

**Department for Work and Pensions**

**Working Paper No 74**

# **Workplace Pension Market model**

**Kyla Malcolm, Tim Wilsdon and Charles Xie**

A report of research carried out by Charles River Associates on behalf of the  
Department for Work and Pensions

© Crown Copyright 2009. Published for the Department for Work and Pensions under licence from the Controller of Her Majesty's Stationery Office.

Application for reproduction should be made in writing to The Copyright Unit, Her Majesty's Stationery Office, St Clements House, 2-16 Colegate, Norwich NR3 1BQ.

First Published 2009.

ISBN        978 1 84712 689 4

Views expressed in this report are not necessarily those of the Department for Work and Pensions or any other Government Department.

# Contents

Acknowledgements .....	v
The Authors.....	vi
Glossary.....	vii
Summary .....	1
1 Introduction .....	3
2 Baseline dataset .....	5
2.1 Choice of datasets .....	5
2.2 Employers' Pension Provision Survey .....	6
2.3 Annual Survey of Hours and Earnings .....	7
2.4 Labour Force Survey.....	8
2.3.1 <i>Calculating job churn</i> .....	9
2.3.2 <i>Identifying job churn by segment</i> .....	10
2.5 Merging data.....	10
2.6 Costs of pension provision for providers.....	11
2.6.1 <i>Set up costs</i> .....	12
2.6.2 <i>Ongoing costs</i> .....	13
2.6.3 <i>Opt-out and de-enrolment costs</i> .....	14
3 Model construction and functionality .....	17
3.1 Model structure .....	17
3.2 Assumptions .....	19

3.2.1	<i>Structural assumptions</i> .....	19
3.2.2	<i>Assumptions with user flexibility</i> .....	20
3.3	Ongoing development .....	24
Appendix A	Job churn analysis.....	25
Appendix B	Cost survey.....	29
Appendix C	Model calculations.....	31

## List of tables

Table 2.1	Participation rate for GPP-only firms by sector.....	7
Table 2.2	Employer and employee contribution rates by salary bands .....	8
Table 2.3	Levies by number of scheme members.....	14
Table A.1	Job churn for agriculture, hunting and forestry plus fishing plus other community, social and personal by firm size and salary band.....	25
Table A.2	Job churn for mining and quarrying plus manufacturing plus electricity, gas and water supply by firm size and salary band .....	26
Table A.3	Job churn for construction by firm size and salary band .....	26
Table A.4	Job churn for wholesale, retail and motor trade by firm size and salary band.....	26
Table A.5	Job churn for hotels and restaurants by firm size and salary band .....	27
Table A.6	Job churn for transport, storage and communication by firm size and salary band.....	27
Table A.7	Job churn for financial intermediation by firm size and salary band .....	27
Table A.8	Job churn for real estate, renting and business activities by firm size and salary band.....	28
Table A.9	Job churn for education plus health and social work by firm size and salary band.....	28

## List of figures

Figure 2.1	Overall job churn by year .....	10
Figure 3.1	Model structure .....	18

# Acknowledgements

We would like to thank Will Farbrother, Cate Fisher, James Lind, Sophie Shore and Daphne White at the Department for Work and Pensions (DWP) for their help and support with this project. We are also grateful for the involvement of the private pension providers who participated in the research.

# The Authors

**Kyla Malcolm**, is a Vice President in CRA's London office. She specialises in regulation and competition issues especially related to financial services markets. In the regulatory arena she has advised on a range of aspects of personal accounts, the proposed regulation of alternative investment funds, the impact of general insurance regulation and the Retail Distribution Review. On the competition side she has recently advised clients on state aid in the financial services sector as well as issues of competition in pensions, banking, payment systems and exchanges.

**Tim Wilsdon**, is a Vice President at CRA and often leads the quantitative work that is conducted in the financial services sector. He has advised on numerous projects related to how financial advisers react to different incentives, issues of behavioural economics and the presentation of information. He led recent work regarding the baseline for A-day, the impact of the European Commission's Financial Services Action Plan in the insurance and pensions sector, and for various clients on distribution strategies.

**Charles Xie**, is a Consulting Associate in CRA's Financial Economics practice. He specialises in understanding incentives and information problems in financial markets especially in insurance and pension markets, as well as regulatory policy. His interests cover information economics and game theory as well as industrial economics and welfare economics.

# Glossary

<b>Defined Benefit (DB) pension</b>	This is a pension scheme where the pension is related to the member's salary or some other value fixed in advance.
<b>Defined Contribution (DC) pension</b>	This is a pension scheme where the individual receives a pension based on the contributions made and then investment return that they have produced.
<b>Discount rate</b>	This is an interest rate used to reduce an amount of money at a date in the future to an equivalent value at the present date.
<b>Contestability</b>	If companies already have a pension scheme in place, it is important to assess whether the new workplace pension could be sold to that company and whether members of existing schemes would join the new workplace pension. If a particular type of pension is considered to be contestable then all of the members of that pension scheme are assumed to take out the new workplace pension. If a particular type of pension is not contestable then the members of that pension are assumed to stay within the existing pension and do not join the new workplace pension.
<b>Group Personal Pension (GPP)</b>	This is a personal pension which is provided through a contract between an individual and a pension provider and is accessed through <b>an employer</b> .

<b>Group Stakeholder Pension (GSHP)</b>	This is a personal pension which complies with regulations which limit charges and allows individuals flexibility about contributions and which is accessed through an employer.
<b>Job churn or job turnover</b>	This is calculated as the number of employees that changed job in the last year divided by the total number of employees in that sector.
<b>Net Present Value (NPV)</b>	This estimates the value today (i.e. the present value) of a series of cash flows over time. It is the standard measure used for assessing whether it is worthwhile undertaking a particular project – in this case whether selling a pension to a particular firm will be profitable.
<b>Participation rate</b>	The participation rate is the proportion of employees who join a pension.
<b>Participation rate hurdle</b>	This is the participation rate above which companies continue to use their existing contribution rates rather than using those entered by the user (assuming the former are above the latter).
<b>Segment</b>	This is any subgroup of the overall market. In the discussion in the report it typically refers to a particular firm size or combination of firm size, sector and salary.
<b>Visual Basic for Applications or VBA</b>	This is a programming language which has been used in the model in order that the calculations undertaken in the model are performed quickly.

# Summary

Charles River Associates (CRA) was asked by the Department for Work and Pensions (DWP) to examine the impact of the 2012 pension reforms on the workplace personal pensions market. The primary aim of the research was to understand how different levels of charges and charging structures impact the profitability of serving different market segments.

This report sets out details of the model which CRA has developed for DWP. It focuses on the underlying approach to developing the model. It is important to note that the model is aimed at assessing whether or not it is profitable for private sector providers to offer a new pension to a particular type of firm and not whether it is worth continuing to offer, or to expand, existing pensions.

