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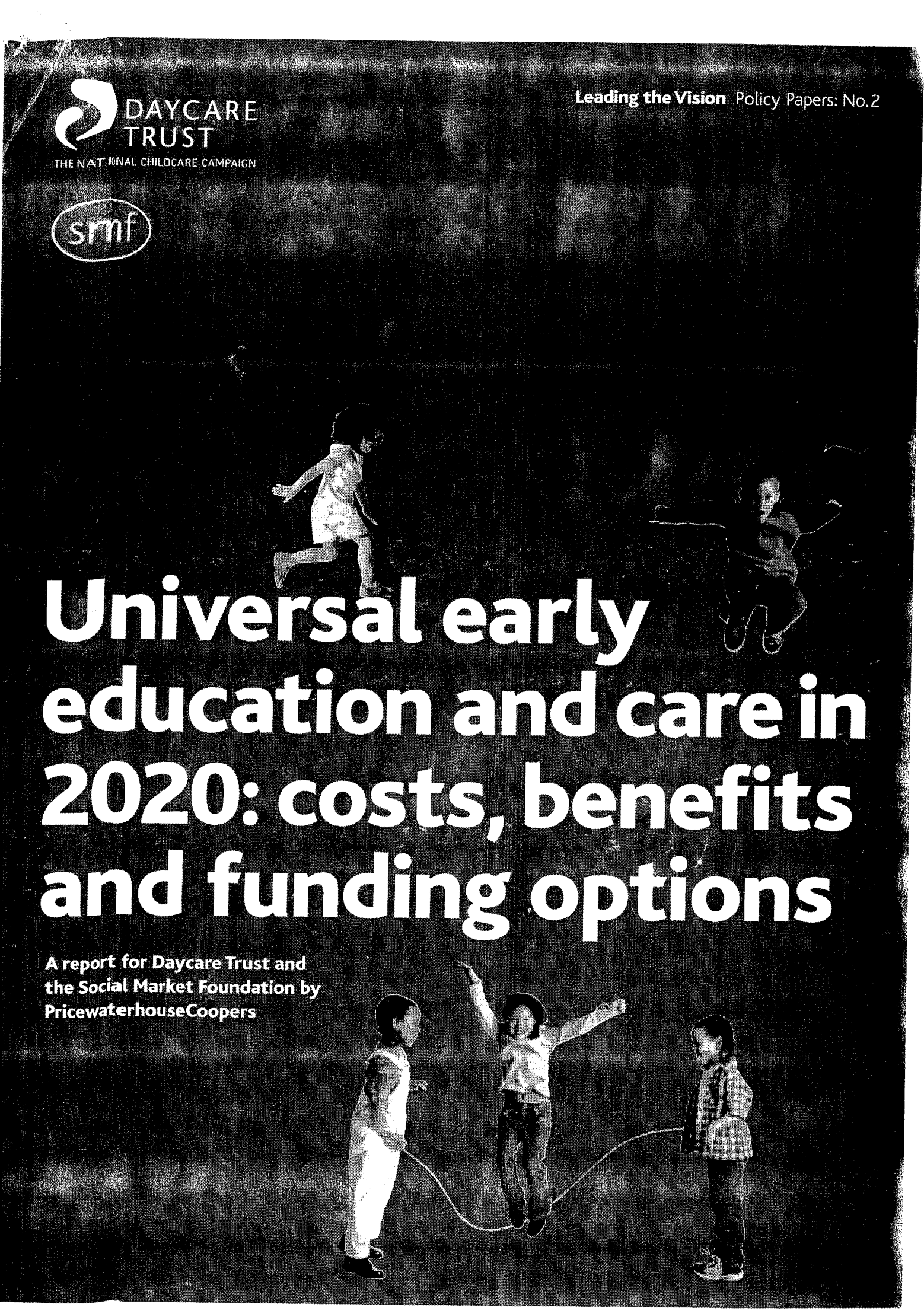
Leading the Vision Policy Papers: No.2

Universal early education and care in 2020: costs, benefits and funding options

A report for Daycare Trust and the Social Market Foundation by PricewaterhouseCoopers



About this report

This report was commissioned from PricewaterhouseCoopers in August 2004 by Daycare Trust and the Social Market Foundation as a contribution to the ongoing debate on the future of early education and care in the UK. The report considers the costs, benefits and options for funding provision of universal early education and care in 2020 that has been developed jointly by Daycare Trust and the Social Market Foundation. The primary author of the report is John Hawksworth, Head of Macroeconomics at PricewaterhouseCoopers.

We are grateful to officials at DfES and the Treasury for help with data requests and taking time to discuss the project with us. We are also grateful to Professor Peter Moss and Professor Edward Melhuish for taking time to meet us and provide advice on the project, to Tim Langdon for providing information on the possible use of DBFO schemes for new children's centres, and to participants at a Daycare Trust roundtable event hosted by HSBC at Canary Wharf on 6 September 2004, which discussed some preliminary findings from the study. The content of the report, however, remains the responsibility of PricewaterhouseCoopers, Daycare Trust and the Social Market Foundation.

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Contents

Universal early education and care in 2020: costs, benefits and funding options is the second report in the *Leading the Vision* series of policy papers.

It was commissioned from PricewaterhouseCoopers by Daycare Trust and the Social Market Foundation. The report considers the costs, benefits and options for funding a vision of universal early education and care in 2020 that has been developed jointly by Daycare Trust and the Social Market Foundation.

The *Leading the Vision* policy papers are written by Daycare Trust and by leading experts in the childcare and early years sectors. The papers draw on the contributions of academic experts, childcare organisations, civil servants, policymakers, think tanks, opinion formers and key stakeholders who have shared their views and their vision of a new universal childcare and early years sector in Britain at a series of policy roundtables organised by Daycare Trust between July 2004 and February 2005.

We hope that this report will make a valuable contribution to the development of the Government's ten year plan for delivering universal childcare. It sets out an ambitious package of support and services for children from birth to 14 and their families which would rival the best in Europe. While the costs may slightly outweigh the quantifiable economic benefits, we believe that the social benefits of our vision make it very attractive. The report also raises further issues that need to be explored to ensure that quality affordable early education and care are available to all families.

Executive summary

Extending affordable, high quality early education and care is an increasingly important element in Government strategy

The UK Government has made significant additional investments in pre-school education and care since 1997, with further increases planned over the period to 2007/8. The Government has also set ambitious longer term objectives, including: an end to child poverty by 2020; a Children's Centre in every community; the option of access to integrated, flexible education and care throughout the year for all 3 and 4 year olds; and a primary school offering guaranteed 8am-6pm childcare in every community.

Building on this strategy, what should be the long-term vision for early education and care in the UK?

Daycare Trust and the Social Market Foundation have developed a vision[1] for universal early education and care in 2020 with the following key elements:

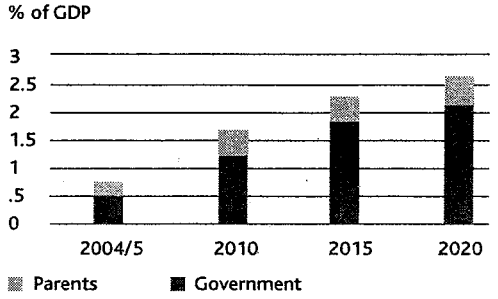
- 12 months paid parental leave: 6 weeks at 90% of earnings and the rest at national minimum wage levels; this leave allowance could be shared between mothers and fathers and is aimed at providing all parents with the option of being able to afford to stay at home and care for their children during the first year of their life if they choose to do so;
- a home care allowance paid to parents who choose to stay at home to look after children aged 12-24 months, with a reduced allowance available to those working part-time; an alternative option considered here would be to extend parental leave to 18 months (these two variants are referred to below as Policy Packages 1 and 2 respectively);
- entitlement to 20 hours per week free early education and care for up to 48 weeks per year for all 2,3 and 4 year olds, funded by grant payments to providers;
- additional wrap around education and care from 8am-6pm for 48 weeks per year for all 2, 3 and 4 year olds and for 1 year olds whose parents choose not to take up the home care allowance option (or the parental leave option where this is extended to 18 months);
- additional wrap around education and care for 5-14 year olds (before/after school and during school holidays), delivered through extended schools;
- a mixed economy of provision for these services, including Children's Centres, childminder networks, and other early years providers in the private, voluntary and maintained sectors;
- a significant 'upskilling' of the early years workforce, with an objective that 60% should have a graduate-level teaching qualification by 2015, with the other 40% having level 3 (NVQ3) qualifications by that date;
- income-related subsidies for early education and care over and above the 20 hours per week free element; and
- childcare tax credits would eventually be abolished to help meet the costs of this package, which would primarily be funded through supply-side grants to early education and care providers.

The costs of the package would be significant

At present, we estimate that total spending on early years education and care in the UK, plus parental leave payments, is just under £10 billion in 2004/5 (around 0.8% of GDP). Our estimates of the total costs of the vision over the period to 2020 are illustrated in Figure 1 below. For the first policy package with the home care allowance, this implies a total cost of around 2.6% of GDP, an increase of around 1.8% of GDP (c.£21 billion at 2004/5 values) on current spending levels. Costs are broadly similar in the second option with parental leave extended to 18 months and no home care allowance. The order of magnitude of these cost estimates is not surprising, since it is a Scandinavian-style package and both Sweden and Denmark currently spend around 2-2.5% of GDP on early education and care (excluding parental leave payments).

Sweden and Denmark currently spend around 2-2.5% of GDP on early education and care (excluding parental leave payments)

Figure 1: Projected build-up of costs over time



Source: PwC estimates for Policy Package 1 (costs are similar for Policy Package 2)

1 See Alakeson (2004) for further details of the rationale behind this vision. 2020 is chosen both as a realistic date for implementing the vision and because it coincides with the Government's target date for eliminating child poverty, to which universal early education and care can be argued to be a key contributor.

2 The EPPE project is the first major European longitudinal study of a national sample of young children's development (intellectual and social/behavioural) between the ages of 3 and 7 years. The effects of pre-school education for 3 and 4 year olds were investigated by collecting a wide range of information on over 3,000 children, their parents, their home environments and the pre-school settings they attended.

The analysis assumes that parents on average contribute around 30% of the costs for the non-free elements of the 2020 package, broadly in line with current average parental contribution rates in other EU countries. On this basis, the gross cost to government is estimated at around 2.2% of GDP in 2020, or around 1.7% of GDP (c.£20 billion at 2004/5 values) above current government spending levels in the early years area.

High quality, affordable early years provision can boost female employment levels, which, in turn, can help both to increase economic output and to reduce child poverty

But the vision would also deliver significant economic and social benefits

High quality, affordable early years provision can boost female employment levels, which, in turn, can help both to increase economic output and to reduce child poverty, much of which is linked to low employment levels of lone parents in particular. In the longer term, higher female employment can also help to meet the economic and financial challenges of an ageing population, as can the potential increase in future productivity if children develop better cognitive skills at an early age through high quality pre-school education and care, as suggested by research from the EPPE[2] project and other studies in the UK and elsewhere.

Extended parental leave and home care allowances would complement this programme by allowing more contact between parents and children in the first 1-2 years of life, which research suggests is critical for later emotional and social development. The overall package also allows parents who want to spend more time with their children in this early period a better chance of remaining attached to the workforce, rather than taking extended career breaks that can have significant negative effects on lifetime earnings potential and, related to this, future pension levels.

