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Review of the DWP Cost Benefit Framework and how it has been applied.

David Greenberg
Genevieve Knight

A report of research carried out by the Policy Studies Institute on behalf of the Department for Work and Pensions

Department for Work and Pensions

Working Paper No 40

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Acknowledgements

The Authors

David Greenberg is a labour economist who received his PhD at MIT in 1966. Much of his research focuses on the evaluation of government programmes that are targeted at the low-income population, especially public assistance, employment, welfare-to-work and training programmes. He is a professor emeritus of economics at the University of Maryland Baltimore County (UMBC). Before coming to UMBC in 1982, he worked for the Rand Corporation, SRI International, and the US Department of Health and Human Services. In 1996 he spent the year as a visiting professor at the Budapest University of Economic Science; in 2000 he spent the year as a visiting professor at the Centre for Research in Social Policy at Loughborough University in the UK; and in 2002 he worked as a labour market analyst at the Prime Minister's Strategy Unit within the British Cabinet Office.

Genevieve Knight is a Principal Research Fellow at the Policy Studies Institute (PSI). She completed her Ph.D. in Economics in 2003 with the University of Sydney, with a thesis examining the issues in applied evaluation of active labour market programmes. A range of labour market issues have been the main focus of her research. She has worked with PSI since 1998 and has undertaken a broad range of evaluation research. Before PSI, she worked at the Centre for Economic Performance at the London School of Economics, and before this worked in Canberra, Australia at the Australian Bureau of Statistics and on various academic research projects in Sydney.

Abbreviations and acronyms

Additionality	Additionality refers to effects that are attributable to a programme and, therefore, would not occur in the absence of the program. Thus, without additionality there would be no programme benefits and costs.
AME expenditures	AME expenditures include payments such as those for training subsidies and transportation reimbursements. (AME refers to Annually Managed Expenditures.)
CBA	Cost-Benefit Analysis attempts to quantify, in monetary terms, the value of as many of the consequences of these programmes as possible to determine whether their benefits outweigh their costs.
CBF	Cost Benefit Framework provides guidance on how Department for Work and Pensions (DWP) cost-benefit analyses should be conducted and reported.
Cost-effectiveness	Cost-effectiveness pertains to programme benefits relative to programme costs, usually expressed as the pounds of benefits per pound invested.
DEL-A expenditures	DEL-A expenditures include the administrative costs incurred by DWP in running programmes. (DEL refers to Departmental Expenditure Limit.)
DEL-P expenditures	DEL-P expenditures include the costs of the contracted-out provisions of programmes.

DWP	Department for Work and Pensions.
Deadweight losses	Deadweight losses are reductions in economic welfare that result from distortions to economic incentives. These distortions are most often attributable to taxes or subsidies.
Displacement effects	Displacement effects occur if a firm expands at the expense of other firms because its employment costs are subsidised by the government.
Distributional weights	Distributional weights attempt to adjust benefits and costs for the possibility that a pound that is received by a low income household may be of greater value than a pound that is received by a high income household.
Employment and training programmes	Employment and training programmes provide services (e.g. job search, training, and subsidised jobs) to non-workers on benefits to help them move into paid employment.
IB	Incapacity benefits are cash benefits available to disabled persons and persons with health problems who are not working or who are working only a few hours.
Impacts	Impacts are programme effects (e.g. on employment and benefit receipts) on programme participants.
IS	Income Support is a non-contributory, income-assessed benefit available to people who are not required to work.
JSA	Jobseeker's Allowance provides cash benefits to unemployed persons who are actively seeking work.
Micro-simulation model	Micro-simulation models use data on individuals (i.e. micro-data) to predict how changes in government programmes will affect individuals and what the changes will cost the government.

Multiplier	Multiplier is a value greater than one that is used to adjust estimates of expenditures if it is expected that they generate benefits to the economy that exceed their immediate value.
NDDP	New Deal for Disabled People is a voluntary programme that provides counselling and services through Job Brokers to help the disabled and people with health problems enter employment.
NDLP	New Deal for Lone Parents is a voluntary programme that provides counselling and services through Jobcentre Plus to help unemployed and economically inactive lone parents enter employment.
Net benefits	Net benefits are the benefits of a programme less the costs of the programme.
Product market corrector	Product market corrector is a value greater than one that is used to adjust estimates of programme impacts on earnings when the social value of the output workers produce exceeds their wages.
Scale problems	Scale problems pertain to difficulties that arise in comparing the cost-effectiveness of programmes of greatly different sizes.
Sensitivity tests	Sensitivity tests are used to determine how estimates of benefits and cost change when the assumptions on which they are based are changed.
Substitution effects	Substitution effects occur if participants in a programme take jobs that individuals who did not participate would otherwise have held.

Summary

Aims and research methods

The Department for Work and Pensions (DWP) developed the Cost Benefit Framework (CBF) guidance in an attempt to systematically assess the relative and actual cost-effectiveness of its policies and programmes in a consistent way. The primary purpose of the framework is to try to ensure that public funds are spent efficiently so that they generate the greatest net benefits to society. The framework was developed in consultation with analysts from across DWP, as well as representatives from Her Majesty's Treasury (HMT), Department of Trade and Industry (DTI), Department for Education and Skills (DfES) and the academic and evaluation sectors.

In 2006, DWP reviewed its employment programmes during the Comprehensive Spending Review and tried to apply the CBF guidance across all employment programmes for the first time, to look at the comparative cost-effectiveness of programmes using data on costs and performance in 2004/05. This analysis, which reported cost-effectiveness ratios for each studied programme, has not been published externally. Following the experience of trying to apply the CBF for the first time, the Department internally reviewed how effective the exercise had been and has been implementing several revisions to the CBF guidance to improve its cost-benefit analyses (CBAs). The objective of this report is, therefore, to critically review the CBF and suggest possible improvements in analyses conducted under it.

A critical review was made of all the pertinent written DWP documents provided to us by the project manager. These included the draft CBF guidance itself, the 2004/05 and 2005/06 CBA results that were available at the time this report was being written (March 2007), internal CBF guidance review documents and available league tables. The review examined these and assessed how improvements could be made to these in the short term. In addition, on specific points that arose from the review of DWP documents, the cost-benefit literature was addressed. In particular, the review attempted to examine how to improve the consistency of the evaluation evidence base for programmes in order to improve comparability across the CBAs. To inform the review further, interviews were made with DWP analysts who are involved with the CBF cost-benefit studies.

Key findings and conclusions

The report discusses a number of steps that might be taken to improve the CBF guidance and the underlying CBAs. The CBAs that are being conducted with the CBF guidance are improving over time. The purpose of this report is to contribute to this improvement.

The CBF guidance and internally produced CBAs were lacking complete and up-to-date detailed documentation on how the estimates were produced, and it was stated that this was due to the lack of time available for their production. This reduced both the consistency across the CBAs and the ability to assess the CBA and the steps involved in producing estimates. This documentation should include formulations, data sources, judgements and assumptions made, sensitivity analyses applied and a discussion of any weaknesses in evidence. A key recommendation is to ensure that for all CBAs, documentary evidence describing the CBA steps is produced as part of their construction, and that it is maintained for any subsequent alterations.

Also, the CBF guidance should specify clearly how the number of additional jobs should be determined, for both the cases where net impacts on employment and benefits are available and when they are not available. Detail on the process of determining the average wage paid at the jobs where former programme participants are employed should also be added to the CBF guidance.

The remainder of the recommendations are summarised with an indication distinguishing those with the highest priority in our opinion, and those with lower priority. The ease and speed with which these can be implemented is also indicated. Of the high priority recommendations, only three would take a long time to implement; those that remain are relatively easy and quick to implement. The high priority recommendations are listed here. The lower priority recommendations are not listed here but can be found in the conclusions.

High priority/short-term recommendations

- Apart from ensuring net impact estimates on employment are made available for programmes as much as possible, where net impact estimates are missing, documentation should be produced on the formulation and data sources, judgements and assumptions of any substitute information made as part of the CBA, and sensitivity analyses applied, together with discussion of the implications of the weak evidence base for the CBA, when substitutions are made for net impacts (Section 2.3).

- When estimates of impacts on employment exist for multiple time periods, use the largest one for determining the number of additional jobs resulting from employment and training programmes (Section 2.4).

- When the impact on net earnings is unavailable for a programme, the substitute information that is used instead should be carefully documented and sensitivity analyses applied, together with a discussion of the implications for the CBA (Section 2.7).

- When certain benefits and costs are not incorporated into the estimates of net benefits, the implications of their omission need to be discussed in reporting the cost-benefit findings (Sections 3.1 and 3.2 and elsewhere).

- We do not recommend reporting estimates of the monetary values of programme impacts on difficult to monetise outcomes such as health, self-esteem, child-welfare, and life-satisfaction until reliable estimates of these impacts become available (Section 3.2).

- Drop the product market corrector that is currently used (Section 3.5).

- Do not use a multiplier in estimating net benefits unless unemployment rates are high (Section 3.6).

- Use Jobcentre Plus historical annual cost accounts for the year closest to the programme impact estimates (Chapter 4).

- Ideally, both programme benefits and costs should be measured after the programme has reached a steady state, but to the extent this is not feasible, exclude start-up or set-up costs in estimating programme costs (Section 4.1).

- Include Departmental Expenditure Limit administrative (DEL-A) costs from Jobcentre Plus annual cost accounts where they exist for a programme, and when including them in the CBA divide by the number of programme participants to get a measure comparable across programmes (Section 4.1).

- Report judgements, data sources and assumptions for cost estimates together with discussion of any weaknesses in evidence and the implications for the CBA (Section 4.1).

- In conducting sensitivity analyses, make alternative assumptions concerning the value of the loss of non-market time (i.e. 'leisure') that occurs when programme participants enter employment (Section 4.3).

- The likely importance or unimportance of general equilibrium effects should be discussed in presenting findings from the CBF CBAs (Section 4.5).

- Sensitivity tests should be conducted of estimated net benefits to see if programme ranking changes when alternative assumptions are made. Section 5.5 provides a suggested list of these tests.

- Strong consideration should be given to replacing the net-benefits-per-additional-job ratios that are currently used to rank programmes with net-benefits-per-participant ratios (Section 5.6).

- Although it is necessary to rank programmes on the basis of ratios, great care should be exercised in reporting and interpreting the resulting ranking because the ratios are inevitably subject to serious scale problems (Section 5.6).

High priority/middle- or long-term recommendations

• Net impacts should be estimated more often, ideally for all programmes, using valid evaluation designs to estimate employment impacts and impacts on being off benefits. Doing this necessitates timely consideration of the data requirements, particularly before the outset of a new programme (Section 2.1).

• It is important to allow job duration values that are used in the CBF CBAs to vary by target group in a way that reflects how they actually differ, even when the precise values are unknown (Section 2.6).

• When an early brief CBA exists, together with a later independent or more carefully constructed CBA for the same programme, then the former CBA should be compared and updated. This is already done on an ongoing basis and should continue (Section 5.4).

1 Introduction and background

1.1 Background

CBA is a tool that has often been used to assess Government-funded social programmes such as those that try to move individuals from benefit programmes into work. It attempts to quantify, in monetary terms, the value of as many of the consequences of these programmes as possible to determine whether their benefits outweigh their costs from a societal point of view and, hence, whether the programme is economically efficient. It can also be used to indicate whether the programme improves the well-being of those who participate in it and what the net effect of the programme is on the government's budget. In addition, it can be used to rank programmes from each of these three perspectives – that is, from the point of view of society as a whole, the government and the programme participant. CBA can be conducted prior to introducing a programme to help determine whether the benefits from the programme are likely to exceed its costs or after the programme is underway, to help determine whether more or fewer resources should be spent on it.[1]

The DWP has developed CBF guidance that it uses to conduct CBAs of its policies and programmes. The CBF guidance is usually applied to ongoing programmes and the focus is usually on two of the three perspectives mentioned above – the social (or economy-wide) perspective and the Government (or fiscal or Exchequer) perspective. The framework is used to attempt to rank DWP programmes in terms of their relative cost-effectiveness in a systematic and consistent way. The primary purpose of doing this is to help ensure that public funds are spent efficiently so that they generate the greatest net benefits to society. The framework was developed in consultation with analysts from across DWP, as well as representatives from HMT, DTI, DfES and the academic and evaluation sectors.

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[1] For greater detail on the uses of cost-benefit analysis, as well as the methods involved in applying it and issues concerning its application, see HM Treasury's *Green Book* (2003) and Boardman (2006).

The focus of DWP's CBF guidance is entry into employment. This is the critical success factor by which most DWP active labour market programmes are judged[2]. The CBF guidance focuses on the net impact of programmes, i.e. it is only concerned with the benefits arising from job entries that would not have happened in the absence of the programme. Thus, DWP's CBF guidance uses two main measures of cost-effectiveness: (a) net benefits to the Exchequer that result from additional jobs; and (b) net benefits to the economy that result from additional jobs. Both these measures are intended to be indicative and are not meant to be considered in isolation but interpreted alongside other evidence. In general net benefits to the Exchequer are easier and more straightforward to estimate than the broader net benefits to the economy. Appendix B gives more details about these measures.