Data for the model is based on information from the Employers' Pension Provision Survey (EPP), Annual Survey of Hours and Earnings (ASHE) and Labour Force Survey (LFS) where various aspects of the data have been analysed and merged together to create a single baseline dataset for the model. Data from the EPP has been used at the level of individual firms which means that firm specific variation is carried through to the baseline dataset and also therefore to the results from the model.

CRA conducted a small survey of providers to gather information regarding the cost of providing a new workplace personal pension. This provided information on provider costs as well as setting out differences in costs between firms of different sizes. The survey sought to differentiate between set up costs and ongoing costs as well as between scheme level costs and individual member specific costs. Each of these costs is then applied in the appropriate way in the model.

The model has been built to ensure that there is considerable flexibility in assumptions that can be used in scenario analysis. The key elements where the user has flexibility are:

- contestability: the user can choose whether members of Defined Benefit (DB), Defined Contribution (DC), Group Personal Pension (GPP), Group Stakeholder Pension (GSHP) schemes in pensioned companies are contestable, i.e. whether these members would join the new workplace pension scheme or whether they would remain in their existing schemes;

- charging structure: the user has flexibility over both the structure and level of charges;
- contribution rates: the user can decide whether currently unpensioned companies will contribute at the current industry average level or at rates set by the user;
- participation rate hurdle: the user can set the hurdle rate above which companies continue to use their existing contribution rates rather than using those entered by the user;
- participation rates: the user can set participation rates for pensioned and unpensioned companies; and
- costs of pension provision: the user can choose to use the cost calculations which have resulted from our survey or to set out their own estimates of costs of provision.

# 1 Introduction

Charles River Associates (CRA) was asked by the Department for Work and Pensions (DWP) to examine the impact of the 2012 pension reforms on the workplace personal pensions market.

The Pensions Act 2008 sets out a series of measures aimed at encouraging wider participation in private pension saving. The aim of these reforms is to overcome the decision-making inertia that currently characterises individuals' attitudes to pension saving and to make it easier for individuals to save for their retirement. The measures in the Pensions Act include a duty on employers to automatically enrol all eligible workers into qualifying workplace pension provision from 2012 and to provide a minimum contribution (of three per cent of qualifying earnings) towards the pension saving for those employees who participate. The Pensions Act also sets out plans for the establishment of a new national occupational pension scheme, personal accounts, that employers can use as a qualifying scheme.

Our research builds on previous work by the Pensions Commission which, as part of its analysis, examined the cost of private sector pension provision.<sup>1</sup> The Pensions Commission set out the cost of providing a Group Personal Pension (GPP) for a company with 23 employees.

The primary aim of our research was to understand how different levels of charges and charging structures impact the profitability of serving different market segments. In particular, DWP wanted to understand which firms would be profitable for the private sector to serve and which firms would not be profitably served by private sector pension providers after the pension reforms are implemented. The research included:

- gathering information on the administrative costs of providing workplace personal pensions; and
- construction of a model to assess the profitability of different market segments under different charging scenarios.

---

<sup>1</sup> See, in particular, *A New Pension Settlement for the Twenty-First Century*, The Second Report of the Pensions Commission, November 2005.

This report sets out details of the model which CRA has developed for DWP. It focuses on the underlying approach to developing the pension model and discusses some of the flexibility available from the model. It is important to note that the model is aimed at assessing whether or not it is profitable for private sector providers to offer a new pension to a particular type of firm and not whether it is worth continuing to offer, or to expand, existing pensions. The research for this report and the construction of the pension model was undertaken between July and August 2009.

This report focuses on:

- the baseline dataset used in the pension model – this is examined in Chapter 2; and
- details on the model construction – this is provided in Chapter 3.

## 2 Baseline dataset

This chapter sets out details of the data that has been used to construct Charles River Associates (CRA) pension model. In Section 2.1 we set out the reasons for the choice of the three datasets which have been used in the model. In Sections 2.1 to 2.4 we briefly set out what information came from each dataset. Section 2.5 explains how they were combined together to form the baseline data used in the model. Section 2.6 provides details on the methodology used to collect information on the costs of pension provision.

### 2.1 Choice of datasets

The choice of datasets used in the model reflected the Department for Work and Pensions (DWP) needs. DWP required a model which:

- assessed the profitability of selling a new workplace personal pension and as such needed to be structured according to characteristics of firms rather than individual employees; and
- could be combined with other DWP information which was based on the firms in the Employers' Pension Provision Survey (EPP) (see Section 2.2).

For these reasons, it was agreed that the model be structured around the EPP which therefore became the starting set of information for the model.

However, while the EPP has good data on the characteristics of the firm and the type of pension provision which is offered by the firm, it has insufficient information regarding employees. In particular, the EPP does not have information about employee contributions to pensions. Hence, this information needed to be identified from an alternative source of data.

The Annual Survey of Hours and Earnings (ASHE) is focused on information at the level of the individual and provides good information about salaries and contribution rates to pensions (both by employers and by employees). Hence data from ASHE was used to supplement the information in the EPP. Understanding contribution rates is crucial to the assessment of profitability of pension schemes. This is because contributions are the main driver of revenue (both directly where

a contribution charge is applied, and also indirectly through the growth of assets under management).

Finally, it is important to understand the frequency with which employees change jobs and information on this was not available from either the EPP or ASHE. Hence it was necessary to supplement these datasets through the use of information from the Labour Force Survey (LFS). Job change is important because it impacts the length of time during which individuals continue to contribute to a particular pension and generally pensions will be more profitable where individuals contribute to them for a longer period of time.

Since no one dataset contained all of the necessary information for the purpose of modelling pension profitability, it was therefore necessary to obtain and combine data from each of these datasets.

We understand that DWP intends to update the data in the model as later versions of the datasets become available.

## 2.2 Employers' Pension Provision Survey

The Employers' Pension Provision Survey (EPP) has been a regular survey over the last 15 years. The data used in our model is based on the seventh survey from 2007. The EPP survey was conducted among private sector employers in the UK excluding small businesses without employees and the public sector. The dataset contains results from around 2,360 firms.

The survey describes the extent and nature of pension provision among private sector employers. Due to the requirements of DWP the raw underlying EPP data has been used (on an anonymised basis) in the model – with the help of DWP the EPP data has been put into the format that provides sufficient information for the purpose of building the model without disclosing the identity of each individual firm. As such the model includes data for all 2,360 firms. Data from the EPP for each of these firms includes:

- number of employees;
- what industry the firm is in;
- whether the firm provides a pension;
- if so, what types of pensions are provided;
- how many members are in each pension scheme; and
- an appropriate national weighting such that the EPP data can be scaled to be representative of all firms.

In addition to using the raw data on individual firms that are in the EPP, the EPP data is also used for the basis of assumptions regarding firms that are currently unpenioned. Table 2.1 sets out the average participation rate of employees in a Group Personal Pension (GPP) scheme where the GPP scheme is the only pension that the firm has.

