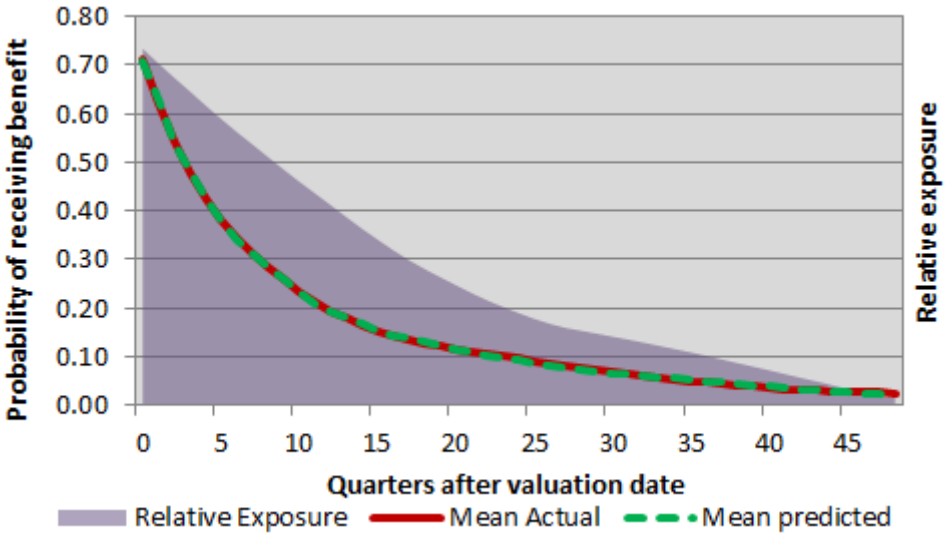


Figure 23.4 **Probability that a client without qualifying benefit is receiving CCS, given they received CCS sometime in the 12 months to the valuation date**



The probability of a client without a qualifying benefit receiving Childcare Subsidy trails off relatively quickly, with less than 50% still receiving after a year. This pattern appears fairly stable across different time periods.

As with the group of clients with a qualifying benefit, there is a strong dependency on the age of the beneficiary, with the distribution heavily skewed towards younger ages and peaking at a younger age than for the first group.

23.2.3 Average benefit payments while on benefit

As illustrated in Figure 23.5 and Figure 23.6, the ABP is reasonably consistent between the two components of the liability.

Figure 23.5 **Actual and modelled ABP by calendar quarter for qualifying recipients**

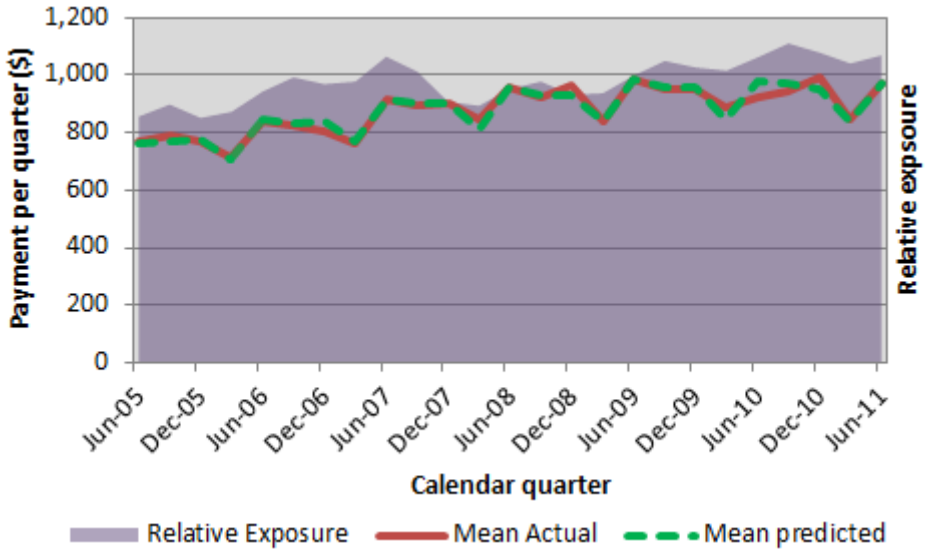
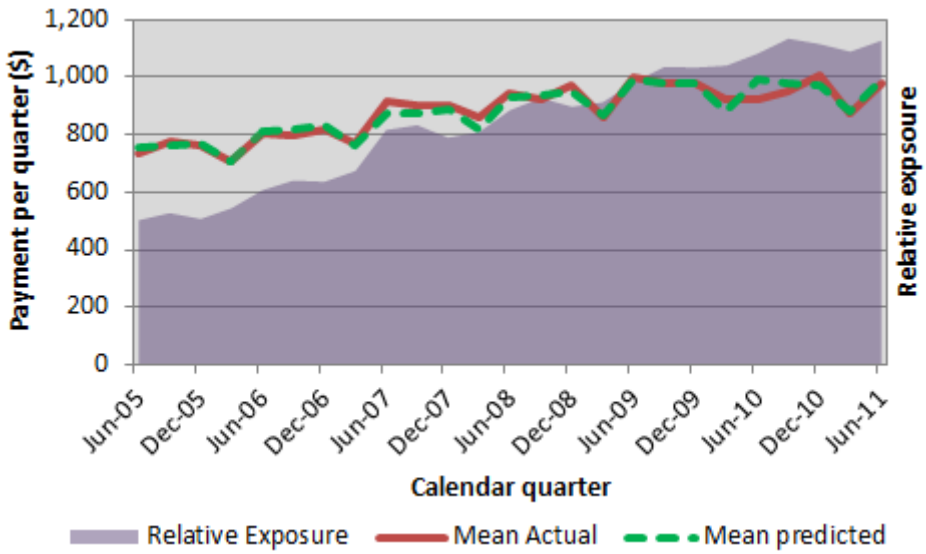


Figure 23.6 **Actual and modelled ABP by calendar quarter for non-qualifying recipients**



The ABP has remained relatively stable in recent years, with some seasonality present including a significant dip in each March quarter.

Further details for all CCS models can be found in the electronic appendices.

23.3 Summary of forecasts

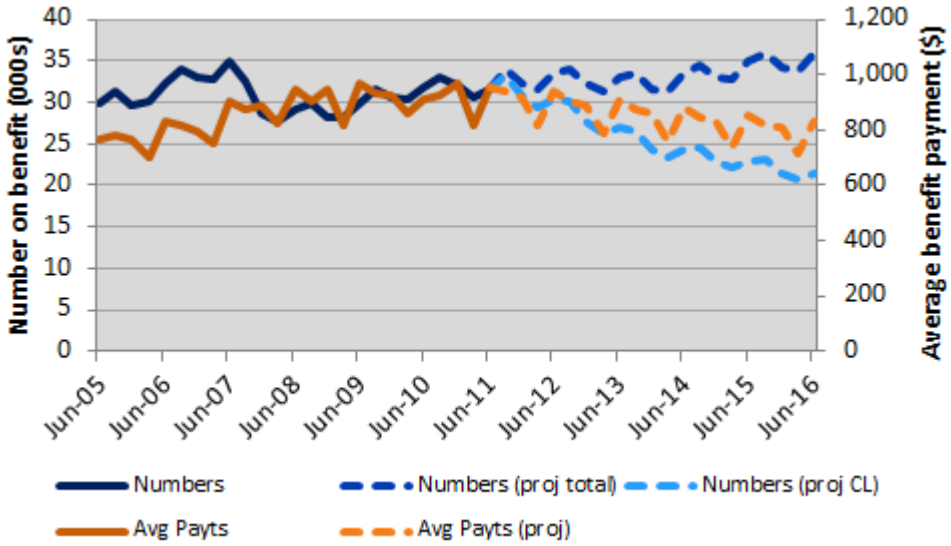
The following table shows the current and future client liabilities for this benefit.

Table 23.3 **Current and future client liabilities for Childcare Subsidy for qualifying recipients**

Liability	Current values, undiscounted ($m)	Actual values, undiscounted ($m)	Actual values, discounted to "premium" date ($m)	Mean term (yrs)
Current	863	1,026	743	5.6
2011/12	149	184	124	6.5
2012/13	130	166	108	6.6
2013/14	118	155	99	6.7
2014/15	112	150	94	6.8
2015/16	107	148	92	6.8

The average mean term of the liability is consistent with the Childcare Subsidy only being paid until the child reaches 5 or 6 years of age and is slightly higher for future periods, reflecting a slightly younger age profile of future clients.

Figure 23.7 **Historical and forecast numbers and ABPs (current values) for qualifying recipients**



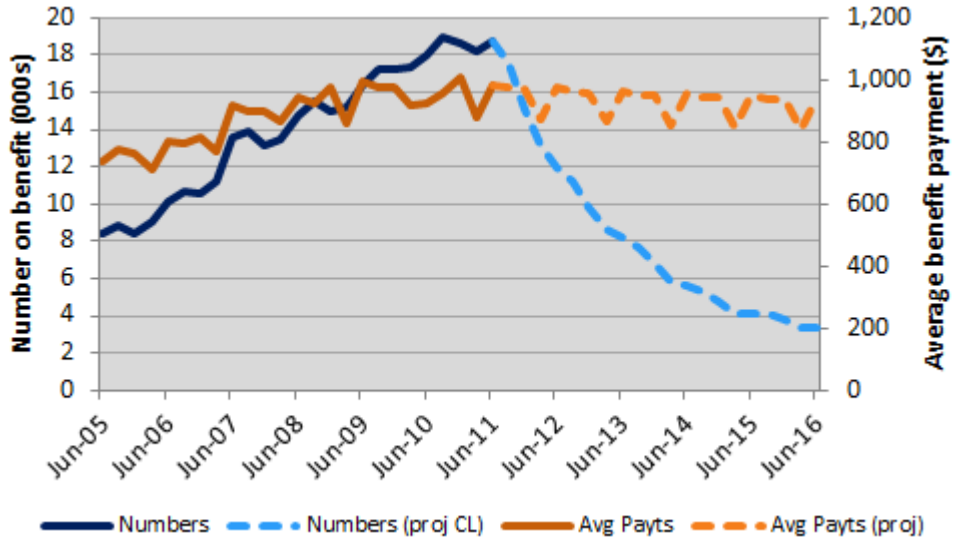
The numbers of Childcare Subsidy recipients with an associated qualifying benefit is forecast to trend upwards, which is consistent with the increase in the pool of qualifying recipients. The proportion attributable to current client liability is forecast to fall relatively slowly.

Table 23.4 **Current client liability only for Childcare Subsidy for non-qualifying recipients**

Liability	Current values, undiscounted ($m)	Actual values, undiscounted ($m)	Actual values, discounted to "premium" date ($m)	Mean term (yrs)
Current	198	222	182	3.5

The current client liability for recipients of Childcare Subsidy who do not receive a qualifying benefit is roughly a quarter of that for those who do while their average mean term is significantly lower at 3.4 years.

Figure 23.8 **Historical and forecast numbers and ABPs (current values) for non-qualifying recipients**



The number of Childcare Subsidy recipients within the current client liability who do not receive another Tier 1 or Tier 2 benefit falls away much more rapidly than the cohort of people who do have an additional Tier 1/2 benefit. This is because:

- The drop-off rate for clients with other benefits is partially offset by those clients in the system but not currently receiving CCS entering this benefit in the future; and
- People not receiving other benefits tend to have shorter spells on CCS.

Figure 23.9 **Quarterly benefit payments, in current values for current and future qualifying recipients**

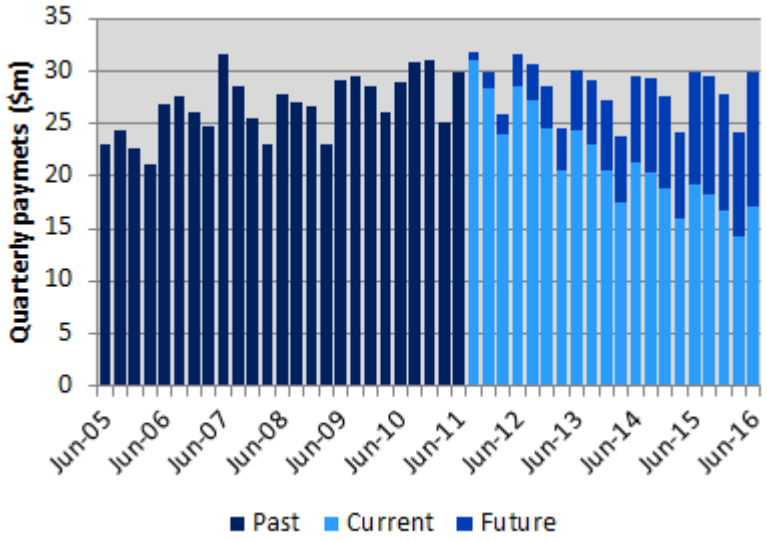
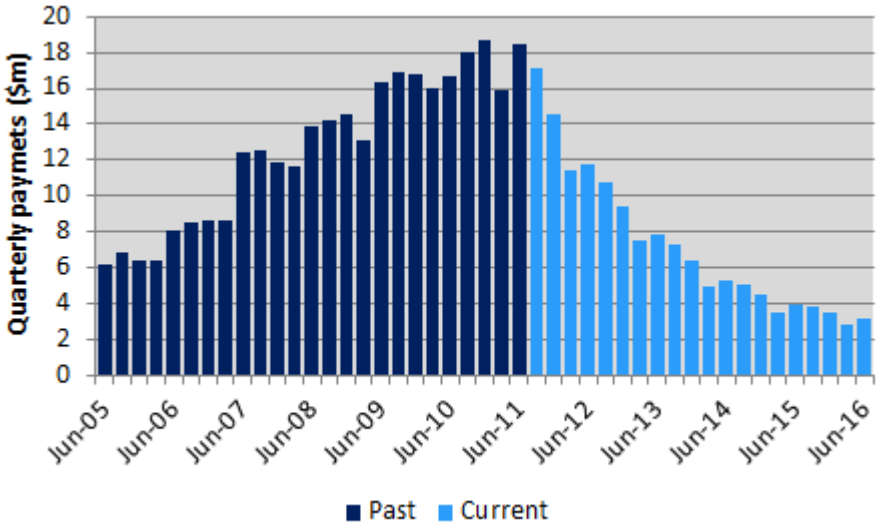


Figure 23.9 shows the historical and projected payments for Childcare Subsidy recipients who also receive an additional qualifying benefit. This is the combination of the numbers and ABPs in Figure 23.7. Finally, the future payments to non-qualifying recipients of Childcare Subsidy benefits are illustrated below in Figure 23.10.

Figure 23.10 **Quarterly benefit payments, in current values for non-qualifying recipients who have received CCS in the past 12 months**



23.4 Key risks

General risks affecting the liability valuation are discussed in Section 9. Additionally, child care tends to be an area of rapid change, which can arise from:

- Modifications to government policy;
- Trends in the delivery of child care services by providers; and
- Trends in the usage of child care services by parents.

These, combined with the history of strong trends in CCS, add to the uncertainty of this component.

PART D.3

TIER 3 ASSISTANCE

24 EMPLOYMENT INTERVENTIONS

24.1 Introduction

A number of Tier 3 benefits relating to supporting beneficiaries into employment are grouped together for valuation purposes under the umbrella "Employment Interventions". The dominant payment categories in EI are currently the Transition to Work Grant and the Course Participation Assistance, as seen in the table below.

The Transition to Work Grant is available to those New Zealand citizens and permanent residents who are aged 16 years or older and are currently looking for a job, moving into a job or moving between jobs. It is intended to cover the costs of searching for a job, travelling to interviews, clothing required for work and other similar expenses.

The Course Participation Assistance is only available to people who are currently on a benefit or on stand-down for a benefit and covers the costs of attending a training course.

Benefit Name	Code	% 10/11 benefit	Comment
Transition to Work Grant	626	78.2%	
Training Incentive Allowance	833	15.6%	
Course Participation Assistance	630	6.2%	
Pre-enrolment Fee	834	0.0%	
Transition To Work Allowance	475	<0.05%	
Work Start Grant	622	0.0%	Changed to Transition to Work Grant in April 2007
Pathways payment	623	0.0%	Code not in current use

Employment Interventions ("EI") represent a relatively small amount of welfare payments, totalling around $30m in payments over the year ending 30 June 2011.

Recall that our definition of current client liability includes those people who have received a Tier 1 or 2 benefit excluding CCS ("qualifying benefit") in the past 12 months. This was discussed in Section 4.2.2. As EI is neither a Tier 1 nor Tier 2 benefit, there are the following components of the EI liability:

- The current and future client liability attached to those currently in receipt of a qualifying benefit.
- The current client liability only attached to those who do not receive a qualifying benefit.