In 2006 DWP reviewed its employment programmes to inform policy decisions around priorities during the Comprehensive Spending Review. As part of this work, DWP tried to apply the CBF guidance across all employment programmes for the first time to look at the comparative cost-effectiveness of programmes using data on costs and performance in 2004/05. Due to the timescales involved this work was done quickly and consequently had to rely upon readily available evidence to inform its assumptions and produce the estimates. This was an acknowledged limitation of the work given that the available evidence varies considerably between programmes. In light of this, analysts in the Department were keen not to read too much into the detail but to consider only the broader messages emerging from the results and how these might be interpreted alongside other evidence. The analysis, which was based on league tables that reported cost-effectiveness ratios for each studied programme, has not been published externally.

Following the experience of trying to apply the CBF for the first time, the Department internally reviewed how effective the exercise had been and has been implementing several revisions to the CBF guidance to improve its CBA. The Department also considered this an opportune time to seek independent expert advice to report on the work to date, the improvements being made as well as the ways in which we might improve the framework further in the medium- to longer-term.

The objective of this report is to critically review the CBF guidance and suggest possible improvements in analyses conducted under it. The review critically assesses the way in which the CBF guidance has been applied. It also reviews the Department's current effort to update and refine its cost-benefit estimates. The appropriateness of the revisions being made to the methodology is assessed and recommendations are made about how these estimates can be improved in the short-term using existing evidence. Finally, the review considers how the CBF and the way it is applied can be enhanced by improving the quality and consistency of the evidence on which it relies. The report does not attempt to assess how

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[2]   Although programmes may have a number of operational and intermediate objectives, the ultimate objective of all DWP Active Labour Market Programmes is movement into work.

successfully the CBF guidance has been applied so-far, as this cannot be done in the absence of comparing the CBF CBAs with independent CBAs of the same programmes that have not been subject to similar time and resource constraints. Thus far, very few such analyses exist. It is clear that the CBAs that are being conducted with the CBF guidance are improving over time. The purpose of this report is to contribute to this improvement.

1.1.1 A cost-benefit accounting framework

Most of the CBAs conducted under the CBF guidance are of programmes involving some combination of counselling, training, job placement, and subsidised employment. In this report, we refer to these programmes as 'employment and training programmes', although they are also often called 'welfare-to-work' programmes.

The basic CBA accounting framework that is used today in conducting most CBAs of employment and training programmes, was originally developed during the late 1960s and refined in the early 1980s. A stylised version of this framework appears in Table 1.1. Although details concerning the specifics of the framework must vary somewhat from one programme to another, depending upon the specific nature of the services provided, the table lists those benefit and cost components that are typically measured.

Table 1.1 Stylised CBF of employment and training programmes

	Society (A) (B + C)	Participant (B)	Taxpayer or Government (C)
Output produced by participants			
Gross earnings	+	+	0
Fringe benefits	+	+	0
Participant work-related expenditures			
Tax payments	0	-	+
Expenditures on child care, transportation, etc.	-	-	0
Use of transfer programmes by participants			
Benefit payments	0	-	+
Program operating costs	+	0	+
Use of support programmes by participants			
Support services received by participants	-	0	-
Allowances received by participants	0	+	-
Support programme operating costs	-	0	-

In Table 1.1, plus signs indicate anticipated sources of benefits and minus signs anticipated sources of costs from different perspectives. The first column (A) shows aggregate benefits and costs from the perspective of society or the economy as a whole. The remaining columns show the distribution of benefits and costs to the two groups that are typically relevant in assessing employment and training programmes: participants or clients served by the demonstration program (B); and taxpayers who pay for the programme (C). This last perspective is identical to that of the government and is sometimes called the 'fiscal perspective'.

Benefits and costs that accrue to society are simply the algebraic sum of benefits and costs to participants and to taxpayers because society is the sum of these two groups. Hence, the table implies that if a programme causes benefit payments received by participants to decline, this should be regarded as a savings or benefit to taxpayers (or the Government), a cost to programme participants (albeit one that may be offset by earnings), and neither a benefit nor a cost to society as a whole but simply income transferred from one segment of the population to another. Costs to one group that are exactly offset by benefits to another group are often referred to as 'transfers' in CBAs.

The approach represented in Table 1.1 is consistent with the standard one used in CBA. In standard CBAs 'a pound is a pound', no matter to whom it accrues. Thus, in Table 1.1, a pound gained or lost by an employment and training programme participant is treated identically to a pound gained or lost by a taxpayer or to the Government. Consequently, if a programme caused the benefit payments received by participants to fall, this would be viewed as not affecting society or the economy as a whole because the loss to participants would be fully offset by benefits to non-participants in the form of reductions in Government budgetary outlays.

Typically, however, employment and training programme participants have much lower incomes, on average, than taxpayers. As discussed later in this report, a case can sometimes be made for treating the gains and losses of low-income people differently than those of higher-income people. This is almost never done in CBAs of employment and training programmes, however. Instead, as can be seen in Table 1.1, they simply lay out the results so that the distributional consequences of a particular programme can be observed.

Table 1.1 divides the benefits and costs associated with employment and training programmes into four major categories: The first two of these categories pertain to effects that result if a programme increases the work effort or productivity of participants – for example, by helping participants find private-sector employment through job search assistance. On the one hand, the value of the output they produce will rise, which should be reflected by increases in earnings and fringe benefits. On the other hand, if hours at work rise, expenditures on child care and transportation will also increase. And if earnings rise, tax payments will also increase. The third major cost-benefit category in Table 1.1 pertains to decreases in dependency on benefit payments that may result from an employment and training

programme. Such reductions in dependency should cause both the amount of payments distributed under benefit programmes and the cost of administering these programmes to fall. The fourth major category refers to expenditures on support services for programme participants. These expenditures include the operating costs of the programme being subjected to a CBA, as well as other costs that result from programme activities – for example, training at external organisations that is taken on the recommendation of programme advisers and allowances to cover child care expenses.

Three of the subcategories listed in Table 1.1 pertain to job-related expenditures and require clarification: participant expenditures on childcare, transportation, and so forth; support services received by participants; and allowances received by participants. The first of these subcategories refers to total job-required outlays by programme participants on such items as childcare, transportation, and uniforms. The sub-category of support services pertains to the direct provision of such goods by a Government agency, and the allowances sub-category refers to Government reimbursement of job-required expenditures by participants. Table 1.1 reflects the philosophy that all programme-induced increases in job-required expenditures should be treated identically: as resource costs to society engendered in producing goods and services. Of course, to the extent the Government directly provides support services to participants, client outlays for this purpose will be smaller. In a CBA, this would be reflected by a smaller expenditure amount appearing under the participant expenditures on job-related outlays and a larger expenditure amount appearing under the subcategory of support services received by participants.

Benefits and costs that are sometimes referred to as intangible effects but are rarely, if ever, actually estimated in evaluations of employment and training programmes do not appear in Table 1.1. Examples of intangible effects include the values of leisure foregone and satisfaction gained from the substitution of work for benefit payments. Almost by definition, such impacts are very difficult to measure. Somewhat more tangible, but also difficult to measure benefits of employment and training programmes, such as programme effects on health and crime, are also not included in the table. Later in the report, we discuss how these various difficult to measure effects might be treated in CBF CBAs.

1.2 Research methods

As part of our critical review of the CBF guidance, we examined all the pertinent written DWP documents provided to us by the project manager. These included the draft CBF guidance itself, the 2004/05 CBAs produced using the framework, 2005/06 CBA results that were available at the time this report was being written (March 2007), internal CBF guidance review documents and available league tables. The review examined the internal CBAs and assessed how improvements could be made to these in the short term. In addition, the general cost-benefit literature was examined on specific points that arose from the review of DWP documents. In particular, the review attempted to address the issue of how to

improve the consistency of the evaluation evidence base for programmes to increase comparability across the CBAs.

A number of interviews with DWP analysts who are involved with the CBF cost-benefit studies were conducted to inform the review further. These interviews took place over two days and were used to discuss and identify any generic issues that those interviewed found in implementing the CBF guidance, as well as recent proposed changes to it. They also helped us learn more about the procedures followed in conducting previous CBF CBAs. The DWP project manager suggested who should be interviewed, assisted in arranging the interviews and provided other relevant information. A set of pre-specified questions was used to establish consistency in the information gathered. These questions are shown in Appendix A. This exercise allowed us to obtain additional details concerning the CBAs previously carried out at DWP and helped establish an opinion base regarding the feasibility of improving the evidence for different programmes.

1.3   The report structure

The report sets out a number of key issues. The issues arising in estimating the additional earnings resulting from the implemented programmes are dealt with in Chapter 2. This is followed by an exploration of how to treat other programme benefits in Chapter 3. Estimating the additional costs from programmes is covered in Chapter 4. Chapter 5 contains a discussion of other issues that arise in constructing CBAs under the CBF. The report concludes with the set of recommendations arising from the review.

2 Issues in estimating additional earnings resulting from programmes

2.1 What is the best strategy for obtaining reliable impact estimates?

Reliable impact estimates form a key component in measuring the benefits from a programme. If the benefits of the programme are not to be overestimated, net impacts must be used rather than gross impacts. While gross impacts measure such outcomes as the earnings and benefit payments received by participants in employment and training programmes, net impacts provide estimates of the earnings increases and benefit payment reductions that **result from** participating in the programmes. See Section 3.1 for a discussion of the minimum impacts required for a meaningful CBA.

Most DWP employment programmes provide a variety of services that aim to improve the employment, hours or earnings of benefit recipient groups. Thus, an estimate of the net impact of a programme on employment or earnings is essential in conducting CBAs. Net impact estimation requires that differences in outcomes be measured – for example, employment with a programme and employment without the programme. The specific way in which the comparison is made to estimate an impact is the **evaluation design**.

There are a number of alternative evaluation designs, some of which provide better estimates than others. A basic set of alternative designs are described below in order of general design validity.

The most ideal design is an experimental one in which there is random allocation to either a programme participation group or a control group that does not receive

programme services. Random assignment helps ensure that the two groups can be directly compared in terms of various outcomes, such as earnings or employment, with any differences in these outcomes attributable to the programme. An important aspect of this experimental design is to ensure that baseline information is collected from the time of random assignment or before. In addition, follow-up information must be collected after random assignment. This allows evaluators to compare differences between the programme and control groups, both before and after the programme. It is also possible to compare outcomes only after the programme if baseline data was not collected. However, this does not allow for systematic differences between the programme and control groups that may exist even after random assignment[3]. It, therefore, relies heavily on random assignment to produce similar groups. If differences between the two groups arise from chance variation or a failure to implement random assignment properly, then the impact estimates that are produced will have lower validity[4].

Valid impact estimates can sometimes be produced with a non-experimental design that mimics the experiment described above. Such a design would involve comparing outcomes for a programme group with the same outcomes for a suitable comparison group[5] that does not experience the programme being evaluated. Ideally, both baseline and follow-up data on outcomes would be available. The baseline data help in statistically controlling for differences between the programme and comparison group that existed before the programme group entered the programme. However, the lack of random assignment means that it is difficult to properly deal with differences between the groups that may be unmeasurable (this is termed 'selection bias' in the evaluation literature) even with statistical adjustments. As in the case of an experimental design, in the absence of baseline data, it is possible to compare outcomes for only the post-programme period. However, the lack of baseline data means that any pre-existing systematic

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[3] Baseline data allows control for systematic differences between participants and non-participants that are observable and which existed before participation and are stable over time and remain so after participation. They also allow for unobservable differences which do not vary over time. The value of baseline data is applicable to the experimental design and the non-experimental design but more important for the latter.

[4] Note also that tests of the usefulness of the baseline data are important and usually check that the difference between the programme and comparison group is stable over time for some period before the programme, so that it might be inferred that the systematic difference is stable over time and continues into the post-programme period. If the baseline difference is not stable, it may not exist post-participation, which can also cause a bias in estimates if the baseline difference has been incorporated.

[5] Determining whether a comparison group is 'suitable' is an important consideration, which involves assessing the similarity of the groups to be compared.

differences between the programme and comparison group that affect the comparison cannot be accounted for. As a result, the estimated impacts can be biased.

Finally, it is also possible to conduct a before-after assessment of outcomes for a group of programme participants. This can be the most problematic design of those considered. Without a comparison group in the analysis, there is no accounting for what would have happened in the absence of the programme. In other words, change can occur over time without the programme. However, this design can be reasonably valid if non-programme factors are not expected to affect the outcomes of interest, or, in some cases, when the time period is short. Note that in choosing measures of the relevant data for a period before the programme began, it is important to consider how equivalent the baseline period is to the point in the labour market business cycle and characteristics of the programme period – and hence, it might be less valid to consider baseline information that was quite historical – for example, if the programme had been running for a long time.

The before and after design may be the best available if a suitable comparison group that does not experience the programme being evaluated does not exist. This might occur in the case of programmes that are implemented nationally for all areas at the same time. However, it is sometimes possible to stagger the introduction of a programme in a way that allows a comparison group to be drawn from the areas starting later. Alternatively, the group to which the programme is applied might be subdivided in some way so that the programme is introduced later for some of the subgroups. However, the suitability of the comparison group that results is an important consideration in determining whether this design can produce valid net impact estimates[6].