**Table 2.1 Participation rate for GPP-only firms by sector**

Sector	Sample size for GPP-only firms	Average participation rate %
A,B,O (A: Agriculture, hunting and forestry; B: Fishing; O: Other community, social and personal service activities)	25	22
C,D,E (C: Mining and quarrying; D: Manufacturing; E: Electricity, gas and water supply)	88	48
F (Construction)	16	39
G (Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods)	46	55
H (Hotels and restaurants)	17	13
I (Transport, storage and communication)	14	63
J (Financial intermediation)	11	84
K (Real estate, renting and business activities)	75	59
M,N (M: Education; N: Health and social work)	21	56

Source: DWP analysis of EPP. The letters refer to the standard Alphabetical Index used in the UK Standard Industrial Classification of Economic Activities (UK SIC(92)).

It is clear from this that there is considerable variation in the participation rate for firms in different sectors. In the pre-2012 baseline (see Section 3.2), these calculations are used as the estimates of the participation rates for firms that are currently unpensioned. The participation rates for GPP firms are used because the model is focused on assessing the profitability of a workplace personal pension scheme for which a GPP is the closest existing type of pension to use. The participation rates are used for firms that only have a GPP because the presence of other types of pensions is likely to impact the participation in the GPP.

## 2.3 Annual Survey of Hours and Earnings

The ASHE survey has been conducted annually since 2004 replacing the New Earnings Survey. The ASHE results for 2007 are based on sample of approximately 142,000 employees.

The survey provides information on the levels, distribution and make-up of earnings and the number of hours in paid work. The information which is of relevance for the purpose of the baseline dataset includes:

- the industry that the employee is in;
- the size of the company that the employee works for;
- salary of the employee;
- pensionable pay of the employee;

- age of the employee;
- pension type if the employee has a pension;
- estimated employer and employee pension contribution; and
- appropriate weightings.

We set out below the average employer and employee contributions into a GPP based on ASHE data. This is split out for different salary bands and relates to the average contributions of those with pension contributions.

**Table 2.2 Employer and employee contribution rates by salary bands**

Sector	Employer contributions		Employee contributions	
	£5,035- £33,540 %	Greater than £33,540 %	£5,035- £33,540 %	Greater than £33,540 %
A, B, O (A: Agriculture, hunting and forestry; B: Fishing; O: Other community, social and personal service activities)	6.9	8.8	3.4	3.9
C, D, E (C: Mining and quarrying; D: Manufacturing; E: Electricity, gas and water supply)	5.5	7.4	3.5	4.2
F (Construction)	6.0	7.8	3.0	3.7
G (Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods)	5.4	7.7	3.2	3.7
H (Hotels and restaurants)	7.6	18.4	4.2	4.1
I (Transport, storage and communication)	6.7	8.2	3.5	3.3
J (Financial intermediation)	9.7	12.2	2.7	3.6
K (Real estate, renting and business activities)	6.1	7.5	3.2	4.0
M, N (M: Education; N: Health and social work)	8.5	8.9	4.1	4.7

Source: DWP analysis of ASHE.

In general, employees with higher salaries have higher contribution rates for both employer and employee contributions. As with the participation rates estimated from the EPP, there are substantial differences between sectors.

## 2.4 Labour Force Survey

The LFS dates back to 1973 and has been conducted quarterly since 1992. The sample covers about 0.1 per cent of the UK population, consisting of about 50,000

responding households in Great Britain and approximately 2,000 responding households in Northern Ireland every quarter. In the survey, each individual in the household is interviewed and asked the same questions for five consecutive quarters.

We use quarterly data from 2002 Q1 to 2008 Q2 to determine job churn or job turnover rates. These are based on the industry, the number of employees in the firm, and the gross salary of individuals. The specific variables included were:

- industry (main job);
- number of employees at work place;
- gross weekly pay in main job; and
- length of time with current employer.

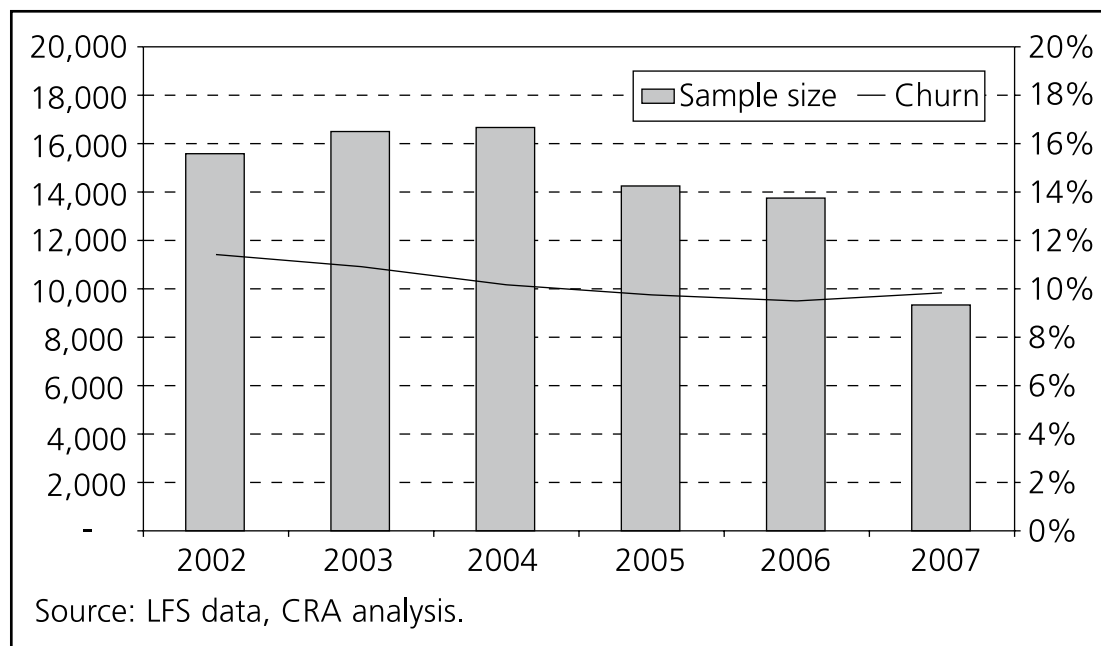
### **2.3.1 Calculating job churn**

Job churn is an important factor to be included in the model as people tend to leave the pension scheme provided by their previous employer and join the scheme provided by the new employer when they change their jobs. For the previous scheme this involves the issue of transfer-out. For the new scheme, this involves the issue of transfer-in and it will incur set up costs for new joiners on an ongoing basis as well as the ongoing costs.

Given the structure of the LFS data, we calculate job churn based on the job that the individual left. Hence, for each individual we examined information related to their first quarter responses and their fifth quarter responses.

The individual was identified as having changed job if in the fifth quarter they stated that they had been at their current job for less than a year. Employment characteristics such as sector, firm size and salary were then taken from their first quarter responses. An individual's response in the first quarter gives us the characteristics of his previous job if he has changed jobs in the last year and gives us characteristics of his current jobs if he has not changed jobs in the last year.