We consider, model and value these components separately.

24.2 Current experience

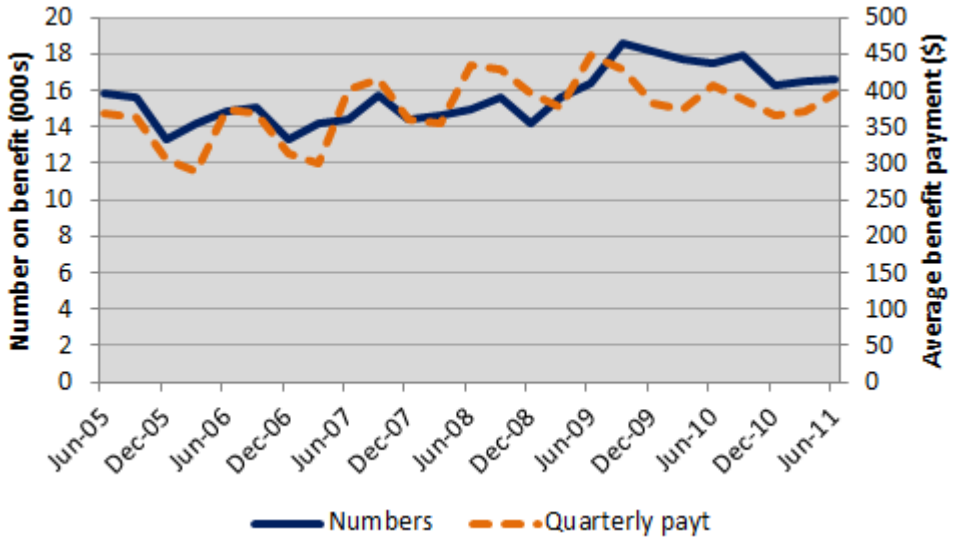
24.2.1 General experience and trends

The following table and graph show the recent experience for EI for those also receiving a qualifying benefit.

Table 24.1 **Recent Employment Intervention experience for beneficiaries with a qualifying benefit**

Year	Payments ($m)	Average number on benefit	Average quarterly benefit payment (ABP) per client ($)
2007/08	22	15,000	370
2008/09	24	15,500	390
2009/10	28	18,000	390
2010/11	25	16,900	370

Figure 24.1 **Trends in Employment Intervention for beneficiaries with a qualifying benefit. ABP in June 2011 values.**

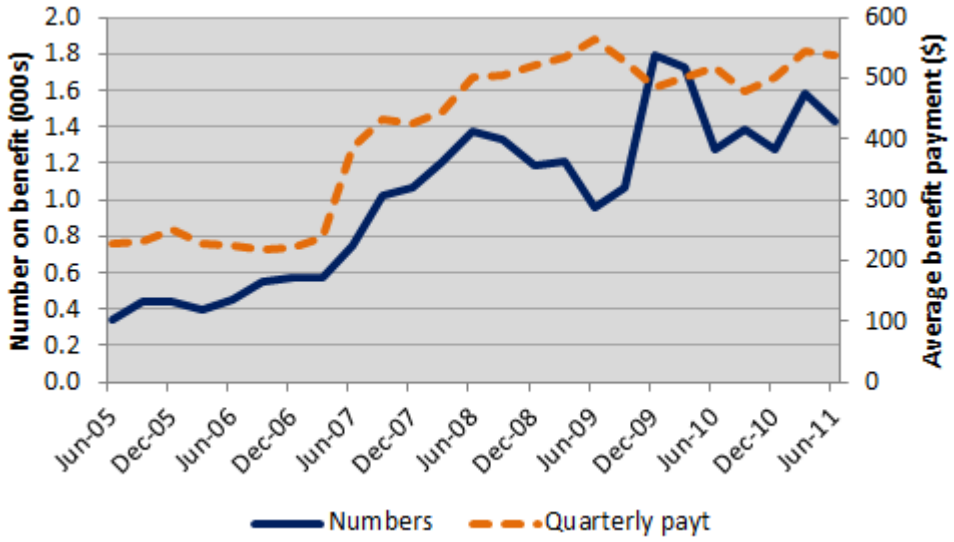


The total number of beneficiaries has been trending slowly upwards over time, with a marked increase over the June 2009 to June 2010 period, corresponding to the general economic downturn at that time. Quarterly average benefit payments have flattened off in the last couple of years, with a noticeable decrease in the amount of seasonality.

Table 24.2 **Recent Employment Intervention experience for beneficiaries without qualifying benefit**

Year	Payments ($m)	Average number on benefit	Average quarterly benefit payment (ABP) per client ($)
2007/08	2	1,200	420
2008/09	2	1,200	490
2009/10	3	1,500	480
2010/11	3	1,400	510

Figure 24.2 **Trends in Employment Intervention for beneficiaries without a qualifying benefit**

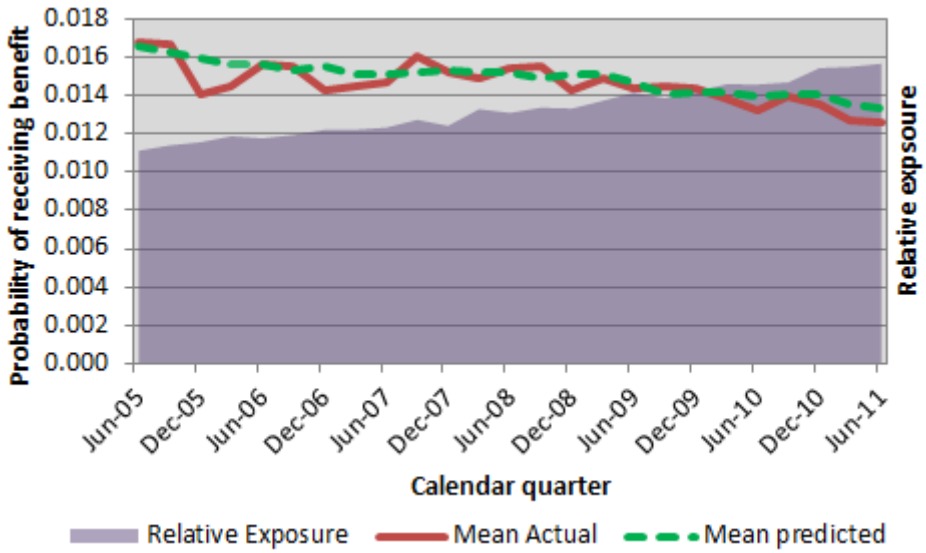


For people who do not already receive a qualifying Tier 1 or Tier 2 benefit, there was a strong upwards trend in the number of people receiving EI payments from 2005 to 2009. However, the number of people receiving an EI grant who do not have a qualifying benefit is still an order of magnitude lower than the number who do receive a qualifying benefit. This is consistent with the Course Participation Assistance only being available to those on a main benefit as well as the very narrow range of people outside of main benefit recipients who are eligible for a Transition to Work grant. There is a clear jump in the ABP in the June 2007 quarter, corresponding with the change from the Work Start Grant program to the Transition to Work program. In the last couple of years, the ABP has stabilised at a level slightly above that for those people who receive a qualifying benefit.

24.2.2 Modelling of numbers on benefit

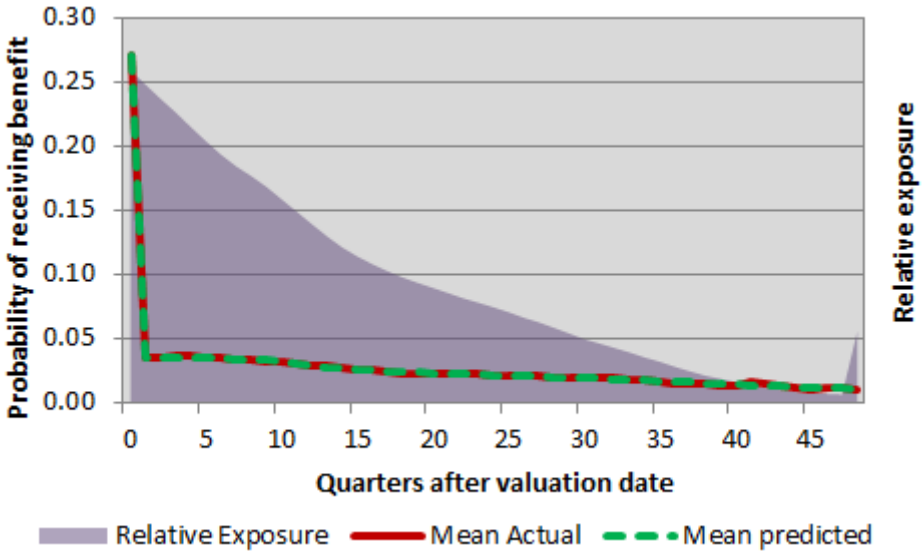
Recall that for *other benefits and assistance* including EI, the number of recipients is modelled as a proportion of total number of clients in the system. Thus numbers are modelled as a single probability model. The actual and predicted probabilities for this model for qualifying beneficiaries by calendar quarter are shown in Figure 24.3.

Figure 24.3 **Probability that a welfare beneficiary is receiving EI for beneficiaries with a qualifying benefit**



There has been a slow decline in the proportion of beneficiaries who receive employment intervention. This implies that growth in EI is below the rate of numbers in the welfare system generally.

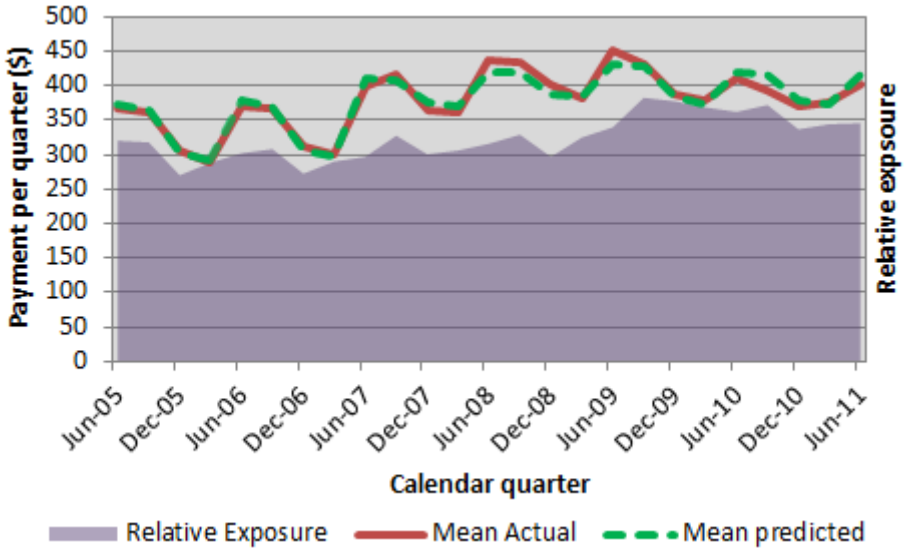
Figure 24.4 **Probability that a client without qualifying benefit is receiving EI, given they received an EI payment sometime in the 12 months to the valuation date**



The proportion receiving EI for this cohort falls off very rapidly from the valuation date – it immediately falls to less than 5% and is followed by further decay. This is because of the very short term nature of the benefit. In projections, this effect is combined with the upwards trend over time (see Figure 24.2).

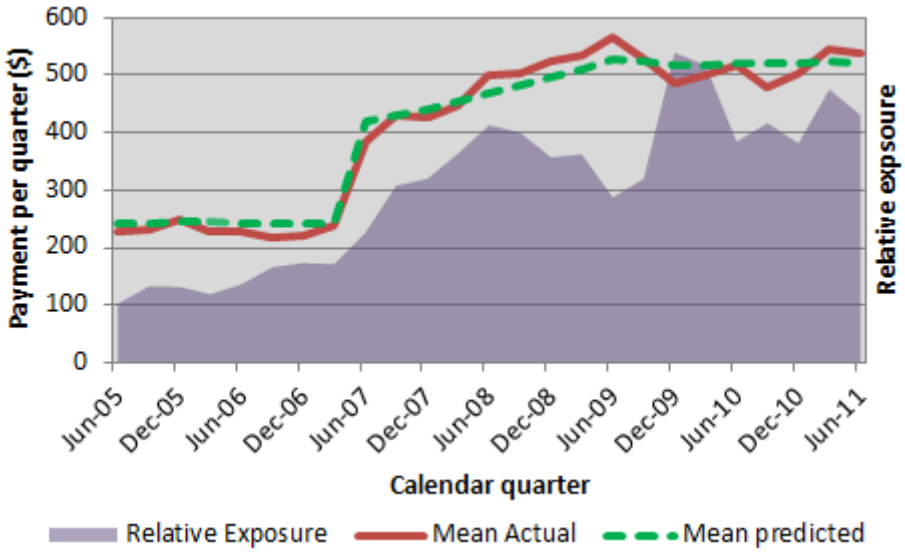
24.2.3 Average benefit payments while on benefit

Figure 24.5 **Actual and modelled ABP by calendar quarter for qualifying recipients**



There is strong seasonality in the average benefit payments, high in June and September quarters. This is likely to be related to Course Participation Assistance payments. Otherwise the ABP is reasonably stable, apart from the influence of the 2007 program change.

Figure 24.6 **Actual and modelled ABP by calendar quarter for non-qualifying recipients**



For those EI recipients that do not also receive a qualifying benefit, there is a clear impact of the 2007 change from the Work Start Program to the Transition to Work program. The strong increase following this transition appears to have stabilised in mid-2009.

Further details for all EI models can be found in the electronic appendices.

24.3 Summary of forecasts

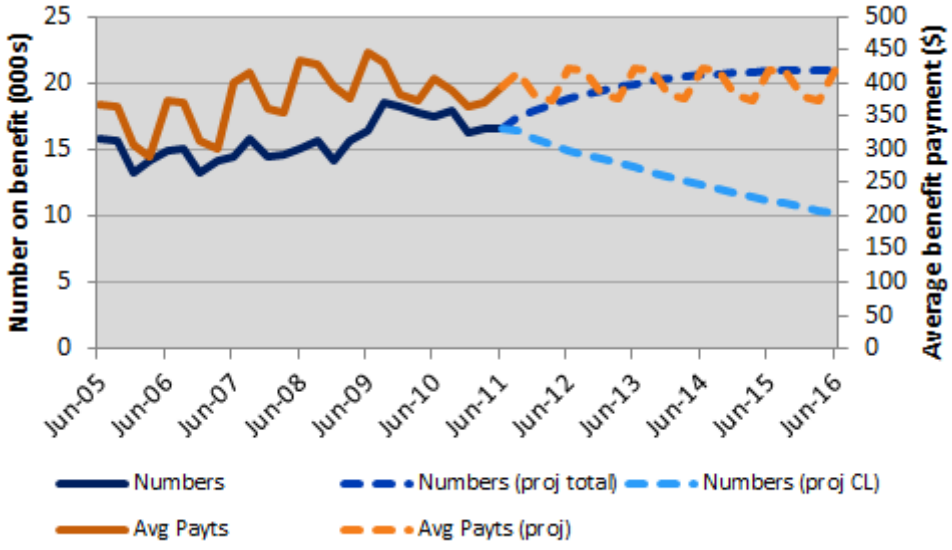
The following table shows the current and future client liabilities for this benefit.

Table 24.3 **Current and future client liabilities for Employment Intervention for qualifying recipients**

Liability	Current values, undiscounted ($m)	Actual values, undiscounted ($m)	Actual values, discounted to "premium" date ($m)	Mean term (yrs)
Current	251	320	203	7.1
2011/12	59	75	47	6.9
2012/13	47	62	39	6.9
2013/14	40	54	33	6.8
2014/15	36	49	30	6.8
2015/16	32	46	27	6.8

The mean term is reasonably stable between the current and future client liability periods, reflecting the fairly stable demographics.