For the economy as a whole, we estimate (drawing on previous PwC research that has been updated for this study) that this package could boost total UK parental employment by around 700,000, implying an increase in national output of around 1% of GDP in 2020. In addition, we estimate that the longer term quantifiable economic benefits of the package, in terms of increased lifetime employment and earnings of parents and the future productivity of children as adults, could be of the order of 0.5% of GDP, when expressed as an equivalent annual present value. It should be stressed, however, that this base case estimate is subject to significant uncertainties, with **a plausible range for total economic benefits being of the order of 1-2% of GDP in equivalent annual terms**. Note that this is the incremental estimated economic benefit of moving from where we are now to the vision for 2020, over and above the benefits from current provision. These estimated economic benefits are broadly of the same order of magnitude as the incremental costs discussed above, as illustrated in the table below, although the margin of error on the net benefit estimates is clearly large. Furthermore, this cost-benefit comparison excludes potentially important **social benefits** from the 2020 vision. These kinds of benefits are difficult to quantify in financial terms, but would include:

- helping the Government to achieve its target of eliminating child poverty by 2020,

Estimated incremental costs and benefits from universal early education and care vision for 2020 compared to current position (Policy Package 1)

	Impact on Exchequer		Overall economic impact	
	% of GDP	£ billion at 2004/5 values	% of GDP	£ billion at 2004/5 values
Incremental economic benefits	0.4–1 (+ social benefits)	5–12 (+ social benefits)	1–2 (+ social benefits)	12–24 (+ social benefits)
Incremental costs	1.7	20	1.8	21
Net economic benefits/costs	-0.7 to -1.3 (+ social benefits)	-8 to -15 (+ social benefits)	-0.8 to +0.2 (+ social benefits)	-9 to +3 (+ social benefits)

Note: results for Policy Package 2 would be similar Source: PwC estimates

bearing in mind that the only countries to come close to achieving this at present are those such as Sweden and Denmark with universal systems of early education and care provision; of course, this needs to be supplemented by a broad range of other policies to combat child poverty, but studies[3] suggest that early education and care can make a significant contribution to this objective, particularly by boosting lone parent employment, which is only around 33% in the UK for single mothers with children under 5;

- helping to boost the life chances of disadvantaged children through giving them access to affordable, high quality early education and care, which studies such as the EPPE project in the UK suggest can boost their readiness for school, although this clearly needs to be supported by educational and other policies to support disadvantaged children through school and beyond in order to prevent the gains from improved early education and care being eroded over time; and
- reducing future spending on remedial education, healthcare and criminal justice costs through giving children from disadvantaged backgrounds a better start in life; US studies (e.g. the long-term study following children who participated in the Perry pre-school programme in the 1960s) suggest that $1 spent on effective pre-school provision could later return around $7 in such savings, although it should be noted that this only refers to the most disadvantaged children, so these results cannot simply be extrapolated to the proposals for universal early education and care discussed in this report. This does, however, provide a strong argument for extending good quality early education and care to all disadvantaged children, not just those living in current Sure Start areas (which only cover just over half of children living in poverty).

Once these wider social benefits are taken into account, it can be argued that, even if the costs slightly outweigh the quantifiable economic benefits, the policy would still be an attractive one to pursue because of its wider social benefits.

The net impact on the public finances would be significantly less than the gross costs

The increased economic activity generated by the extension of early education and care would also boost tax revenues and reduce social security spending. We estimate that this positive effect on the public finances could be of the order of 0.4-1% of GDP (around £5-12 billion at 2004/5 values). This needs to be set against the estimated incremental costs to the Exchequer of around 1.7% of GDP. So the net cost to the public finances, to be met either from higher taxes or reduced spending elsewhere, would be around 0.7-1.3% of GDP (around £8-15 billion per annum at 2004/5 values). This additional cost would build up gradually over the period to 2020 as the vision was implemented.

The fact that universal early years provision is unlikely to be fully self-financing for the Government does not imply that it should not be pursued if it can deliver net benefits to the economy and society as a whole. It does mean, however, that the policy needs to be assessed against other competing public investments since, in practice, there will always be limits on the ability of governments to finance higher spending through higher taxation or increased borrowing.

Direct grants to providers should be the primary funding mechanism

The vision for 2020 is an ambitious one and will only be achieved if early years education and care providers are funded on a stable and sustainable basis. We consider that this requires the bulk of government funding to be in the form of direct grants to providers, as in countries such as Sweden and Denmark. We also see attractions in the proposed New Zealand funding regime, which links the grant per child-hour to factors such as child:staff ratios and staff qualification levels, so giving providers a financial incentive to increase quality levels. But this requires a significant improvement in the data available on the costs of provision and the relationship to key drivers such as child:staff ratios.

Parents can also be expected to make a contribution to the non-free elements of education and care, but this should be subsidised by the state in a way that is related to income and the number of children in each family. Overall, to make good quality education and care affordable for all families who want it, parental contributions should average no more than around 30% of total costs, but this could vary significantly by income. Further work is needed on the detailed design of the parental contribution regime, but both the Swedish system of capped, income-related fees and the New Zealand system of income-related subsidies would be worthy of further consideration.

3 As reviewed in Kamerman et al. (OECD, 2003)


Dear Zoo

1. Introduction

1.1 This report was commissioned from PricewaterhouseCoopers (PwC) by Daycare Trust and the Social Market Foundation (SMF) in mid-August 2004. The purpose of the report is to examine the costs and benefits of a long-term vision for universal early education and care developed jointly by the project sponsors, and also to consider options for funding this expanded early years[4] provision. The report is based primarily on desk research, supplemented by a limited programme of meetings and discussions with government officials, academic experts and practitioners in the field.

Background to the study: current Government policy

1.2 Increasing the quantity and quality of early years provision represents an important cross-cutting policy objective for the UK Government. The National Childcare Strategy was launched in 1998 and, since then, new childcare places have been created for over a million children and nursery education places for all 3 and 4 year olds. This major progress has been reflected in a significant rise in public expenditure on early education and childcare to a total combined budget of over £6 billion per annum in 2004/5 (including childcare tax credits and statutory maternity pay).

1.3 Further rises are planned up to 2007/8, as announced in the 2004 Spending Review in July. In particular, the Sure Start budget is set to increase by £769 million between 2004/5 and 2007/8, which *inter alia* will help to: fund around 2,500 Children Centres by 2008; deliver part-time early education to 12,000 two year olds living in disadvantaged areas on a pilot basis; and support at least 120,000 additional childcare places by 2008, including those in extended schools.

1.4 The Government also published a Five Year Strategy for Children and Learners (DfES, July 2004), which set out longer term aims in the early years area to:

(a) end child poverty;
(b) create far more opportunities for flexible working, particularly for parents of very young children;
(c) provide access to integrated, flexible education and care throughout the year for 3 and 4 year-olds, for all families that want it;
(d) establish a Children's Centre in every community;
(e) have a primary school offering guaranteed 8am-6pm (wraparound) childcare in every community;
(f) provide parenting support for every parent who wants it; and
(g) identify children at risk early, and give them the help and support they need so that no child slips through the net.

1.5 In pursuit of these aims, the Government has also announced its intention to publish a ten year strategy for early years education and care at the time of the Pre-Budget Report (PBR), which is expected in November 2004. This can be expected to flesh out these long-

4 'Early years provision' should be interpreted throughout this report as also encompassing enhanced wraparound and holiday care for children aged 5–14, which is an important part of the vision for 2020 discussed in this report. This is also the way in which the Government uses the term 'early years' in its Five Year Strategy for Children and Learners.

5 Patricia Hewitt expressed support for extending parental leave to 12 months in an interview with the Financial Times published on 20 September 2004. This policy was earlier proposed by Margaret Hodge, the Minister for Children, in a speech to the Social Market Foundation on 27 May 2004.

6 An excellent review of the literature is provided in Carneiro and Heckman, 2003.

term aims and how they will be achieved in more detail. In particular, it will be important to define more precisely what is meant by the phrase 'in every community', and what services these Children's Centres and extended schools will be expected to provide. In practice, it is likely (and appropriate) that government funding will continue to give priority to more disadvantaged areas but, in general, the long-term aims set out above do appear to represent a clear move towards a more universal system of early years education and care. This was confirmed by the Prime Minister in his speech to the Labour Party conference on 28 September 2004, in which he stated that one of ten key domestic policy aims of a Labour third term would be: "Life made easier for families. More choice for mums at home and at work. Universal, affordable and flexible childcare for the parents of all 3-14 year-olds who want it from 8 in the morning to 6 at night and a Sure Start Children's Centre in every community in Britain."

1.6 Similar objectives were set out by the Chancellor in his Labour Party conference speech on 27 September 2004, in which he also supported the case for extending parental leave, saying that: "So as Patricia Hewitt[5] has said, we will now set as a goal for the next term a total of twelve months paid parental leave, giving parents more choice to stay at home for the first year of their child's life."

1.7 In summary, the Government has made significant advances in funding and promoting early years education and childcare provision since 1997 and has indicated that it has ambitious long-term objectives to extend this in the future. But what would be the costs and benefits of such a policy?

Assessing the costs and benefits of universal early years provision

1.8 As far as we are aware, there have been only a very limited number of attempts to quantify in a systematic and comprehensive way the costs and benefits of universal childcare provision. Some studies have been undertaken in the US[6], but their results do not easily translate into a national UK context and they have tended to focus on schemes for the disadvantaged, rather than more universal provision. We have come across one very interesting study for Canada (Cleveland and Krashinsky, 1998), which does suggest that the economic benefits of a significant extension of good quality childcare could exceed the costs but, as with the US research, the results do not translate easily to the UK context.

1.9 In the UK, there have been a number of studies looking at the benefits of good quality pre-school provision on child development in the early years, including most recently the EPPE study (2003a, 2003b), which have tended to suggest positive impacts on cognitive and social development, although effects on emotional development remain more controversial. But it is difficult to translate these child development effects into estimates of longer-term economic benefits, given that the EPPE study has so far only followed children through to the age of 7. Attempts to compare benefits and costs are also bedevilled by the uncertain reliability of available cost data (EPPE, 2004), as discussed later in this report.

1.10 In August 2003, PwC made its own contribution to this debate by publishing a paper containing a preliminary high-level cost-benefit analysis of universal childcare provision for 1 to 4 year olds in the UK. The analysis aimed to provide a broad indication of the overall orders of magnitude for the main elements of current and future costs and benefits. It focused primarily on the overall economic costs and benefits arising from the proposed changes from a broad social welfare perspective, looking forward over a period of 65 years (i.e. from infancy to a typical retirement date). It also provided illustrative estimates of the potential net impact on the public finances both in the short term and in the longer run.

1.11 The overall conclusion of our 2003 study was that, in the short term, the total costs of moving towards universal childcare for 1-4 year olds were broadly offset by the economic benefits in terms of increased employment and earnings for the parents enabled to go back to work earlier. In the long run, once the effects on the future employability and earnings potential of the children as adults were taken into account, as well as the gain in lifetime earnings for the parents from avoiding prolonged career breaks, the study found that the net benefits to the economy as a whole could well be positive, although ongoing government subsidy would be required. However, many of the cost and benefit estimates in the study were subject to significant uncertainty, so a fair interpretation of the results would be that the economic benefits and the costs broadly offset each other. Since the significant potential social benefits of the policy, notably in boosting lone parent employment and so reducing child poverty and income inequality, were not included in the economic analysis, however, this still suggests that there might be net

gains to society from a policy of moving towards universal early education and care provision in the UK.

1.12 Given the limitations of our 2003 study, it was recognised that considerable further research was needed, both on the benefits side and the costs side, before any firm policy conclusions could be drawn.

Scope of the present study

1.13 The present study is focused on costing the long-term vision of universal early education and care provision developed by Daycare Trust and the SMF, as described further in Section 2 below, and discussing how this might be funded. In the process, it addresses three of the limitations of the 2003 PwC study:

(a) the earlier study relied on estimates of the current costs to parents of childcare, without any allowance for future quality improvements; the present study models this quality effect explicitly by allowing for a significant improvement over time in the average qualification level of the early years workforce and, as a consequence, in average salary levels;

(b) the earlier study looked only at 1-4 year olds, while the vision developed by Daycare Trust and the SMF also encompasses enhanced parental leave in the first 12-18 months of life and extended 8am-6pm wrap around care for school age children; and

(c) the present study looks at funding options for the proposals, which was not a topic covered in the 2003 study.