Job churn is then calculated (by sector, size, salary band and various combinations of these) as the number of interviewees that changed job in the last year divided by the total number of interviewees in that sector. The results of this analysis are shown for the overall sample in Figure 2.1. We used the average job churn calculated across the whole period from 2002-2007 which, for the overall sample, was around ten per cent.

**Figure 2.1 Overall job churn by year**

### 2.3.2 Identifying job churn by segment

In order to capture the variation in job churn by different segments in the model, the data has been broken down by sector, firm size, and gross salary band. It is possible to break down the LFS data at this level, and calculate job churn for each group. However, when we examine the data at this level, the sample sizes in some groups are very small, and produce unrealistic job churn numbers with very high (as high as 57 per cent) and very low (as low as nought per cent) churn in certain groups. As such, the results from this methodology were not considered to be robust.

Instead, we use the data broken down by sector and firm size (sample sizes are still reasonably high at this level), and then we use the aggregate churn figures by salary to break down these results further by salary band as well. This was done by taking the churn data by sector and firm size, and then breaking this figure down into three separate figures for each salary band, using a scaling factor which is based on how much the average churn for that salary band deviates from the overall average churn rate across all salary bands.

Finally, we calculated from the LFS data the job churn rates broken down by sector, firm size and salary bands. Details on the job churn rates used can be found in Appendix A.

## 2.5 Merging data

The data from EPP, ASHE and LFS were then merged together to create a single baseline dataset for the model. This merging happened at the level of the EPP dataset, i.e. the dataset retained the full 2,360 firms with information from ASHE mapped into the EPP dataset based on firm size and sector.

CRA then merged in data from the LFS based on firm size and sector but also providing different job churn calculations for different salary bands within the firm size and sector combination.

It should be noted that using the EPP at the level of individual firms means that firm specific variation is carried through to the baseline dataset and also therefore to the results from the model. For example, if the set of firms in the EPP which have nine employees have low salaries, low contribution rates and low participation rates compared with firms in the EPP which have eight employees, the model could lead to the counterintuitive result that fewer firms with nine employees are profitable compared to firms with eight employees.

Using the EPP raw data also means that there may be particular firm size, industry and pension provision combinations which either have small sample sizes or do not arise in the data. Therefore, care must be taken when examining the results of the model.

## 2.6 Costs of pension provision for providers

Our research builds on previous work by the Pensions Commission which, as part of its analysis, examined the cost of private sector pension provision.<sup>2</sup> The Pensions Commission set out the cost of providing a GPP for a company with 23 employees. In this research DWP sought to obtain additional information which:

- provided more recent information on the cost of pension provision: The Pensions Commission reported in 2005 whereas DWP wanted to obtain data for 2009 as well as to understand any differences in costs between figures collected through this research and those reported by the Pensions Commission; and
- provided information for different firm sizes: The Pensions Commission only set out the cost of providing a GPP for a firm with 23 employees whereas DWP wanted to obtain data for the cost of providing a GPP to firms of different sizes.

CRA therefore designed a cost survey in order to capture this information. The survey sought to differentiate between set up costs and ongoing costs as well as between scheme level costs and individual member specific costs. Each of these costs is then applied in the appropriate way in the model. DWP specified the firm size categories to be used in the survey in order that the categories could be combined with other DWP information which itself was based on categories used in the EPP survey.<sup>3</sup>

A cost survey was designed and sent to a small number of current pension providers. Providers were asked to report costs associated to setting up a new workplace personal pension scheme such as a GPP scheme or a group stakeholder pension (GSHP) scheme.

---

<sup>2</sup> See, in particular, *A New Pension Settlement for the Twenty-First Century*, The Second Report of the Pensions Commission, November 2005.

<sup>3</sup> Firm categories used in the EPP follow HMRC conventions.

Providers completed the survey on the basis that individual company information would be kept confidential and therefore results have been provided to DWP on an aggregate basis. The information is based on results from six different providers which together have a market share of over 30 per cent of workplace personal pensions. In addition to the completion of the survey, discussions were held with all of these providers to ensure that the survey had been completed accurately and to gain a deeper understanding of current costs and how different costs might be expected to change in the future. Pension providers have completed the survey on the basis of average costs rather than the cost of serving a marginal firm, that is, the cost data in the table refers to the average cost of providing pension schemes to all their clients rather than the incremental costs related to serving an extra client. Results of the survey were compared with the costs identified by the Pensions Commission and evidence from the discussions with providers in order to ensure that the results were robust.

The structure of the cost survey is shown in Appendix B and we provide further information on each of the cost categories below.

### **2.6.1 Set up costs**

We consider the different set up costs incurred by private sector pension providers below.

#### *Scheme set up costs*

Scheme set up costs reflect the need to put arrangements in place between the provider and the employer in order to be able to operate the scheme. The results show that the cost for scheme set up increases with the size of the employer although if calculated on a cost per employee basis, these costs would fall as the size of firm increases.

#### *Cost of initial advice*

The cost of initial advice is based on the assumption that the pension scheme is advised and that the advice is undertaken on a commission basis. Some of the firms who responded to the survey have recently exited the commission based market and therefore provided information based on the level of commission that they would previously have paid had they continued to distribute their products through commission based advisers. The structure of advice costs is such that, as far as the provider is concerned, the initial commission cost would be the same irrespective of the size of the company.<sup>4</sup>

---

<sup>4</sup> It is possible that individual advisers may choose to reduce the amount of commission that they receive in order that the price of the pension for the client is lowered. This might be expected to arise more for larger firms than for smaller firms but this issue has not been captured in the costs included in the model.

It should be noted that there is a trade-off between the cost of initial advice and the cost of ongoing advice. Different advisers may choose a different combination of initial and ongoing commission from the same provider, and different providers may offer different combinations or have advisers who, in practice, prefer slightly different structures. Discussions with providers enabled an understanding of this trade-off and thereby to combine the information on the cost of initial advice and ongoing advice in the most appropriate manner.

#### *Set up cost per member*

Set up costs for members (i.e. for the individual employees) reflect the need to start a record for each new member and to provide that member with information about the pension. There is a slight decline in the costs per individual as the firm size increases reflecting economies of scale.

A small number of respondents to our survey have outsourcing arrangements in place regarding their pension administration. For these respondents the cost was the same per individual irrespective of the size of the company that the individual worked for. The benefits of economies of scale are seen through a reduction in the cost per individual for the pension provider as a whole as the total number of individuals served by that pension provider increases.

Combining the set up costs from some providers who had flat costs across firm sizes and some providers who had declining costs across firm sizes leads to the overall results showing only a modest decline in costs as firm size increases.

### **2.6.2 Ongoing costs**

We consider the different ongoing costs incurred by private sector pension providers below.

#### *Ongoing scheme costs*

Respondents were asked to consider whether there were any ongoing costs at the level of the overall scheme. All respondents indicated that ongoing costs were not typically incurred at the level of the overall scheme, hence no ongoing scheme level costs have been included in the model.