Figure 24.7 **Historical and forecast numbers and ABPs (current values) for qualifying recipients**



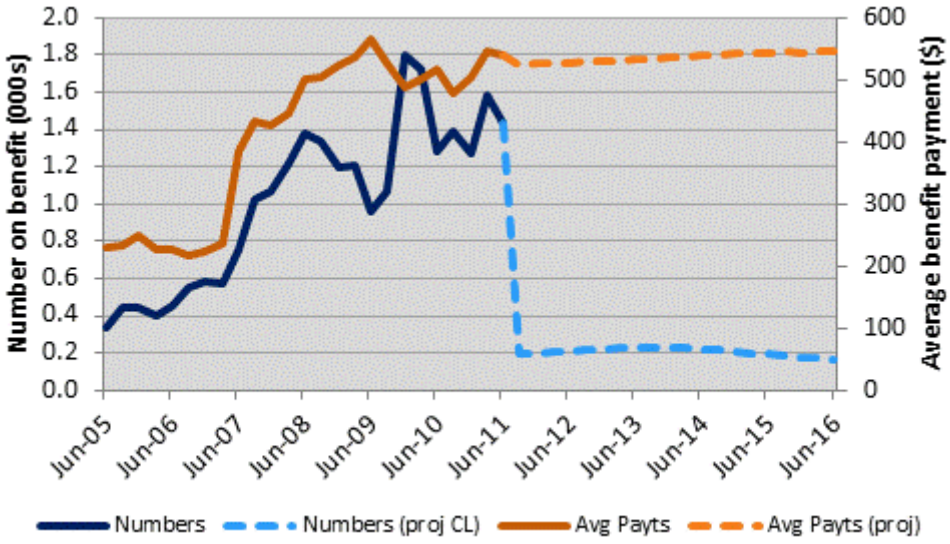
Average benefit payments are forecast to remain stable.

The following table and graph illustrate the current client liability for those who have not also received a qualifying benefit.

Table 24.4 **Current client liability only for Employment Intervention for non-qualifying recipients**

Liability	Current values, undiscounted ($m)	Actual values, undiscounted ($m)	Actual values, discounted to "premium" date ($m)	Mean term (yrs)
Current	6	9	5	9.0

Figure 24.8 **Historical and forecast numbers and ABPs (current values) for non-qualifying recipients**



From Figure 24.8, we see that the numbers receiving EI in the absence of a qualifying benefit falls rapidly to low levels due to the very short term nature of this benefit.

Figure 24.9 shows the historical and projected payments for EI, which is the combination of the numbers and ABPs in the previous graph. This is the combination of the numbers and ABPs in Figure 24.7. Finally, the future payments to non-qualifying recipients are illustrated below in Figure 24.10.

Figure 24.9 **Quarterly benefit payments, in current values for current and future qualifying recipients**

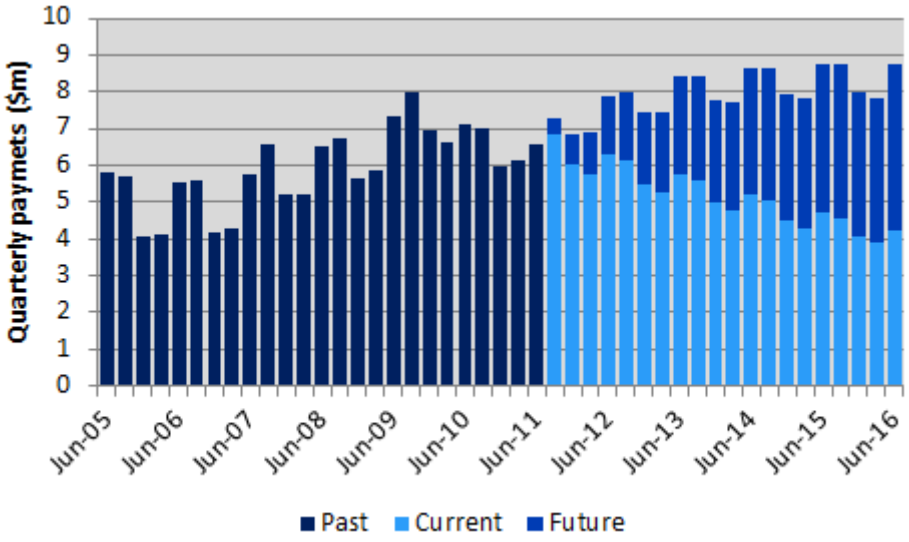
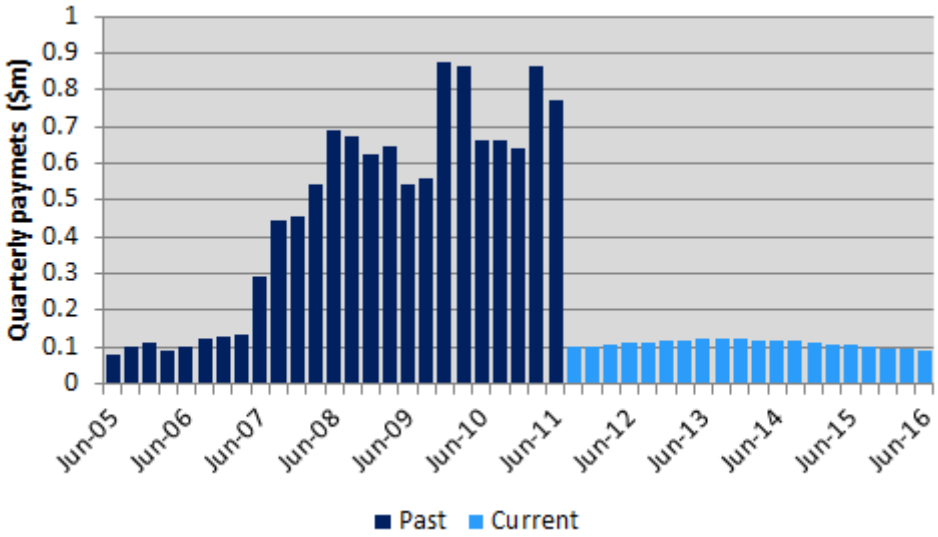


Figure 24.10 **Quarterly benefit payments, in current values for non-qualifying recipients who have received EI in the past 12 months**



24.4 Key risks

The EI payments are very small compared to most of the benefits in this valuation, so uncertainty in this benefit has a very minor impact on the overall liability. The payments are also likely to be more tightly monitored, reducing potential risks of abuse. One risk is that the upward trends seen in 2008 and 2009 (probably partly tied to the deteriorating state of the economy at that time) return at some point in the future.

25 HARDSHIP ASSISTANCE (NON-RECOVERABLE)

25.1 Introduction

Hardship assistance ("HS") is a range of different payments provided to people in financial hardship and a number of other special circumstances. This includes:

- Non-recoverable one-off payments made to people in financial hardship;
- Other on-recoverable one-off payments to people in special circumstances (e.g. to help refugees to establish themselves in New Zealand);
- Non-recoverable weekly payments made to people who have essential ongoing costs that exceed their weekly income;
- Non-recoverable weekly payments made to people in special circumstances (e.g. Farmers who are in financial difficulty following an adverse weather event); and
- Non-recoverable one-off and ongoing payments to help people with essential costs during a civil defence emergency or other adverse event.

Note that only non-recoverable hardship payments are valued in this section. Recoverable hardship payments are valued in Section 27, Net Loans Cost.

Note that some Tier 3 payments have been excluded from scope, e.g. Veterans' Pensions, 90% of which are paid to clients aged 65 and above.

Benefit Name	Code	% 10/11 benefit	Comment
Temporary Additional Support	450	39.1%	
Miscellaneous Subsidy	835	27.4%	
Special Needs Grant- NON RCOVR	621	18.4%	
Special Benefit	460	8.9%	
Civil Defence Payment	840	4.5%	
Residential Support Service	830	0.1%	
Clothing Allowance	596	<0.05%	
Home help family group conference	655	<0.05%	
Funeral Grant	190	0.3%	
Funeral Grant	191	0.6%	
Funeral Grant	192	0.1%	
Disables civilian amputee	440	<0.05%	
Home help multiple births	652	0.4%	
Home help domestic emergency	653	0.1%	
Home help families needing domestic	654	0.1%	
War funeral grant	193	0.0%	Code not in current use
Special Benefit non-recoverable	461	0.0%	Code not in current use

Hardship Assistance is a Tier 3 benefit. In recent years, total benefits paid have ranged between $170m and $320m. Some of these payments include assistance paid to people affected by the recent Christchurch earthquakes. It is a reasonably significant minor benefit, contributing about 5% to annual payments and the total liability.

Recall that our definition of current client liability includes those people who have received a Tier 1 or 2 benefit excluding CCS ("qualifying benefit") in the past 12 months. This was discussed in Section 4.2.2. Because HS is not a qualifying benefit, the HS liability has the following components:

- The current and future client liability attached to those currently in receipt of a qualifying benefit.
- The current client liability only attached to those who do not receive a qualifying benefit.

We consider, model and value these separately.

25.2 Current experience

25.2.1 General experience and trends

Table 25.1 and Figure 25.1 show the recent experience for beneficiaries who have also received a qualifying benefit. We note that the numbers were relatively stable between June 2005 and June 2008 at around 100,000 – 120,000. Numbers receiving hardship increased thereafter, which corresponds to the worsening economic situation and poorer employment rates. There was a large spike in numbers receiving Hardship Assistance in December 2010 and March 2011; we understand this is largely due to payments made to earthquake victims.

The ABP is inversely correlated to the numbers receiving benefit: in general, the more beneficiaries, the lower the ABP. This is particularly true of the spike in HS payments following the Christchurch earthquake and aftershocks.

Table 25.1 **Recent Hardship Assistance experience for beneficiaries with a qualifying benefit**

Year	Payments ($m)	Average number on benefit	Average quarterly benefit payment (ABP) per client ($)
2007/08	169	111,400	380
2008/09	211	137,000	390
2009/10	251	163,400	380
2010/11	307	302,100	250

Figure 25.1 **Trends in Hardship Assistance for beneficiaries with a qualifying benefit. ABP in June 2011 values.**

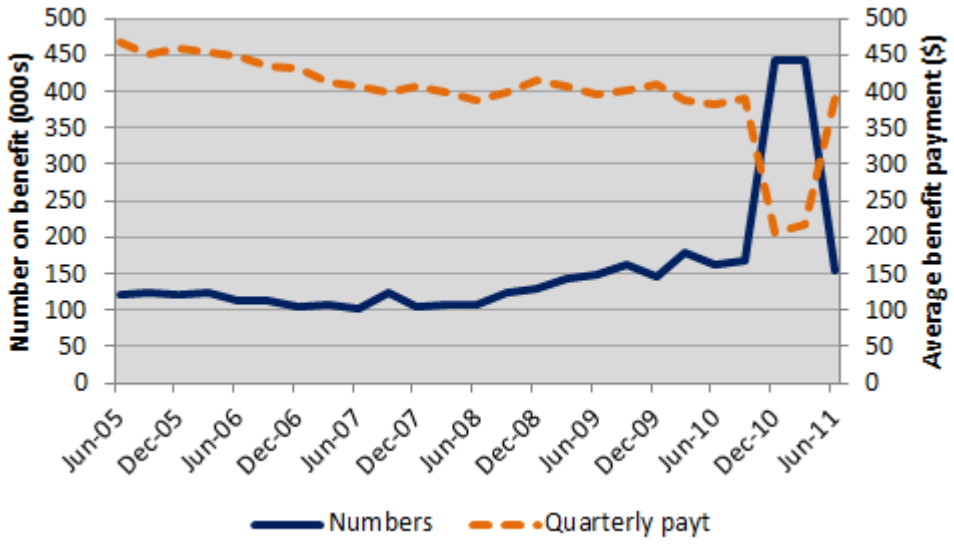
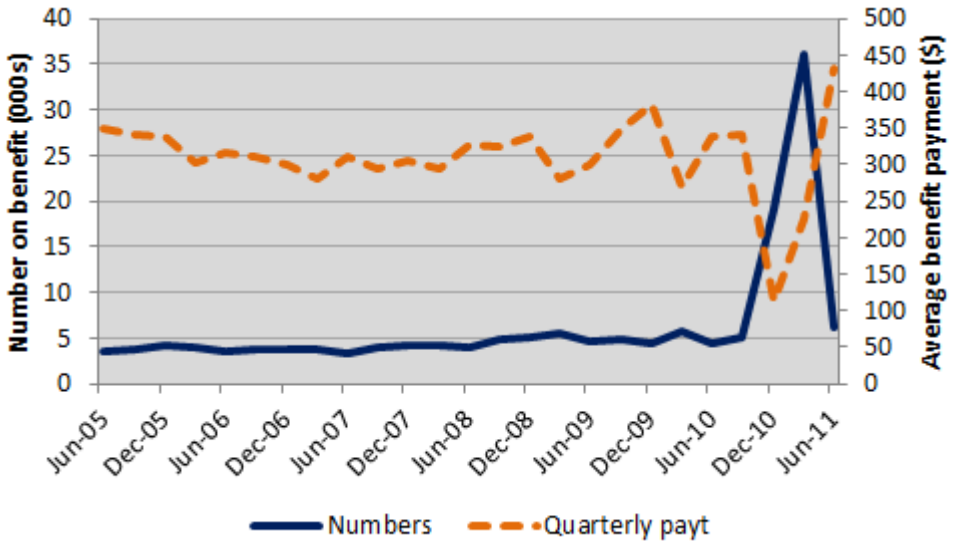


Table 25.2 and Figure 25.2 present the same results, but this time for those outside the welfare system, i.e. not recently receiving a qualifying benefit. The trends are very similar, including the spike in numbers in December 2010 and particularly in March 2011, albeit at a lower level for both numbers and ABP. Compared to recipients with a qualifying benefit, numbers receiving is an order of magnitude lower, while ABPs are about 20% lower.

Table 25.2 **Recent Hardship Assistance experience for beneficiaries without qualifying benefit**

Year	Payments ($m)	Average number on benefit	Average quarterly benefit payment (ABP) per client ($)
2007/08	5	4,100	290
2008/09	6	5,100	290
2009/10	6	4,900	320
2010/11	14	16,600	220

Figure 25.2 **Trends in Hardship Assistance for beneficiaries without a qualifying benefit**



25.2.2 Modelling numbers on benefit

Recall that for *other benefits and assistance* including HS, the number of recipients is modelled as a proportion of total number of clients in the system. Thus numbers are modelled as a single probability model. The actual and predicted probabilities for beneficiaries with a qualifying benefit for this model are shown in Figure 25.3. For those people without a qualifying benefit, the probability model is effectively a survival model tracking how long clients will continue to receive HS after the valuation date. The plot of actual and modelled proportions on benefit by time since the valuation date is shown in Figure 25.4 for these non-qualifying beneficiaries.

The calendar quarter trends have been discussed in the previous subsection. Additionally, the probability of receiving HS is somewhat lower for those aged 50 and over and particularly for those aged 60 and over.

Figure 25.3 **Probability that a welfare beneficiary is receiving Hardship Assistance for beneficiaries with a qualifying benefit**

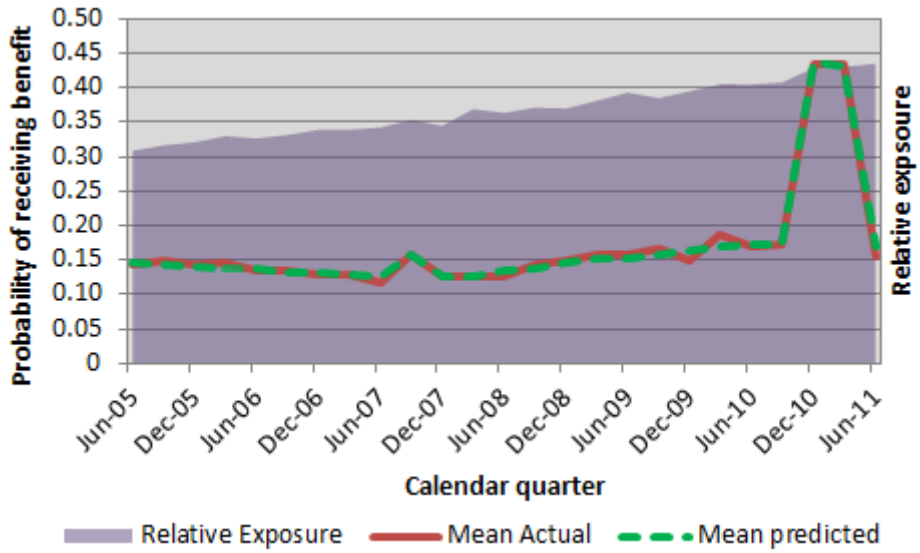
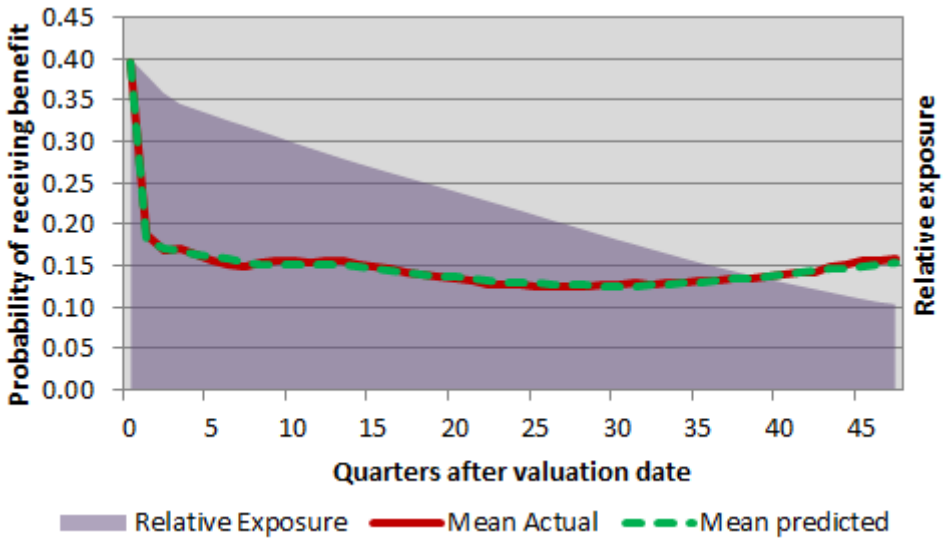


Figure 25.4 **Probability that a client without qualifying benefit is receiving HS, given they received HS sometime in the 12 months to the valuation date**



The drop-off in HS payments beyond the valuation date for non-qualifying beneficiaries is stark, although not quite as severe as for EI recipients – more than 80% won't be receiving HS in future quarters. This reflects the very short term nature of the benefit.