1.14 It should be recognised, however, that the scope of the present study also necessarily has its limitations, given both the limited time available for its completion and the availability of data. In particular:

(a) the study draws, in revised and updated form, on the analysis of economic benefits in our 2003 report, but has not done significant new work in this area;

(b) the study has been reliant on readily available cost data, since time was not available to conduct any new primary research in this area; it has become apparent during the course of the study, however, that there are significant concerns about the reliability (and consistency across different sources) of the available cost data; this means that the results of the study are subject to significant margins of error, although it should be noted that this would in any event be the case for a study focused on the long-term costs of new policy proposals, even if better current cost data were available; and

(c) while the general pros and cons of alternative funding regimes have been considered, including looking at some international comparators and carrying out some simple illustrative modelling, it is beyond the scope of this study to carry out detailed modelling of funding regime options; this would require much more detailed analysis of micro-level data than was possible during the relatively short duration of this study.

Structure of report

1.15 The remainder of the report is structured as follows:

Section 2 articulates the vision for 2020 and discusses possible transition paths;
Section 3 presents estimates of the costs of delivering the vision;
Section 4 presents estimates of the economic benefits of the vision, updating the findings of our 2003 study, and compares these to the estimated costs;
Section 5 reviews options for funding the vision, both in relation to government spending and parental contributions; and
Section 6 concludes and identifies a number of areas for further research.

1.16 The analysis is supported by two annexes:
Annex A provides further details of the data sources used and the assumptions made in order to derive our cost and benefit estimates; and
Annex B includes a list of references to other relevant publications.

2. The vision for 2020

2.1 Daycare Trust and the Social Market Foundation have put together a vision for early years education and care in 2020 with the following key elements:

(a) 12 months paid parental leave: 6 weeks at 90% of earnings and the rest at minimum wage levels;

(b) a home care allowance paid to parents who choose to stay at home to look after children aged 12-24 months (we refer to this as 'Policy Package 1'), with a reduced allowance available to those working part-time; an alternative option considered here would be to extend parental leave to 18 months (we refer to this as 'Policy Package 2');

(c) entitlement to 20 hours free early years education and care per week for up to 48 weeks per year for all 2,3 and 4 year olds, funded by grant payments from local authorities to providers;

(d) additional wrap around education and care from 8am-6pm for 48 weeks per year for all 2, 3 and 4 year olds and for 1 year olds whose parents do not take up the home care allowance option (or the parental leave option where this is extended to 18 months);

(e) additional wrap around education and care for 5-14 year olds (before/after school and during school holidays), delivered through extended schools;

(f) a mixed economy of early years provision, including Children's Centres, childminder networks, and other early years providers in the private, voluntary and maintained sectors;

(g) a significant 'upskilling' of the early years workforce, with an objective that 60% should have a graduate-level teaching qualification by 2015, with the other 40% having level 3 (NVQ3) qualifications by that date;

(h) income-related subsidies for early education and care over and above the 20 hours per week free element; and

(i) childcare tax credits would eventually be abolished to help meet the costs of this package, which would primarily be funded through supply-side grants to early education and care providers

2.2 The last two elements in the vision are discussed further in Section 5 in the context of funding options more generally. The other seven key elements in the vision are discussed in turn below. This discussion covers not only the desired end-point in 2020, but also the preferred transition path to this end-point. The section concludes with a summary table showing how the vision might evolve between now and 2020. We note here that 2020 was chosen both as a realistic date for completing the implementation of this ambitious vision and because it coincides with the Government's target date for eliminating child poverty, to which this policy could potentially make an important contribution.

2.3 A more detailed description of the vision for 2020 and the research findings that underpin it is set out in a paper by Vidhya Alakeson of the Social Market Foundation, which is being published in parallel to this report. We cross-refer to this report where appropriate.

Parental leave

2.4 The basic proposal here (Policy Package 1) is that the period of paid parental leave is extended from a total of 6 months at present to 12 months by 2020. This paid leave allowance would be able to be shared between mothers and fathers in a way chosen by each family to suit their circumstances, which should help to promote a positive contribution of fathers to the early development of their children. Since the aim is to focus help on less well off parents, the period during which payment would be at 90% of earnings would be kept at 6 weeks[7], but the second period of leave would be extended from 20 weeks to 46 weeks over the period to 2010, while the flat-rate amount paid would increase progressively from around 60% of national minimum wage at present to 80% by 2010 and 100% from 2015 onwards. At October 2004 values, this minimum is assumed to be set at just over £180 per week, assuming a 37.5 hour standard working week at £4.85 per hour.

2.5 The proposal to extend the leave period is intended to extend to all parents the choice to look after their children at home during the first year of life. The importance of giving parents this choice is backed up by extensive academic research, as detailed in Alakeson (2004), which finds that parental leave is associated with better maternal and child health, including lower maternal depression, lower infant mortality and fewer low weight babies. Although the immediate consequence of this may be that employment rates for parents with children aged up to 12 months fall, in the longer term it could boost employment by helping parents (particularly, but not only, mothers on lower incomes) to remain attached to the workforce, rather than not returning to their jobs because they feel that 6 months is too early an age to be passing care of their children over to a third party. Research suggests that there could also be gains from this in terms of pre-school child

7 This is because extending the period over which payment is earnings-related rather than flat rate would give most benefit to better-off families (particularly households with two high earners). We assume that this first six weeks of paid leave would generally be taken by the mother, so we have costed this based on average female earnings (see Annex A for details).

development and so subsequent educational performance and, in the long run, in terms of economic activity and productivity levels, although this latter effect is difficult to quantify as discussed further in Section 4 below.

2.6 The proposed extension of parental leave would also bring the UK more in line with European standards. Mercer, an international human resources consultancy, calculated in 2003 that a woman in the UK earning £15,000 a year is paid £3,558 for six months' maternity leave, compared to £6,058 in Italy, £6,756 in Denmark and £7,500 in Norway[8].

Home care allowance

2.7 In Policy Package 1, we assume that parents who choose to stay at home to look after their children between the ages of 12 months and 24 months receive a home care allowance that averages 50% of national minimum wage by 2020 (the allowance would build up over time to this level). There would also be an option to combine part-time working with receiving a home care allowance reduced on a pro-rata basis (e.g. by 50% for those working half-time).

2.8 This proposal is broadly similar to the regime in Finland, although the payments there are somewhat lower[9], with an income-related supplement for poorer families. The Finnish scheme covers all children under the age of 3 but, as discussed in Alakeson (2004), this may have drawbacks in giving disincentives for 2 year-olds to enter centre-based care, particularly those from disadvantaged families who, research suggests, would have most to gain from this care. For this reason, it is suggested that the UK home care allowance would only be available for parents of 1 year olds.[10]

2.9 The idea of this proposal is to provide a genuine choice to parents between staying at home during the second year of their child's life and working. As discussed further below, the employment option would be supported with wider provision of subsidised childcare for 1 year olds.

2.10 In a variant option (Policy Package 2), we consider the effect of extending parental leave to 18 months in total, with the extra six months continuing to be paid at national minimum wage levels. Subsidised care for 1 year olds would still be available as an alternative in this option, as discussed further below. The extension of parental leave would be in place of the home care allowance, which is for 12 months but paid at half the level. The direct costs of the two alternative packages are therefore the same (unless take-up differs), although the subsidised care alternative for 1 year olds may have somewhat different costs in the two packages, as illustrated by the estimates set out in Section 3.

Free early years education and care for 2–4 year olds

2.11 At present, all 3 and 4 year olds receive 12.5 hours free pre-school education per week for an average of 33 weeks per year. In total, therefore, they receive around 412.5 hours of free pre-school education a year, primarily in nursery schools but also delivered in some cases by other providers such as private day nurseries and childminders.

2.12 The Government has already announced a number of pilot schemes to extend this free education element to 12,000 two year olds by 2007/8. We assume that provision for 2 year olds builds up gradually over time, reaching 80% by 2020 (we assume that 20% of parents might prefer not to take up this option for 2 year olds, whereas we assume there is 100%[11] take-up for 3-4 year olds).

2.13 We also assume, however, that as an early priority the number of weeks of free education and care is extended from 33 weeks to 48 weeks by 2010. As a secondary priority the duration of the free education and care is then extended from 2.5 hours to 4 hours per weekday between 2015 and 2020. These relative priorities are influenced by research findings, notably from the EPPE study, suggesting that it is the frequency rather than the daily duration of early years education that matters most for pre-school child development. By 2020, children aged 2-4 are therefore assumed to be offered around 960 hours of free education and care, an increase of around 130% on current provision for 3-4 year olds. The long-term aim is both to benefit the children and to provide better cover for parents wanting to work at least part-time by extending the duration of free early education and care to 4 hours per weekday, 48 weeks per year.

2.14 As discussed further in Section 5, we assume that providers of this free education and care service receive direct grants to meet in full the costs involved, which we expect will require significant increases on the current real level of the Nursery Education Grant in order to meet the costs of a more highly skilled early years workforce. There will also be additional costs for 2 year olds, given the higher staff: child ratios required for this age group. We also factor a London premium into this funding, reflecting the higher costs of provision in the

8 Mercer Human Resources Consulting (2003).

9 Finland has a basic home allowance equivalent to around £50 per week, plus an income-related supplement of up to around £20 per week. In contrast, we assume the UK home care allowance would build up to a level (in 2004/5 equivalent terms relative to average earnings) of around £90 per week from 2015 onwards. See Alakeson (2004) for further details of the Finnish scheme.

10 The home care allowance could be shared between mothers and fathers. Another possibility might be to make the allowance transferable, in whole or in part, to grandparents involved in looking after 1 year olds for significant periods. This would need further consideration, however, and so is not part of the core vision outlined here.

11 In practice, take-up is likely to be slightly below 100%, for example because some parents will prefer to pay to use independent nursery schools. But latest DfES data show 98% take-up for 4 year-olds and 88% for 3 year-olds, so any cost saving from lower take-up are unlikely to be significant.

capital. A London cost premium is also included in the other elements of the education and care package discussed below.

Additional wrap around education and care for 1–4 year olds

2.15 In addition to the core 20 hours per week of free education and care, subsidised wrap around education and care would be offered for 2-4 year olds to top provision up to a maximum of 10 hours per weekday (i.e. 8am-6pm) for 48 weeks per year. Parents are assumed to be on holiday during the other four weeks and so able to care for the children themselves during this period.

2.16 A similar 10 hours per weekday of early education and care provision, but without the 4 hours of free provision, would be offered to parents of 1 year olds who do not take up the home care allowance (in Policy Package 1) or the extra 6 months of parental leave (in Policy Package 2).

2.17 Parental contributions for this wrap around care are assumed by 2020 to cover 30% of total costs on average, which is broadly in line with the average in other EU countries and is designed to ensure that this is an affordable option for parents wanting to work either part-time or full-time. But this is only the average contribution and we would expect this to vary by income, with the poorest families paying nothing or only a nominal fee. Options for setting parental contributions are discussed further in Section 5, but for the overall cost calculation it is only the average share of costs met by parents that matters.

Additional wraparound provision for 5–14 year olds (extended schools)

2.18 Consistent with the Government's 'extended schools' initiative, we assume that there is an expansion in school-based (or school-related) breakfast clubs, after-school clubs and holiday clubs providing 8am-6pm cover for working parents, as well as offering worthwhile experiences for the children. This would involve a combination of supplementary education (e.g. homework clubs for older children) and other activities (e.g. sports, arts and crafts, drama and dance, chess clubs etc).

2.19 We assume that take-up of this subsidised service is high for 5-7 year-olds (on average 70% of the maximum possible hours provided), but drops off to 40% on average for 8-10 year olds and only 15% for 11-14 year olds.

2.20 As for the pre-school provision, we assume that parental contributions average 30% of total costs, but this would vary by income (and perhaps other factors such as the age of the children and the nature of the activities – some might be free if staffed by volunteers).

A mixed economy of provision

2.21 The vision does not spell out exactly what proportion of the services should be delivered by different types of providers[12], since this is something that would be expected to evolve over time rather than being pre-planned. But, in general, a mixed economy approach is envisaged that would encompass integrated Children Centres, childminder networks, independent nursery schools and other existing and new early years providers in the private, voluntary and maintained sectors.