#### *Ongoing cost of advice*

Current commission structures for workplace personal pensions typically include ongoing commission based on the value of contributions. As noted with the cost of initial advice, not all providers pay commission and there is a trade-off between initial commission and ongoing commission. The ongoing cost of advice resulting from the survey is flat across firm sizes reflecting market practice.

#### *Ongoing cost per member*

Ongoing costs per member relate to issues such as the need to send out statements to customers and other ongoing costs associated to the business. Separate costs

have been provided for members who are currently contributing to their policies and those who are not contributing (those who have gone 'paid-up') but where the providers still holds their accumulated funds. The latter is slightly cheaper due to the lack of need to administer payments and less interaction with members. These costs fall slightly with firm size reflecting the fact that some (but not all) providers indicated there were economies of scale across firm sizes.

#### *Fund management cost*

Fund management costs were based on the value of assets under management and were flat across firm sizes reflecting the fact that pension providers group the investments across their portfolio of workplace personal pensions rather than on a firm basis. The results given by pension providers reflect the cost of passive management although most firms will typically have actively managed funds.

#### *Discount rate*

In addition to these costs, firms provided information about the discount rate or internal rate of return hurdle that they use when considering future flows of costs and revenues. Results were consistent with estimates by CRA regarding the cost of capital for insurance and pension providers.

#### *Other costs*

Finally, the model also includes costs associated to The Pensions Regulator's general levy as well as the Pension Protection Fund (PPF) administration levy. Both of these levies depend on the number of scheme members and have a minimum payment per scheme for different scheme sizes.

**Table 2.3 Levies by number of scheme members**

	2-11	12-99	100-999	1,000-4,999	5,000-9,999	10,000+
General levy per member (£)	0	1.34	0.94	0.81	0.54	0.41
General levy minimum payment per scheme (£)	14	–	140	940	4,050	5,400
PPF administration levy per member (£)	0	4.33	3.12	2.43	1.84	1.29
PPF administration levy minimum payment per scheme	42	–	430	3,120	12,150	18,400

Source: The Pension Regulator. Note that the bandings refer to the number of scheme members rather than the firm size.

### **2.6.3 Opt-out and de-enrolment costs**

Decisions related to the opt-out process that will be required had not been made at the time at which the cost survey was undertaken. Cost calculations were therefore undertaken on the basis of the understanding of the policy at the time

which was that individuals were fully enrolled into a pension scheme and any who chose to opt-out would subsequently be de-enrolled.<sup>5</sup> As such this would require individuals to have records set up, the potential that contributions would be transferred from employers to providers and then the possible need to return the value of these contributions.

Providers generally struggled to estimate the expected cost of de-enrolment because of the uncertainty of the policy and because many of them disagreed with the process as set out at the time and had therefore not investigated the anticipated cost for their own consideration as they believed that the policy would change.

Given that auto-enrolment is a new policy this also meant that there was considerable uncertainty surrounding the expected cost. The example of the current cooling off period in which individuals have 14 or 30 days to change their mind about having invested in a pension was considered for the purpose of comparison. In practice, however, an extremely small number of people use the cooling off period and therefore pension providers currently use a manual process to deal with these requests. By contrast it is likely that automated processes would be employed for individuals opting out after 2012 and therefore the cooling off period was not considered by providers to be an appropriate analogy to use.

Instead, during interviews with providers, we discussed the different components of the process in order to establish the expected cost of each step. Given the process described for auto-enrolment, all interviewees agreed that the initial set up cost would need to be incurred. In addition to this some providers indicated that the process could be considered to be similar to that of retirement or transfer when funds are returned. A small number of providers were then able to offer an estimate of the cost of the whole de-enrolment process.

---

<sup>5</sup> At the time of the fieldwork for this research, only consultation on the first set of pension regulations had taken place (spring 2009). Subsequently government has consulted on the second set of pension regulations (autumn 2009) and published a response to the consultations on the first set of pension regulations. These include changes to the regulations which DWP intends to minimise refunds.



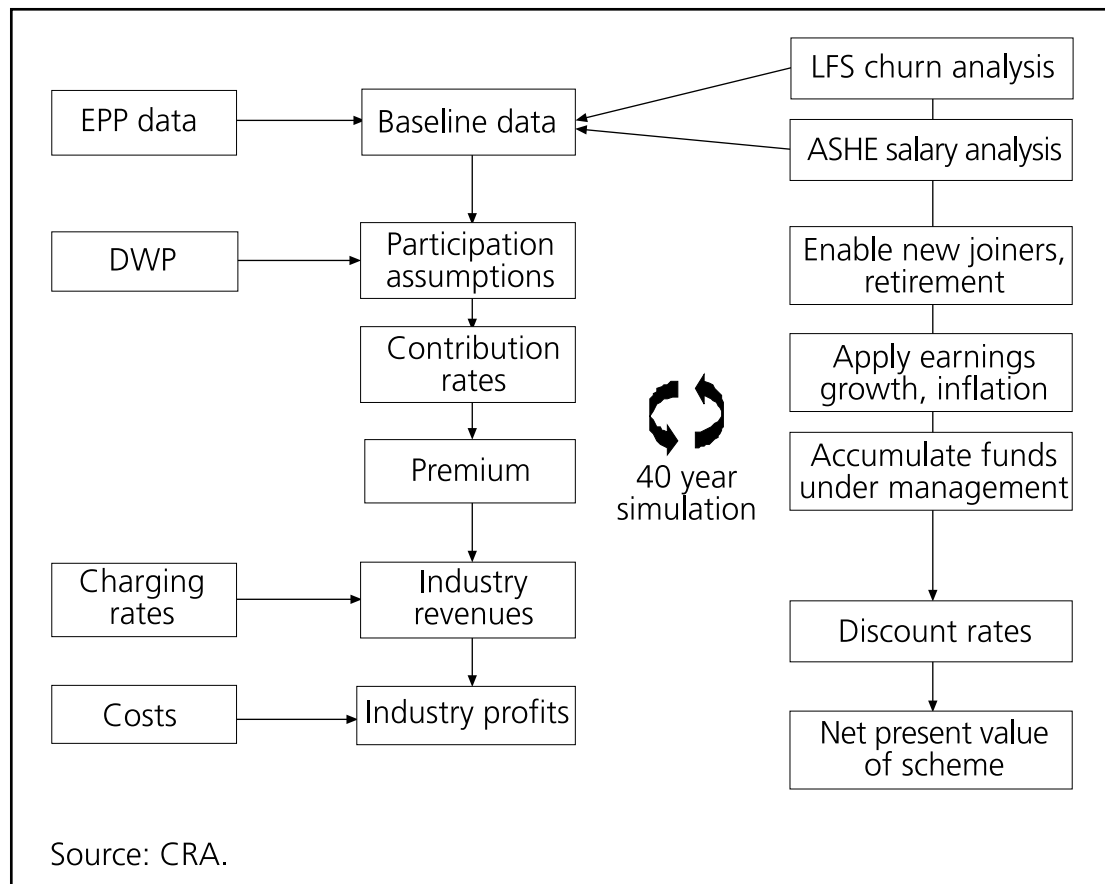
# 3 Model construction and functionality

Charles River Associates (CRA) was asked by the Department for Work and Pensions (DWP) to construct the model in order to assess the impacts of the workplace pension reforms on the market at the level of the individual firm. The model is constructed in the way to assess the profitability for a private sector pension provider to provide workplace pension to individual firms which may or may not already have pension schemes in place.