25.2.3 Average benefit payments while on benefit

Figure 25.5 **Actual and modelled average quarterly payments by calendar quarter for qualifying recipients**

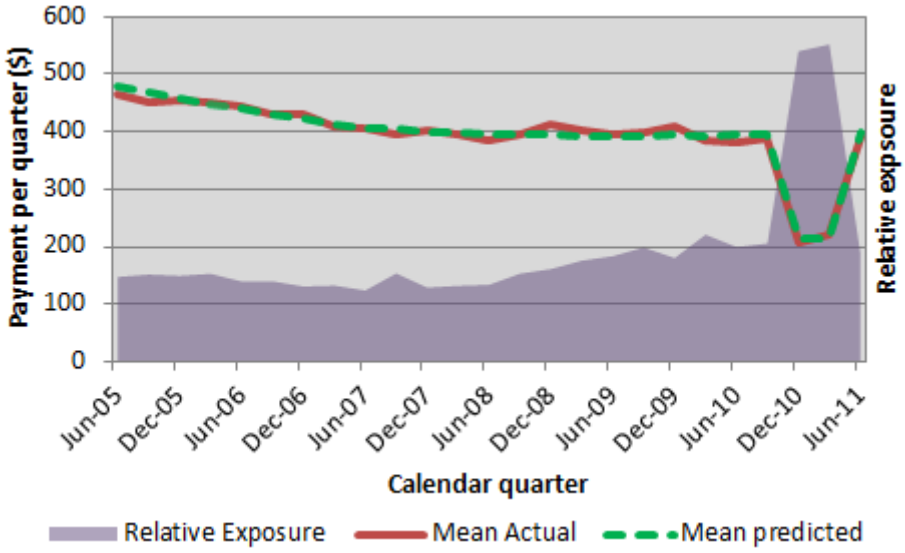
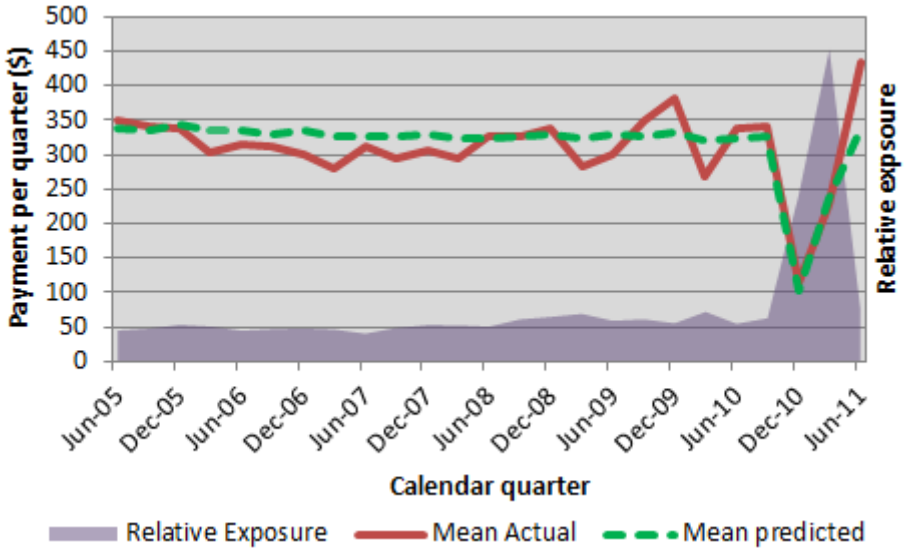


Figure 25.5 shows the ABP for Hardship Assistance for those receiving Tier 1 or Tier 2 benefits. Ignoring the recent earthquake experience, the average modelled level is approximately $400 per quarter. Longer durations and older ages tend to have higher payments.

Figure 25.6 **Actual and modelled average quarterly payments by calendar quarter for non-qualifying recipients**



The actual and modelled experience for the ABP for those not receiving Tier 1 or 2 benefits is shown in Figure 25.6. The volatility for each of the past three quarters adds some uncertainty to the projection. Generally speaking older claimants have higher ABPs.

Further details for all EI models can be found in the electronic appendices.

25.3 Summary of forecasts

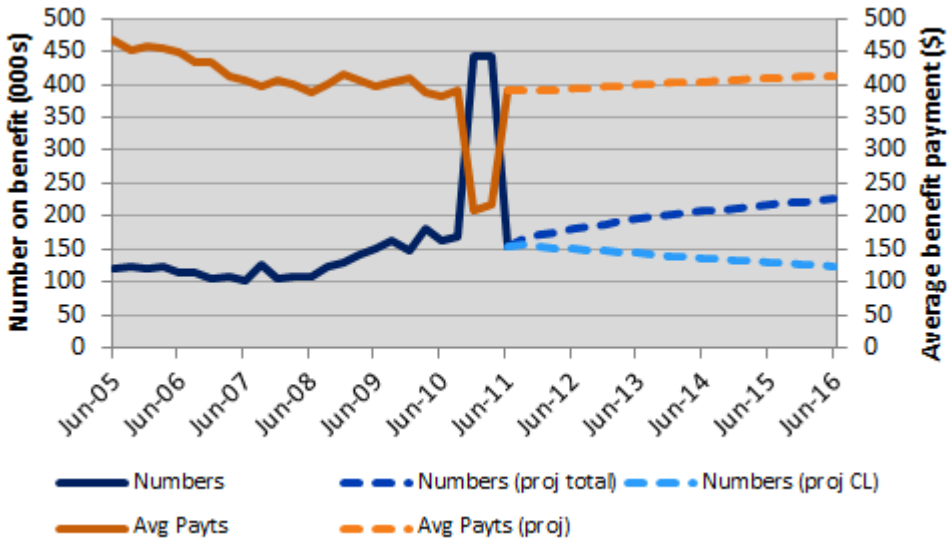
The following table shows the current and future client liabilities for this benefit.

Table 25.3 **Current and future client liabilities for Hardship Assistance for qualifying recipients**

Liability	Current values, undiscounted ($m)	Actual values, undiscounted ($m)	Actual values, discounted to "premium" date ($m)	Mean term (yrs)
Current	5,740	8,846	3,789	12.3
2011/12	1,140	1,861	715	13.3
2012/13	977	1,633	614	13.2
2013/14	872	1,492	555	13.0
2014/15	799	1,403	515	13.0
2015/16	740	1,339	485	13.1

The mean term for both current and future client liabilities is relatively high (12-14 years) reflecting that current and future clients will continue using the benefit extensively throughout coming years. Note that this is despite the short term nature of the HS benefit itself – those leaving HS in a quarter will generally be replaced with other qualifying recipients entering the benefit.

Figure 25.7 **Historical and forecast numbers and ABPs (current values) for qualifying recipients**



Numbers accessing HS are forecast to gradually increase. This increase is projected to be particularly strong amongst people entering the system in the recent past and near future.

The increase also continues the trends seen in the recent past, even allowing for quake assistance. The APB is not projected to change significantly over time.

Table 25.4 **Current client liability only for Hardship Assistance for non-qualifying recipients**

Liability	Current values, undiscounted ($m)	Actual values, undiscounted ($m)	Actual values, discounted to "premium" date ($m)	Mean term (yrs)
Current	228	377	141	13.6

The current client liability for recipients of Hardship Assistance who do not receive a qualifying benefit is about 3% of that for those who do. Despite this, the average mean term is comparable, reflecting the stability in numbers after the initial drop. The historical and forecast experience over the next five years for these non-qualifying beneficiaries is also shown in Figure 25.8. Numbers (current client liability only) are forecast to slowly drop, while ABP shows a gradual increase. Note that this liability includes the future HS payments to those who received quake assistance, making it significantly larger than it would otherwise be.

Figure 25.8 **Historical and forecast numbers and ABPs (current values) for non-qualifying recipients**

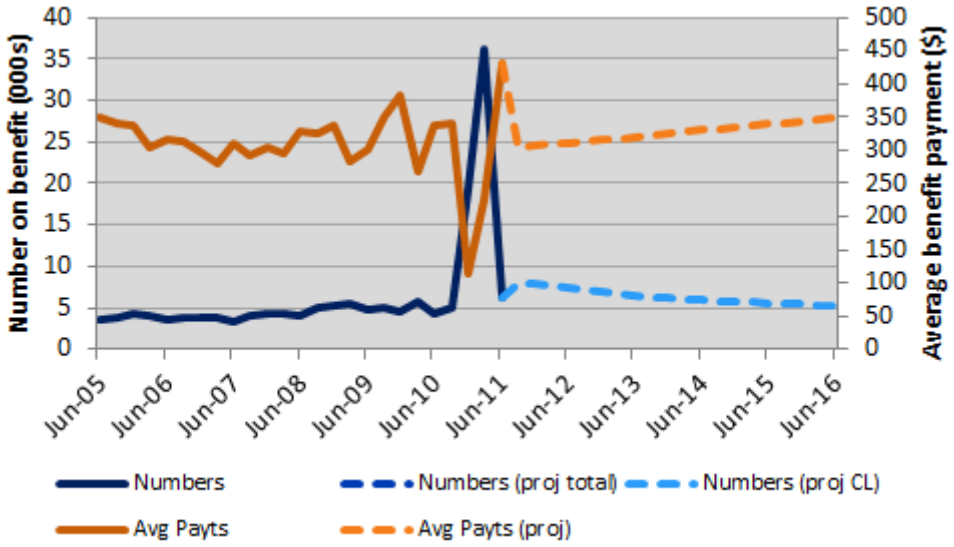
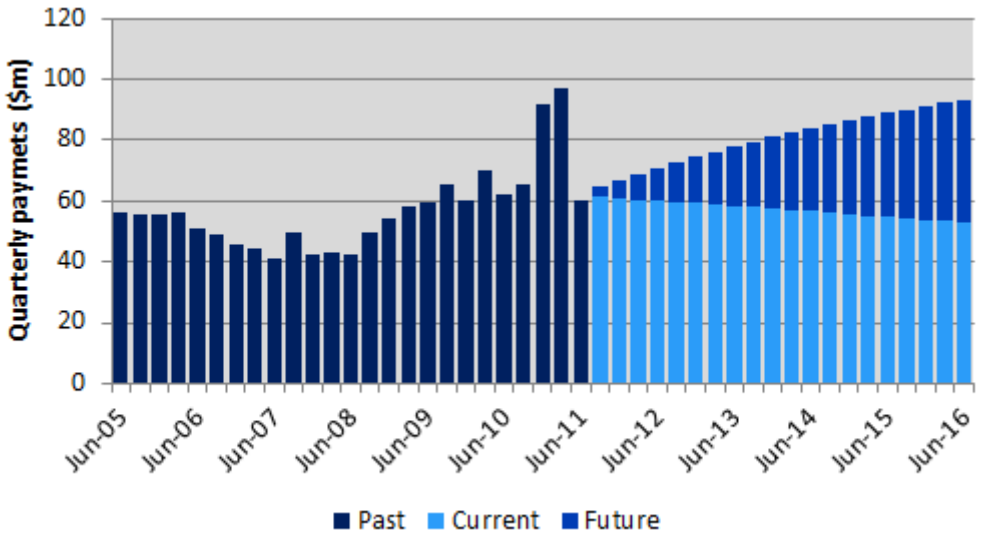
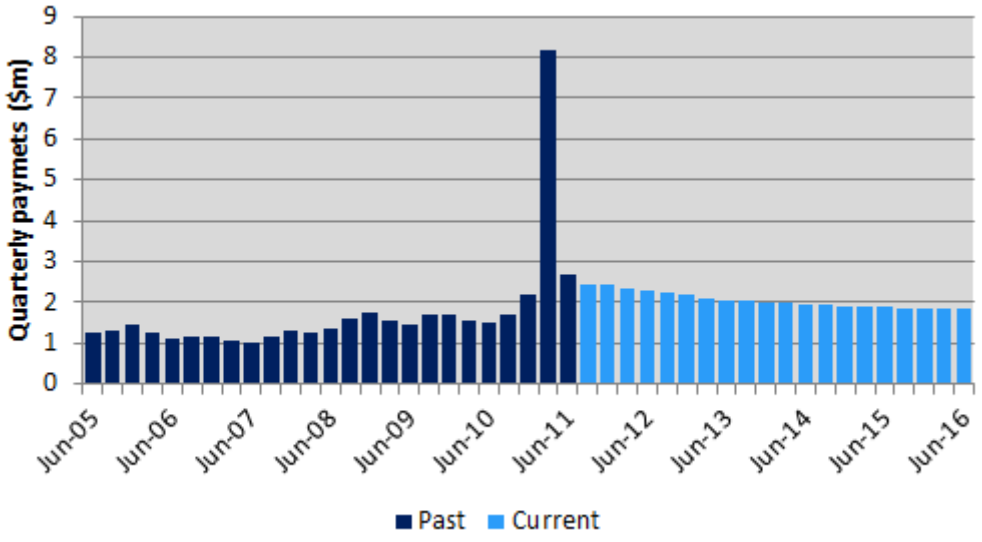


Figure 25.9 **Quarterly benefit payments, in current values for current and future qualifying recipients**



Finally, Figure 25.9 shows the historical and projected payments for HS, which is the combination of the numbers and ABPs in Figure 25.7, while Figure 25.10 shows the past and current client liability for non-qualifying Hardship Assistance beneficiaries. It is clear that payments to clients not in receipt of a qualifying Tier 1 or 2 benefit make up a very small proportion of past and future payments.

Figure 25.10 **Quarterly benefit payments, in current values for non-qualifying recipients who have received HS in the past 12 months**



25.4 Key risks

Hardship assistance is a fairly sizeable benefit, although not as large as the key Tier 1 benefits or the Accommodation Supplement. Its recent variability highlights a couple of benefit specific risks:

- We have made no allowance for future natural disasters, but recognise that they would have a significant impact on hardship payments; and

- After excluding effects of natural disasters, the benefit has seen significant upward and downward trends over the 20 year history studied, the reasons for which are not completely understood – it is possible that the current increasing trend could eventually stop or even reverse, materially reducing the HS liability.

PART D.4

MODELS FOR CALCULATING THE LIABILITY ASSOCIATED WITH FUTURE CLIENTS

26 MODELS FOR CALCULATING THE LIABILITY ASSOCIATED WITH FUTURE CLIENTS

26.1 Key benefits

As discussed in Section 4.3.8, the future client liability is split into two components to better estimate the numbers and profile (age and benefit received):

- Those off benefit for between 1 year and 10 years at the time of the valuation; and
- Those new to the benefit system plus those who have been off benefits for more than 10 years.

The first cohort is estimated by projecting forward clients in the NOB state for durations between 1 year and 10 years as at June 2011 and retaining those that transition from NOB onto any benefit. The future client liability of this cohort is then estimated as described in Section 4.3.8.

The estimation of the liability for the second subset of the future client liability is also discussed in that section. A time series model for each of the benefit types was built, and projected for the five years from June 2011 to yield estimated numbers coming onto benefit, whose liability may then be projected.