For a newly started programme, it is usually easier to select an evaluation design. But it is often difficult to develop an evaluation design that is appropriate for a programme that has been ongoing for a long time and that is universally available, and so this case is now considered. As for other cases, the most valid and reliable strategy is an experimental design, the first of those considered above. However, such a design may confront issues with legal entitlement to services – but where these issues are not present or when more people wish to participate in a programme than can be accommodated or when a programme is not reaching all of it's intended population, randomisation can be justified as a fair means of distributing programme services. One non-experimental alternative

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[6]   Note that programme participation or exposure should be carefully considered in selecting comparison groups – for example, evaluators need to consider whether they had reasonable access to information about the programme, whether they would be able to participate in the programme if they applied and whether they could be assessed as eligible for the programme. These factors can affect the suitability of the comparison group.

to an experimental evaluation in the case of a programme that has been ongoing for some time is to compare participants and non-participants, using statistical adjustments to control for differences between the two groups. Techniques that can be used for this purpose include matching, propensity score matching and regression analysis, such as the Heckman selection model or instrumental variables (see, for example, Heckman, Lalonde and Smith 1999, Heckman and Hotz 1989, and Bryson, Dorsett and Purdon 2002).

Clearly, any evaluation designs that require pre-programme baseline measures (which are all the most valid designs) necessitate timely consideration – in other words, enough time needs to be allowed prior to the introduction of the programme for the evaluation baseline measures to take place. In particular this is needed if surveys are to be designed and used to collect measures. Administrative data that already exists can provide useful baseline information; however, it may be difficult to get the desired variables/measures that are needed for the evaluation impact measures, such as earnings.

2.2   Using impact estimates in a cost-benefit analysis

In an ideal CBA of employment and training programmes, the key estimates of net impacts (for example, programme effects on earnings and benefit payments) would exist for each month the impacts persist. In practice, these ideal measures often do not exist. As a result, in conducting CBF CBAs, it may be necessary to compute programme effects on benefit payments as the product of separate estimates of average benefit payments and the programme's effect on the number of individuals leaving benefits. Similarly, it may be necessary to compute programme effects on earnings as follows:

$$(\Delta J)(D^A)(W^A)$$

where ΔJ is the number of additional jobs resulting from the employment and training programme, D^A is the average duration of the additional jobs obtained by programme participants and W^A is the average wage paid at these jobs.

A number of issues that arise from this approach are discussed in later sections of the report. In this section, we assume that the net impact estimates exist for several years after individuals enter a programme, although programme impacts may continue past this period. An illustration of actual time profiles for the New Deal for Disabled People (NDDP) appears as Figure 2.1[7].

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[7]   Figure 2.1 is taken from Greenberg and Davis (2007). NDDP covers both new and continuing incapacity benefit claimants who register with Job Brokers who administer the programme. Figure 2.1 pertains to continuing claimants who registered.

Figure 2.1   Impacts on the employment of New Deal for Disabled People registrants over time
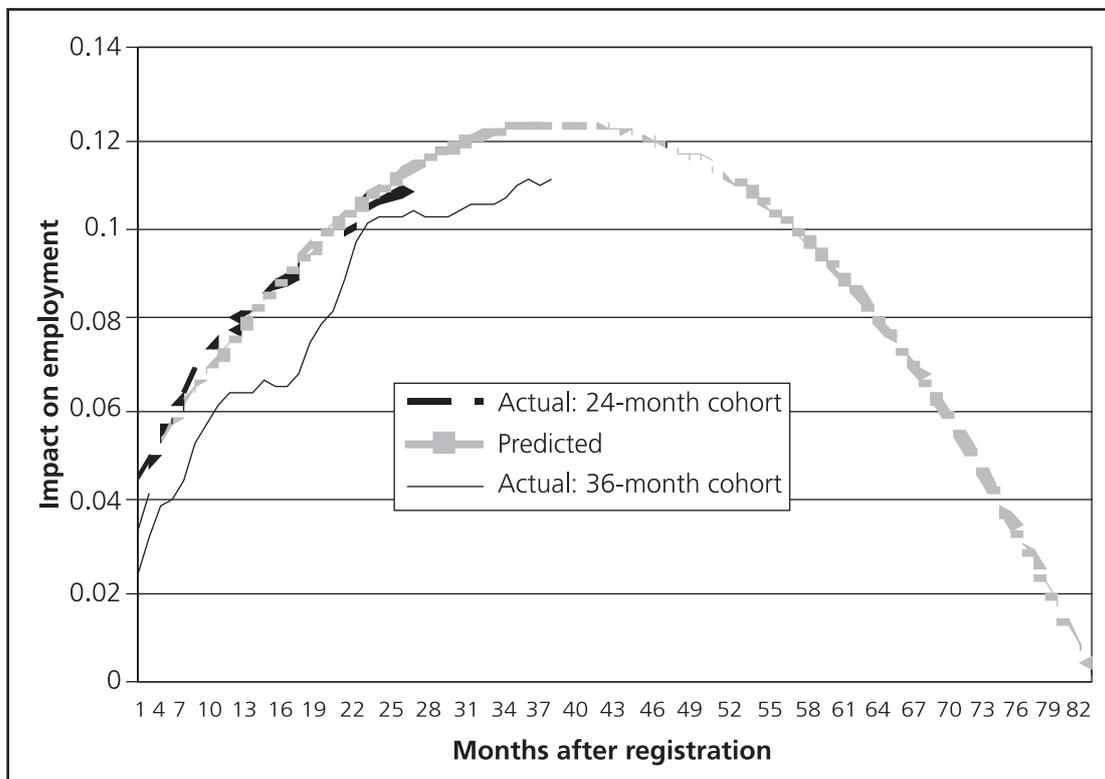
Three time profiles are shown in Figure 2.1. All three profiles pertain to programme impacts on earnings. The shortest of the profiles was estimated for a large group of NDDP registrants who were followed for 24 months. The middle length profile was estimated for a much smaller group of NDDP registrants who were followed for 36 months. It is obvious from these two profiles that NDDP's impact on employment did not end at either 24 or 36 months, although it does appear to be beginning to taper off at 36 months. Thus, to estimate impacts past the 36-month point, it was necessary to extrapolate. This, was done by first estimating a regression equation in which the impact in each month was the dependent variable and the number of months after registration and the square of the number of months were used as dependent variables (for details see Greenberg and Davis 2007). The estimated regression equation was then used to predict future programme impacts on employment. These regression-predicted impacts are shown in Figure 2.1 as the curve with grey dashes. As can be seen, the impacts were predicted to persist for 82 months.

Once the predicted impacts were available, the total number of additional months of employment for an average or typical NDDP registrant that could be attributed to the programme was estimated as the area under the time profile curves. In doing this, the 24-month curve was used for the first 24 months after registration and the regression-predicted curve was used for the remaining months (see Greenberg and Davis 2007). This estimate of NDDP's impact on the additional months an

average registrant was employed as a result of NDDP, was then multiplied by an estimate of the average monthly take-home earnings received by NDDP registrants when they were employed. The resulting value provided an estimate of NDDP's impact on earnings for an average registrant.

2.3   What are the issues in estimating the number of additional jobs resulting from a programme when net employment impact estimates do not exist for the programme?

Evidence is not always available of programme net impacts on employment. As this is a key figure in the CBA, in practice under the CBF guidance a substitution is sometimes made where an estimate is constructed based on other data. The substitute information was formed in various ways. For example, for the disability programmes substitute data were used in several cases in differing ways: firstly, using impacts from other programmes like NDDP, sometimes with an adjustment for whether, in the constructors judgement, the programme in question is expected, a priori to, have higher or lower additionality (although the basis for the judgement was not made clear). Secondly, in some cases qualitative information was used about whether the respondent thought they would have found work without the programme to formulate an additionality estimate. For New Deal 50 plus (ND50plus) an assumption was used to define the additionality figure, although again, the judgement basis was not well established.

Due to the lack of evidence, substitute information was sought in the construction of several CBF CBAs for good reason: to proceed with comparisons of the CBF CBAs of different programmes, it was necessary to be able to use some data to complete these CBA estimates. Thus, substitute information was sought for some of the CBA estimates where better evidence was not already available. However, it is unlikely that the validity of these estimates using such substitutes is always well founded, and this can undermine the CBA. The substitution of net impacts of very similar programmes probably has the least problems for several reasons, including that it substitutes a net impact estimate rather than gross, and if the programme is very similar then an inference that it is applicable may be reasonable[8]. The use of the qualitative evidence that tried to simulate a net impact where only post-programme outcomes were known for a programme and comparison group has quite low validity because of the weakness of qualitative evidence such as non-representative sampling (which means that statistical inference does not apply)

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[8]   Note that it is important to examine the programmes for similarities and differences and give an assessment of the validity of this substitution on the basis of this.

and usually small sample sizes[9]. However the judgment based on assumptions are likely to be even lower in validity as they were formed on even less relevant evidence. The important aspect for improving validity of substitute information is the use of evidence, and examining, assessing and reporting the value and relevance of the substitute evidence. Statistically valid, quantitative estimates of the net impacts of the programme are the recommended ideal against which the validity is compared.

The impact estimate on employment is critical for the additional jobs estimate, and hence, the issues overlap with those discussed in Section 2.4. One issue is the low validity of these substitute estimates. Secondly, there is the resultant variation across evaluations that the use of these substitutions introduces when other CBAs use valid net impacts of employment in their construction. Thirdly, documentation on the formulation of estimates, giving data sources and reasoning for judgements was usually lacking. This undermines the CBA quality as without this documentation the CBA validity cannot be assessed, or validated. Finally, the implications of the lack of data, subsequent substitutions and their validity for the CBA need to be discussed in reporting the CBA findings. However, often they were not.

The constructions and approaches used for substitute evidence were mostly informative where they did attempt to seek out useful evidence to use where the evaluation information for a programme was lacking. Where the key impact measures are missing, the weak nature of the evidence base can be improved by increasing the amount of sensitivity analysis for the substituted information, so that the implications are better explored[10].

The employment impact estimate is very important, particularly with DWP CBAs, where usually earnings estimates are not directly available (see Section 3.1). Incorporating evidence of this impact as a requirement for a programme's evaluation where at all possible would improve CBA construction. Smaller programmes could rely on administrative data to produce this, using evaluation designs as discussed in Section 2.1, with HM Revenue and Customs (HMRC) data on jobs and earnings and DWP data on benefits used to estimate the impacts. It would be helpful to improve the evidence base on which the CBAs are based, by ensuring, well in advance that the minimum impacts are available for the CBA (as set out in Section 3.1). However, where substitutions are made, better documentation and discussion of the implications is needed, together with sensitivity analysis. Note,

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[9]   Qualitative evidence can also refer to subjective assessments from surveys, for example answers about the proportion who thought the programme helped them to get into a job. The validity of subjective evidence is also quite low, and strong caveats need to be added.

[10]   It is possible that an average outcome of a reasonable number of sensitivity analyses could be used to produce a substitute that considered a number of reasonable scenarios.

however, that increasing the amount of sensitivity analysis does not improve the evidence base – it just gives a better understanding of how the results would be affected if alternative assumptions were made and that these alternatives cannot be discounted because of uncertainty about what the assumptions should be. This is particularly important where substitute information has been used.

2.4 What issues arise in converting impacts on employment into additional jobs?

As indicated in Section 2.3, estimates of programme impacts on employment are not always available. When they are available, an approach that has sometimes been used in conducting CBAs with the CBF guidance involves converting the estimates of impacts on employment into the number of additional jobs resulting from a programme. This approach relies on the following formula:

$$\Delta J = J(\Delta \%E / \%E)$$

Where:

ΔJ = Number of additional jobs resulting from the programme

J = Number of programme participants who obtained employment

$\Delta \%E$ = Estimated programme impact on employment

$\%E$ = Percentage of the programme group in employment

The number of programme participants who are employed, J, is available from programme administrative records. The percentage of programme group members who are employed, $\%E$, and the estimated programme impact on employment, $\Delta \%E$, are available from impact analyses. The latter is usually reported as the percentage point increase in employment attributable to the programme.

The formula multiplies an impact estimate by the number of job entries and then divides the resulting value by the percentage of the programme group that is employed. This last step is essential because without it the number of additional jobs resulting from a programme would be understated. Thus, if 3,000 participants in a particular programme obtained jobs, and the impact study found that of the 30 per cent of the programme group in the sample who were employed, one-third (ten percentage points) would not have been employed in the absence of the programme, 1,000 of the 3,000 jobs would be estimated to have resulted from the programme (3,000 x (10/30).

This formulation is perfectly reasonable, but inconsistencies result in using it because most impact analyses produce impact estimates for a given cohort of programme participants over multiple time periods – for example, for each of several months or several years – and the size of the impact estimates change over time. More specifically, impacts for a given cohort are typically found to first increase and then decline. Thus, the time profile appears to resemble an inverted

U[11]. As a consequence, an impact estimate for a particular time period must be selected. Alternatively, impact estimates could be averaged over several time periods. The value of %E would, of course, be selected for the same time period or periods.