## 3.1 Model structure

The model assesses individually the profitability of providing workplace pension to each of the 2,360 firms recorded in the Employers' Pension Provision Survey (EPP) survey, based on the merged baseline dataset from the EPP, Annual Survey of Hours and Earnings (ASHE) and Labour Force Survey (LFS) data, as well as the results of the cost survey and a number of assumptions which are explained in Section 3.2. Figure 3.1 illustrates the structure of the model.

Figure 3.1 Model structure



The baseline dataset feeds into the model as input data providing information on key variables such as the number of employees in the firm, whether they are in any pension schemes, the level of salaries, current participation and contribution rates etc. This, together with the assumptions on the participation and contribution rates provided by DWP, gives the total contributions. Over time these contributions accumulate as assets under management with investment returns also applied in the model.

Over the lifetime of the pension scheme, many new employees will join the firm and the pension scheme, and many existing employees may change job or retire. Assumptions are therefore needed about the funds that are transferred out over time. In addition, earnings and other factors need to be updated over time by earnings' growth or inflation. Detailed assumptions are set out in Section 3.2.

The revenue is then calculated based on the assumptions regarding charging structures and levels set by DWP (which can be easily changed in the model). The cost survey provides information on the costs of providing a workplace personal pension to individual firms by size. Taking all the factors above into account, we calculate the profit of pension provision of each year of the scheme life and discount it to find the net present value (NPV). It is this NPV calculation which determines whether it is profitable to provide the workplace pension to the firm.

The NPV calculation has been performed over a 40 year period. Given the level of discount rate which has been used, extending the period makes minimal difference to the calculation as results from years further in the future are discounted back to very small numbers in today's value.

This process is then repeated for each of the 2,360 firms in the EPP survey. Using the weightings from the EPP it is then possible to calculate a profile for the whole market.

The model has been built in Excel for ease of use by DWP staff and uses Visual Basic for Applications (VBA) to perform calculations quickly.<sup>6</sup>

Details of the calculations in the model can be found in Appendix C.

## 3.2 Assumptions

There are a number of assumptions which are embedded in the model and which we describe below.

### 3.2.1 Structural assumptions

#### *New scheme*

It is important to note that the model is aimed at assessing whether or not it is profitable for private sector providers to offer a new pension to a particular type of firm and not whether it is worth continuing to offer, or to expand, existing pensions. When the company already has pension schemes in place, it is assumed that they will be replaced by the new scheme if the existing schemes are considered contestable (see Section 3.2.2).

#### *Schemes in equilibrium*

For the purpose of simplification, the sizes of all firms are assumed to be stable, that is, the number of employees of the firm stays stable over time. Every year, a number of employees leave the firm based on the job churn rates we calculated from the LFS data. Meanwhile, the same number of employees joins the firm, making the total number of employees of the firm stay stable. In addition, the characteristics of those joining the firm are assumed to be the same as those leaving the firm (including in respect of their likely pension participation and contribution rates). In this way, the characteristics of the firm and its employees remain stable over time.

#### *Eligibility*

Under the Government's pension reforms, employees with a salary less than £5,035 or who are younger than 22 do not need to be auto-enrolled, hence in

---

<sup>6</sup> This is a programming language which has been used in the model in order that the calculations undertaken in the model are performed quickly.

the model those employees meeting these criteria who are not already members of a pension scheme are not auto-enrolled in the model. Employees who are already members of existing pension schemes are all automatically considered to be members of the new pension scheme (assuming it is contestable). The model does not consider ineligible employees who choose to opt in, or voluntary savers.

#### *Transfer in or out*

Labour mobility is not unusual – according to the LFS data, about ten per cent of the labour force change their jobs each year. When people leave a firm, they may transfer out the pension funds they have accumulated in the pension scheme provided by the firm and transfer the funds into the pension scheme that is provided by the new firm that they are going to join.

Since the model is constructed at the firm level and not the individual level, including transfers in and out was considered an unnecessary complication for the model. Furthermore, in the majority of cases where individuals change employer, pensions are not transferred. Therefore, for the purpose of simplification, the model does not assume that there are any transfers in or out at the point of job change. Instead, the fund is assumed to be left under the management of the previous pension provider, i.e. the individual goes paid up and there are no more contributions made by employees.

The exception to this is in the case of retirement where a proportion of the accumulated assets under management are taken out. The proportion of funds which is transferred out depends on the average age of employees at the firm in question since this determines the number of employees who reach retirement each year.

### **3.2.2 Assumptions with user flexibility**

In this section we set out the assumptions on various aspects of the model in which there is some user flexibility. The user does not have the ability to change the underlying structure of the model but set different parameters within the model such as the level of charges, contribution rates and which part of the market is being considered.

#### *Contestable market*

Companies may or may not already have pension schemes in place. If they do already have pension schemes, these could be any combination of Defined Benefit (DB), Defined Contribution (DC), Group Personal Pension (GPP) or Group Stakeholder Pension (GSHP). When considering the profitability of a new workplace personal pension, it is therefore important to assess which part of the pension market is under consideration. There is user flexibility in setting whether or not firms that already have different types of pension provision are considered to be contestable in terms of selling the new pension. For example, the user can set whether or not firms that already have a GPP represents a contestable firm to which the new pension can be sold.

If a particular type of pension is considered to be contestable then all of the members of that pension scheme are assumed to take out the new workplace pension. If a particular type of pension is not contestable then the members of that pension are assumed to stay within the existing pension and do not join the new workplace pension.

### *Participation*

Assumptions on participation vary between the pre 2012 baseline model and post 2012 scenarios.

#### **Pre 2012**

In the pre 2012 scenario, the model assesses the profitability of workplace pension provision in the current world before the 2012 pension reforms. Firms are categorised into two types:

- companies that do not currently have any pension schemes (unpensioned companies); and
- companies that already have at least one of these pension schemes in place (pensioned companies).

In this scenario, if the company is currently unpensioned, the employees are assumed to join the scheme at a rate equal to the average participation rate of employees in that industry. This participation rate is based on companies that have only GPP schemes in place as shown in Table 2.1.

If the company already has a DB, DC, GPP or GSHP scheme in place (i.e. is a pensioned company), employees who are currently not in any of these schemes are assumed to continue to not participate in a workplace pension scheme and therefore would not join the new workplace pension scheme.