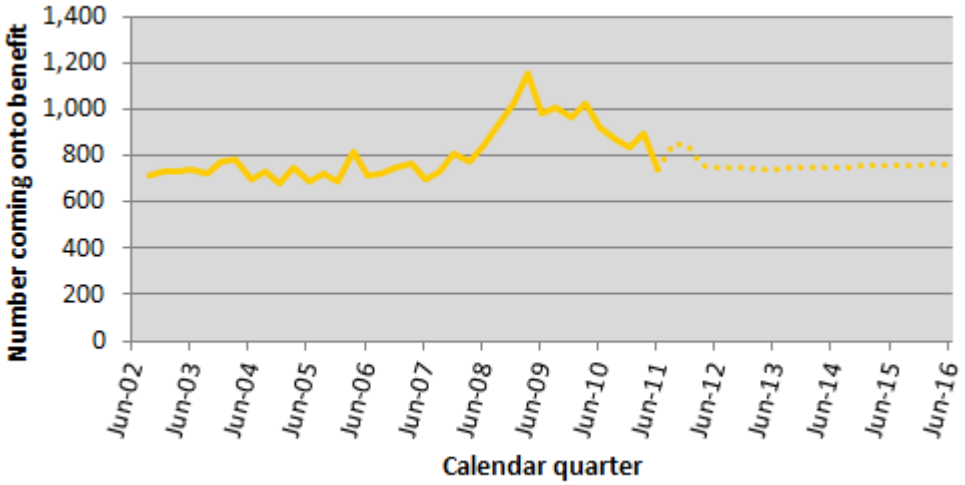
This section describes the time series models built for each of the five benefit types – the four key benefits and the OTH benefit (required so that we may estimate the future key benefit liability from those who first transition onto a minor benefit), and the assumptions used in their projection.

26.1.1 Domestic Purposes Benefit

Figure 26.1 shows the numbers of people coming onto the Domestic Purposes Benefit for the first time or after a continuous period off benefit for at least 10 years from September 2002. The numbers were reasonably stable between 2002 and 2007, before increasing materially during the global financial crisis. Since then, numbers coming onto the benefit have reduced back to levels similar to those seen in 2007 and earlier.

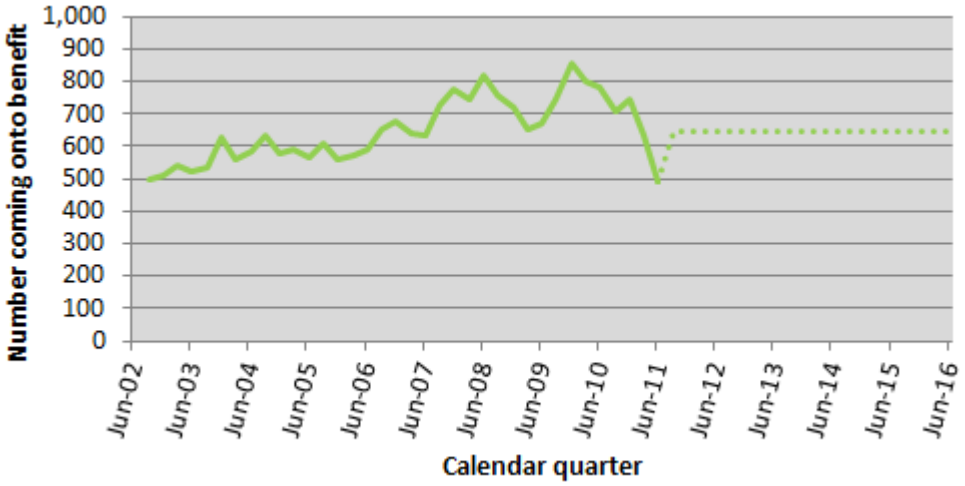
We fitted a Poisson GLM to the quarterly numbers of DPB newcomers which depends on the annual percentage change in GDP and the unemployment rate. Using forecast GDP and unemployment rates, the forecasts shown in Figure 26.1 by the dashed line were obtained.

Figure 26.1 **DPB – past (solid line) and projected (dashed line) numbers coming onto benefit each quarter**



26.1.2 Invalid's Benefit

Figure 26.2 **IB – past (solid line) and projected (dashed line) numbers coming onto benefit each quarter**



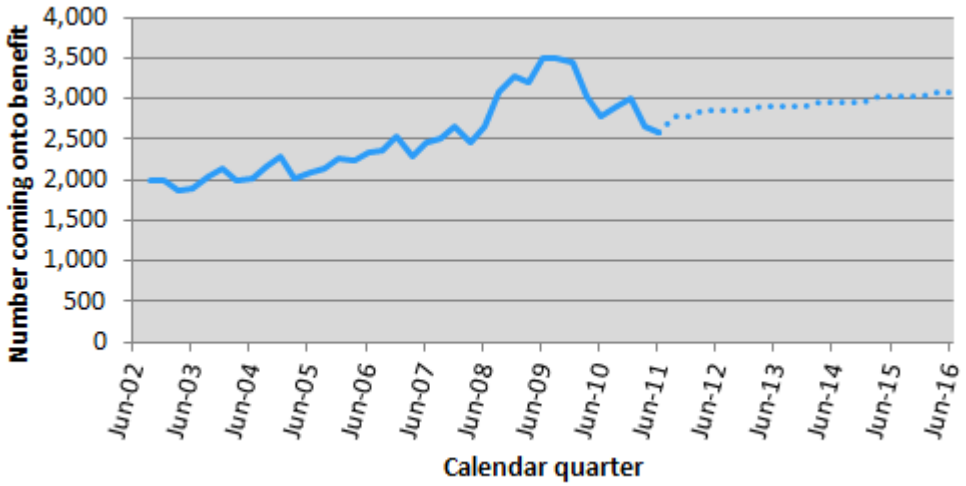
The numbers newly on benefit for IB are shown in Figure 26.2. These were stable between 2003 and 2006 before increasing in recent years. Most recently (March and June 2011) numbers have dropped down to lower levels.

We have selected the average over the year to June 2011 as the projection for the next twenty quarters, represented by the dashed line in the figure.

26.1.3 Sickness Benefit

The past experience for SB is shown in Figure 26.3. Over the years since 2002, there has been a gradual increase in the numbers coming onto benefits through SB, with a large increase during the global financial crisis.

Figure 26.3 **SB – past (solid line) and projected (dashed line) numbers coming onto benefit each quarter**



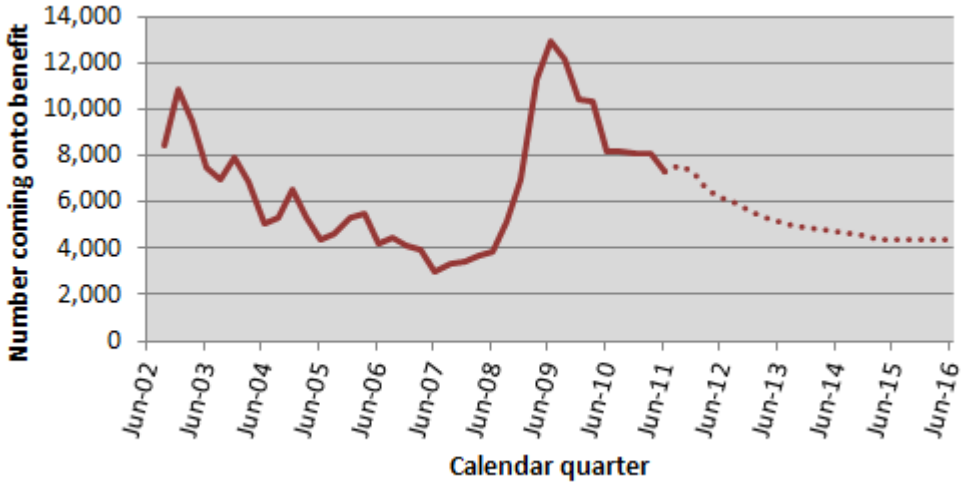
Some exploratory modelling indicated that, ignoring the experience in 2008-2010, the growth was approximately proportional to the growth in the New Zealand population over that time. Thus, to produce projected values, we assumed the future numbers coming onto SB would grow at this same rate from the average level in the 2011 financial year. These projections are shown on the graph as the dashed line.

26.1.4 Unemployment Benefit

The numbers of newcomers to UB are closely related to the unemployment rate. This rate fell between 2002 and mid-2008 resulting in the reduction in numbers seen in Figure 26.4. During the global financial crisis, unemployment rates suddenly increased, leading to soaring numbers moving onto UB.

The projections of future UB numbers assume a similar relationship to that between the numbers and the unemployment rate between 2002 and mid-2008, with the projections scaled so that they start at the average level over the 2011 financial year.

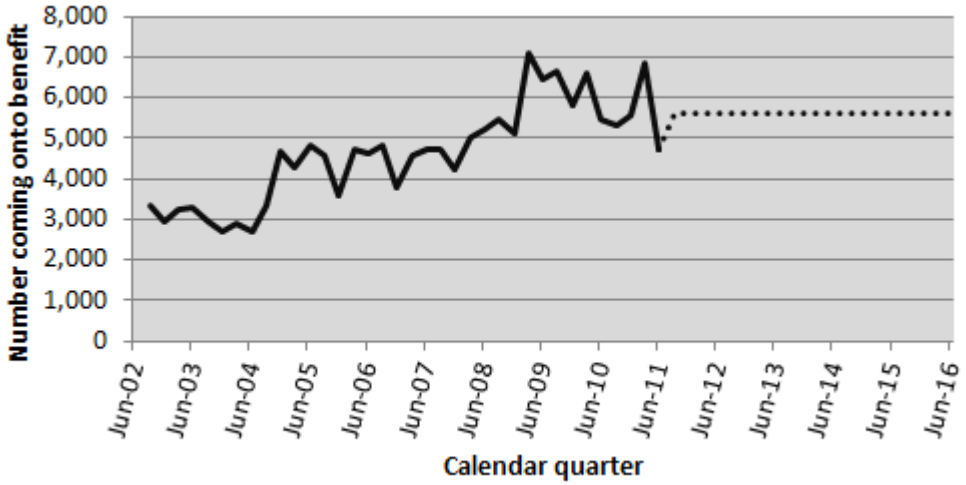
Figure 26.4 **UB – past (solid line) and projected (dashed line) numbers coming onto benefit each quarter**



26.1.5 Benefit state: OTH

Finally, the numbers entering the OTH state are shown in Figure 26.5. These numbers appear characterised by periods of stability punctuated by jumps to a new level, with the level in recent years (2009-2011) being at all-time highs.

Figure 26.5 **OTH – past (solid line) and projected (dashed line) numbers coming onto benefit each quarter**



In setting projection assumptions for the next five years, we have assumed that the recent high levels were partly due to the global financial crisis and have selected the average of the most recent year as the basis for future quarters.

26.1.6 Double counting correction

As it stands, there would be an element of double counting between the two components of future client liability outlined at the start of this section. To illustrate this, consider the example of the future client liability cohort for the September 2012 quarter. The numbers newly on benefit consist of those who are completely new to the benefit system as well as those who have been off benefit for more than ten years as at June 2012. This latter group includes those people who were off benefit for between 9 and 10 years at June 11, but who are projected to stay off benefit until the September 2012 quarter. These people appear in the first component of the future client liability and therefore are counted twice.

To deal with this problem, we must remove the double counted group from one of the components of future client liability. We have chosen to remove them from the newcomers' future client liability cohort.

The double counting increases as we move further into the future: given the definition of the future client liability cohorts, there is no double counting in the first future quarter (September 2011), a small level in the second future quarter (those who have been off benefit for 41 quarters or 10.25 years), a larger group in the third quarter (those who have been off benefit for 41-42 quarters) and so on, up to quarter 20 where the double counting is of all those who have been off benefit for 41 to 59 quarters (10.25 to 14.75 years) – at the valuation date (June 2011) these people have been off benefit for between 5 and 10 years and are thus already in the future client liability projection.

Figure 26.6 **Correction for double counting**

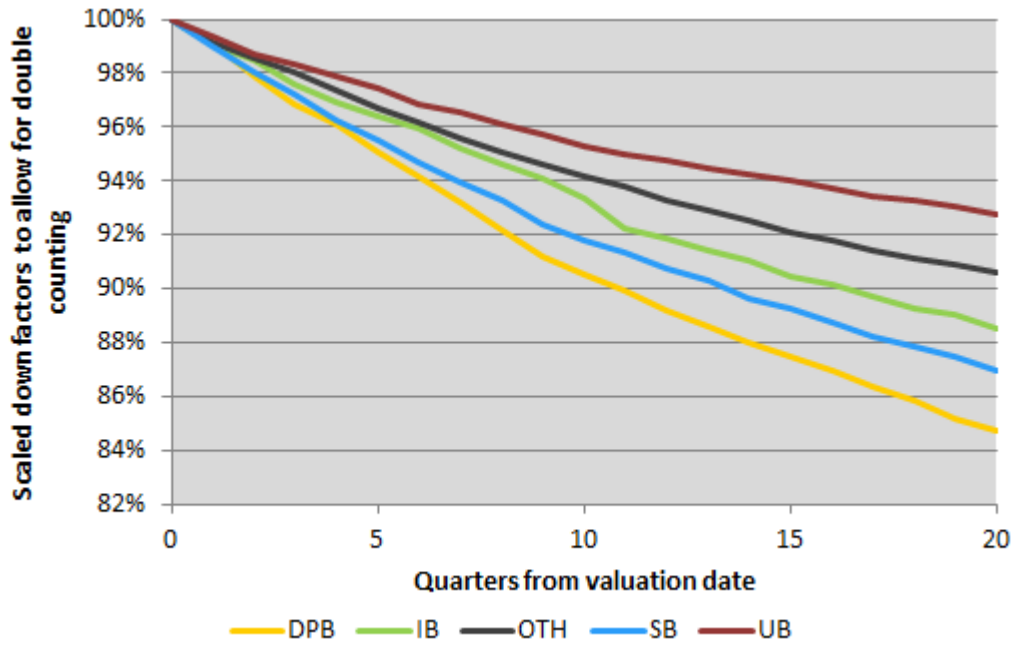


Figure 26.6 shows the corrections made for double-counting for each of the benefit types.

26.2 *Other benefits and assistance*

The number of clients receiving any particular *other benefit or assistance* was estimated as a proportion of the total number of qualifying recipients, estimated via a probability model. This structure means that the future client liability components simply require a forecast of the number of new people entering the system (that is, new numbers qualifying), on whom the probability models are then applied, rather than requiring a separate future client liability model for each benefit type. This is a significant benefit of this modelling approach. As discussed in Section 4.5.5, two models are needed:

- A model predicting the number of people entering the system for the first time; and
- A model predicting the number of former clients re-entering the system ("reactivation model"). That is, those who have previously received benefits but were not qualifying at the valuation date.

The first model also requires an age distribution assumption for those new clients joining the system.

26.2.1 New entrants into the system

Figure 26.7 **Number of new entrants into the system by quarter**

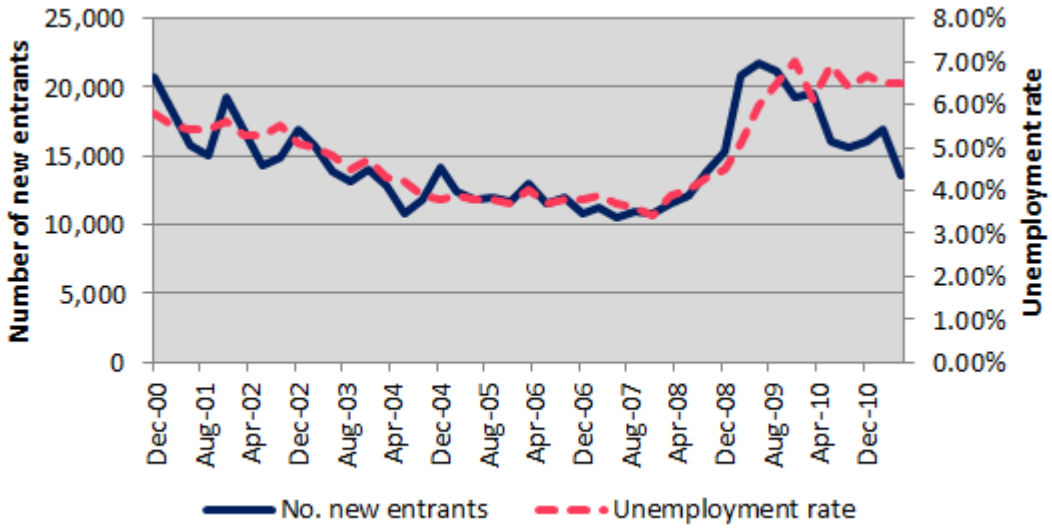
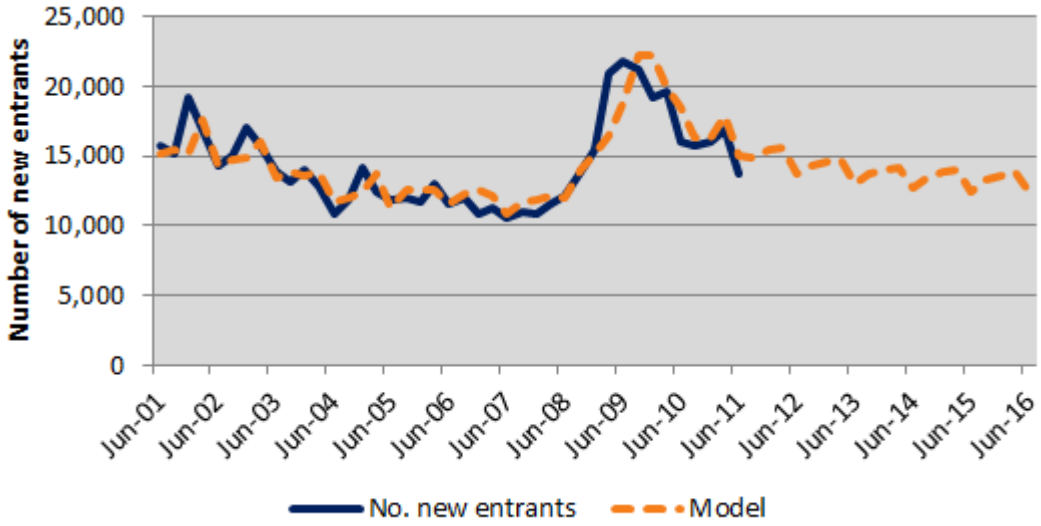


Figure 26.7 shows the number of new entrants into the system, with the unemployment rate overlaid. The correlation is clear, although it is not the whole story; numbers entering depends on both the level of the unemployment rate as well as its recent change. This explains why the number of new entrants has fallen back to typical levels despite unemployment remaining above 6%. There are also some seasonal factors and auto-correlated behaviour in the time series. This time series has been fitted with reference to these effects in a GLM. The resulting fit, with corresponding forecasts, is shown in Figure 26.8. The forecast numbers are fairly stable, with a slight downtrend to reflect the forecast fall in unemployment as well as the seasonal pattern.