2.22 The hope would be that increased funding levels would attract a significant number of new providers into the market, as well as providing a secure basis for existing providers to expand. In some cases, consolidation would be expected as larger and more efficient providers bought up smaller providers, leading to a less fragmented market in the long run.

A significant upskilling of the early years workforce

2.23 Delivering the vision will require a significant increase in the size of the early years workforce, but also an increase in its average quality. In particular, we assume that, on average, around 60% of the workforce should have graduate-level qualifications comparable to those of a primary school teacher, with salary and benefits to match. The other 40% of the workforce is assumed, again on average, to have level 3 qualifications, with salary levels broadly comparable to a nursery nurse (see Annex A for details of the assumptions made on salaries). This proposal reflects research showing that staff qualifications are one of the most important drivers of quality in early education and care.

2.24 This 'upskilling' of the workforce to levels similar to those typically seen in Sweden or Denmark[13] is essential if consistently high quality early years education and care is to be provided that can produce the hoped-for benefits in terms of the development of cognitive, social and emotional skills. It is also essential if good quality staff are to be attracted to and retained within the early years workforce in future, in contrast to current patterns of high staff turnover and recruitment difficulties[14]. The cost implications of this upskilling are discussed in Section 3.

12 For costing purposes, 70% of the provision is assumed to be of a daycare type, with 30% being through childminders at 15% lower average cost. But this is only a working assumption for costing purposes, not a prediction of what the actual mix of provision will turn out to be.

13 In New Zealand, the objective is even more ambitious. The aim set out in the Government's ten year strategy in 2002 is to move to a 100% teacher (or equivalent) workforce by 2012 in the early years sector.

14 As documented in the DfES/Sure Start Early Years and Childcare Workforce survey, 2002/3.

15 We have not modelled possible future employer contributions to early years education and care costs, but estimates by the NAO (2004) suggest that these accounted for only around 2% of total spending on early years provision in 2002/3, so this makes little difference to the overall results.

2.25 Given this higher quality workforce, child:staff ratios are assumed to remain at current levels required by Ofsted for different age groups. Allowances are also made in the costing for senior managers and support staff not included in these child:staff ratio calculations (see Annex A for details).

Summary

2.26 The attached table summarises the key features of the vision outlined above and how this is assumed to evolve at key dates between now and 2020. Some of these assumptions are discussed further in the next section of this report.

Table 1 – Key assumptions for evolution of early education and care vision to 2020

Key assumptions	Latest estimates (where available)	2010	2015	2020
% graduates (or equivalent)	c.20%	35%	60%	60%
Child:staff ratios	Ofsted levels: 3:1 (age 1) 4:1 (age 2) 8:1 (age 3-7) (not specified for over-7s)	Same up to 7 15:1 (8-10s) 25:1 (11-14s)	Same as in 2010	Same as in 2010
Free education and care per day (hours)	2.5	2.5	2.5	4
Free education and care (weeks per year)	33	48	48	48
% coverage/take-up of free education/ care for 2 year olds	0% (apart from pilots)	40%	60%	80%
% coverage/take-up of subsidised care for 1-2 yr olds	Aiming for 20% via Sure Start	30%	40%	50%
% coverage/take-up of subsidised care for 3-4 yr olds	Aiming for 20% via Sure Start	30%	50%	70%
% coverage/take-up of subsidised care for 5-14 year olds	Not known	5-7: 30% 8-10: 20% 11-14: 5%	5-7: 50% 8-10: 30% 11-14: 10%	5-7: 70% 8-10: 40% 11-14: 15%
Period of parental leave at 90% earnings (weeks)	6	6	6	6
Period of parental leave at lower rate (weeks) in 12 month option	20	46	46	46
Period of parental leave at lower rate (weeks) in 18 month option	20	72	72	72
% minimum wage for parental leave after first period	c.60%	80%	100%	100%
% minimum wage for home care allowance	0%	40%	50%	50%
Average parental contribution to childcare fees (%)	c.70-75%	50%	30%	30%

3. Costs

Introduction

3.1 The main new element in this study has been the development of a detailed costing model for the vision of early years provision and paid parental leave outlined in the previous section of this report. This contrasts with the approach adopted in our 2003 cost-benefit analysis, where we simply took an estimate of the average cost per full-time place to parents of around £120-125 per week, based on the January 2003 Daycare Trust survey. The latest DfES data from local authorities suggests broadly similar average childcare costs for England of just over £120 per week, while the January 2004 Daycare Trust survey suggests that average childcare costs have increased further to around £125-135 per week (depending on the age of the children). But all of these estimates seem too low if the aim is to deliver consistently high quality early education and care provision. A review of Early Excellence Centres (Bertram et al, 2002), for example, estimated average costs at £4 per child-hour, or around £200 per week for a 50 hour week (i.e. 8am-6pm for five days). This was based on a very small sample of centres, but may be more representative of current high quality providers in the UK. Another estimate we have seen, for the Pen Green Centre in Corby, which is generally acknowledged as a high quality provider, suggests average costs of just under £180 per week for a full-time place.

3.2 Rather than use these current cost data as a guide to future costs, however, we have adopted a more sophisticated modelling approach this time in order to explore more explicitly the cost of achieving higher quality provision through upskilling the early years workforce.

Results of cost modelling

3.3 Below we set out the results of a modelling exercise looking at the potential costs of two alternative policy packages in 2020. We distinguish between the cost to government and the total cost (including parental contributions [15]).

3.4 Results are expressed as a percentage of projected national income (GDP) in 2020, which is the best guide to the affordability of these packages, bearing in mind that tax revenues will tend to rise broadly in line with GDP in the long run. To translate these results into cash terms at today's values, each 1% of GDP is likely to be worth around £11.8 billion in 2004/5 (see final column in table 2).

3.5 The results in Table 2 below are based on the

assumptions set out in Annex A, as applied to the vision for 2020 outlined in the previous section.

16 More precisely, Swedish spending on early years provision in 2002 was estimated at 1.9% of GDP, but this excluded the cost of parental leave payments.

Table 2: Estimated costs of vision for early years provision in 2020

% of GDP	Cost to government	Parental contributions	Total cost	£ billion at 2004/5 GDP values
a) 12 months parental leave	0.5*	-	0.5	5.7
b) Home care allowance for 1 year olds	0.1	-	0.1	1.6
c) Subsidised care alternative for 1 year olds	0.3	0.1	0.4	4.8
d) 20 hours pw free education or childcare for 2-4 year olds	0.6	-	0.6	7.1
e) Wrap around care for 2-4 year olds	0.4	0.2	0.6	7.1
f) Holiday/after-school care for 5-14 year olds	0.3	0.1	0.4	4.1
Total costs: Policy Package 1	**2.2**	**0.4**	**2.6**	**30.4**
- £ billion at 2004/5 GDP values	*25*	*5*	*30*	
a2) 18 months parental leave	0.6*	-	0.6	7.3
c2) Subsidised care for 19-24 month olds	0.2	0.1	0.3	2.9
d), e) and f) as above	1.3	0.3	1.6	18.3
Total costs: Policy Package 2	**2.1**	**0.4**	**2.5**	**28.5**
- £ billion at 2004/5 GDP values	*24*	*5*	*29*	

*Larger employers might be expected to make a small contribution to these parental leave costs (c.8% under the current regime).
Source: PwC estimates (rounded to nearest 0.1% of GDP or £0.1bn; columns and rows may not add up exactly due to rounding)

3.6 The main point that emerges from this analysis is that, unsurprisingly, these policy packages are relatively expensive. The total cost to government is estimated at just over 2% of GDP, or around 2.5% if parental contributions are included. These estimates are broadly similar in magnitude to Swedish[16] and Danish cost estimates of around 2-2.5% of GDP (although these may not be entirely comparable in terms of the services provided). This is plausible, since we are effectively considering a Scandinavian-style policy package here.

Comparison with current spending levels

3.7 The estimates in Table 2 are for total costs, but it is also important to look at incremental costs over and above estimated current spending levels. Table 3 shows some approximate estimates put together from official sources for government spending and total spending in 2004/5. These are subject to some uncertainties, particularly in the case of parental spending on childcare, which is an updated version of a 2002/3 estimate in the 2004 NAO report on early years provision.

Table 3: Estimates of current spending on early years in 2004/5

	£ billion	% of GDP
Statutory maternity pay and maternity allowance	1.3	0.11
Nursery education for 3–4 year olds	3.3	0.28
Sure Start	1.1	0.09
Childcare tax credit	0.7	0.06
Total: public spending	**6.4**	**0.54**
Parental spending on childcare	3.5	0.30
Total early years spending	**9.9**	**0.84**

Source: PwC estimates based on information from DfES, DWP and NAO

3.8 Comparing the estimates in Tables 2 and 3 for Policy Package 1 (results for Policy Package 2 are similar), we can see that:

(a) incremental government spending in 2020 over and above current levels would be around 1.7% of GDP (or around £20 billion at 2004/5 GDP values); and

(b) incremental total spending in 2020 above current levels would be around 1.8% of GDP; this indicates that the overall level of parental contributions only increase slightly as a percentage of GDP in this vision, reflecting the fact that, while the overall quantity of early years provision increases significantly, the average parental contribution rate is much reduced in order to make this provision affordable.

17 The model may slightly overstate this effect at present, since non-staff costs are linked automatically to staff costs and so also rise proportionately to salaries. But this is only a relatively small effect given that non-staff costs are assumed to account for only around 30% of total costs in the model.

Costs during the transitional period

3.9 We can also look at how these costs build up over time, based on the assumptions on the transition to the vision set out in Table 2 above. The results of this analysis are shown in Table 4 below for Policy Package 1 (the spending profile over time is similar, but slightly lower, for Policy Package 2).

3.10 We can see that the rate of increase in spending is reasonably smooth up to 2015, but then decelerates somewhat after the 60% graduate staff ratio has been achieved. Some increases in government spending have already been factored in up to 2007/8 (as announced in the July 2004 Spending Review), but not at as fast a rate as implied by our projections above.

Table 4: Build up of costs on the path to the vision for 2020 (Policy Package 1)

% of GDP	2004/5	2010	2015	2020
Costs to government	**0.5**	**1.3**	**1.9**	**2.2**
Parental contributions	**0.3**	**0.4**	**0.4**	**0.4**
Total costs	**0.8**	**1.7**	**2.3**	**2.6**
Costs to government (£ billion at 2004/5 GDP values)	6.4	15	22	25
Total costs (£ billion at 2004/5 GDP values)	9.9	20	27	30

Source: PwC estimates

Sensitivity analysis

3.11 We have also looked at the sensitivity of the costings for the vision in 2020 to some of the key assumptions made, as summarised in the table below. Results for intermediate years would be qualitatively similar.

Table 5: Sensitivity analysis for key cost assumptions

Change from base case in 2020 (% of GDP)	Policy package 1		Policy Package 2	
	Gov't costs	Total costs	Gov't costs	Total costs
Base case	2.2	2.6	2.1	2.5
10% salary increase	+0.2	+0.2	+0.2	+0.2
Lower child:staff ratios*	+0.5	+0.6	+0.4	+0.5
100% take-up rates	+0.6	+0.7	+0.5	+0.7
Higher staff qualifications**	+0.2	+0.2	+0.2	+0.2
Parental leave paid at 90% of earnings for 6 months rather than 6 weeks	+0.2	+0.2	+0.2	+0.2
Free education kept at 2.5 hours per weekday rather than being increased to 4 hours***	-0.1	-0.1	-0.1	-0.1

* 2:1 for 1 year olds; 3:1 for 2 year olds; 6:1 for 3-4 year olds
**90% graduate level staff in all cases
***With compensating increase in wraparound care for 2-4 year olds to 7.5 hours per day
Source: PwC estimates (rounded to nearest 0.1% of GDP)

3.12 We can see from Table 5 that total costs rise slightly less than proportionately with salary increases[17], reflecting the fact that this does not alter the costs of parental leave or home care allowances.

3.13 Lowering child:staff ratios from 3:1 to 2:1 for 1 year olds, from 4:1 to 3:1 for 2-year olds and from 8:1 to 6:1 for 3-4 year olds has a larger effect on total costs, increasing these by around a third on average. This shows the importance of this assumption in the model.