Members of DC, GPP and GSHP schemes, respectively, will all join the new GPP scheme (if their scheme is considered to be part of the contestable market). If the scheme is not considered to be part of the contestable market, none of them will join.

Since DB schemes are fundamentally different in structure and typically offer value in excess of these seen generally seen in defined contribution schemes, it is not appropriate to assume that they would join the new workplace personal pension. For this reason, if the DB scheme is considered to be contestable, DB members will only join the new GPP scheme at the average participation rate of employees in GPP schemes in that industry.

#### **Post 2012**

In the post 2012 pension world, employees will be automatically enrolled into a pension scheme. Auto-enrolment does not apply to employees with a salary less than £5,035 or those who are younger than 22 years old, although such employers can opt in, they are ineligible for auto-enrolment so not considered in the model.

For un pensioned companies, eligible employees will join the new scheme at a participation rate set by the user which can be split by firm size and industry sector.

Non-members in pensioned companies (i.e. employees who are currently not in any pension scheme) join the new scheme at a participation rate which is set by the model user. These participation rates can be set by firm size and industry and can be set at a different rate to the participation rates that apply for un pensioned companies.

Existing members of DC, GPP and SHP schemes will all enter the new GPP scheme if their previous scheme is considered as part of the contestable market or none of them will join the new scheme if the existing scheme is not considered to be part of the contestable market. If DB schemes are considered to be contestable, DB members will only join the new GPP scheme at the average participation rate of employees in GPP schemes in that industry.

### *Contribution rates*

As with the participation rates, the assumptions on employee and employer contributions also vary between the pre 2012 baseline model and the post 2012 scenarios.

#### **Pre 2012**

For employees in un pensioned companies, contribution rates (both employee and employer) are assumed to be at rates equal to the average GPP contribution rates of employees in that industry (set out in Table 2.2).

For pensioned companies, members of DC, GPP and SHP schemes (if contestable) will carry on contributing at the same level as before for both employee and employer contributions.

DB members, if contestable, contribute at the average contribution rates for GPP schemes in that industry.

#### **Post 2012**

For un pensioned companies, the user can either:

- set both employee and employer contribution rates equal to the current average GPP contribution rates; or
- enter their own figures for contribution rates by firm size and industry, e.g. using the minimum rates set out under auto-enrolment.

For pensioned companies, if the current participation rate of the company is below the participation rate hurdle level set by the user, all new GPP members will contribute at the level set by the user for both employer and employee contributions. Alternatively, if the current participation rate is above the hurdle level, existing pension members either:

- carry on contributing at the existing level for both employer and employee contributions; or
- contribute at the rates set by the user if this is higher than the existing rates.<sup>7</sup>

### *Charging structure*

The model contains flexibility regarding charges giving the user the ability to set both the charging structure and the level of charges applied.

### *Summary of flexibility in scenario structures*

The model provides the user with a high degree of flexibility in scenario analysis. The key elements where the user has flexibility are:

- contestability: the user can choose whether members of DB, DC, GPP, GSHP schemes in pensioned companies are contestable, i.e. whether these members would join the new workplace pension scheme or whether they would remain in their existing schemes;
- charging structure: the user has flexibility over both the structure and level of charges;
- contribution rates: the user can decide in the post 2012 world whether currently unpensioned companies will contribute at the current industry average level or at rates set by the user;
- participation rate hurdle: the user can set the hurdle rate above which companies continue to use their existing contribution rates rather than using those entered by the user (assuming the former are above the latter);
- participation rates: the user can set participation rates for pensioned and unpensioned companies. These apply to the currently unpensioned individuals in these companies (since existing members of a contestable scheme are always assumed to join the new pension); and
- costs of pension provision: the user can choose to use the cost calculations which have resulted from our survey or to set out their own estimates of costs of provision.

### *Results*

Profitability is calculated at the level of the individual firms. The model can produce a range of different types of results. Some of the ways in which the results can be examined include:

- profitability by firm/segment: the model calculates the number and proportion of profitable firms by segment;

---

<sup>7</sup> When there are multiple 'largest' schemes, the contribution rate of the largest contestable scheme with the highest contribution rate is used.

- level of profitability: the model can also provide estimates of the level of profitability although this needs to be interpreted with care since in practice very high profits will be competed away;
- realised participation rate: in the post 2012 world, the user defined participation rates lead previously unpensioned employees to be auto-enrolled. As such, the model can be used to calculate a realised participation rate.

### 3.3 Ongoing development

Given the short timescales in which the model was developed, there are a number of areas of modelling where simplifications have been made and where extensions could be made in the future. The model has been designed with a very flexible structure and where further development of the model by DWP would be relatively straightforward. Some of the potential areas that could be developed are set out below.

#### *Existing schemes*

In this stage of the work, we have provided a model which sets out how different charging structures impact the profitability of serving different employers. The model does this from the perspective of setting up a new pension scheme. Therefore, the model does not consider the ongoing provision of existing schemes.

The model could be extended to separately examine information on existing schemes in order to identify where it would be profitable for providers to extend existing arrangements to additional employees.

#### *Transitional and staging arrangements*

Pension reforms will commence in 2012 but responsibilities regarding the employer duty and the default contribution rates will be phased in over time. The impact of the phasing of contribution rates will have an impact on provider profitability if employers make contributions at the minimum level required under the reforms. As such, there are likely to be some firms which are currently identified in the model as being profitable but which in practice may only be profitable for providers setting up schemes once the eight per cent minimum contribution level has been reached. Currently, the model does not take into account issues connected with the transition and staging arrangements, but could be extended in this way.

# Appendix A

## Job churn analysis

This section sets out the results of the job churn analysis. As explained in Section 2.4, analysing the Labour Force Survey (LFS) data at the level of sector, firm size and gross salary band leads to some very small sample sizes for some segments. As such the results from this methodology were not considered to be robust. Instead, we use the data broken down by sector and firm size (sample sizes are still reasonably high at this level), and then we use the aggregate churn figures by salary to break down these results further by salary band as well.

We set out the results of this for each sector in Table A.1 to Table A.9. Each table shows the proportion of employees who change job each year by firm size and their salary band.

**Table A.1 Job churn for agriculture, hunting and forestry plus fishing plus other community, social and personal by firm size and salary band**

Firm size	Less than £5,035	£5,035-£33,540	Greater than £33,540
	%	%	%
1 to 10	16	16	12
11 to 19	16	16	12
20 to 24	15	14	11
25 to 49	19	19	14
50 to 249	16	15	12
250 to 499	12	12	9
500 or more	11	10	8

Source: Charles River Associates (CRA) analysis.

**Table A.2 Job churn for mining and quarrying plus manufacturing plus electricity, gas and water supply by firm size and salary band**

<b>Firm size</b>	<b>Less than £5,035 %</b>	<b>£5,035-£33,540 %</b>	<b>Greater than £33,540 %</b>
1 to 10	16	16	12
11 to 19	19	19	14
20 to 24	14	13	10
25 to 49	15	15	11
50 to 249	15	15	11
250 to 499	14	13	10
500 or more	10	9	7

Source: CRA analysis.