We recommend using the largest of the estimated impacts, regardless of the time period in which it occurs, and the value of %E for the same time period. More programme participants will be working **as a result of the programme** during this time period than during any other period. For example, Figure 2.1 implies that the peak employment impact for NDDP occurred about 35 months after registration and was just in excess of .12, suggesting that at the peak the employment level of registrants was a little over 12 percentage points higher than it would have been in the absence of the programme. Use of this 'peak impact' value would produce the correct estimate of the additional jobs resulting from

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[11] For example, a meta-analysis that included 27 random assignment evaluations of over 70 US mandatory welfare-to-work programmes targeted at recipients of Aid to Families with Dependent Children, which was previously the US's major cash welfare programme, found that programme impacts on employment first increased but began to decline after two or three years and ended after five to seven years (Greenberg, Cebulla, and Bouchet 2005). An earlier meta-analysis by some of the same researchers obtained very similar results for impacts on earnings (Greenberg *et al.* 2004), as did a meta-analysis of US government-funded training programmes (Greenberg, Michalopoulos, and Robins 2004). The findings in the Greenberg, Cebulla, and Bouchet study are especially supportive of the existence of an inverse U-shaped time pattern because a number of the evaluations included in their meta-analysis measured impacts for three, four, or even five years. The one exception to the inverse U-shaped time-trend pattern was for adult women in the Greenberg, Michalopoulous, and Robins (2004) study. They found that earnings impacts for adult women who participated in training programmes first increased for several years and then remain undiminished. However, earnings impacts for the other two groups they analysed, adult males and youth, did seem to follow the pattern. Moreover, except for adult women in the Greenberg, Michalopoulous, and Robins (2004) study, the impact peak and end of the impacts occurred at roughly the same points in time in all three studies. Of course, these meta-analyses pertain to the 'average' programme in the sample of all those examined. Individual programmes may have somewhat different patterns. For example, Knight *et al.* (2006) found that the impacts of the New Deal for Lone Parents (NDLP) remained substantial after four years, although they had begun to diminish slightly by that time. Dolton and O'Neill (2002) found that Restart still had substantial impacts on the unemployment rates of males (but not females) five years after initial participation in the programme, although there is again some indication that they had begin to diminish by that time.

the programme **if** each individual who took a job as result of the programme, kept that job until the peak impact occurred, or longer. In practice of course, participants will leave jobs during each time period and other participants will find jobs during the same period. Thus, the latter replace the former. To the extent such 'churning' takes place, use of the largest impact estimate will result in understating the total number of additional jobs resulting from the programme, but by less than using an impact estimate from another time period or using the average values of several estimates. It is also possible that programme impacts still appear to be increasing when the impact analysis ends. If the rate of increase has begun to diminish, however, it should be possible to determine the approximate value of the peak impact by using the available impact estimates as the dependent variable in a regression equation and a quadratic specification of the time period corresponding to each impact estimate (i.e. the number of months since entering the programme and the number of months squared) as independent variables[12].

2.5   Can estimates of impacts on being off out-of-work benefits be used to estimate employment entry?

In some cases, programme impacts on employment have not been estimated, but programme impacts on being off benefits have been. If it can be assumed in such instances that all programme participants who exit from their current benefit programme as a result of the employment and training programme being analysed enter jobs, the number of additional jobs can be accurately estimated by modifying the formula presented in the previous section as follows:

$$\Delta J = J(\Delta \%L / \%L)$$

Where:

ΔJ = Number of additional jobs resulting from the programme

J = Number of programme participants who obtained employment

L = Estimated programme impact on being off benefits

%L = Percentage of the programme group leaving their current benefit programme

This formula is obviously identical to the one in the previous section, except that $\Delta \%L$ is used as a proxy for ΔE. The obvious problem with using the formula is that the assumption upon which it is based is invalid; some individuals who leave a benefit programme do not enter employment. To suggest just a few possibilities,

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12   If the rate of increase has not begun to diminish, then it may be that the time period considered is too short. Without further evidence on the impact over time, it is a matter of judgement as to when the peak impact might occur.

they may enter another benefit programme, leave the country, or die. In addition, some people may no longer qualify for benefits as a result of marriage in the case of lone parents or for health improvements in the case of disabled people and people with health problems. If some individuals who leave a benefit programme as a result of an employment and training programme do not enter employment, then ΔL will exceed ΔE and the estimate of ΔJ will be too large.

If the percentage of those who leave their current benefit programme to enter employment is known, the estimate of ΔL can then be multiplied by this figure and used in the formula that appears above to provide a corrected estimate of the number of additional jobs. Data on the destination of those who have left several different benefit programmes suggest that around 60 per cent enter employment. It is important to recognise, however, that the percentage entering employment is probably higher for those who leave benefits **as a result** of an employment and training programme, although exactly how much higher is unlikely to be known. If it is higher, the 'adjusted' estimate of ΔL would be too small.

Even when programme impacts on employment have been estimated, it is still useful to use estimates of programme impacts on being off benefits to produce an alternative estimate of the number of additional jobs. The reason is that both the survey data and HMRC data that have been used to estimate employment impacts miss employment spells and, as a consequence, understate impacts on employment. This is especially true of the latter. For example, workers with earnings that are below the taxable threshold or who are self-employed are not recorded in the HMRC data as having a job. Thus, additional jobs that are determined on the basis of employment impacts estimates will tend to be understated. On the other hand, if additional jobs are determined on the basis of estimates of programme impacts on being off benefits and these estimates are not corrected for the fact that some of those leaving benefits do not enter jobs, the resulting estimate of additional jobs will tend to be overstated. Thus, the alternative estimates will bracket the true number of additional jobs resulting from a programme and are, therefore, useful for sensitivity tests.

2.6 Given an estimate of additional jobs, how should job duration be estimated?

Programme benefits from each additional job depend, importantly, on the earnings received by those who take the jobs. This, in turn, partially depends on the number of additional months of employment that result from the programme being subjected to a CBA. As discussed in Section 2.2, it is sometimes possible to directly estimate the additional months of employment that result from a programme as the area under a time profile curve of programme impacts on employment. When it is not possible to do this, additional months of employment can be computed as the product of the number of additional jobs that result from the programme and the length of time an average person who obtains one of these jobs continues to

be employed[13]. Thus, job duration is a key variable in estimating the benefits of some of the programmes for which CBF CBAs are conducted.

For those programmes for which existing estimates of job duration have not been available, CBF cost-benefit studies have been based on a uniform assumption – that each additional job lasts for one year. This, of course, eliminates differences in job duration as a source of variation in net benefits across programmes. Ideally, the net benefit estimates should reflect this variation. Thus, efforts should be made to determine job duration for more programmes.

A straightforward approach to obtaining an estimate of job duration is to use existing survey data to determine how long different programme target groups typically remain in jobs once they acquire them. Some data sources might be previous specific evaluation surveys of the target group, the destinations survey (although this survey follows individuals for only four to six months after they leave benefits), or more general surveys such as the Labour Force Survey (LFS) (although it is sometimes difficult to identify the appropriate benefit claimant group in these surveys[14]). For example, separate estimates could be obtained for disabled people and people with health problems, lone parents, younger workers, older workers, and the long-term unemployed. It would be even better if these estimates pertain to the first job after leaving benefits. A major drawback of this approach is that the estimates would pertain to all the members of each target group, not just those individuals who acquired jobs as a result of participating in a specific employment and training programme. Moreover, only one estimate would be available for each target group. Thus, comparisons of the net benefits for two programmes that treat the same target group would not reflect the possibility that one programme may place its participants in longer duration jobs than the other. Still, as well they should, comparisons among programmes targeting different population groups (e.g. lone parents versus young workers) would reflect the fact that members of some groups tend to keep their jobs longer than members of other groups.

A second approach begins by summing estimates of programme impact on employment across the time periods during which there is an impact (see Section 2.2). This will provide an estimate of the number of additional months a typical participant works as a result of an employment and training programme. Note that those participants who do not work at all as a result of a programme, and, thus, have zero values for each time period are included in this average. To take

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13   Note that although they may continue to be employed, they may not necessarily remain in the job they initially entered.

14   For example, these surveys do not allow direct identification of the programme group, and so indirect measures can be constructed from them. However, it can be difficult to identify the specific programme target group, for example, for New Deal for 25 plus (ND25plus) one needs to be able to identify not only the unemployed but Jobseeker's Allowance (JSA) claimants, and also the length of claim for the target entry group.

account of this in determining the job duration of those who do work as a result of the programme, the impact estimates for each time period should be divided by the percentage of the programme group that is working during the time period prior to summing them. Also note that the procedure just outlined provides an estimate of the number of additional months worked as a result of the programme. This estimate will differ from months actually worked for those individuals who would have worked some months even in the absence of the programme. However, additional months worked as a result of a programme is probably the most appropriate figure for most purposes.

Job duration can obviously only be computed in this manner for those programmes for which the required employment impact estimates are available. However, the duration estimates for the programmes for which they are available could be assigned to programmes for which they are not available that targets a similar population. For example, if duration estimates are available for a programme that targets disabled people and people with health problems (e.g. the NDDP), they could be used for other programmes that also target the disabled and people with health problems (e.g. Access to Work or Reemploy). As in the case of using survey data to estimate job duration for different programme target groups, doing this would not take account of the possibility that one programme places its participants in longer duration jobs than another, even though they target members of the same group; but it would allow for the fact that different target populations are likely to stay in jobs for different lengths of time.

2.7   How are earnings best estimated when programme impacts on earnings are not available? Is it reasonable to assume the hourly wage corresponds to the minimum wage?

Sometimes earnings estimates are to be substituted because the programme impacts on earnings are not available.

If possible the most appropriate substitute is survey information that has been collected on the programme, and the best measure is the average earnings of those who enter work after the programme. A similar alternative measure would be administrative data of earnings of those who enter work after the programme. This helps give a measure that is for the most similar group. However, it is not as valid to use this as the programme impacts on earnings because this measure does not necessarily reflect the earnings of those who respond to the programme. Instead, this measure reflects simply all those who enter work, and is hence, possibly an overestimate or underestimate depending on whether the average earnings of those who respond to the programme are higher or lower than the average of all those who enter work after the programme. If there is not much variation in the distribution of earnings of all those who enter work after the programme, then this issue can be reduced. If the survey was collected some time

ago, then updating by using the annual increase in the average earnings figures produced by the Office for National Statistics (ONS) can help make the data more representative of the current year.

If no programme survey information is available, then conduct a search for substitute information from a survey that contains earnings, with coverage of a group that is as similar as possible to the programme group – for example, a survey of a group that exits benefits would be more useful than a survey of the general population; a survey with coverage of a group that exits the same benefit as the programme group is even more useful. It is also possible that the average job for those entering work after the programme is described in terms of occupation, industry, supervisory level and other information that might help match a suitable earnings distribution from other published sources.

Sometimes there might be no relevant survey earnings to substitute, and the legal minimum wage might be substituted. This should only be considered when all viable alternatives have been exhausted. It is unlikely to be correct that 100 per cent of those entering work after the programme receive the minimum wage, instead this is the floor above which the distribution of wages occurs and so the average will lie somewhere above the minimum wage. This measure also suffers the same problem in that it does not reflect those who respond to the programme. For a substitute based on the minimum wage, one should use whatever evidence can be found to determine the likely distribution above the minimum wage that can be attributed to this programme group, and then add a mark-up to the minimum wage to reflect this.

In writing the CBA, a description should be made of the selection process by which the earnings estimates are chosen to be substituted in for the earnings impacts, explaining what alternatives were considered and why this is deemed the best alternative. This allows the validity of this substitution to be assessed. Sensitivity analysis of the substituted values would help explore the importance to the CBA of the weakness of the evidence used.

It would be a useful requirement for evaluation designs for a programme that they estimate an earnings impact together with the employment impact and benefit impact (also see Section 2.1). This would facilitate construction of the CBA.

3   How to treat other programme benefits

3.1   Which impacts need to be estimated at a minimum for a meaningful cost-benefit analysis?

At a minimum, CBAs of employment and training programmes require estimates of programme impacts on earnings and benefit programme receipts[15]. Earlier, we discussed various ways in which these estimates might be obtained. Programme operating costs and payments of financial incentives and allowances to programme participants also need to be known.

Once estimates of programme impacts on earnings and transfer payments are obtained, they can be combined with other information to derive a number of additional impacts – for example, programme effects on tax payments and receipts, National Insurance (NI) contributions, housing and Council Tax benefits, tax credits, childcare cost, commuter travel cost, and deadweight loss from taxes[16]. This leaves out a number of potential programme impacts such as those on health and crime, but, as discussed in the following section, CBAs can be, and typically are, conducted without obtaining estimates of these impacts. The implications of leaving certain impacts out of the analyses need to be explicitly discussed in presenting findings, however.

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[15]   'Benefit programme receipts' includes both the benefits individuals are receiving when they enter an employment and training programme and the benefits they receive after leaving the programme. For example, a disabled person may be receiving incapacity benefits upon entering NDDP, then take a job, and finally lose the job and receive JSA. Housing Benefit and Council Tax Benefit (CTB) are not included here, but are discussed in the following paragraph.

[16]   Deadweight loss that results from distortions to economic incentives that are caused by taxes is discussed in Section 4.4.

While the CBF CBAs require estimates of programme impacts on earnings and transfer payments, and estimates of programme operating costs and payments of financial incentives and allowances to programme participants, these estimates are better for some programmes than for others. The earnings impacts, in particular, are sometimes derived from estimates of programme impacts on employment or being off benefits and other times from just educated guesses about the additional jobs resulting from different programmes. Estimates of impacts on employment and being off benefits are obviously vastly superior to guesses about numbers of additional jobs, but are nonetheless still typically subject to serious methodological and data limitations. And these are more serious in some instances than in others.

In the case of some programmes, the earnings impacts that are derived are limited in three additional respects: First, earnings impacts that are derived from estimates of programme impacts on employment or from estimates of the number of additional jobs that result from a programme, will not incorporate the possibility that some programme participants who would have worked even in the absence of the programme, increase their weekly hours as a result of the programme. Such increases are especially likely in the case of the NDDP, which conditions the size of the incentive fees paid to Job Brokers to the number of weekly hours their employed customers work. Second, earnings impacts that are derived from estimates of programme impacts on employment or from estimates of the additional jobs that result from a programme, will not incorporate the possibility that hourly wage rates increased as a result of the programme. Third, there are a few employment programmes that place individuals into subsidised jobs (e.g. Reemploy) or into jobs in which individuals temporarily work for no wage (e.g. Access to Work). In principle, the market value of the output that is produced in these jobs should be counted as a benefit in the CBA of these programmes, although, in practice, it is difficult to value this benefit.