3.14 Assuming 100% take-up rates for both parental leave and the free education and care elements of the packages also raises costs significantly, although our base case assumptions are more realistic here in practice. Indeed take-up rates could well be lower than we assume, although it may not be prudent to budget on this basis.

3.15 Assuming that 90% of the workforce is qualified to graduate level, rather than 60% in the base case, has a similar effect on total costs to a 10% average salary increase.

3.16 We can see therefore that all of these four factors have material impacts on costs, although the child:staff ratio and take-up rate assumptions are perhaps the most important based on this analysis.

3.17 The final two rows in Table 5 show the cost impact of two further alternative policy options. The first of these is to pay parental leave at the higher rate of 90% of earnings for 6 months rather than 6 weeks. This would add around 0.2% of GDP to costs (i.e. over £2 billion per annum at 2004/5 values), but as this would disproportionately benefit higher earning parents, it might not seem the best use of resources.

3.18 The second option flows from the argument that there may be no need to increase the number of hours of free education for 2-4 year olds from 2.5 to 4 hours per weekday in terms of benefits for child development. Instead there could be an increase in wrap around care to 7.5 hours per weekday to ensure that working parents were still covered. But the consequent reduction in costs for this alternative option would be relatively small at only around 0.1% of GDP.

Implications for the size of the early years workforce

3.19 The analysis above has focused on financial costs, but it is also important to take account of the implied increase in the size of

the early years workforce. Present estimates put this at around 280,000[18], but to deliver this vision for 2020 is likely to involve an increase of the order of around 400,000 (i.e. by around 140%), although this is sensitive to the precise assumptions made on take-up. To the extent that many of these extra staff will need to be graduates with appropriate teaching training, this is also likely to produce a one-off increase in training costs during the transition, followed by a higher ongoing level of training costs in order to maintain standards.

3.20 Additional ongoing training costs are implicit in the overall costings set out above, but we have not looked in detail at the transitional costs involved in generating the increased, higher quality workforce up to 2020. In approximate terms, however, we might assume the additional cost per person as being, say, of the order of £10,000 a year for graduates and, say, £5,000 for those seeking level 3 qualifications. For an increase in the workforce of around 400,000 with 60% graduates and 40% level 3 staff, this might suggest a cumulative cost of around £3.2 billion[19], but this would be spread over a period of 10-15 years (i.e. around £210-320 million per annum or around 0.02-0.03% of GDP). Relative to the overall annual costs shown in Table 3, this is not a large extra cost, but it is subject to significant uncertainty and could be higher in practice. Teacher training budgets would need to be adjusted upwards accordingly.

Costing of children's centres programme

3.21 In addition to estimating the overall costs of the vision, we were also asked to look at the potential costs of the government's long-term objective to put a *'children's centre in every community'*. In practice, this is far from straightforward, since data are not readily available on the comparatively small number of existing children's centres and, in any event, the scope of the services provided by different centres will vary depending on the characteristics of the local area. In areas where there is significant existing daycare provision, for example, the children's centre itself may not provide additional daycare places. In other areas, particularly those that are more disadvantaged with patchy existing provision, providing additional daycare places will be a core element of the children's centre offering. But at present the details of how fast this programme will be rolled out in different areas, and in what form, have not yet been worked out, and would require a great deal of additional primary research both on existing early education and care capacity in different areas and on likely costs[20]. This is beyond the scope of the present study, so we have restricted ourselves here to some purely illustrative calculations aimed at showing possible orders of magnitude for day-care-related running costs (i.e. excluding the cost of non-daycare services) and capital costs for a children's centre programme of a certain assumed scale. Given the significant uncertainties involved, however, too much reliance should not be put on these illustrative calculations.

Daycare-related running costs

3.22 Focusing on the results for children aged 1-4, the analysis suggests an average cost for a full-time place comprising 50 hours of education and care per week for 48 weeks per year of around £10,000 per annum (at 2004/5 values), or just over £200 per week on average. This is based on the assumptions for 2020 set out in Table 1 above, including 60% graduate-level staff.

3.23 If, for the sake of illustration, we assume the objective is to have, say, 10,000[21] children's centres by 2020, with an average of, say, 50 full-time early years education and care places per centre, then this would imply a total cost of around £5 billion per annum (at 2004/5 values), or around 0.5% of GDP. This excludes the cost of the other services provided by the children's centres, but these might be assumed to be met from existing funding streams. This may not be a valid assumption for such an expanded programme of children's centres, but exploring this further is beyond the scope of this study given the lack of readily available data on children's centre costs[22].

3.24 At first sight, daycare-related running costs of around £5 billion a year seem small compared to the cost estimates discussed above for the whole vision, but it should be remembered that even 10,000 children's centres would probably only be sufficient to provide around 500,000 full-time early years education and care places, whereas there are around 2.8 million children aged 1-4 in the UK, which might translate into a total demand for up to 2 million full-time equivalent places. Even an ambitious children's centre programme would therefore need to be extensively supplemented by childminder networks and other types of daycare provider in order to deliver the kind of vision for 2020 discussed earlier in this report.

Capital cost estimates

3.25 Estimates of capital costs for children's

18 DfES/Sure Start Childcare and Early Years Workforce survey 2002/3 (Overview Report, Table 4.1).

19 This figure could be higher once staff turnover is taken into account.

20 Some cost information is available from evaluation reports on Early Excellence Centres, but it is based on relatively small samples of highly diverse centres and is therefore not regarded by DfES as offering a very reliable guide to the future costs of children's centres.

21 This figure was suggested in an earlier Daycare Trust policy paper by Sally Holtermann (2001), although it should be noted that this is a relatively ambitious vision compared to the Government's existing target to establish 2,500 children's centres by 2007/8, many of which will be based on existing Sure Start centres, Early Excellence Centres and Neighbourhood Nurseries. Given the ambitious nature of the overall vision for 2020, however, this illustrative assumption of 10,000 centres by that date does not seem inappropriate here.

22 The Second Annual Evaluation Report 2000-1 for the Early Excellence Centre Pilot Programme (Bertram et al, 2002) included an estimate of average running costs for EECs of around £600,000 per annum, which might imply total costs of the order of at least around £6 billion per annum if replicated for children's centres. But there was a very broad range of cost estimates for individual EECs and the averages may well not be typical of children's centres in future in terms of the range and scale of services provided. So little reliance can be put on these kinds of estimates for this purpose.

centres are subject to the same uncertainties as discussed earlier, relating both to the scale of the intended programme and the likely variation in the range of services provided in different centres. One illustrative calculation that we have seen suggests that, in order to provide a range of services including 50 full-time daycare places, a building of around 1,000 square metres might be required for a newly built centre, at a total cost (including fees) of around £1.5 million (these are England & Wales average costs and would clearly vary by region, being significantly higher in London in particular).

3.26 This rough estimate is only indicative of the broad order of magnitude of capital costs involved, but it does illustrate that these are not huge projects by comparison with some other public sector capital projects. For individual centres, relatively complex procurement methods such as PFI/DBFO would not be viable. If there were a large number of such new build projects, however, then the programme as a whole in a given region (combining a number of local authority areas) might be of the scale necessary to make such financing options viable. The options for financing such a programme are discussed further in Section 5.

Summary of cost analysis

3.27 The analysis carried out in this section shows that the vision for 2020 will not be cheap. Given that it is, broadly speaking, a Scandinavian-type vision, it is not surprising that it involves Scandinavian-type cost levels for government of around 2.2% of GDP by 2020 in total, or around 1.7% of GDP above current spending levels. A programme of 10,000 children's centres would have significantly lower costs than this in relation to early education and care provision, but would need to be supplemented by a range of other providers such as childminders networks and private nurseries in order to deliver the vision for 2020.

3.28 As illustrated by our sensitivity analysis, and bearing in mind the comparatively low reliability of much of the available data on costs of early years provision, there are considerable uncertainties around the precise cost estimates set out in this report, but the broad order of magnitude seems plausible. In judging whether it would be worth incurring these costs, however, it is important to consider the significant benefits that this policy package could offer.

4. Benefits and comparison to costs

Introduction

4.1 In assessing the potential benefits of the early years vision set out in Section 2 above, and comparing these estimated benefits to the cost estimates in Section 3, a clear distinction needs to be made at the outset between:

(a) the overall **economic impact** of the proposals; this reflects the net impact of early years provision on the economy, i.e. in terms of increased employment and/or productivity. The value of this can be measured with reference to any consequent increase in earnings by parents (in both the short term and the longer term) and by children (in the longer term when they enter the labour market), less the cost of the additional resources (both labour and capital) that need to be transferred into the early years sector in order to deliver the increased provision; and

(b) the **fiscal impact** on the Exchequer (which is less important than the economic impact as a decision criterion for government policy, but would need to be taken into account in public finance projections and budgeting). This reflects the share of the total costs of the additional early education and care provision that is funded by government, less the increase in tax revenues as those parents who are enabled to work will pay more tax on their increased earnings and/or spending. There could also be some savings in benefit payments if low-income parents move back into work. In the longer term, higher future earnings by the children as adults will also generate additional tax revenues; not all children may benefit in this way, of course, but we are considering the average effect here.

4.2 In both cases, the focus of the analysis is on the incremental benefits and costs of the vision for 2020 relative to a base case that we define as a continuation of the 'current situation' (i.e. spending levels as a % of GDP remaining constant at estimated 2004/5 levels, as summarised in Table 3 above).

4.3 Following the approach adopted in our 2003 study, as described in Section 1 above, we have focused here on those benefits that are less difficult (although still not easy) to quantify in monetary terms. Impacts on income distribution and child poverty levels have not been taken into account, although

in qualitative terms they could provide a very important element in the case for universal early years educare provision. We have also not tried to quantify a range of knock-on benefits in terms of better early education and care leading to a lower requirement later for remedial education spending, improved health and lower crime rates. These longer-term knock-on benefits have been found to be significant in US[23] studies of increased pre-school provision in disadvantaged areas. It is more debatable, however, how significant they would be in relation to universal early years provision, over and above the long-term effects on the future earnings of the children already factored into the model (which might be interpreted in part as a proxy for some of these other effects, since someone who is less healthy or in prison is likely to be less productive).

4.4 We have also excluded from our estimates of benefits the value of the time savings for relatives and friends who may no longer have to provide unpaid, informal care under a universal provision regime (although some grandparents or other close family relations or friends may be happy to continue to play this role for at least some of the time).

Baseline assumptions

4.5 In order to derive estimates of the economic benefits, we have made use of the same model as in our 2003 cost-benefit study, but have reviewed and updated the assumptions to reflect the fact that, while the vision for 2020 for 1-4 year olds is similar to that considered in the earlier study, it also includes extended parental leave arrangements and extra provision for 5-14 year olds, as well as an increased average quality of provision through the assumed upskilling of the early years workforce. The effect of these changes, relative to our 2003 study, is assumed to be:

(a) no change in our assumption on the short-term employment effect for parents, since any reductions in those working due to extended parental leave (and the home care allowance in Policy Package 1) will be offset by greater employment for parents of primary school children due to better after-school and holiday care provision; it is very difficult to estimate these offsetting effects with any precision, but as a working assumption it seems reasonable that they will tend to cancel out (e.g. because the extended provision for 5-14 year olds may help a larger number of parents than the parental leave extension, but the short term effect of the latter on parental employment may be proportionately greater on average[24]);

(b) given the quality improvements assumed through upskilling the workforce, we are more confident about our assumption that there will be positive long-term effects on the future productivity and employment as adults of the children enjoying extra pre-school provision; we have therefore upgraded the assumed average effect on lifetime earnings of the children from 2% to 3%, although we would emphasise that this is an average effect, which would be expected to be greater for children from disadvantaged backgrounds, but might be zero or close to zero for children from more affluent backgrounds; and

(c) a significant boost to the lifetime earnings of parents (particularly mothers) from remaining attached to the workforce while their children are young due to the extension of parental leave, the home care allowance and the extension of provision for school age children; in our original study, we only assumed modest long-term benefits to parents from avoiding prolonged career breaks while their children were young, but these may already have been underestimates of the true potential benefits from this source and, with the extended vision for 2020 now being considered, we feel it is plausible to assume that benefits are at twice the level assumed in our original study (i.e. a 3% boost to the subsequent average lifetime earnings[25] of mothers assumed to be working full-time while their children are aged 1-7 and a 1% boost to the average lifetime earnings of mothers working part-time during this period).