Figure 26.8 **Actual, modelled and forecast numbers of new entrants by quarter.**



The age distribution for the new entrants was based on the observed distribution over the two years to 30 June 2011. The distribution appears fairly stable, although allowance was made for annual seasonality; March quarters in particular tend to have a greater number of younger clients.

26.2.2 Reactivation model

The reactivation model is the probability of a former client coming onto benefits again. It depends on client age, time since the valuation date (or pseudo-valuation date in the case of historical modelling), date client first came onto benefits and calendar quarter.

Figure 26.9 and Figure 26.10 show the actual and modelled averages for reactivation rate by calendar quarter and quarters since valuation respectively. The calendar quarter figure shows that the overall rate of reactivation is about 0.9%, with a recent spike corresponding to the historical spike in unemployment. We expect current levels to continue over the next few years. The quarters since valuation date shows the falling likelihood of reactivation the further into the future a client is projected. This is a consequence of the fact that the longer people stay off benefits the less likely they are to return. This, combined with the fact that the pool of people who can possibly reactivate is finite, means that the number of reactivations falls off rapidly with time, contributing to the falling pattern by future year observed in the future client liability.

Figure 26.9 **Probability of former client reactivating by calendar quarter**

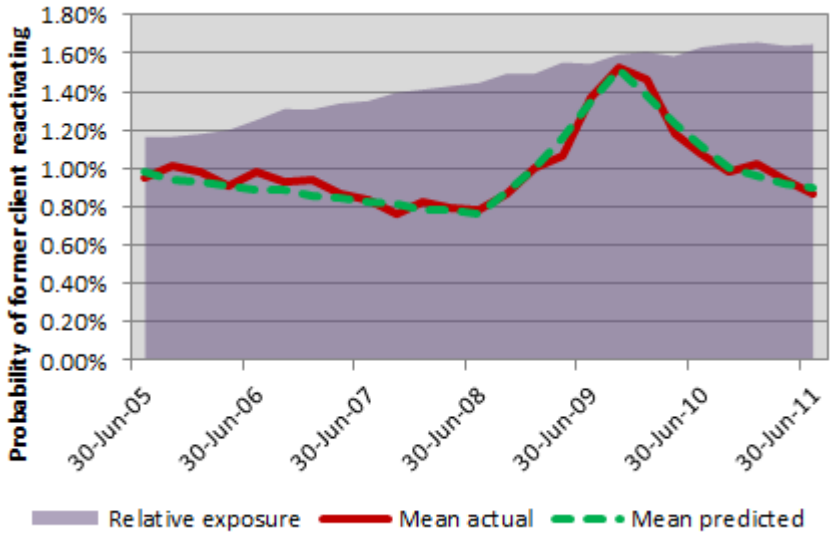
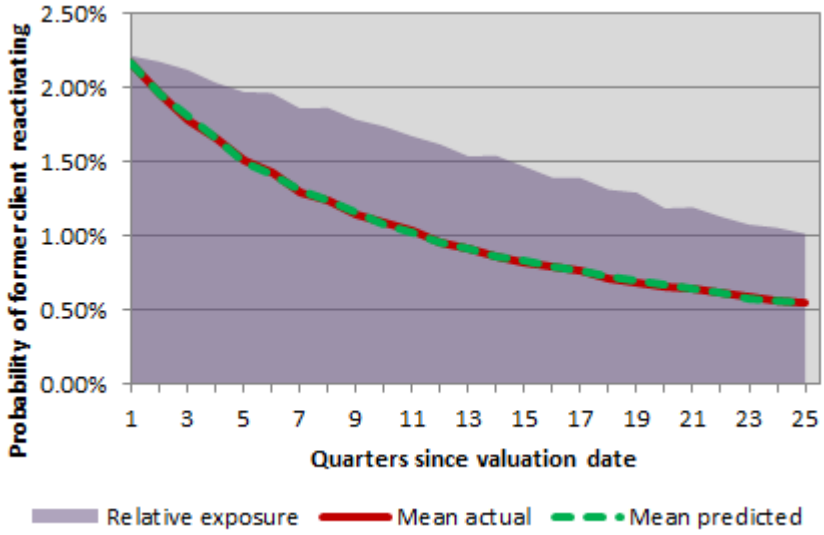
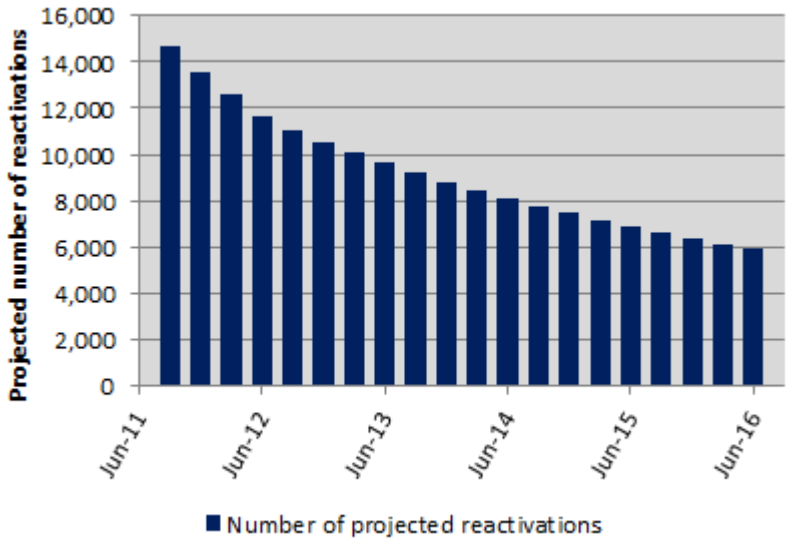


Figure 26.10 **Probability of former client reactivating by number of quarters after the valuation date**



One other notable feature concerning the reactivation model is the particularly high rate for younger ages – about 5% per quarter on average for those under 20. Finally, forecast numbers of reactivations are shown in Figure 26.11, and further details can be found in the electronic appendices.

Figure 26.11 **Projected number of former clients re-entering the welfare system by quarter**



PART D.5

NET LOANS COST AND MSD EXPENDITURE

27 NET LOANS COST

As discussed in Section 4.6 there are a number of different ways a loan to a client can arise. We have been provided data on recoverable amounts related to:

- Overpayments, including those due to benefit fraud; and
- Recoverable assistance (including benefit advances).

Various subcomponents related to each of these items have been valued separately. Details are provided in the following sub-sections.

27.1 Overpayments and fraud

27.1.1 Introduction and current experience

Overpayments and fraud represent about 3% of payments made by MSD. The table below shows the recent experience for payments and recoveries. Over the past year 90% of payment amounts relate to overpayments, with the remainder attributable to fraud.

Table 27.1 **Recent Overpayments and fraud experience**

Calendar quarter	Payments ($m)	Recoveries ($m)
Sep-09	51	34
Dec-09	50	33
Mar-10	54	33
Jun-10	57	33
Sep-10	59	37
Dec-10	55	35
Mar-11	51	32
Jun-11	58	33

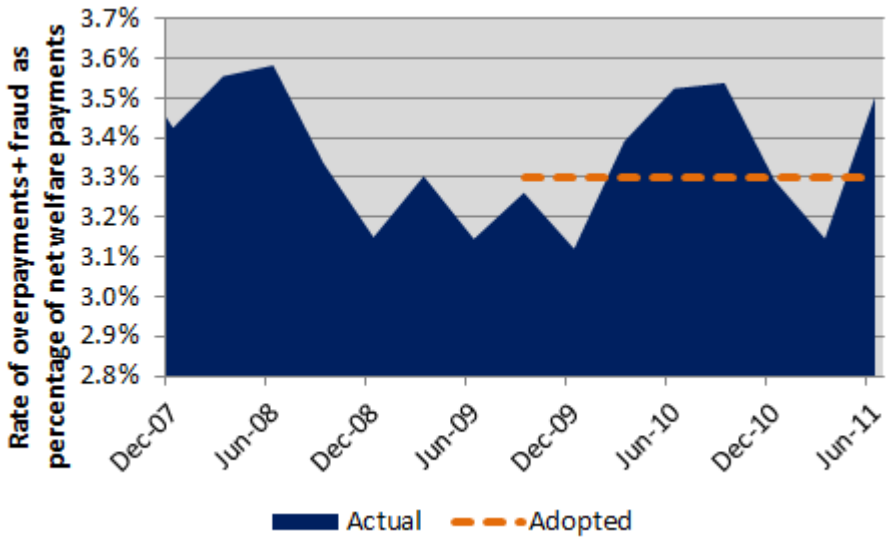
The majority of overpayments and fraud are eventually recovered – we estimate about 80% of their value (see Section 27.1.5). However, the speed of recovery is limited due to legal requirements not to cause undue hardship on clients. In some cases there is a maximum deduction from benefits of $25 per week.

For these reasons a large amount of the debt outstanding is from debts established for past payments. At the valuation date we estimate that there is $636m of overpayments and recoveries outstanding. An estimate of the proportion of this total that will be recovered is required.

27.1.2 Debts raised

Levels of detected overpayments and fraud have been relatively stable as a percentage of overall welfare payments. We have adopted 3.3% as the rate of overpayments and fraud applicable to all future payments.

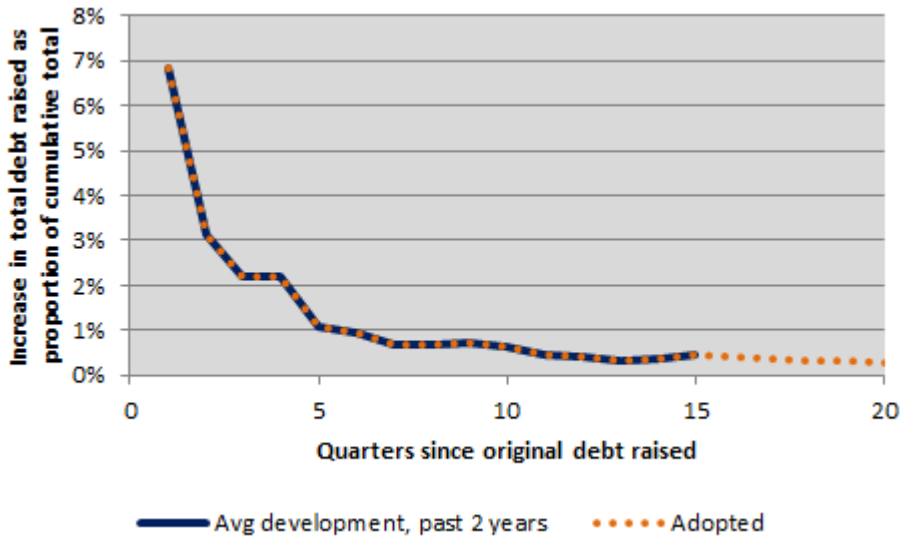
Figure 27.1 **Actual and adopted rates of overpayment and fraud**



27.1.3 Development on outstanding debt

One feature of the outstanding debts is that it is still appears possible for clients to accrue further debt before the existing balance is paid off. We have modelled this pattern using historical data, as shown in Figure 27.2. Debts are assumed to continue to develop for 10 years – see the section on tail assumptions below for further information.

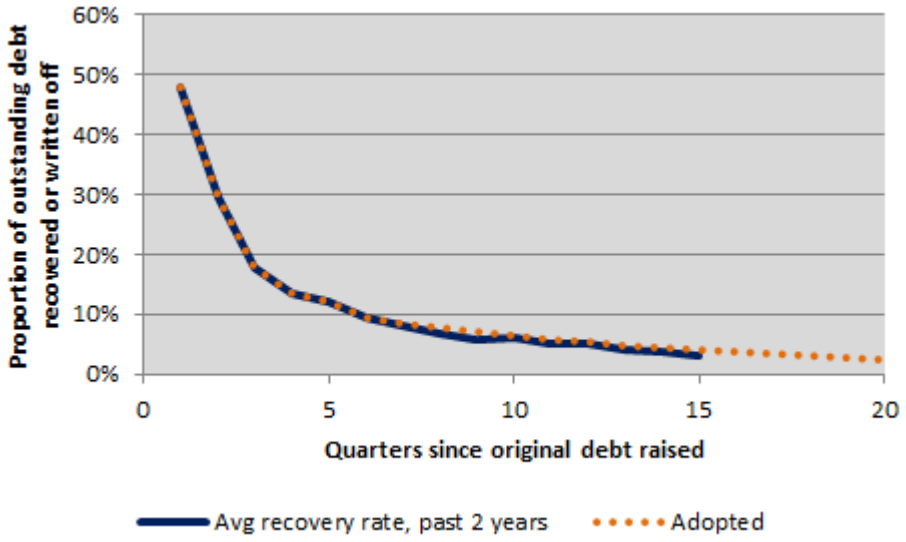
Figure 27.2 **Development of total debts raised amongst existing debtors, overpayments and fraud**



27.1.4 Recovery and write-off rates

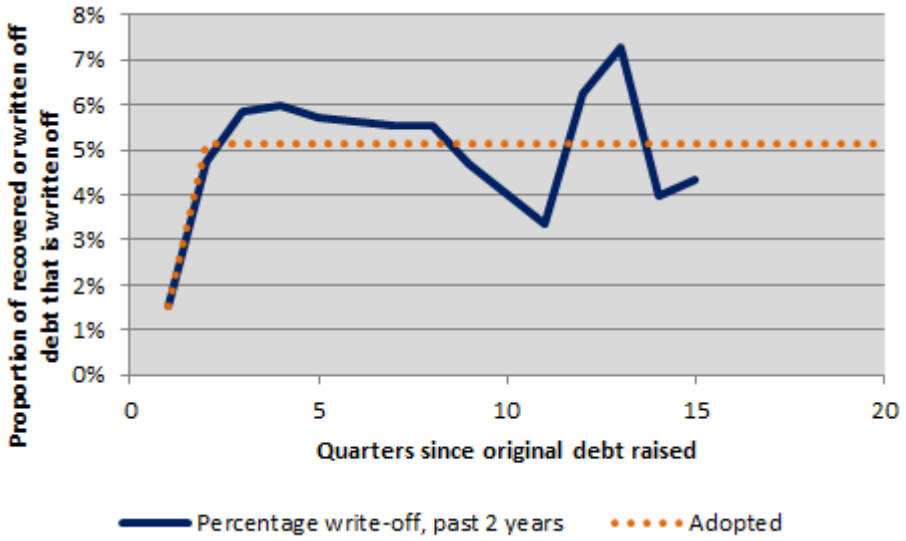
We have estimated the proportion of outstanding debts that are recovered or written off, which depends on the time since the original debt was raised. Recovery rates are strong for the first few quarters, but decay quickly to low levels. Recent history and projected rates are shown in the figure below. For the purposes of this analysis, debt adjustments and transfers have been treated as recoveries.