3.2 To what extent does ignoring hard to estimate and monetising benefits such as health, crime, and impacts on children distort cross-programme comparisons? How should these effects be treated in Cost Benefit Framework cost-benefit analyses?

There are a number of (potential) programme benefits that are not valued in CBAs conducted under the CBF guidance. Important examples include the value of possible programme impacts on health, crime, the welfare of children, self-esteem and happiness. The reason they are not valued in analyses is that the information necessary to do so seldom exists. The sizes of the impacts on these outcomes are rarely measured and, even when they are, it is often difficult to place a monetary

value on them.[17] Indeed, for the same reasons, these benefits are rarely valued in any CBAs of programmes that train participants and/or help place them in jobs. In the remainder of this section, we discuss how several of these unmeasured benefits might be treated in CBF CBAs.

Two DWP memos have recently been written that provide some estimates that **could** be used to value improvements in health and reductions in crime and drug abuse that result from programme-induced increases in employment. However, both memos stress that existing evidence is inconclusive about the size of these effects or, indeed, even about whether causal links between employment and health, or employment and crime and drug abuse actually exist. Thus, we do not recommend using the estimates reported in the memos to place monetary values on improvements in health and reductions in crime and drug abuse that **might** result from programme-induced increases in employment. Doing so is at least as likely to distort the analysis as contribute to it.

If programme impacts on health, crime and drug abuse are not valued, it becomes important in reporting league tables of the CBF cost-benefit findings to point out that the comparison of programmes **may** be somewhat misleading unless readers consider these effects, even though this can only be done somewhat speculatively. For example, it can be pointed out that **if** a causal link does exist between employment and health, programmes that are targeted at the disabled and people with health problems are more likely to result in health improvements for a given increase in employment than programmes that are targeted at other groups. Similarly, it can also be pointed out that programmes targeted at youth or at the long-term unemployed will probably have a greater effect in reducing crime and drug abuse than programmes targeted at lone parents, older people, and the disabled, given the same increase in employment, but only **if** increases in employment really do **cause** crime and drug misuse to fall.

Over time, it should be possible to establish whether some of the employment and training programmes that are subjected to CBF CBAs result in improvements in health by estimating the impacts of these programmes on health status[18]. This would require that survey information on health outcomes be collected for both a programme group and a comparison group. Similar survey information could be collected on measures of self-esteem and happiness to examine programme impacts on these outcomes. However, collecting sufficiently accurate survey data on crime and drug use so that programme impacts on these outcomes can also be estimated seems highly problematic. For obvious reasons, survey respondents are reluctant to admit to such behaviours. Police crime records on programme and comparison group members could possibly be gathered instead, but such studies

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[17]   This is less true of health and crime than of the other outcomes mentioned above (for example, see Boardman *et al.*, Chapter 15).

[18]   Impacts on health have been estimated as part of the Pathways to Work evaluation (see Bewley, Dorsett and Haile 2007).

would probably be labour-intensive and expensive (see also Chapter 8, MDRC 1980).[19]

Several recent studies have used a random assignment evaluation design to estimate the impacts on child welfare of US welfare-to-work programmes for lone parents. In general, these effects appear to be small and mixed. That is, it is not clear whether these programmes improve child welfare or tend to operate in the opposite direction. However, one recent review has concluded that there is fairly strong evidence that recent mandatory work-related activities have reduced student achievement among adolescents (Grogger, Karoly, and Klerman 2002), while another synthesis concludes that welfare-to-work programmes with financial incentives have had small positive effects on children in elementary school, but other programme features had little effect on young children (Morris *et al.* 2001). Until impact findings become available for UK programmes, or at least clearer findings become available for US programmes, it is probably best that reports of CBF CBAs do little more than mention that employment and training programmes may affect the children of lone parents, but even the direction of impact is unclear.

3.3 Should using a micro-simulation model to obtain some impacts (e.g. Working Tax Credit, Council Tax Benefit, tax payments, employer and worker National Insurance contributions, etc.) and to treat take-up be considered?

It would be simpler and produce better estimates that account for dynamics and characteristics if a micro-simulation model was used for these impact estimates. A model such as the TAXBEN model of the Institute of Fiscal Studies (IFS) can facilitate this. The advantage of these types of models is that they examine the changes for individuals rather than looking at averages. A tax and benefit model is a computer programme that calculates the effects of possible changes in the fiscal system on a sample of households. By using a sample which is representative of the population, such models allow users to make accurate inferences about the aggregate revenue

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[19]   A number of years ago, police records were obtained for members of programme and control groups that were sampled as part of a random assignment evaluation of an employment programme demonstration (Kemper, Long, and Thornton 1981). The intent was to value the programme's impact on crime for two programme target groups: recovering drug addicts and ex-convicts. The programme was found to have appreciably reduced crime among the first group but to have substantially increased it among the second, suggesting, perhaps, that the study's methodology might be flawed.

implications of specific changes, and to examine the distributional effects of policy on different sub-groups of the population. TAXBEN operates on data taken from the Family Expenditure Survey (FES), a yearly representative sample of 7,000 UK households. It currently also allows modelling of individual's budget constraints and replacement rates (see Giles and Macrae 1995). In the absence of this, the methods currently used for CBAs under the CBF guidance are, however, adequate where they use the tax tables. In considering take-up, many CBF CBAs have previously assumed that take-up of these other benefits is total at 100 per cent. It would be better to take a more realistic account of take-up, which is unlikely to reach 100 per cent. A micro-simulation model could assist with this. The use of further analytical evidence on actual take-up rates is also useful, which is the approach DWP is adopting in its 2005/06 update.

3.4 How should savings in administering benefit programmes be estimated?

Because employment and training programmes may reduce participation in income transfer programmes such as JSA, Incapacity benefits and Income Support (IS), they may also reduce the cost of administrating these programmes. In principle, these savings should be included in conducting CBF CBAs, although this is not done currently.

DWP has estimates of the annual costs of administering various income transfer programmes – for example, the annual cost of administering IS is estimated to be about £40 per recipient and the annual cost of administering Incapacity benefits is estimated to be about £25 per recipient. If estimates of programme impacts on months or years off benefits also exist, the savings in administering income transfer programmes is readily computed as the product of administrative costs and programme impact on time off benefits.

Estimates of savings in administering income transfer programmes were made in this way in a recent CBA of the NDDP (Greenberg and Davis 2007). Because the annual costs of administering income transfer programmes are apparently quite small, the estimated savings were also relatively small (in the order of £20 or £30 per programme registrant). Thus, whether estimates of these savings are included in the CBF CBAs is unlikely to be very important.

3.5 Is the use of the product market corrector recommended by the Cost Benefit Framework guidance appropriate?

Because of the existence of monopoly power in the economy, some workers who enter employment as a result of employment and training programmes are paid less than the value of the output they produce. More specifically, some workers generate monopoly rents that accrue to the owners of the firms for whom they

go to work because the value of their marginal product exceeds their marginal revenue product and, hence, their wage rate. Thus, estimates of programme impacts on earnings understate programme benefits. To correct for this, the CBF document recommends that estimates of programme impacts on earnings be multiplied by a 'product market corrector' that equals 1.26 (DWP 2006). This value was computed by taking the reciprocal of labour's share of factor income (which is about 0.8).

Although it is undoubtedly true that employment and training programmes engender monopoly rents as a result of increasing employment, some of these rents are received by the foreign owners of UK firms. While the monopoly rents that accrue to UK citizens should, in principle, be counted as benefits from employment and training programmes, those that are received by non-citizens typically are not counted in CBAs of social programmes.

More importantly, the reciprocal of labour's share of factor income does not appropriately correct for monopoly in the economy. Although the 1.26 figure mentioned above correctly implies that for each pound of earnings in the economy, a total of 26 pence are returned to the other factors of production (e.g. capital, land and entrepreneurship), there is no reason to think that all, or even most, of these returns result from monopoly rents. Just like labour, capital, land and entrepreneurship earn returns even under perfect competition. Use of the 1.26 figure would be appropriate if it could be assumed that the additional workers who are employed as a result of employment and training programmes make use of capital and land that would exist in the absence of the programmes but be underutilised or even stand idle. This assumption is tenuous, however, and even if it were valid, the resulting programme benefits would only partially consist of monopoly rents.

In summary, we do not think use of the existing product market corrector is appropriate. Given its purpose, it is probably much too large a value (although it could possibly serve as an upper bound in a sensitivity analysis). A more appropriate corrector would be the share of national income that consists of monopoly rents, and even this figure should be multiplied by the proportion of monopoly rents that are received by UK citizens. We asked a few cost-benefit experts if they knew of any studies that provided an estimate of this value, but they did not. Until an appropriate value can be derived, we recommend that those who conduct CBF CBAs point out in reporting them that estimates of earnings impacts will understate the total benefits resulting from employment and training programmes to the extent that increases in employment increase monopoly rents in the economy.

3.6 Should a multiplier be used in computing programme benefits?

It is sometimes contended that the additional earnings engendered by employment and training programmes will be spent to make purchases and the firms from whom the purchases are made will, in turn, spend their newly gained revenues, and this, in turn will generate still more revenues that will be spent, and so-forth. It is then further argued that programme impacts on earnings should be multiplied by a value greater than one to take account of these effects. A similar argument for using a multiplier can be made about revenues that are expended in supporting the programmes.[20]

A multiplier of this sort is not currently used in conducting the CBF CBAs, and we believe that one should not be used unless rates of unemployment are high or large amounts of other resources (e.g. land, buildings and machinery) are underutilised. Under these circumstances, increases in the demand for various products could potentially reduce levels of unemployment and increase the utilisation of other idle resources such as empty buildings, and a multiplier could be used to take account of this. In the absence of high levels of unemployment and idle resources, however, increases in spending by programme participants or expenditure incurred in operating employment and training programmes will put upward pressure on prices and cause labour and other resources to shift from one use to another. Increases in prices will make producers better off but consumers worse off, and thus, on net, do not have substantial effects on programme benefits.[21]

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[20]   The effects discussed in this paragraph take place in secondary, rather than in primary, markets. That is, they occur in markets that are indirectly affected by employment and training programmes. Chapter 5 of Boardman *et al.* (2006) demonstrates that effects that occur in secondary markets do not engender net benefits of appreciable magnitude unless these markets are distorted and can, therefore, usually be ignored in CBAs.

[21]   See Boardman *et al.* (2006, Chapter 5) for a detailed discussion.

4 Issues in estimating additional costs resulting from programmes

4.1 Is the measure of costs currently being used reasonable for comparing programmes?

Ideally in CBAs, the estimate of programme costs should measure the programme's opportunity costs. In other words, the measure should be the value of the resources that are used to support the programme that, as a result of the programme, cannot be used for other purposes. For example, the staff that administer programmes are unavailable for other types of work. The opportunity cost of the programmes is the value of what they would have produced in the absence of the programmes. In practice, their salary is used in CBAs as an approximation of their opportunity cost.

A careful cost analysis is the best means of measuring costs, starting with a list of the programme components and then finding suitable measures for all aspects of programme costs. A reasonable alternative that is used for the CBF CBAs is to take the total annual costs as measured by Jobcentre Plus accounts. The actual historical figures for costs should be used rather than the predicted costs set out in the design or programme cost model when the programme started. These actual costs should be taken from the year most closely corresponding to the programme impact estimates. Ideally, costs, like programme impacts, should be measured after a programme has reached a steady-state. To the extent this is not possible, any programme start-up or set-up costs that are identifiable and included in the programme expenditure figures should be excluded in estimating the costs of an ongoing programme[22]. To identify these set-up costs, it may be

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[22]   Set-up costs are more likely to be charged in the first one or two years of the programme.

useful to contact the Jobcentre Plus cost person responsible for these accounts for an explanation of the cost items included in the expenditure.

The DEL-P programme expenditure amount for operational costs sets out the programme costs related to running the programme, while the Annually Managed Expenditures (AME) contains payments such as for training subsidies or transportation refunds. However, DEL-A contains the administrative costs and these are kept separately from these programme expenditure costs for some programmes. For other programmes, the DEL-A costs are not available or identifiable for the specific programme, but are grouped together with other administrative costs, and remain not included in the programme expenditure. Clearly it is desirable to include the administrative costs in a measure of the costs of a programme to avoid an underestimate of costs. Not including these administrative costs relies on the strong assumption that they amount to zero. However, it is likely that administrative costs are not trivial in size even if they do not form a great share of the programme costs.

That the administrative costs are measurable for some programmes but not for others, and are, therefore, included in costs for some programmes but not others, can lead to inconsistencies across CBF CBAs. If administrative costs exist for a subset of programmes, it is better to use these than a broad assumption that is possibly invalid. Note that the administrative costs of some programmes may be much higher than others, and hence, each programme needs to be assessed. When the value of the administrative costs for a programme is missing, the first step should be to write a comprehensive list of what administrative tasks might exist for delivering this programme[23]. The next step is to then try to substitute in costs for these tasks, perhaps from cost data from other comparable programmes, and reach an estimate of the administrative costs. From the basis of the completed itemised list with available costings, a judgement can also be made of whether it is reasonable to assume that there are no administrative costs. The facilitation of DWP resource requirements for this task is not clear, however.