**Table A.3 Job churn for construction by firm size and salary band**

<b>Firm size</b>	<b>Less than £5,035 %</b>	<b>£5,035-£33,540 %</b>	<b>Greater than £33,540 %</b>
1 to 10	20	20	15
11 to 19	21	21	15
20 to 24	19	19	14
25 to 49	20	20	15
50 to 249	16	16	12
250 to 499	12	12	9
500 or more	14	14	10

Source: CRA analysis.

**Table A.4 Job churn for wholesale, retail and motor trade by firm size and salary band**

<b>Firm size</b>	<b>Less than £5,035 %</b>	<b>£5,035-£33,540 %</b>	<b>Greater than £33,540 %</b>
1 to 10	19	19	14
11 to 19	22	22	16
20 to 24	20	20	15
25 to 49	21	21	15
50 to 249	18	18	13
250 to 499	14	14	10
500 or more	12	12	9

Source: CRA analysis.

**Table A.5 Job churn for hotels and restaurants by firm size and salary band**

Firm size	Less than £5,035	£5,035-£33,540	Greater than £33,540
	%	%	%
1 to 10	29	28	21
11 to 19	33	32	24
20 to 24	32	31	23
25 to 49	29	29	21
50 to 249	23	22	17
250 to 499	28	27	21
500 or more	19	18	14

Source: CRA analysis.

**Table A.6 Job churn for transport, storage and communication by firm size and salary band**

Firm size	Less than £5,035	£5,035-£33,540	Greater than £33,540
	%	%	%
1 to 10	16	16	12
11 to 19	20	19	14
20 to 24	12	11	8
25 to 49	20	19	14
50 to 249	15	15	11
250 to 499	15	14	11
500 or more	10	9	7

Source: CRA analysis.

**Table A.7 Job churn for financial intermediation by firm size and salary band**

Firm size	Less than £5,035	£5,035-£33,540	Greater than £33,540
	%	%	%
1 to 10	17	17	12
11 to 19	12	11	8
20 to 24	14	14	11
25 to 49	14	14	10
50 to 249	14	14	10
250 to 499	14	14	10
500 or more	12	12	9

Source: CRA analysis.

**Table A.8 Job churn for real estate, renting and business activities by firm size and salary band**

Firm size	Less than £5,035	£5,035-£33,540	Greater than £33,540
	%	%	%
1 to 10	18	18	13
11 to 19	17	16	12
20 to 24	18	17	13
25 to 49	18	18	13
50 to 249	16	16	12
250 to 499	16	15	12
500 or more	14	14	10

Source: CRA analysis.

**Table A.9 Job churn for education plus health and social work by firm size and salary band**

Firm size	Less than £5,035	£5,035-£33,540	Greater than £33,540
	%	%	%
1 to 10	14	13	10
11 to 19	12	11	9
20 to 24	12	11	8
25 to 49	11	10	8
50 to 249	10	10	7
250 to 499	10	10	7
500 or more	7	7	5

Source: CRA analysis.

# Appendix B

## Cost survey

The structure of the cost survey is set out as below. Each category of the costs is broken down into five bands according to the number of members of the pension scheme: 1-4, 5-49, 50-249, 250-499 and 500 plus.

### Set up costs

- Set up cost per scheme (£).
- Cost of initial advice (percentage of first year contributions).
- Set up cost per member (£).

### Ongoing costs

- Ongoing cost per scheme (£).
- Ongoing cost of advice (percentage of contributions).
- Ongoing cost of contributing individual (£).
- Ongoing cost of non-contributing (paid-up) individual (£).
- Fund management cost (percentage of assets under management).



# Appendix C

## Model calculations

There are a number of calculations which are contained within the model.

For each year of scheme life there are calculations related to:

- contributions;
- revenue;
- ongoing costs;
- set up costs; and
- profit.

The following abbreviations are used:

- Annual Management Charge (AMC);
- Funds under Management (FUM).

### Contributions

Gross Contribution = Number of Employees \* Participation Rate \* Pensionable Pay \* Contribution Rate \* (1 + Earning Growth) ^ (Year - 0.5).

Net Contribution = Gross Contribution \* (1 – Contribution Charge).

Average Contribution = Gross Contribution / Members of Pension Scheme.

### Revenue

Revenue from Contribution Charge = Gross Contribution \* Contribution Charge.

Revenue from AMC = FUM in current year \* AMC.

Total revenue = Revenue from Contribution Charge + Revenue from AMC.

In which:

FUM of current year = (FUM of previous year + Net Contribution in current year) \* (1 + Investment Return) ^ 0.5 \* (1 - AMC) \* (1 – Proportion of funds annuitised).

## Ongoing costs

Total Ongoing Costs = Ongoing Cost of Advice + Ongoing Cost of Contributing Individuals \* (1 + Inflation Rate) ^ (Year – 1) + Ongoing Cost of Paid-up Individuals \* (1 + Inflation Rate) ^ (Year – 1) + Cost of Levy \* (1 + Inflation Rate) ^ (Year – 1) + Ongoing Cost of De-enrolment \* (1 + Inflation Rate) ^ (Year – 1) + Ongoing Cost of New Joiners \* (1 + Inflation Rate) ^ (Year – 1) + Ongoing Cost of Fund Management.

In which:

Ongoing Cost of Advice = Gross Contribution \* Ongoing Cost of Advice Percentage.

Ongoing Cost of Contributing Individuals = Total Members of Pension Scheme \* Ongoing Cost of Contributing Individuals per Individual.

Ongoing Cost of Paid-up Individuals = (Number of Paid-up Individuals from previous year + Number of Paid-up Individuals in current year) \* Ongoing Cost of Paid-up Individuals per Individual.

Ongoing Cost of De-enrolment = Number of Employees \* Job Churn Rate \* (1-Participation Rate) \* Cost of De-enrolment per Individual.

Ongoing Cost of New Joiners = (Set up Cost of Contributing Individuals per Individual + Average Contribution \* Set up Cost of Advice Percentage) \* Number of New Joiners in current year.

Ongoing Cost of Fund Management = FUM \* Fund Management Cost.

## Set up costs

In addition to the Total Ongoing Costs, the first year also incurs set up costs.

Total Set up Cost = Scheme Set up Cost + Set up Cost by Individual + Set up Cost of Advice.

In which:

Set up Cost by Individual = Pension Members \* Set up Cost by Individual per Individual.

Set up Cost of Advice = Pension Members \* Pensionable Pay \* Contribution Rate \* (1 + Earning Growth) ^ 0.5 \* (1 – Contribution Charge) \* Set up Cost of Advice Percentage.

## Total costs

Total Cost = Total Ongoing Costs + Total Set up Cost.

## Profit

Present Value of Net Profit = (Total Revenue – Total Cost) / ((1 + Discount Rate) ^ (Year - 0.5)).

Net Present Value (NPV) = Sum of present value of net profit for all years.