Figure 27.3 **Proportion of outstanding debt recovered or written-off**



We then divide the amounts recovered or written-off into subcomponents. Besides the first quarter, we assume that 5.1% of this amount is written off, with the remainder recovered. See Figure 27.4.

Figure 27.4 **Rate of debt write-offs, relative to the total of recoveries + write-offs**



27.1.5 Applying the models

The four sets of assumptions covered in sections 27.1.2, 27.1.3 and 27.1.4 allow future cash flows related to overpayments to be calculated. First, the duration (number of quarters since original debt) of outstanding debts is calculated. This is then developed by increasing for new debts, then decreasing for recoveries and write-offs. Second, the 3.3% assumption (scaled down to properly allow for debt development) can be applied to current and future client liability cash flows. Once the debts are established their subsequent increase and decrease due to development can be projected.

For debts established before June 2007 we needed to identify the balance attributable to overpayments and fraud. We estimated this portion to be 64%, using the distribution of outstanding balances at the valuation date for debts raised after June 2007. We also estimated that the debt had an average duration of ten quarters as at June 2007.

Combining the models gives the following implications concerning overpayments and fraud:

- After a debt is established, total debts raised are expected to increase by a further 28%. This represents extra overpayments and fraud that will be accrued by a client before their outstanding debt reduces to zero;
- Approximately 82% of overpayments and fraud are assumed to be recovered, with the remainder written off or uncollected. After allowing for the time value of money during the period the debt is collected, the recovery percentage reduces to about 80%; and
- The average collection date is 1 year after the establishment of the original debt.

27.1.6 Tail assumptions

The relatively short time period for which data is available means that trends in development need to be extrapolated into durations for which there is no observed data. We have made the following assumptions, recognising that they are subject to significant uncertainty:

- Existing debts do not increase beyond ten years after original debt establishment; and
- No recoveries are made beyond ten years after original debt establishment. At the ten year mark 5% of the outstanding balance is assumed to be recovered, as a means of allowing for later recoveries.

27.1.7 Results

Overpayments and fraud can be divided into four categories, related to the time the debt was established and the direction of the cash flow (to or from MSD).

Table 27.2 **Current client liability estimates for overpayments and fraud**

Liability	Payments		
	Current values, undisc. ($m)	Actual values, undisc. ($m)	Actual values, disc. to "premium" date ($m)
Further overpayments/fraud on existing debtors	103	108	100
Recoveries on overpayments/fraud on existing debtors	-187	-196	-181
Overpayments/fraud related to future payments	3,233	4,698	2,286
Recoveries on overpayments/fraud related to future payments	-2,629	-3,869	-1,832
Net cost – overpayments/fraud	**520**	**741**	**373**

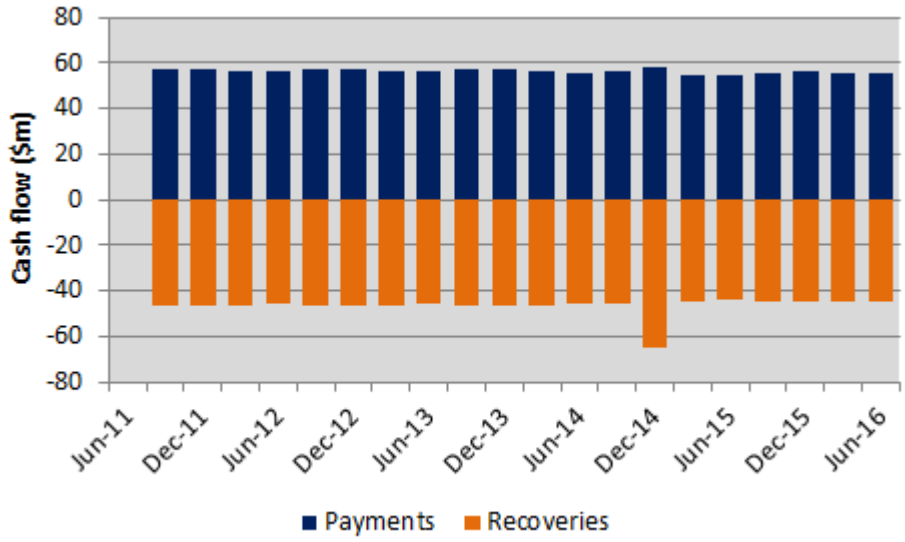
Only the last two categories are relevant to the future client liability, presented in the following table.

Table 27.3 **Future client liability estimates for overpayments and fraud, inflated and discounted to the effective premium date**

Loans category	Future client liability 2011/12 ($m)	Future client liability 2012/13 ($m)	Future client liability 2013/14 ($m)	Future client liability 2014/15 ($m)	Future client liability 2015/16 ($m)
Overpayments/fraud related to future payments	292	234	205	189	180
Recoveries on overpayments/fraud related to future payments	-234	-187	-164	-151	-144
Net cost – overpayments/fraud	**58**	**47**	**41**	**38**	**36**

Finally Figure 27.5 shows the projected payments and recoveries over the next five years.

Figure 27.5 **Projected cash flows for overpayments and fraud over the next five years. The lump in recoveries in December 2014 reflects the tail assumptions being applied to the pre-2007 outstanding debts.**



27.2 Recoverable assistance

We start by discussing recoverable assistance payments, which was modelled along similar lines to *other benefits and assistance*. We then discuss the assumptions made relating to recoveries.

27.2.1 Introduction

The following benefit types have been classed as recoverable assistance for the purposes of this valuation.

Benefit Name	Code	% 10/11 benefit	Comment
Advance of Benefit	831	84.9%	
Special Needs Grant	620	8.5%	
Recoverable Assistance Payment	820	6.2%	
SWIFTT excess/DMS refund	930	0.5%	
Unidentified receipt refund	944	<0.05%	

Advance of benefit is the dominant category, with smaller but still significant components under payment codes 820 and 620. These payments represent approximately $150m per year.

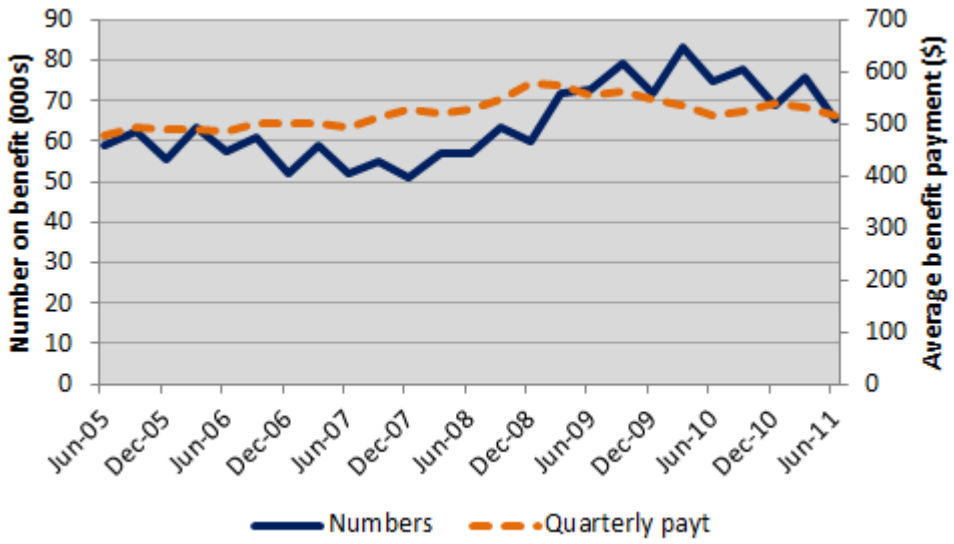
27.2.2 Current experience

The following table and graph show the recent experience for recoverable assistance.

Table 27.4 **Recent Recoverable Assistance payment experience**

Year	Payments ($m)	Average number on benefit	Average quarterly benefit payment (ABP) per client ($)
2007/08	109	54,900	500
2008/09	144	66,900	540
2009/10	162	77,200	520
2010/11	148	71,800	520

Figure 27.6 **Trends in Recoverable Assistance. ABP in June 2011 values.**

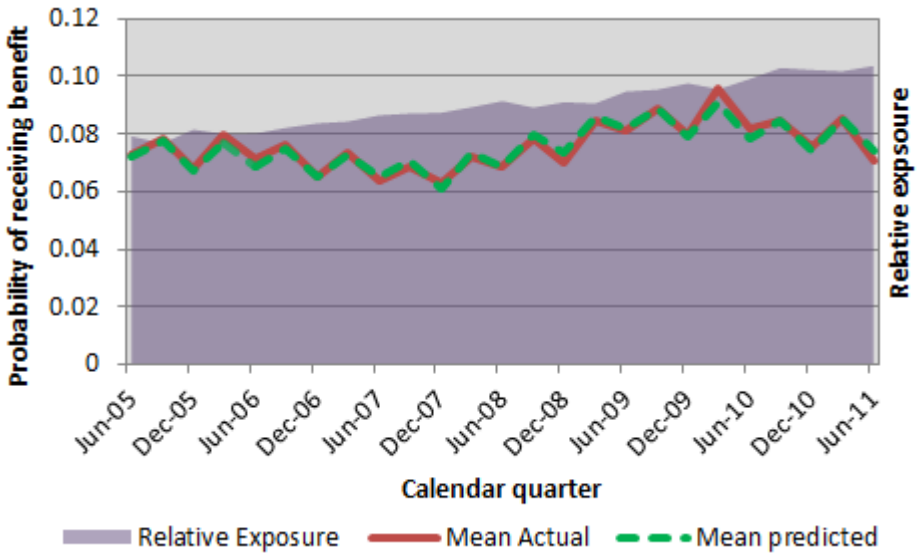


The number of clients receiving some form of recoverable assistance has increased significantly since 2008, in line with the increase in the unemployment rate. ABP levels have remained relatively stable, and current levels are near their long term average.

27.2.3 Modelling numbers and ABP

Recall that for *other benefits and assistance* the number of recipients is modelled as a proportion of total number of clients in the system. The same approach is used for Recoverable Assistance payments. Thus numbers of recipients are modelled as a single probability model. The actual and predicted probabilities for this model are shown in Figure 27.7.

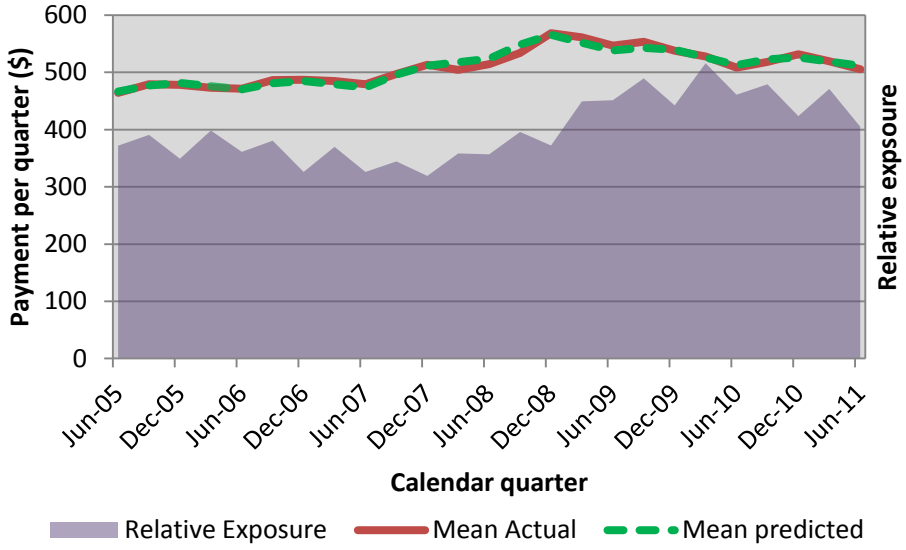
Figure 27.7 **Probability that a welfare beneficiary is receiving Recoverable Assistance**



There is a slight correlation visible with the unemployment rate and a significant seasonal pattern, but otherwise utilisation of recoverable assistance has been relatively stable over time. There are significant trends in the probability of receiving Recoverable Assistance relating to both duration and age. In particular:

- Utilisation drops markedly with age. About 9% of clients age 30 receive assistance, compared with 4% of clients aged 60; and
- The level of use for those aged less than 20 has risen markedly since the year 2000.

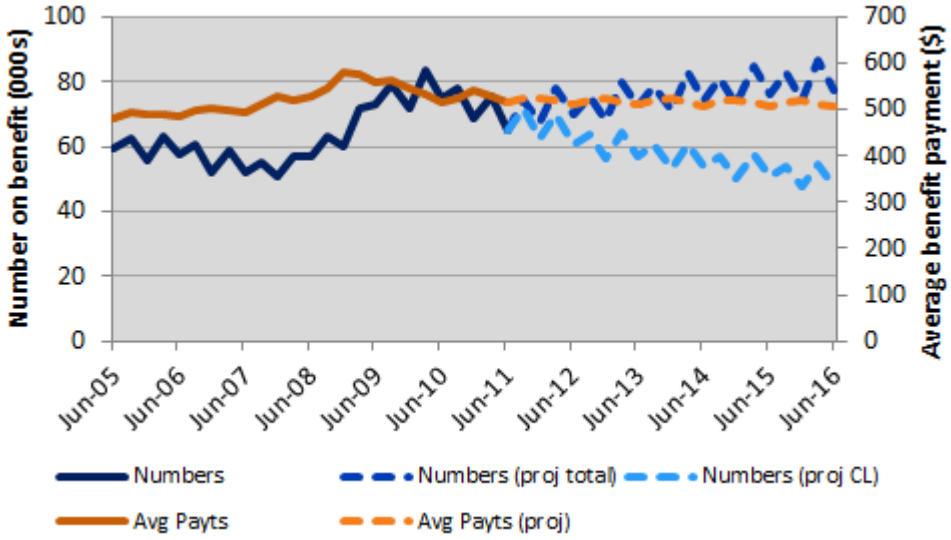
Figure 27.8 **Actual and modelled average quarterly payments by calendar quarter**



There is little to note in the ABP model in terms of its trend over time, apart from the slight peak at the end of 2008.

Figure 27.9 shows the projections of numbers and APB over the next five years. These reflect fairly steady assumptions, with a slow increase in overall numbers reflecting a growth in total clients in the system. The portion attributable to the current client liability falls slowly and is expected to be 60% after five years. The seasonality in numbers is projected to continue, and ABP is projected flat.

Figure 27.9 **Historical and forecast numbers and ABPs (current values), Recoverable Assistance payments**



27.2.4 Recoverable Assistance recoveries

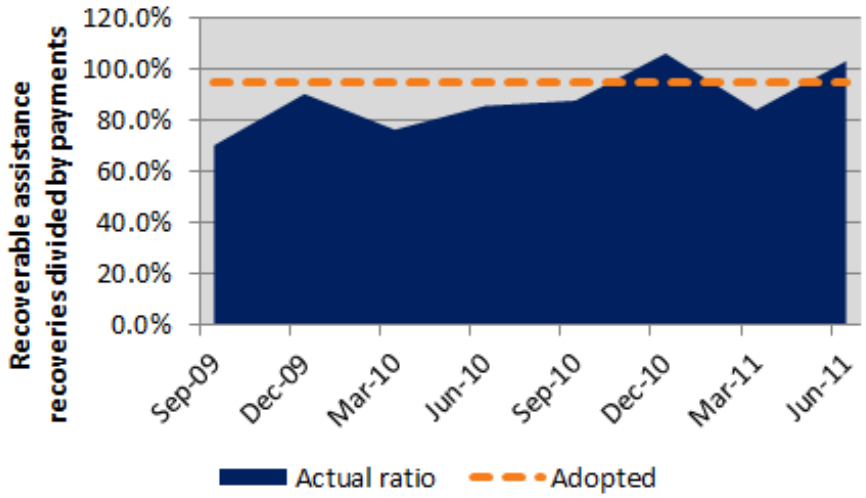
The following table and figure show the recent relationship between recoverable assistance payments and recoveries.

Table 27.5 **Total benefits paid (excluding expenses) and recoverable assistance payments recovered by calendar quarter**

Calendar quarter	Payments ($m)	Recoveries ($m)
Sep-09	44	31
Dec-09	39	35
Mar-10	44	34
Jun-10	39	33
Sep-10	41	36
Dec-10	36	39
Mar-11	39	33
Jun-11	34	35

Table 27.5 shows historical recoveries related to recoverable assistance. The recoveries have been stable over the past two years, both in absolute terms and relative to total recoverable assistance payments made by MSD. Thus for projection purposes we have assumed that these recoveries are a constant proportion of total benefit payments.