Any judgements, underlying assumptions, data sources and references for figures taken from other sources or publications need to be recorded in the CBA report, so that the validity of the figures can be assessed.

4.2 How should childcare and travel costs be treated in Cost Benefit Framework cost-benefit analyses?

It is evident that programmes that increase employment also increase work-related travel cost and, at least in the case of lone parents, childcare cost. These are costs to the affected individuals and, because such individuals are a part of society, to society as a whole. If the government helps subsidise work-related costs, they

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[23]   However, it may be difficult for all parties to agree the contents of the list, in the first instance.

are also costs from the government's perspective. Although these costs are not currently valued in CBF cost-benefit studies, it should not be too difficult to do so by examining survey information on what low wage workers spend on travelling back and forth to work and on the percentage of employed lone parents who use paid childcare and the amounts they pay. Until this is done, documents that report CBF CBAs should at least mention that these costs exist and could be of some importance. Childcare costs are especially likely to be relevant when programmes that target lone parents are compared to other programmes.

4.3   How should losses of leisure be treated in Cost Benefit Framework cost-benefit analyses?

Individuals must give up time they use for other purposes when they go to work. This time is often called 'leisure', although it may, in fact, be used for productive purposes. Thus, 'non-market time' may be a better term. The key point is that leisure or non-market time may be of considerable value to those relinquishing it and, consequently, it is a cost to participants resulting from programmes that increase employment. Because these workers are also part of society, it is also a cost to society. It is important to recognise, however, that this cost does not fully offset the improvements in earnings that result from increases in employment.

This can be seen in Figure 4.1, which represents an individual who is initially unemployed but finds a job because of participating in an employment and training programme. This individual's labour supply curve is represented by curve S. In the absence of the programme, they would have a (potential) market wage of W* but would not be working. Assume now that as a result of participating in the programme, they obtain work at h* hours, although their market wage remains at W*. Thus, as a result of the programme, their earnings increase by areas A + B. However, the increase in earnings represented in area B is fully offset by the individual's loss of leisure. Thus, only area A, the area above the labour supply curve, represents an increase in the individual's surplus and should be counted as a true benefit of the programme.

There is some previous research that implies that, consistent with Figure 4.1, the loss of leisure offset to the improvements in earnings that result from increases in employment is substantial, probably not less than a quarter of the earnings increase and quite likely more (Bell and Orr 1994; Greenberg 1997, and Greenberg and Robins 2005). This suggests that in conducting CBF CBAs, or at least in conducting sensitivity tests of these analyses, it might be conservatively assumed that one quarter of the estimated increases in earnings are offset by losses in non-market time.

Figure 4.1   Value of lost non-market time for unemployed people who find a job
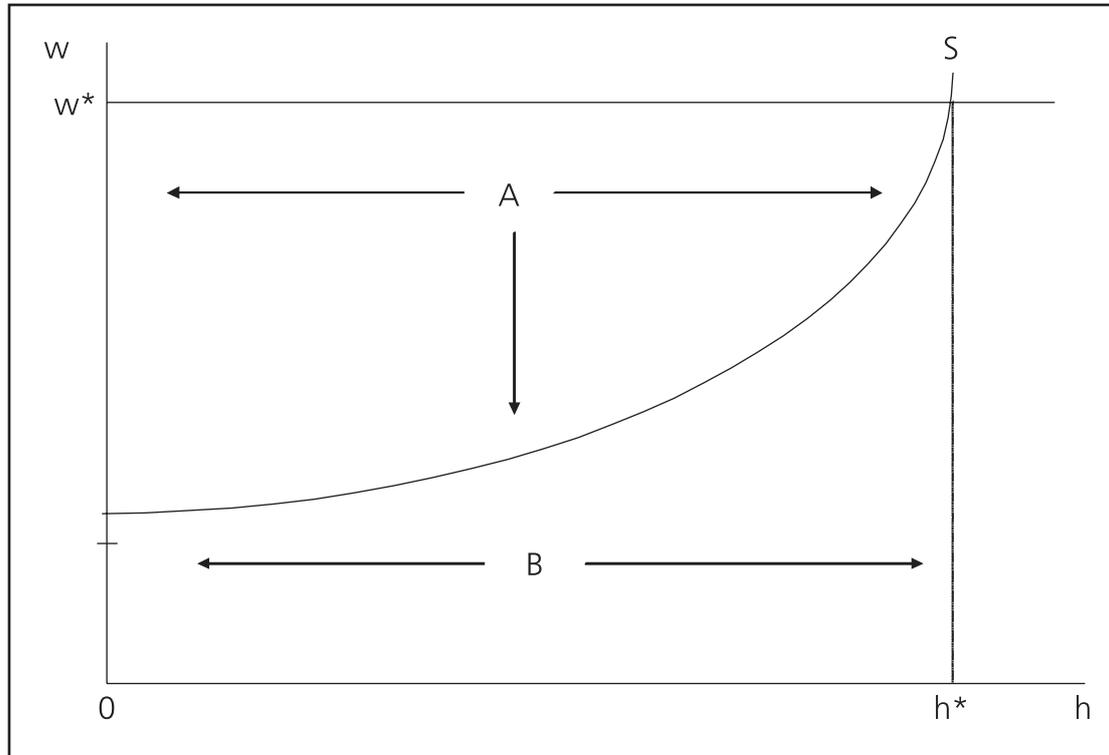
4.4   How should deadweight losses from taxes be treated in Cost Benefit Framework cost-benefit analyses?

If employment and training programmes change the revenue flows from taxes received by the Exchequer, economic distortions that are caused by taxes also change. For example, taxes on earnings reduce incentives to work and taxes on investment reduce incentives to invest. These distortions (usually called 'deadweight losses' or 'marginal excess tax burden' by economists) result in substantial losses in economic efficiency. For example, after reviewing a number of US studies, Boardman *et al.* (2006, pp. 428-429) conclude that the loss to the economy from each additional dollar of taxes that are collected in the US is in the order of 40 cents or 40 per cent. Less evidence is available for the UK, but DWP economists have concluded that the efficiency loss from an additional pound of taxes in the UK is around 25 pence or 25 per cent.

In conducting the CBF CBAs, this 25 per cent estimate has been used to compute the effects of employment and training programmes on deadweight loss by multiplying it by estimates of programme impacts on the government's fiscal position, which can be measured as net programme benefits from the government's perspective. As shown in Table 1.1, net government benefits mainly consist of programme operating costs and programme-induced increase the tax payments of programme participants and decreases in their benefit receipts. Thus,

net government benefits from a programme can be either positive or negative. At least in principle, programmes with positive net fiscal benefits allow lower tax revenues than would otherwise be the case, thereby reducing deadweight loss, while programmes with net negative fiscal benefits require greater tax revenues, thereby increasing deadweight loss. It can be argued, however, that because the main intent of the CBF CBAs is to facilitate cross-programme comparisons so that funds can be shifted from less cost-beneficial programmes to more effective programmes, programme operating costs for **all** the analysed programmes combined would neither increase nor decrease as a result of the CBAs. To the extent this is true, estimates of deadweight loss are neither necessary nor appropriate.

Although we consider this argument reasonable, it is only germane when the sole objective of CBA is to create league tables and then use them to compare programmes. CBAs that attempt to determine whether the net benefits of individual programmes are positive or negative should continue to incorporate estimates of programme impacts on deadweight loss. Moreover, it should be recognised that if funds are shifted from less cost-beneficial programmes to more cost-beneficial ones, then tax revenues received by the government will, in fact, change because the superior programmes will tend to have larger impacts on the earnings of programme participants and, hence, on their tax payments. Similarly, superior programmes would tend to result in greater reductions of payments under government benefit programmes. These effects would probably be fairly small, however.

On balance, we would recommend continuing to include estimates of deadweight loss in the CBF CBAs. In our view, doing so will result in better estimates of economic net benefits than not doing so. Furthermore, it seems somewhat peculiar to include estimates of deadweight loss in studies of individual programmes, and then ignore it in constructing league tables, and doing so may be difficult to explain. However, this is a close call; the case for inclusion is not strong.

If deadweight loss is included, the computation of it should include the total programme effect on government revenues (i.e. the programme's net benefit from the government perspective) because both the benefits and costs from the government perspective lead to distortions and deadweight losses. It would appear odd to ignore programme operating costs in computing deadweight loss but include programme effects on the taxes paid by and the transfer benefits received by programme participants. At present, the 25 per cent value mentioned above appears to be the best estimate that is available for use in computing deadweight loss, although 40 per cent might be used in conducting sensitivity analyses.

4.5   How should general equilibrium effects (e.g., substitution and displacement effects and impacts on the wages of non-participants) be treated in the Cost Benefit Framework cost-benefit analyses?

The employment and training programmes that are assessed using the CBF guidance may have effects on the well-being of those who are not enrolled in the programme and, because of this, on the economy. Such effects include equilibrium wage effects, substitution effects and displacement effects. Empirical evidence about the magnitude of these effects is quite limited, however. Hence, in reporting CBAs that are conducted with the CBF guidance, general equilibrium effects are not often mentioned, and when they are, the discussion tends to be brief and somewhat speculative in nature. The latter approach seems appropriate given the lack of knowledge about the size of these effects. In other words, except in those rare instances when a reliable estimate exists, we suggest simply acknowledging the possible existence of general equilibrium effects and discussing whether they are likely to be important. In the remainder of this section, we consider what might be said about general equilibrium effects.

If participants in an employment and training programme search harder for jobs or work more weeks or hours than they otherwise would, the resulting increase in labour supply will tend to lower the equilibrium wage within the labour markets in which they work. Thus, workers who are employed in the same labour markets as programme participants could receive lower wages than otherwise. For this effect to be very large, however, three conditions must hold: (1) the minimum wage must not constrain downward movements in wage rates; (2) programme participants must account for a fairly large share of the workers in the relevant labour markets; and (3) programme effects on job search and employment must be fairly large.

Most government programmes that provide training and/or help participants enter employment seem unlikely to bring about substantial equilibrium wage effects. Most participants who are employed because of the programmes tend to work in low-wage labour markets. Thus, at least to some degree, the minimum wage probably constrains reductions in equilibrium wages. Moreover, the programme target groups tend to be narrow (e.g. the disabled and people with serious health problems, the long-term unemployed, lone parents, etc.). Thus, members of these groups usually account for only a fairly small proportion of the total supply population in any given labour market. Finally, programme impacts are typically fairly modest.

Substitution effects occur if participants in a programme hold jobs that individuals who do not participate would otherwise have held. If these non-participants become unemployed or accept lower-wage jobs as a result, then their earnings

fall. Displacement effects occur if one firm expands at the expense of others because its employment costs are subsidised by the government. Despite these potentially adverse effects, there is very little research that quantifies their magnitude. However, a recent evaluation of the New Deal for Young People (NDYP) provides a preliminary analysis of substitution effects that suggests they could be modest (Blundell *et al.* 2002). Displacement effects are only relevant in the case of programmes that subsidise employment, and such programmes are relatively few in number.

The magnitude of the substitution effect is likely to depend on the state of the local labour markets. If a local labour market in which former programme participants work is tight, then alternative job opportunities are likely to be available to those outside the programme target group; but if it is loose, the cost of substitution to those affected could be substantial.

5   Other issues in constructing cost-benefit analyses using the Cost Benefit Framework

5.1   How should participation in multiple programmes be treated?

The issue of multiple programme participation is complicated. For example, the literature is not yet clear on how best to validly estimate the impact from multiple programme participation over time. There are some econometric techniques that attempt to isolate the impacts; however, as yet, these techniques do not resolve all the issues[24]. The CBA ideally needs a valid impact estimate to measure the benefits of the programmes.

Some examination of the evaluation designs can assist. An important consideration is what participation the comparison group experiences. If the comparison group has no programme participation at all, then for the participant group, the participation rates for each programme will be important to assessing the average contribution to the impact arising from the multiple programme participation. In this case, a weighted average of the programme impacts, informed by the participation rates, might give a reasonable estimate of the overall impacts, if the impact of

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[24]   See, for example, Bergemann, Fitzenberger and Speckesser (2004), Lechner and Miquel (2002). In the end, however, a rigorous framework for the evaluation of second participation in the same programmes has not yet been developed. Up to now, a plausible approach for credible evaluation of the incremental effect of repeated participation has been discussed only theoretically by Lechner and Miquel (2002).

each programme is known. An overall impact estimate would produce the impact of the overall mix of multiple participation that occurred. This is usually what is produced in evaluations of multiple component programmes, such as the Pathways to Work, where participants might have had a number of experiences from the alternative options. The participation rates for each programme are then important to inform what participation mix was contributing to the impact. Alternatively, the comparison group may have had some multiple programme participation as well. If the comparison group have, on average, gone through all the same programmes as the participant group, except for one particular programme, the impact would measure the net differential and reflect participation in that one programme only. The minimum that should be done in a CBA to examine multiple participation is to include an assessment of the scale of the issue, with how many go on multiple programmes, or who repeatedly participate in a programme over a period of time. This information should come from the evaluation of net impacts.

Another aspect of the CBA is that of dealing with the costs for each of the programmes participated in. These should be summed, as the costs are incurred for each participation[25].

One issue is that many evaluations of programme impacts do not consider what history of programme participation the participant has outside of the current programme under consideration[26]. In this case, the benefits are considered to arise from only the most recently experienced programme participation. If other programme participations contributed to the final outcome then this is not a correct attribution and the impact is an overestimate of the effect of that programme. Again, getting a measure of the scale of other programme participation can inform whether the attribution of the programme impact is correct.