4.6 A more detailed description of the baseline assumptions and sources of information that underpin our model estimates of benefits is provided in Annex A. A summary of our key baseline assumptions is provided in Table 6 below. It should be emphasised that these assumptions are subject to significant uncertainties and are only intended as a starting point for analysis, so too much weight should not be put on their precise values. As discussed further below, we have undertaken sensitivity analysis for all the key assumptions on benefits.

Longer-term knock-on benefits have been found to be significant in US studies of increased pre-school provision in disadvantaged areas

23 The EPPE study in the UK (2003) has also found clear evidence that good quality pre-school education and care can contribute to reducing the proportion of children with special educational needs when entering primary school, but has not attempted to put a financial value on this benefit.

24 Although it should be noted that extension of parental leave may create additional demand for temporary workers to fill in for parents taking leave, so the net effect on employment may not be great (although it could add to labour market tightness and so wage pressures).

25 One issue here that requires further research is whether there might, as seems to have been the case in Sweden, be a tendency for a dual labour market to develop, with low paid but family-friendly jobs for women (particularly in the public sector) and higher paid but less family-friendly jobs for men (particularly in the private sector).

26 The UK literature in this area is reviewed in Harmon, Oosterbeek and Walker (2000). Our model assumes, therefore, that the impact of additional pre-school provision on future productivity is the equivalent on average across the population of between 30% and 60% of the impact of one additional year of formal education. We might note here that the EPPE study suggests a gain of around 7.8 months in early literacy development at age 5 from three years of high quality pre-school provision compared to children with no such provision (after adjusting for other relevant factors influencing early literacy).

Table 6: The model's key baseline assumptions on economic benefits

Benefits	
Employment effects (parents)	The baseline assumption is that the employment rate for women in the 25-49 age band in the UK would rise over a 10 year period to around 7 percentage points lower than the UK male rate. This would, for example, place the female employment rate at around 81% for 25-34 year olds compared to around 72% now. This would raise overall UK female employment rates towards, but not completely up to, Swedish/Danish levels, with a net increase of around 700,000 jobs over the 10 years. We assume that 56% of the jobs would be full-time and 44% part time. This is in line with the current UK average split for women. As discussed further in Annex A, this assumption can be related to our estimate that around 1.3 million mothers would be potentially 'released' from childcare responsibilities by the shift to universal pre-school provision, with around 400,000 of these mothers choosing to work full time and around 300,000 part time as a result. The other 600,000 are assumed to choose to continue to look after their children at home.
Long-term benefits (children)	This is one of the most challenging assumptions to set. The model assumes an average productivity increase of 3%, i.e. that lifetime earnings for those children who benefit from additional early years education and care are on average 3% higher than they would have been without this provision. Most of the existing US studies which have directly estimated the impact of early years provision on subsequent earnings have used data drawn from families located in disadvantaged areas where the benefits of childcare are likely to be significantly higher than in more affluent communities. Some such studies, which are reviewed in Carneiro and Heckman (2003), have estimated earnings effects of 10% or more. Within the context of universal early education and care provision, however, this will be counterbalanced by the fact that, for better-off children, there may be much lower benefits (although the EPPE study does suggest some gains to cognitive development even for better-off children from high quality pre-school provision of a year or more). Our 3% estimate, therefore, represents an average impact across the whole population of 1-4 year olds. It is broadly consistent, for example, with universal early education and care provision leading to a 10% increase in earnings for the most disadvantaged 30% of children and, on average, having no effect on the remaining children. But there are many other possible combinations to give the 3% weighted average effect assumed here. It is also worth noting that a key finding from the literature on the returns to education is that one additional year of compulsory education is likely to result, *ceteris paribus*, in a 5–10% increase in lifetime earnings streams.[25]
Long-term benefits (parents)	The model also allows for a longer-term boost to the lifetime earnings of mothers who are able to avoid a prolonged career break as a result of the additional early education and care provision (see Annex A for details of this effect, which is assumed to lead to a 3% increase in the lifetime earnings of mothers who are enabled to work full-time and a 1% increase for mothers enabled to work part-time while their children are aged 1–7).
Share of extra earnings flowing to Exchequer	This is currently set at 40%, based on recent Office of National Statistics figures on the proportion of gross income paid in direct and indirect tax.
Reduced benefit payments	We have assumed annual benefit savings of around £1,000 for each additional full-time job and £500 for each part-time job (2004/5 values). These may in fact be rather low estimates, particularly for lone parents moving back into work.

Source: PwC assumptions

Baseline results

4.7 In principle, the kind of cost-benefit model we have developed needs to be estimated in a *dynamic* way (i.e. current and future streams of costs and benefits need to be estimated in order to build up a long-term picture of the net costs/benefits in discounted present value terms). In practice, however, it is convenient to express the results in terms of equivalent annual present values[27] in a particular year, which is taken here to be 2020 as this is the date by which the vision is assumed to have been implemented in full.

4.8 Table 7 summarises our estimates of annual equivalent benefits in 2020 under our baseline assumptions. Excluding the longer-term effects that might be considered more speculative, the estimated total annual economic benefit is around 0.9% of GDP (£10.8 billion at 2004/5 values), with a consequent gain to the Exchequer of around 0.4% of GDP (around £5 billion per annum at 2004/5 values). If the estimated equivalent annual value of longer-term benefits to both the parents and the children are added in, however, then the estimated benefits to the economy as a whole increase to around 1.5% of GDP (around £18 billion at 2004/5 values), with a gain to the Exchequer estimated at around 0.7% of GDP (around £8 billion per annum at 2004/5 values). Note that all of these are incremental benefits relative to a continuation of current levels of early years spending and provision.

4.9 We can immediately note that the incremental benefits to the economy as a whole of around 1.5% of GDP per annum are broadly similar to the estimated incremental total costs of around 1.8% of GDP per annum from Table 3 above. Bearing in mind the significant potential social benefits (i.e. reduced child poverty and income inequality etc) that might also be attributed to this policy package, but are not included in the figures above, the fact that the quantifiable economic benefits and costs seem broadly to cancel out suggests that there might be benefits to society as a whole from the early years vision, relative to the current position. This is not to say that there might not be some intermediate position that could have even greater net benefits, but it does suggest that moving in the direction of the vision could be socially beneficial.

4.10 The analysis also suggests, however, as did our 2003 study, that there will inevitably be net costs to the Exchequer from this policy in order to make universal early years provision affordable for parents. Our costings suggest that the incremental cost to the government over and above current spending would be of the order of 1.7% of GDP (see Table 3 above), while the offsetting gains in terms of increased tax revenues and reduced social security benefit payments would only be of the order of 0.7% of GDP according to the estimates in Table 7. Even taking a long-term view, the net cost to the Exchequer might therefore be of the order of around 1% of GDP, or around £12 billion per annum at 2004/5 values. This is not to say that the policy should not be pursued if it promises net benefits to society as a whole, but it does mean that it needs to compete for funds against a range of other potentially socially beneficial public sector projects, given that

27 These are the annual values that, over the full 65 year period under consideration in our model, have the same discounted present value if they recur each year to the actual flow of estimated benefits over the period.

Table 7: Estimated annual benefits when early years vision is fully implemented in 2020

% of GDP (£ billion per annum at 2004/5 GDP values also shown in brackets)	Estimated overall economic benefits	Estimated Exchequer benefits
Short-term benefits		
Employment benefits (parents)	0.9% (£10.8bn)	0.35% (£4.3bn)
Reduced benefit payments	0	0.05% (£0.6bn)
Total short-term benefits	**0.9% (£10.8bn)**	**0.4% (£4.9bn)**
Longer term benefits (equivalent annual values)		
Lifetime earnings of children	0.4% (£5.0bn)	0.2%(£2.0bn)
Lifetime earnings of parents	0.2% (£2.2bn)	0.1% (£0.9bn)
Total longer term benefits	**0.6% (£7.2bn)**	**0.3% (£2.9bn)**
Total estimated benefits	**1.5% (£18.0bn)**	**0.7% (£7.8bn)**

Source: PwC estimates

there will always be some limits to the ability of governments to raise taxes or increase borrowing to fund such investments.

Could comparable benefits be achieved through income transfers?

4.11 Another question that arises here is whether there might be other more efficient ways to achieve similar benefits, for example in terms of relieving child poverty and increasing pre-school child development. A detailed review of this issue is beyond the scope of this study, but we note that recent EPPE research[28] (2004) tends to suggest that good quality pre-school education and care is significantly more cost-effective than income transfers in achieving improvements in at least some important aspects of pre-school child development. The study suggested, for example, that three years of high quality pre-school provision (compared to no such provision) could boost the literacy level of a child starting school by the equivalent of around 7.8 months of normal development. In contrast, increasing annual household income from zero to £67,500 would only be associated on average with an improvement in literacy equivalent to around 6.3 months of normal development, but would be significantly more expensive. Although the results of this analysis need to be interpreted with care, they are certainly supportive of significant child development benefits from both the duration and quality of pre-school attendance.

4.12 More generally, a detailed review of the international literature in a recent OECD working paper (Kamerman *et al*, 2003) suggests that both income transfers and improved pre-school provision (including extended parental leave) are necessary to tackle child poverty, so these are best seen as complementary rather than competing policy options.

Sensitivity analysis

4.13 The sensitivity of these benefit estimates to alternative assumptions is illustrated by the analysis in Table 8 below. It shows that:

(a) the results are particularly sensitive to the assumed change in the female employment rate; a one percentage point change in this rate, which is small relative to the uncertainties surrounding this impact, shifts estimated annual benefits by around £1.6 billion; in practice, a shift in this assumption by several percentage points either up or down is quite plausible, so this effect could be larger in practice;

(b) the assumption made on future productivity benefits also has a significant impact; a shift of one percentage point from the baseline produces a change of around £1.7 billion in estimated annual benefits for the economy as a whole;

(c) the assumption on the level of longer term benefits to parents from avoiding prolonged career breaks is also quite significant; if we reduce the assumed size of this effect by 50%, back to the levels assumed in our 2003 study, then the annual economic benefits fall by around £1 billion; we would argue, however, that our new assumptions are more plausible here, given the extended nature of the policy package now being considered relative to our 2003 study (and the fact that our earlier assumptions seem,

28 We are grateful to Professor Edward Melhuish for providing us with a copy of this unpublished research paper.

Table 8: Sensitivity analysis on benefit estimates (gross of costs)

£ billion at 2004/5 GDP values (relative to baseline estimates)	Annual economic benefits (£ billion)	Annual Exchequer benefit (£ billion)
Baseline estimates from Table 7	**18.0**	**7.8**
(1a) Female employment rate 1 percentage point higher than in baseline	+1.6	+0.7
(1b) Female employment rate 1 percentage point lower than in baseline	-1.6	-0.7
(2a) Productivity benefit for children set at 2% rather than 3% in baseline	-1.7	-0.8
(2b) Productivity benefit for children set at 4% rather than 3% in baseline	+1.7	+0.8
(3) Long-term benefit to parents from avoiding prolonged career breaks reduced by 50% (back to levels assumed in 2003 study)	-1.1	-0.5
(4) Average earnings of parents enabled to return to work raised by 10% relative to baseline	+1.0	+0.4

Source: PwC estimates

on further reflection, to have been on the low side in this area);

(d) the benefit estimates are also sensitive to the assumed earnings of women enabled to continue working without a career break (or with a shorter one) by improved childcare provision under the universal option: if average earnings of this group of women were to rise by 10%, this would add around £1 billion to the annual economic benefit, assuming no change in the employment rate (with converse effects for a 10% reduction); and

(e) in general, given the assumptions made in the model, the impact on the public finances is around 40-50% of the overall economic impact and in the same direction.