Figure 27.10 **Recoverable assistance recoveries as a proportion of recoverable assistance payments**



We have assumed that recoveries will equal 95.0% of payments, in line with the average over the past year. This means that the net cost of Recoverable Assistance is 5% of payments, which is the combined cost of non-recovery rates and the time lag associated with collecting debts.

27.2.5 Summary of forecasts

The following table shows the current and future client liabilities for both Recoverable Assistance payments and recoveries.

Table 27.6 **Current and future client liabilities for Recoverable Assistance**

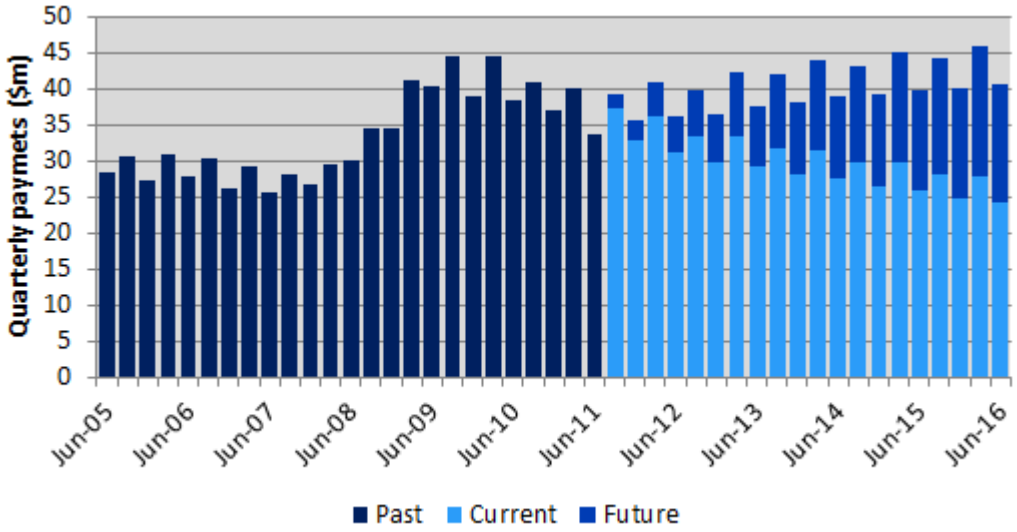
	Payments			Recoveries			Net Cost		
Liability	Current values, undisc. ($m)	Actual values, undisc. ($m)	Actual values, discounted to "premium" date ($m)	Current values, undisc. ($m)	Actual values, undisc. ($m)	Actual values, discounted to "premium" date ($m)	Current values, undisc. ($m)	Actual values, undisc. ($m)	Actual values, discounted to "premium" date ($m)
Current	1,982	2,717	1,479	-1,883	-2,581	-1,405	99	136	74
2011/12	313	443	227	-298	-421	-216	16	22	11
2012/13	261	378	184	-248	-359	-175	13	19	9
2013/14	228	337	156	-217	-320	-149	11	17	8
2014/15	204	310	136	-194	-295	-129	10	16	7
2014/15	186	290	120	-177	-276	-114	9	15	6

The net cost is reasonably small in the overall context of the valuation, but there is a significant amount of relative uncertainty in the estimate. This is because the net cost is

the difference between two significantly larger numbers; a small error for either one can lead to a large impact on the net cost.

Finally Figure 27.11 shows the projected pattern of Recoverable Assistance payments. The pattern for recoveries and net cost is the same, apart from scaling numbers down by 95% and 5% respectively. The pattern shows a steady decline in payments related to the current client liability, but a slow increase in overall payments once future client liabilities are allowed for.

Figure 27.11 **Quarterly benefit payments, in current values**



27.3 Key risks for loans

Some of the uncertainties relating to the modelling of loans are covered in Section 4.6. There is a larger than usual uncertainty associated with the loan estimate due to:

- The lack of data prior to June 2007;
- The fact that net cost is small relative to the estimated inflows and outflows;
- The dimensions of loans not considered as part of the valuation. For example, the undetected portion of overpayments and fraud;
- The difficulty in setting tail assumptions; and
- The difficulty in setting recoveries for long term outstanding debts.

While we believe the loan estimates are a plausible estimate of the future given the available data, a more comprehensive and detailed analysis of loans is likely to give superior results.

28 MSD EXPENDITURE

MSD expenses included within the scope of the valuation are those required to administer the benefits for working-age adults in the valuation, and to help clients prepare for and return to work. Expenditure has been analysed and categorised under the following headings.

- Income support administration
  - Benefit processing ("income" share of Tailored Sets of Services to Help People into Work or Achieve Independence appropriation)
  - Integrity services
  - Collections
  - Temporary measures (e.g. Canterbury earthquake)

- Work focussed investments
  - OSCAR (Out of School Care and Recreation subsidy to providers)
  - Training and employment support (includes Employment Assistance, Vocational Skills Training, Mainstream Supported Employment Programme, Youth Transition Services)
  - Work-focussed case management (includes "work" share of Tailored Sets of Services appropriation; e.g. Job Connect, employment coordinators, work brokerage)

Note that Tailored Sets of Services were apportioned by MSD between income support administration and work focussed investments on the basis of time survey data.

The payments made to these categories over the past five years are shown in Table 28.1 below.

Table 28.1 **Historical MSD expenses, actual values, plus 2011/12 budget**

Expense category	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12 (budget)
	$m	$m	$m	$m	$m	$m
Income Support Administration						
Benefit processing	264	254	259	270	258	251
Integrity Services	33	35	37	33	35	34
Collections	14	3	13	13	11	13
Canterbury earthquake	0	0	0	0	8	0
Admin sub-total	**310**	**292**	**309**	**315**	**312**	**298**
Work-focussed Investments						
Work focussed case management	120	132	147	160	167	175
OSCAR	10	15	19	19	18	19
Training and employment support:						
Employ. Assist	92	73	71	109	113	111
Vocational skills training	92	94	89	86	69	55
Youth transition services	6	7	10	12	12	13
Mainstream employ. Support	0	0	2	4	3	4
Job support scheme	0	0	0	1	0	0
Life skills training	0	0	0	0	1	0
Sub-total Training	*191*	*174*	*173*	*212*	*197*	*182*
Invest sub-total	**321**	**321**	**339**	**391**	**382**	**376**
Expenses total	**631**	**613**	**648**	**706**	**694**	**674**

These costs are included in the liability calculation. The main complication in determining the future expense attached to the liability is one of attribution; only a portion of future expenses will correspond to clients belonging to the current or future client liability cohorts, with the remainder attributable to those future clients falling outside the scope of the valuation. To allow for this, the following methodology has been adopted:

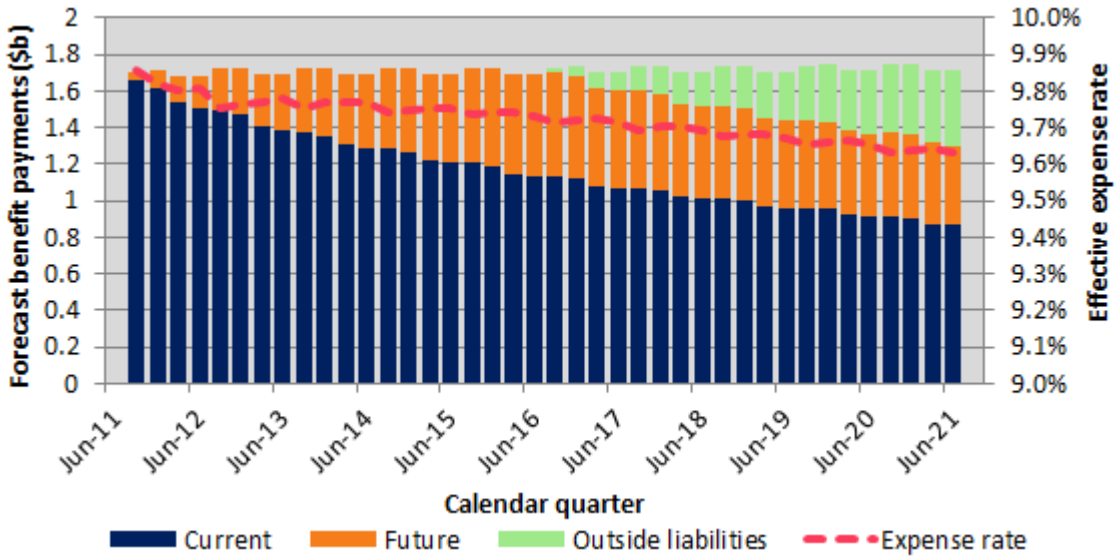
- Our model for future expenses assumes that the total expense costs are **fixed in real terms**. This means that they increase in line with benefit rate inflation (tied to CPI) in nominal terms. The expense level is set equal to the 2011/12 budget, $674m;
- This amount is divided into quarterly expenses, based on historical seasonality of benefit payments;
- For each future calendar quarter, expenses were allocated proportionally between current client liability cash flows, future client liability cash flows and cash flows falling outside the current and future client liability valuations. The last category was

calculated assuming real benefit growth of 0.2%, equal to the forecast over the next five years;

- This allocation was converted into an expense rate for each quarter; finally
- Total projected expenses in each quarter are allocated between administration and programs, as well as their subcomponents, based on their relative proportions in the 2011/12 budget.

Figure 28.1 shows the quarterly forecast benefit payments over the next 10 years, which drives the attribution of expenses. As future client liability has been calculated for the next five years there are no liability payments outside the scope of the valuation during this period. Thereafter a growing portion of payments fall outside the scope of the valuation liability and thus a decreasing amount of future expense is attached to the valuation liability. The slowly falling expense rate is due to expense payments being held fixed in current values while total benefit payments slowly grow.

Figure 28.1 **Projected future cash flows in current values and implied expense rate required to hold expenses fixed in real terms over the next ten years.**



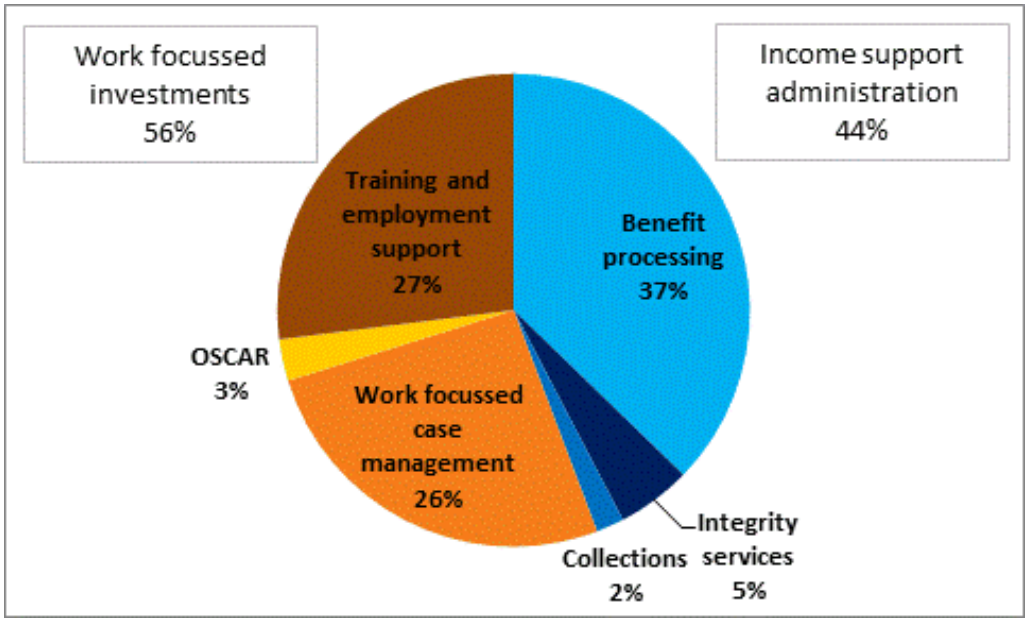
The quarterly expense rate can be used to allocate expenses across age bands and benefit types. The results can also be broken down by expense category. Overall expense results were given in Table 7.4 and Figure 7.10, but both are reproduced here for convenience.

Table 28.2 **Expense category breakdown for current and future client liabilities**

Expense category	Current client liability ($m)	Future client liability 2011/12 ($m)	Future client liability 2012/13 ($m)	Future client liability 2013/14 ($m)	Future client liability 2014/15 ($m)	Future client liability 2015/16 ($m)
Income support administration						
Benefit processing	2,539	323	258	226	208	197
Integrity services	347	44	35	31	28	27
Collections	130	17	13	12	11	10
Temporary measures[9]	0	0	0	0	0	0
Sub- total	**3,016**	**383**	**307**	**268**	**247**	**234**
Work-focussed investments						
Work focussed case management	1,768	225	180	157	145	137
OSCAR	194	25	20	17	16	15
Training and employment support:						
Employment Assistance	1,123	143	114	100	92	87
Vocational skills training	551	70	56	49	45	43
Youth transition services	128	16	13	11	10	10
Mainstream supported employment program	36	5	4	3	3	3
Job support scheme[10]	0	0	0	0	0	0
Life skills training[11]	0	0	0	0	0	0
Sub-total Training and employment support	*1,838*	*234*	*187*	*163*	*150*	*143*
Sub-total	**3,800**	**483**	**386**	**338**	**311**	**295**
MSD Expenses total	**6,816**	**866**	**693**	**606**	**557**	**530**

[9] Temporary measures include payments related to special events such as the Canterbury Earthquake. No forecast of such future events has been attempted. Hence the liability is estimated as nil.
[10] Job support scheme and life skills training expenditure occurred in several of the 5 years of history used to apportion expenses between categories. However, in the most recent year, 2010/11, expenditure on both items was nil. It has been assumed that this will continue.
[11] See note above.

Figure 28.2 **Current client liability: MSD Expenses by category**



PART E

RELIANCES AND LIMITATIONS

29 RELIANCES AND LIMITATIONS

29.1 Purpose and use

This report has been prepared for the specific purpose of assisting MSD in determining an estimate of the current client liability for those on or recently on benefit plus future client liability costs over the next five years. No reliance should be placed on this report for any other purpose without confirming with us that such a purpose is appropriate. Taylor Fry specifically disclaims any responsibility or liability to any party which might claim to suffer any loss as a direct or indirect consequence of relying on this report for any purpose other than the specific purpose described in this paragraph.

Detailed judgements about the definitions, methodology, analyses, assumptions and estimates of current client liability and future client liability described in this actuarial report should be made only after considering the report in its entirety.

Taylor Fry personnel are available to explain or amplify any matter presented in this report.

29.2 Reliance on data

In preparing this report we have relied on historical data and other quantitative information provided by MSD without audit or independent verification. This data is described in Section3.2. We have sought to validate the data internally and externally as described in Section 3.3. These checks suggest that there are no material problems with the data provided. Nevertheless, data accuracy and completeness remains the responsibility of MSD and we do not take responsibility for inadequacies in the valuation arising from errors in the data.

Any material discrepancies in the data should be reported to us to enable us to consider whether this report should be amended.

29.3 Uncertainty

There is an inherent limitation on the accuracy of liability estimates in this report caused by the fundamental uncertainty of attempting to predict the future. In particular there is a large amount of uncertainty related to:

- Changes to the welfare system;
- Changes in the way clients use the welfare system; and
- Changes in the New Zealand macro-economic environment.

All these are highly likely to affect projections, particularly given the long time horizon used in the valuation. A more detailed discussion of key risks is given in Section 9.

Additionally, the liability estimates are inherently uncertain, for the following general reasons:

- Models used to estimate such liabilities represent a simplification of complex real world processes;
- Even if the models used were perfect representations of the nature of the underlying processes, past random fluctuations in the experience of the social welfare system mean that uncertainty arises from estimating the parameters of the models;
- Any shortcomings of and/or errors in the data available increase uncertainty regarding the estimated parameters of the models; and
- Even if the true underlying parameters could be determined precisely for a suite of perfect models, the amounts of the current client liability and future client liability would still be uncertain because of:
    - Random fluctuations in the future experience of the social welfare system; and
    - The possibility of future systemic, i.e. non-random, changes. Note these changes include those listed at the start of this sub-section.

In our opinion, we have used techniques and assumptions which are appropriate, and the conclusions presented in this report are reasonable, given the information currently available. However, it should be recognised that the ultimate costs for the current and future client liability cohorts can be expected to differ, probably materially, from our estimates of those costs.

Finally it is worth noting that this is the first time that a formal actuarial valuation of the NZ Social Welfare liabilities has been carried out. The benefits and data are complex, and inevitably more uncertainty arises than if there was an existing valuation framework and projections requiring only incremental re-calibration. Over time, as more valuations are carried out, this aspect of uncertainty will reduce.