5.2 Net benefits are currently measured from the perspectives of the government and society. Should any other perspectives be considered?

It has been common in cost-benefit studies of social programmes to estimate net benefits from three perspectives: that of the government, that of programme participants and that of society as a whole. In conducting the CBF CBAs to date, estimates are made of net benefits that accrue to the Exchequer and to the economy as a whole, but not to the people who participate in the programmes

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[25]   The benefits of the programmes are more complex and cannot necessarily be simply be summed. The assumption for summing benefits is that the programmes are independent. However, other alternative assumptions are possible.

[26]   In the case of considering the costs and benefits of earlier programme participation, if these took place in different years, then discounting needs to be done for the different years.

being analysed. Thus, the CBF analyses to date assess benefits and costs from the first and third perspectives, but not the second.

The question arises, therefore, as to whether they should. If the CBF CBAs were mainly intended to separately evaluate individual employment and training programmes and determine whether each is cost-beneficial, it would be important to provide information on whether those who participate in the analysed programmes become better or worse off as a result. However, the analyses are mainly used to compare programmes, and it is probably not essential that these comparisons be made from the participant perspective. Nonetheless, such comparisons would be useful and easy to do.

The reason it would be easy to do is that, as a first cut, participant net benefits can be computed as increases in earnings and tax credits that are attributable to a programme less increases in participant taxes, reductions in participant benefit receipts, and increases in participant national insurance contributions resulting from the programme. All these elements are already estimated for purposes of computing Exchequer and economic net benefits. Note that this leaves out the value of programme impacts on health, crime, life satisfaction, the welfare of children, transportation, childcare utilisation, and non-market time. However, these impacts are also not currently valued in computing economic net benefits. If any of these were valued, they could also readily be included in estimating participant net benefits.

5.3   Should distribution weighting be considered?

In the CBF CBAs, as well as in most other CBAs of social programmes, pounds gained or lost by programme participants (e.g. earnings improvements and reductions in benefits) are treated as identical to pounds gained or lost by the Exchequer (e.g. reductions in benefit payments and programme operating costs). It is sometimes suggested that they should not be. The reason is that changes in government revenue flows affect taxpayers and, on average, taxpayers have substantially higher incomes than participants in most of the programmes that attempt to influence employment and earnings. There is a considerable literature that argues that the gains and losses of lower income people should be valued more highly than the gains and losses of higher income people (see Annex 5 of HM Treasury *Green Book* 2003 or Chapter 18 of Boardman *et al.*, 2006 and the references therein). One reason for this is that the value individuals put on each additional pound they receive (i.e. their marginal utility of income) is likely to be higher for low income people than for higher income people.[27]

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[27]   For a discussion of additional reasons for treating high and low income people differently in cost-benefit analysis, see Chapter 18 of Boardman *et al.*, (2006).

As suggested by the cost-benefit literature, this issue can be treated by giving each pound of the gains or losses of relatively low-income people a greater influence in CBAs than each pound of the gains or losses of higher income people. In principle, this would be accomplished by using so-called 'distributional weights' (for a summary, see Chapter 18 of Boardman *et al.* 2006). For instance, the gains or losses of relatively low income people might be given a weight of two and those of relatively high income people a weight of one. The following simple illustrative example reports net benefits for two programmes (A and B) and shows how this can be accomplished:

Table 5.1   How distributional weighting can affect programme ranking

	Unweighted		Weighted	
	Programme A	Programme B	Programme A	Programme B
Participants	£7	£3	£14	£6
Taxpayers or government	£3	£9	£3	£9
Economy	£10	£12	£17	£15

In this example, net benefits are presented for participants, the taxpayer or government, and the economy as a whole. Economic net benefits are computed as the sum of the net benefits accruing to the first two categories. Both unweighted and weighted results are presented, with the weights set to two for programme participants and to one for taxpayer and the government. Programme participants in the two programmes are given the same weight because it is assumed that their incomes are similar. As is true of most of the programmes assessed using the CBF guidance, most programme participants in both programmes are likely to have relatively low incomes.

The main point of the illustration is to demonstrate that the use of distributional weights can change the ranking of programmes when assessed from the economic perspective. As shown in the table, without weighting, economic net benefits are larger for Programme B than for Programme A, but Programme A dominates Programme B with weighting. Note, however, that when viewed from the perspective of the taxpayers or the government, the programme ranking does not change. It also does not change when viewed from the perspective of the programme participants, as long as the participants in different programmes are drawn from a similar income group.

Distributional weighting is not widely used in CBA because the weights that are appropriate for this purpose are unknown and probably unknowable. Although a set of distributional weights can be found in HM Treasury *Green Book* (2003), these weights are illustrative in nature and not based on evidence. Thus, we suggest that in conducting CBAs with the CBF guidance, weighting be limited to sensitivity tests. For example, it would be useful to see how the ranking of programmes

changes when weights of two for participants and one for all other groups are used. This weighting scheme, which is consistent with the weights found in the *Green Book*, assumes that a pound received by programme participants has twice the value of a pound received by anyone else. This assumption seems sufficiently extreme to be useful for the purposes of a sensitivity analysis.

5.4 How should carefully done cost-benefit analyses (e.g. that of New Deal for Disabled People) be blended with those done quickly in-house under the framework? Are they comparable?

Combining carefully done CBAs (which might be independently or internally constructed) with brief in-house CBAs can lead to variation in the quality of CBF CBAs. The variation arises because these brief in-house CBAs are generally constructed using more assumptions and less real data for components, for example, under the CBF guidance, a brief CBA would often construct the additional jobs estimate from the impact estimate and then apply the duration assumption of one year[28] whereas in a carefully done CBA evidence on the duration of the impact would be used. To increase the comparability of the brief in-house CBAs while using the evidence base available, more variations and sensitivity analyses should be made. In addition, to examine the validity of the general one-year duration assumption for CBF CBAs where no other evidence is available, the evidence on duration of employment impacts from a subset of programmes should be explored to see whether this is reasonable.

A difficulty with more carefully done CBAs is that they can be slow to be completed. A brief CBA can be constructed quickly. Where for a particular programme, an earlier brief CBA exists and a more carefully done CBA is completed, a comparison of their results can be made. This subsequent examination of how and why they differ, when both are completed, can provide useful information about the validity of assumptions and data item substitutions. The earlier in-house CBA should then be updated using information from the carefully done CBA.

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[28]   In application of the CBF to date, an assumption of one-year duration has been used where no evidence on impacts on job duration were available. Although it was not possible to assess whether this is reasonable within the scope of this report, the methods described in Section 2.6 can be used for this purpose.

5.5 What sorts of sensitivity analyses of the Cost Benefit Framework cost-benefit analyses might be conducted?

The major objective of sensitivity tests of findings from the CBF CBAs would be to see if the ranking of the analysed programmes change very much when alternative assumptions are made in computing some of the key benefits and costs. Several sensitivity tests were suggested earlier in this report:

1 Alternately using estimated impacts on employment and estimated impacts on being off benefits in determining the additional jobs resulting from the analysed programmes. (The core analysis usually relies on impacts on employment when they are available.)

2 Making alternative assumptions about distributional weights in computing net benefits. For the purpose of the sensitivity tests, a weight of two could be assigned to programme participants and a weight of one could be assigned to taxpayers. (The core analysis implicitly assumes that the distributional weight equals one for both programme participants and taxpayers.)

3 Alternately assuming that the loss of non-market time associated with each pound of increased earnings has a zero value and a value of 25 pence. (The core analysis assumes it has a zero value.)

Another sensitivity test that might be made (and, in fact, has been made) is to alter the assumptions about job duration. In the past, when existing estimates of job duration have not been available, it has most often been assumed that the jobs employment and training programme participants get typically last one year (see Section 2.6). However, there is great uncertainty surrounding this value. Thus, sensitivity tests might be conducted by first dividing the core assumed value in half and, then, doubling or tripling it[29]. In Section 2.6, we suggested two different alternative approaches for determining job duration. Use of these methods would reduce the uncertainty surrounding the length of job duration, but would far from eliminate it. Thus, if one of the suggested approaches is adopted, the resulting job duration values should still be subjected to sensitivity tests by first dividing them in half and then doubling or tripling them.

A further sensitivity test that should be considered concerns the discount rate that is used in computing programme benefits, as the appropriate rate to use in CBA is a topic of some controversy (see Boardman, *et al.* Chapter 10, and the references therein). As recommended by the Treasury *Green Book*, the CBF CBAs use a value of 3.5 per cent in discounting benefits. Sensitivity tests could be conducted with, say, values of two per cent and five per cent. However, unless it is determined or assumed that programme impacts on employment and benefit reduction persist

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[29]   Other multiples can be considered, these are simple examples of what might be a useful point to start at for examining the variation.

for more than a year or two, the CBF cost-benefit findings are unlikely to be very sensitive to the value of the discount rate.

5.6 What are the best measures of cost-effectiveness? Should benefits and costs be divided by additional jobs?

In principle, the results of CBAs are supposed to be used to apply the Kaldor-Hicks criterion, which stipulates that all policies with positive net benefits should be adopted. However, this criterion has to be modified, in practice, if the government does not have sufficient budget to adopt all policies with positive net benefits. Under these circumstances, net benefits would be maximised subject to the government's budget constraint (for further discussion, see Boardman, *et al.*, Chapter 2).

Even the modified Kaldor-Hicks criterion is not really applicable to CBAs conducted under the CBF guidance because these studies do not attempt to measure and monetise **all** the costs and benefits resulting from the analysed programmes. Hence, they cannot usually be used to determine whether net benefits are positive or negative, let alone the exact magnitude of the net benefits. Thus, as previously indicated, they are mainly intended to help guide comparisons amongst programmes.

Because larger programmes tend to have larger costs and benefits than smaller programmes, however, it is difficult to compare them without first standardising for programme size. To facilitate cross-programme comparisons, therefore, costs and benefits are usually divided by some measure of programme size. For example, in reporting the results of CBAs conducted with the CBF guidance, net benefits are typically divided by the number of additional jobs resulting from the programme, thereby producing 'net-benefit-per-additional-job ratios'. In addition, an alternative measure is usually also produced by dividing benefits by costs, producing so-called 'spend-to-save ratios'. This second ratio is usually called the 'benefit-cost ratio' in the cost-benefit literature. Both ratios provide estimates of the average cost-effectiveness of programmes.

Although such ratios facilitate cross-programme comparisons and hence, must be used in making such comparisons, great care should be exercised in interpreting them. For example, both the net-benefits-per-additional-job ratio and the spend-to-save ratio are potentially subject to so-called 'scale problems', which result because the marginal cost-effectiveness of a programme may differ from its average cost-effectiveness. To illustrate, consider a programme with benefits of £1m and costs of £0.5m and a second programme with benefits of £10,000 and costs of £1,000. The second programme obviously has a much larger spend-to-save ratio than the first programme (10 versus 2). It is not apparent, however, that its spend-to-save ratio would remain larger if the scale of the programme was increased so that £0.5m were also spent

on it. Thus, if a like-to-like comparison could be performed, it is not evident which programme would dominate. Similarly, it is not apparent that a programme that results in one additional job and net benefits of £10,000 would remain superior to a programme that produces 1,000 additional jobs and net benefits of £1m if the scale of operation of the two programmes were similar, although the net-benefits-per-additional-job ratio of the first programme is ten-fold the size of ratio of the second programme (£10,000 versus £1,000).

These examples do not imply that ratios should not be used in making cross-programme comparisons. They simply suggest that caution should be taken to ensure that they are not misinterpreted.

Some care should be exercised in computing spend-to-save ratios. To illustrate, consider the administrative savings that occur when individuals leave benefits.[30] These savings can be viewed either as a benefit and added to the numerator of the ratio or as an avoided cost and subtracted from the denominator of the ratio. Although either approach is theoretically correct, cross-programme comparisons will be distorted unless the calculation is the same for all programmes.

In a sense, the spend-to-save ratio is superior to the net-benefits-per-additional-job ratio for purposes of comparing programmes. Costs reflect programme size but not programme success[31], while the numbers of additional jobs that result from a programme are a function of both factors. Thus, when the number of additional jobs is used as a denominator in computing a ratio, the resulting figure is somewhat difficult to interpret. This does not occur when costs are used as a denominator because only project size is standardised.

An alternative to using the number of additional jobs that result from a programme as the denominator in standardising for programme size is to use the number of programme participants instead. This is the approach typically taken in the United States. Like programme cost, the number of programme participants is under the control of policy makers and only reflects programme size, not programme success, in increasing job entry. Like the spend-to-save ratio and the net-benefits-per-additional-job ratio, however, the net-benefit-per-participant ratio is also subject to scale problems.

When used in CBAs that are conducted from the perspective of the economy, the net-benefits-per-additional-job ratio is subject to additional issues that require extra care in interpreting them. To discuss these issues, we begin with a formula (shown below) that is used in CBF CBAs for computing economic net benefits (ENBs):

$$ENB = (\Delta J)(D^A)(W^A) - \Delta C$$

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[30]   Although these savings are not usually estimated in conducting CBF CBAs, in principle they should be.

[31]   Programmes with funding that is determined, at least in part, by some measure of success are possible exceptions.