Summary of benefits analysis and comparison with costs

4.14 Our baseline estimate of incremental annual economic benefits is around 1.5% of GDP in 2020 (or around £18 billion at 2004/5 GDP values), but the sensitivity analysis shows that this is subject to significant uncertainty. To avoid spurious precision, it would therefore be more reasonable to conclude that our estimates suggest annual economic benefits of the order of around 1-2% of GDP (or around £12-24 billion at 2004/5 values). Similarly, our baseline estimate that the gain flowing through to the Exchequer will be around 0.7% of GDP in 2020 would be better expressed as suggesting gains of around 0.4-1% of GDP, allowing for uncertainty both about total benefits to the economy and what proportion of these translate into gains to the Exchequer. It should also be stressed again that all of these economic benefit estimates exclude the potentially important social benefits (e.g. reduce child poverty and income inequality) that could flow from implementing the early years vision for 2020.

4.15 Table 9 below provides a summary of how these incremental benefits compare to our estimates of incremental costs from Section 3 above. For simplicity, we only show the central cost estimate, although these too are subject to significant uncertainties as discussed above.

Our estimates suggest annual economic benefits of the order of around 1–2% of GDP (or around £12–24 billion at 2004/5 values)

Table 9: Comparison of incremental costs and benefits from early years vision for 2020 (Policy Package 1)

	Impact on Exchequer		Overall economic impact	
	% of GDP	£ billion at 2004/5 values	% of GDP	£ billion at 2004/5 values
Incremental economic benefits	0.4-1 (+ social benefits)	5-12 (+ social benefits)	1-2 (+ social benefits)	12-24 (+ social benefits)
Incremental costs	1.7	20	1.8	21
Net economic benefits/costs	**-0.7 to -1.3 (+ social benefits)**	**-8 to -15 (+ social benefits)**	**-0.8 to +0.2 (+ social benefits)**	**-9 to +3 (+ social benefits)**

Note: results for Policy Package 2 would be similar
Source: PwC estimates

4.16 We can see that, relative to the uncertainties involved, incremental economic costs and benefits are finely balanced. But, as the table indicates, it is also important to take potential social benefits into account. As discussed earlier, these kinds of benefits are difficult to quantify in financial terms, but would include[29]:

(a) helping the Government to achieve its target of eliminating child poverty by 2020, bearing in mind that the only countries to come close to achieving this at present are those such as Sweden and Denmark with universal systems of early education and care provision; of course, this needs to be supplemented by a broad range of other policies to combat child poverty, but studies[30] suggest that early education and care can make a significant contribution to this objective, particularly by boosting lone parent employment, which is only around 33% in the UK for single mothers with children under 5;

(b) helping to boost the life chances of disadvantaged children through giving them access to affordable, high quality early education and care, which studies such as the EPPE project in the UK suggest can boost their readiness for school, although this clearly needs to be supported by educational and other policies to support disadvantaged children through school and beyond in order to prevent the gains from improved early education and care being eroded over time; and

(c) reducing future spending on remedial education, healthcare and criminal justice costs through giving children from disadvantaged backgrounds a better start in life; US studies[31] (e.g. the long-term study following children who participated in the Perry pre-school programme in the 1960s) suggest that $1 spent on effective pre-school provision could later return around

29 See Alakeson (2004) for further discussion of research findings on the potential wider social benefits of extended early education and care provision.

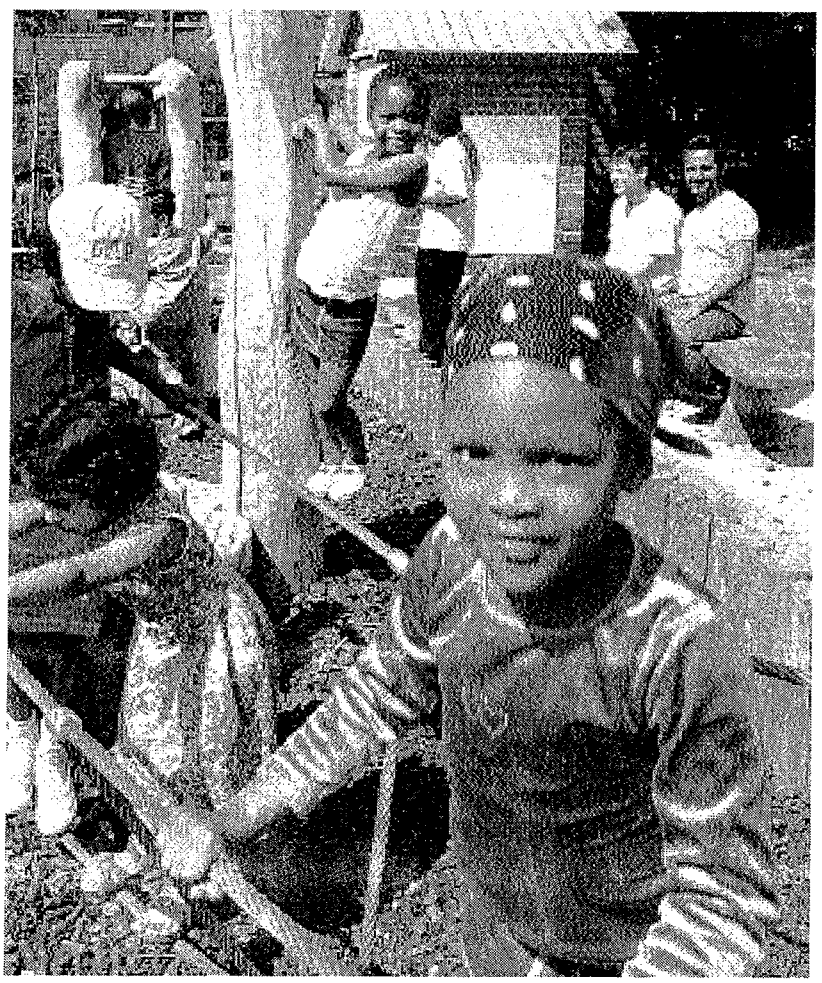
30 As reviewed in Kamerman et al. (OECD, 2003)

31 As reviewed in Carneiro and Heckman (2003).

32 As announced in the 2003 Pre-Budget Report, there is also now tax relief for employer-provided childcare vouchers up to £50 per week, but the total amount of this tax relief is only estimated at around £25 million per annum, which is tiny relative to the overall costs of childcare provision and so can effectively be ignored in this discussion.

$7 in such savings, although it should be noted that this only refers to the most disadvantaged children, so these results cannot simply be extrapolated to the proposals for universal early education and care discussed in this report. This does, however, provide a strong argument for extending good quality early education and care to all disadvantaged children, not just those living in current Sure Start areas (which only cover just over half of children living in poverty, as many of these do not live in the 20% most disadvantaged wards).

4.17 Once these potential social benefits are taken into account, the case for universal early education and care presented in this paper becomes much stronger, at least in terms of moving in the direction suggested by the vision, even if it is not implemented in full. But there will always be a significant net cost to the Exchequer, so this needs to be weighed against other potential public spending priorities, as well as against broader political and economic judgements as to what is an acceptable level for the overall ratio of tax to national income.



5. Funding options

5.1 The funding issue has a number of aspects. At the highest level, the net cost to the Exchequer of the early years vision outlined above would need to be funded through some combination of tax increases, slower growth in other areas of public spending, and (for capital spending) increased public borrowing. These judgements need to be made at the macroeconomic level in the context of Treasury projections for the economy and the public finances as a whole and the Government's overall tax and spending objectives and priorities. Consideration of these wider issues would take us well beyond the scope of this study, although the analysis of potential costs and benefits in this report could provide one possible input to making a judgement on the level of public resources to be allocated to the early years area in the long term.

5.2 At a lower level, however, there are a number of subsidiary funding issues that we have considered in this study, albeit only at a broad strategic level. These are:

(a) the balance between demand-side funding (e.g. tax credits for parents) and supply-side funding (e.g. direct grants to providers);
(b) the design of the supply-side funding regime and its link to objectives such as improving the average quality of provision; and
(c) the level at which fees are set for the non-free elements of the package (e.g. the wraparound care for 2-4 year olds) and the mechanism by which income-related subsidies are given to parents to ensure that these fees are affordable.

5.3 We consider these three issues in turn below, drawing on international comparators where relevant.

Balance between demand-side and supply-side funding

5.4 At present the Government provides a mixture of supply-side funding through local authorities (e.g. for nursery education for 3-4 year olds) and the Sure Start budget, together with demand-side funding for parents through the childcare tax credit[32]. As mentioned in Section 2, the long-term vision for 2020 would eventually involve tax credits being recycled into supply-side grants, although it is not envisaged that this would happen immediately. The first priority would be to increase supply-side grants while retaining demand-side support from tax credits, with the latter only being

phased out after, say, 2010. The details of this transition, however, have yet to be worked out and, as discussed below, some kind of income-related subsidies to make early education and care fees affordable would still need to form part of the overall funding regime.

5.5 The reason for the focus on supply-side funding is that this is seen as being the best way to ensure that early years provision is sustainable in the long run. By contrast, childcare tax credits are seen as problematic for a number of reasons. From the perspective of the providers, there are problems associated with the fact that payments are made to the parent and may not be passed on. From the perspective of the parent, there is a problem in that childcare tax credits may be inadequate in covering only up to 70% of costs, with this being subject to a cap that is lower than actual childcare fees in many areas, particularly London. If the average cost of a full-time childcare place in London is £168 per week, as the latest Daycare Trust survey suggests, but a family with two pre-school children can receive a maximum of only £140 through the childcare tax credit, then they would still have an extra £196 per week to pay, which is likely to be unaffordable for most lower income families. Although it might be possible to address these latter issues through making the childcare tax credit more generous, the concern would remain that this would not provide a reliable and predictable funding stream for existing and potential new providers[33]. This is backed up by the observation that supply-side funding tends to be the dominant form of finance in countries with the best developed systems of early years education and care, such as Sweden, Denmark, France and New Zealand, whereas means-tested demand-side funding is more typical of countries with less well-developed systems, such as the UK and the US[33].

Design of the supply-side funding regime

5.6 There are a number of forms that supply-side funding could take, including:

(a) capital grants to providers to cover new build and refurbishment costs;

(b) funding for running costs on a £ per child-hour[35] basis; and

(c) a longer term Design, Build, Finance and Operate (DBFO) contract, whereby the government would pay for the services provided through a unitary charge that would cover both capital and running costs (including an appropriate rate of return for the provider).

5.7 In practice, we can envisage all of these types of supply-side funding having a role to play. Certainly capital grants in themselves would be of little value without ongoing support for running costs as well. Below we comment further on how the running cost regime might be designed, drawing on parallels with the proposed new funding regime in New Zealand, and then go on to look at the potential role of DBFO schemes in this area.

Funding for running costs: possible lessons from New Zealand?

5.8 While Sweden and Denmark are perhaps the most commonly quoted international comparators in relation to universal (or near universal) early years education and care, there have also been some interesting developments in New Zealand recently. In 2002, the New Zealand government published an ambitious ten year strategy for early childhood education and care[36], including provision of 4 hours per weekday of free education for all 3 and 4 year olds, within a total of 30 hours of grant-supported education and care for all pre-school children. In addition, the government announced plans to move towards an entirely teacher level (or equivalent) early years workforce by 2012.

5.9 In June 2004, the New Zealand government published detailed proposals for funding this new regime, with the focus still being heavily on supply-side grants to all providers meeting the required regulatory standards. These grants currently account for 83% of total funding, together with 5% from special purpose grants and 12% from income-related subsidies to parents, which we discuss later in this section. There will be two basic levels of grant[37]:

(a) a higher level (per child-hour) for the 20 hours per week of free provision for 3-4 year olds, sufficient to cover 100% of estimated costs; and

(b) a lower level (per child-hour) for the subsidised wraparound care for 3-4 year olds up to 30 hours per week, or for the non-free provision for younger children up to this same weekly limit; above 30 hours per week, the parents would need to pay, but with some contribution from income-related subsidies up to a maximum of 50 hours per week.