Where ΔJ is the number of additional jobs resulting from the programme, D^A is the average duration of the additional jobs obtained by programme participants, W^A is the average wage paid at these jobs and ΔC represents the additional costs engendered by the programme being analysed. The first term to the right of the equal sign represents programme gross benefits and the second term represents programme gross costs. The net-benefits-per-additional-job ratio would be computed by dividing both terms in the formula by ΔJ:

$$NB/\Delta J = (\Delta J)(D^A)(W^A)/\Delta J - \Delta C/\Delta J = (D^A)(W^A) - \Delta C/\Delta J$$

As can be seen, this formulation has a rather peculiar property: programme gross benefits are simply the product of D^A and W^A and no longer reflect the additional jobs resulting from the programme. As previously discussed, D^A is usually set equal to one or two years in CBAs that are currently conducted with CBF guidance. W^A will tend to be fairly similar for most programme target groups as they usually tend to work at low wage jobs. If D^A and W^A do not vary very much among programmes, cross-programme comparisons will be driven mainly by variation in programme gross costs and some combination of programme scale and programme success in getting participants into jobs. Errors in measuring either ΔC or ΔJ that are not constant across programmes will tend to distort cross-programme comparisons. Dividing net benefits by the number of participants in a programme, which is measured quite accurately from administrative data, rather than by the number of additional jobs that result, which, as discussed earlier, is especially subject to measurement errors, would help minimise the problems mentioned in this paragraph.

6   Recommendations

The discussion in the report recommends a number of steps that might be taken to improve the CBF CBAs. Some of these steps could be taken immediately and some can only be implemented gradually. Our recommendations are summarised below, along with an indication of where the discussion of each appears in the text. In making these recommendations, we distinguish between those that, in our view, should be given the highest priority and those that have a lower priority. We also distinguish between those that can be done relatively quickly and easily and those that can only be done over the middle or longer-term and, in some cases, involve considerable work and expense. It should be pointed out that only three of our high priority recommendations would take a long time to implement, and one of these is already being done on an ongoing basis. The remaining high priority recommendations are relatively easy and quick to implement. On the other hand, a considerable number of our lower priority recommendations would take some time to implement.

High priority/short-term recommendations

- Apart from ensuring net impact estimates on employment are made available for programmes as much as possible, where net impact estimates are missing documentation should be produced on the formulation and data sources, judgements and assumptions of any substitute information made as part of the CBA, and sensitivity analyses applied together with discussion of the implications of the weak evidence base for the CBA, when substitutions are made for net impacts (Section 2.3).

- When estimates of impacts on employment exist for multiple time periods, use the largest one for determining the number of additional jobs resulting from employment and training programmes (Section 2.4).

- When the impact on net earnings is unavailable for a programme, the substitute information that is used instead should be carefully documented and sensitivity analyses applied, together with a discussion of the implications for the CBA (Section 2.7).

- When certain benefits and costs are not incorporated into the estimates of net benefits, the implications of their omission need to be discussed in reporting the cost-benefit findings (Sections 3.1 and 3.2 and elsewhere).

- We do not recommend reporting estimates of the monetary values of programme impacts on difficult to monetise outcomes such as health, self-esteem, child-welfare, and life-satisfaction until reliable estimates of these impacts become available (Section 3.2).

- Drop the product market corrector that is currently used (Section 3.5).

- Do not use a multiplier in estimating net benefits unless unemployment rates are high (Section 3.6).

- Use Jobcentre Plus historical annual cost accounts for the year closest to the programme impact estimates, and remove any set-up costs from these, to produce adequate cost measures where a cost analysis has not been done (Section 4.1).

- Include DEL-A costs from Jobcentre Plus annual cost accounts where they exist for a programme, and when including them in the CBA divide by the number of programme participants to get a measure comparable across programmes (Section 4.1).

- Report judgements, data sources and assumptions for cost estimates together with discussion of any weaknesses in evidence and the implications for the CBA (Section 4.1).

- In conducting sensitivity analyses, make alternative assumptions concerning the value of the loss of non-market time (i.e. 'leisure') that occurs when programme participants enter employment (Section 4.3).

- The likely importance or unimportance of general equilibrium effects should be discussed in presenting findings from the CBF CBAs (Section 4.5).

- Sensitivity tests should be conducted of estimated net benefits to see if programme ranking changes when alternative assumptions are made. Section 5.5 provides a suggested list of these tests.

- Strong consideration should be given to replacing the net-benefits-per-additional-job ratios that are currently used to rank programmes with net-benefits-per-participant ratios (Section 5.6).

- Although it is necessary to rank programmes on the basis of ratios, great care should be exercised in reporting and interpreting the resulting ranking because the ratios are inevitably subject to serious scale problems (Section 5.6).

High priority/middle- or long-term recommendations

- Ensure net impacts are estimated more often, for all programmes where possible, using valid evaluation designs, and timely consideration of the data requirements, particularly before the outset of a new programme (Section 2.1).

- It is important to allow job duration values that are used in the CBF CBAs to vary by target group in a way that reflects how they actually differ, even when the precise values are unknown (Section 2.6).

- When an early brief CBA exists, together with a later independent or more carefully constructed CBA for the same programme, then the former CBA should be compared and updated. This is already done on an ongoing basis and should continue to be done (section 5.4).

Middle or low priority/short-term recommendations

- If estimates of impacts on being off benefits are used for determining the number of additional jobs resulting from employment and training programmes, they should first be adjusted, if possible, to allow for the fact that not all those leaving benefits as a result of employment and training programmes enter into employment (Section 2.5).

- Whenever possible, estimates of impacts on employment and estimates of impacts on being off benefits should both be used for determining the number of additional jobs resulting from a programme, with the former used for the core CBA and the latter used for sensitivity analysis (Section 2.5).

- An informed estimate of take-up of such benefits as Working Tax Credit (WTC) and CTB, based on further analytical information or microsimulation for take-up rates, would be better than the use of a 100 per cent assumption (Section 3.3).

- Continue to include deadweight loss in estimating economic net benefits (Section 4.4).

- Brief in-house CBAs should include more variations and sensitivity analyses, particularly where any substitute information is used in place of impact estimates, so that they are more meaningful when combined with more carefully done CBAs (Section 5.4).

Middle or low priority/middle- or long-term recommendations

- A knowledge base should be developed of how job duration varies by target group and (to the extent possible) by programme. Section 2.6 provides suggestions as to how this might be done.

- As for Section 2.2, construction of net earnings impacts should be a requirement for evaluation designs for a programme as much as possible (Section 2.7).

- Whenever possible, estimate the impacts of employment and training programmes on difficult to monetise outcomes such as health, self-esteem, child-welfare, and life-satisfaction. This may require the collection of new survey data (Section 3.2).

- Use of a microsimulation model to obtain impacts on WTC, CTB, tax payments and NI contributions would be beneficial; however, the current tabular methods are adequate (Section 3.3).

- Perhaps, begin to develop a product market corrector that is more appropriate than the one that has been used in the past (Section 3.5).

- For programmes for which DEL-A costs are unavailable from Jobcentre Plus cost account data, itemise administrative tasks for delivering the programme and find substitute costs for the tasks, perhaps from similar programmes (Section 4.1).

- Begin determining the increased costs of commuter travel and (for lone parents) childcare when programme participants enter employment (Section 4.2).

- Considering multiple programme participation, the net impact estimate and the evaluation design is important in defining what the net benefit is. Section 5.1 considers how this can be approached. However, an important step is to ensure participation rates are examined for each programme for the participant and comparison groups. The costs of each programme should be summed.

- Consideration should be given to ranking programmes on the basis of their net benefits to those who participate in them. However, it is not essential to do this (Section 5.2).

- Because great uncertainty surrounds the value of distributional weights, assumed values should be used in sensitivity analyses, but not in presenting the core CBF cost-benefit findings (Section 5.3).

A more general recommendation concerns ensuring consistency across the CBF CBAs. The CBF document, which provides fairly detailed information on many relevant topics, ensures a certain amount of consistency. However, as suggested below and as recognised by DWP, this document needs some revision and updating, in part to reflect recent changes in methods that are often written up in memos but not yet reflected in the document. Even more important in helping to ensure consistency is the fact that many of steps required to estimate the costs and benefits of each programme are completed centrally in Sheffield and only a few people are involved.

Nonetheless, in the research that we conducted in preparing this report, we found that documentation did not exist that described some of the steps involved in the CBAs. Thus, we could only determine the procedures followed by asking those involved. Not surprisingly, this lack of documentation and specification, which reflects the lack of time available to provide it and meet other responsibilities as well, resulted in some inconsistencies in how different cost-benefit analyses were done, especially in the case of work that was not conducted centrally.

Much of this variation involved determining the number of additional jobs resulting from each analysed programme, which, as previously indicated, is critical to the CBAs. Given the lack of documentation describing how this crucial step is done, the absence of procedures as to how it should be done, and the fact that it is not done centrally but by staff who are responsible for the various programmes being analysed and, hence, differ from programme-to-programme, not surprisingly, there was considerable variation in the manner in which the step was completed. For

example, estimates of impacts on employment were typically used for determining the number of additional jobs when they were available, but impacts on being off benefits were sometimes used instead, even when the former were available. Because the impacts were typically estimated for several time periods, there were also differences in which of the available estimates were used in determining the number of additional jobs. If impact estimates were not available, answers to survey questions were used to determine the percentage of employed programme participants who felt they would not have got their job without the programme. This percentage was then adjusted downward in unspecified ways prior to being used to determine the number of jobs actually resulting from a programme.

It would seem useful to specify in the framework document how the number of additional jobs should be determined when estimates of impacts on employment and benefits are available and when they are not available. Somewhat similar, but less severe, inconsistencies occur in determining the average wage paid in the jobs at which former programme participants are employed. Thus, the framework should also provide greater detail on how this should be done.

Appendix A
Protocol for interviews of the Cost Benefit Framework guidance

1. Please explain what you do in connection with the CBF work.

2. Which document(s) that we have been sent were you associated with?

3. For what purpose(s) do you think the CBA estimates made under the CBF should be used?

4. Could you explain how estimates of additional jobs have been obtained for the programmes you cover? What assumptions are made?

5. How have you obtained earnings estimates? What assumptions are made?

6. Could you explain how estimates of job duration have been obtained for the programmes you cover? What assumptions are made?

7. From what sources are the cost estimates used in the CBAs of the programmes you cover obtained? (Please define the three cost components: DEL-P, DEL-A and AME.) Do you think this estimate is reasonable for the purposes at hand?

8. Ideally, what reliable measures of impacts would you like to have available for purposes of conducting cost-benefit analyses of the programmes you cover?

9. How do you think deadweight losses from taxes ought to be treated in the CBAs? Why?

10. What do you think about the product market corrector that the Treasury *Green Book* suggests should be used in CBAs?

11. Do you think any other perspectives than those of the fiscal and economic ones should be presented in reporting the CBAs?

12. Do you think the use of distributional weights should be considered?

13. What sort of sensitivity test results, if any, should be reported along with the main CBA findings?

14. Are there any other topics that we haven't covered with you that we should?

Appendix B
Cost Benefit Framework effectiveness calculations

The effectiveness calculations for the 'overall assessment of effectiveness' contain two main measures:

- **Net fiscal or Exchequer effectiveness (in £s)**: This is an estimate of the cost effectiveness to the Exchequer of using the programme. It measures the difference in the costs of a particular programme (the operational costs) and the benefits that flow back to the Exchequer in terms of increased tax revenue and benefit payments saved.

- **Net economic[32] effectiveness in (£s)**: This measures the effectiveness of the programme on the economy more widely. It sets the benefits of increased output in the economy (produced by more people flowing into work) against the cost of running the programme.

The effectiveness calculations focus on the **additional** benefits associated with those **who find work who would not have done so without the help of the programme**.

In measuring the **net fiscal effectiveness**, the following variables are included:

Benefits
- The additional income tax paid by former programme participants now in work.

- The additional employer and employee NI contributions.

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[32]   The term 'Economic' is used as a label for this measure. The *Green Book* uses the term 'social' but it is not used here as the calculations only include employment benefits and do not the quantified wider social cost and benefits identified in Section 5 of the supplementary measures.

- The extra Value Added Tax (VAT) paid by those who have found work as a result of the programmes.

- The benefit payments and other entitlements saved since they left the programme for work.

Costs

- The operational costs of the programme.

- Any in work benefits paid.

The **net benefit to the Exchequer** is then calculated by:

i) estimating the fiscal Exchequer savings – additional taxes paid and the amount of total benefits claimed whilst unemployed or inactive is multiplied by the number of additional people into work. The benefits claimed and taxes used within the calculations are principle benefits (e.g. JSA, IS or IB), Housing Benefit, CTB, income tax, indirect tax, NI contributions. In-work tax credits are subtracted from the Exchequer savings;

ii) subtracting the cost of the programme.

The net benefits are then divided by the number of additional jobs to calculate the net fiscal benefits per additional job or by the number of starts to calculate the net Exchequer benefit per start.

To calculate the **net economic effectiveness**, we consider:

Benefits

- The additional gross wages of those finding work as a result of the programme net of deadweight.

- Product market corrector figure to take into account firm's profits on labour input when estimating output gains to the economy.

Costs

- The costs of running the programme.

In the past DWP has also included as a cost the deadweight cost of taxation – this reflects the fact that raising taxation to fund programmes impacts on work and output incentives in the wider economy.

To estimate the **net benefit to the economy** we:

i) estimate the value of increased output produced by additional workers by multiplying additional workers' salary by a 'product market corrector' and the duration of the job; and

ii) subtract 25 per cent of the net fiscal cost (the deadweight cost of raising taxation).

These net economic benefits (like the net fiscal benefits) are then sometimes expressed per additional job or per start.

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