5.10 The novel feature of this funding regime will be that both the higher level and lower level grants[38] will have two elements:

(a) a **common cost component** (i.e. a set amount per child-hour) that will be intended to cover costs that would be expected to be

33 There might also be a concern that some providers might just raise fees in response to a more generous childcare tax credit, in which case affordability problems would remain for parents.

34 See OECD (2001) and Moss et al. (2003) for further details of regimes in other countries.

35 Linking funding to the actual number of child-hours provided, rather than just the number of places, means that money follows the child and parental choice should therefore act as a driver of quality and efficiency.

36 'Pathways to the Future' (2002), which is available from the New Zealand Ministry of Education website (www.minedu.govt.nz) together with details of the proposed new funding regime published earlier this year. We are grateful to Professor Peter Moss for drawing our attention to this material.

37 The New Zealand system also includes 'equity grants' to boost funding for disadvantaged areas, which might be an attractive feature of a future UK regime, as discussed further in Alakeson (2004).

38 As far as we are aware, the precise details of the levels of funding to be provided have yet to be announced, although the intention is that the new funding regime will operate from 1 April 2005. A detailed funding handbook is due to be published later this year.

broadly similar across providers, such as administration costs, educational resources, professional services (e.g. accounting) and utilities; and

(b) a **variable cost component** that will cover operating costs, labour costs and property costs, where the amount per child-hour in each category will vary according to certain key cost drivers; in the case of labour costs, for example, these might include teacher salary levels, the proportion of registered teachers in a service and child:staff ratios; in the case of operating costs, the age of the children attending and the split between full-day and sessional services will be taken into account.

5.11 The significance of including this variable cost component in the funding formula is that it will not only recognise diversity across service providers, but will also give clear financial incentives to improve quality by, for example, having a higher proportion of teachers in the workforce and reducing child:staff ratios. Given the emphasis on boosting quality in the long-term vision for the UK developed by Daycare Trust and the SMF, this might be an attractive option for the UK funding regime in the long run. It would, however, require much better data on cost drivers than currently exist in the UK, linked to better accounting and financial reporting by providers. An appropriate auditing/inspection process would be necessary to ensure that the system was not being manipulated by providers to secure increased funding without genuine quality improvements. This would take time to put in place, but is not an unreasonable objective in developing a long-term vision.

Potential role of DBFO schemes[39]

5.12 A conventional funding model would be to provide up-front grants to cover capital costs, with a separate funding regime on a £ per child-hour basis on the lines discussed above. An alternative, however, as mentioned in Section 3 above, would be to agree a long-term contract with a consortium including a daycare provider, a construction company, a bank and others for the Design, Build, Financing and Operation (DBFO) of a batch of children's centres in a particular area. The idea would not just be to provide the building and associated accommodation-related services, but also the daycare provision, although some other children's centre services (e.g. health visitors and social workers) might still be delivered by public sector staff in partnership with the private sector provider. While a single children's centre would not be a large enough project to justify a complex PFI/DBFO-type procurement procedure, a sufficiently large batch of centres could make this approach worthwhile. In general, this would require a contract value above a minimum of at least £20 million, whereas indicative capital costs for a newly built children's centre might be only around £1.5 million.

5.13 There have already been a number of LEA-sponsored Schools PFI projects in recent years that have included early years education and childcare facilities, so this is not a new approach. Recent initiatives such as NHS LIFT and Building Schools for the Future (BSF) are seeking to develop strategic partnering arrangements at the Primary Care Trust and Local Authority level with a private sector partner. By 2015, it is planned that all local authorities will have a BSF partner who could potentially provide a DBFO solution for the provision of children's centres by working with established daycare providers. The BSF programme has been developed to make these kind of local investment decisions simpler to deliver in practice.

5.14 At a national level, if (say) 25% of a 10,000 children centre programme up to 2020 took the form of new build projects, then this might translate into a total capital programme of the order of around £3.75 billion over a 15 year period, or around £250 million per annum (all at 2004/5 values). This is still not huge when compared to, say, the programme of NHS hospital construction, but it might be more comparable with other smaller programmes such as building and operating new diagnostic and treatment centres, where DBFO-type approaches (e.g. through NHS LIFT as noted above) have been successfully applied. Children's centres might be considered a potential candidate for this approach given that, in relation to standard Treasury criteria for going down a PFI-type route:

(a) this would be a large capital programme overall, requiring management of both capital and operating risk;

(b) private sector daycare providers have significant experience in dealing with the operating risks, suggesting that there might be potential value for money gains by harnessing this experience; construction and property management companies will already have relevant experience in managing capital and asset-related operating risks from their involvement in Schools PFI projects;

39 We are grateful to Tim Langdon for sharing with us some work he has done on this issue for Asquith Court Nurseries Ltd, which we draw on in this section of our report.

(c) the outputs of the service in terms of FTE daycare places could be defined, although flexibility would be needed to reflect local circumstances and the need to work in partnership with the public sector to deliver other services to be provided by children's centres (e.g. health visitors and social care workers);
(d) operating costs (including the cost of daycare provision not just accommodation-related operating costs) are large relative to capital costs, suggesting that a whole life approach to maximising cost efficiency and effectiveness would be highly desirable, which a DBFO model should encourage; it would also provide a guarantee of long-term funding that would be important in ensuring sustainability for potential private sector providers;
(e) incentives for quality improvement could be built into the contract, by making the unitary charge payable to providers by the public sector sponsor (which would generally be a local authority) dependent on achieving certain quality objectives, much as in the proposed New Zealand funding regime described above;
(f) by batching together projects, the overall size of the contract could be made sufficiently large to avoid procurement costs being disproportionate;
(g) technology in the sector is stable, so long-term contracting should not be overtaken by subsequent developments (as has been a problem in public sector IT projects); and
(h) children's centres would be expected to be in use for long periods of time, making long-term contracts with an operating element appropriate.

5.15 This is not to say that DBFO would be the preferred approach in all cases. Relative to conventional funding, it has the disadvantage[40] that it is likely to require a long-term contractual commitment to fund a certain number of places, whether or not demand is there. Although it might be possible to allow for some flexibility in contracts in this respect, requiring the providers to take demand risk in this way will tend to add to the return on capital required. To use an electricity analogy, this model might therefore be appropriate for 'baseload' provision, where there is a high degree of certainty that the contracted number of places would continue to be needed. But this would have to be supplemented by other more conventional methods where funding is linked to the number of places (or child-hours) provided, as in the New Zealand model. A 'mixed economy' approach would therefore seem appropriate here, but the DBFO model could certainly play its part.

Parental contributions

5.16 It is generally agreed that, except for the free early years education component, some parental contributions will be needed to meet the cost of wraparound care, but that these will need to be set at an 'affordable' level. The difficulty is deciding how affordability should be defined here. In practice, there is no clearcut answer to this question, but the general approach adopted in this report has been to assume that average parental contributions should not be more than around 30% of total costs for the non-free education and care elements, which would be comparable to other EU countries with well-developed early years provision.

5.17 It seems reasonable, however, that parental contributions should be income-related. In Sweden, as shown in Table 10 below, there is also an absolute cap on fee levels, related to the number of children.

Table 10: Swedish system of fees for pre-school provision

	Maximum fee (% income)	Maximum monthly fee in SEK (approx. £ value in brackets)
Child 1	3%	1260 SEK (£94)
Child 2	2%	840 SEK (£62.5)
Child 3	1%	420 SEK (£31)
Child 4	No charge	-

Source: National Agency for Education, Sweden (2003); £ values based on current exchange rate of £1 = 13.43 SEK

5.18 The corresponding fee cap for the UK would be around £21 per week for the first child, falling to only around £7 per week for the third child. Compared to current average childcare costs of around £130 per week (from the January 2004 Daycare Trust survey, averaged across age groups), this would imply a parental contribution capped at around 16% of current costs for the first child, falling to only just over 5% of current levels for the third child. If we allow for the higher future costs implied by the upskilling envisaged in this study (i.e. around £200 per week on average on our calculations, as discussed in Section 3 above), then the parental contribution would be even lower on the Swedish model. This would certainly make early years provision affordable for all, but at the cost of giving a significant tax-

40 It should also be noted that PFI is regarded by some commentators as having relatively limited success in the schools sector as compared to some other areas (see, for example, the discussion in Chapter 7 of the Final Report of the Commission on Public Private Partnerships, IPPR, 2001). But DBFO models seem to have been successfully applied in the diagnostic and treatment centre area, and the general point is that PFI/DBFO models need to be considered on their merits on a case-by-case basis, allowing for particular local circumstances.

41 In practice, childcare subsidy regimes tend to be based on pre-tax incomes for administrative reasons, but it can be argued that it is more relevant to look at parental contributions as a % of disposable income in judging affordability, which is why we have used disposable income data in this illustrative analysis.

payer subsidy to better-off parents who could afford to pay more.

5.19 Another possible regime is the New Zealand system, which as mentioned above gives income-related subsidies for up to 50 hours per week of non-free care (or 30 hours per week on top of free educare for 3-4 year olds from 2007). Table 11 below summarises the subsidy levels per child-hour to apply from 4 October 2004 (they will be raised by 10% from 3 October 2005).

Table 11: New Zealand childcare hourly subsidy rates (from 4 October 2004)

Subsidy per child-hour in NZ dollars (approx. £ equivalent in brackets)	$2.84 (£1.03)	$1.94 (£0.71)	$1.10 (£0.40)
Qualifying weekly income band for families with one child (£ equivalent in brackets)	<$770 (<£280)	$770-850 (£280-309)	$850-930 (£309-338)
Qualifying weekly income band for families with two children (£ equivalent in brackets)	<$950 (<£345)	$950-1040 (£345-378)	$1040-1130 (£378-411)
Qualifying weekly income band for families with 3+ children (£ equivalent in brackets)	<$1110 (<£404)	$1110-1220 (£404-444)	$1220-1330 (£444-484)

Source: NZ Ministry of Education, Guide to New Early Childhood Education Funding System, June 2004 (£ values based on assumed exchange rate of £1 = NZ$2.75). Income levels are defined before tax.

42 This is a somewhat artificial assumption, but is intended to reflect the fact that the average number of pre-school children for families with at least one such child is likely to be around 1.5.

5.20 Relative to current costs of perhaps £3 per hour, or future potential costs of around £4 per hour, the highest rate of subsidy here would cover only around a third of current costs or around a quarter of future costs with quality improvements. However, in New Zealand, this would be in addition to supply-side funding that would cover a significant proportion of provider costs, so the effective subsidy as a % of actual fees charged would be significantly higher than this, although we do not have data readily available on these effective subsidy rates. We do note, however, that no subsidy is given for any family earning more than around £484 per week before tax, or around £25,200 per annum. In a UK context, this would exclude the top third of the income distribution from getting the subsidy, broadly speaking. In this respect, the New Zealand system seems rather more progressive than the Swedish system.

5.21 Another point to note about the New Zealand childcare subsidy system is that the money is paid to providers not parents. Parents apply for the subsidy to the relevant government agency (Work and Income), giving details of their income level, number of children, number of hours of employment or training (there is a minimum requirement here for eligibility), and childcare fees. Once the application has been approved, the subsidy is paid direct to the early years providers who charge the fees, in contrast to the UK childcare tax credit, which is paid to the parent (since it is linked into the Working Tax Credit). UK suppliers may find this a more attractive system to ensure that the money is paid directly to them.

Some illustrative calculations for the UK

5.22 It is beyond the scope of this study to look in detail at how the parental contribution/subsidy regime would work, but we have done some simple calculations using data from the 2002/3 Family Resources Survey (FRS) on the weekly disposable incomes (before housing costs)[41] of households with at least one child aged under 5.

5.23 Unfortunately, we do not have data on the number of children under 5 in these households, but a broadly plausible assumption might be that most parents would have either 1 or 2 pre-school children per household. At the increased cost levels implied by the workforce upskilling in the vision for 2020, the average cost of full-time education and care might be around £200 per week (at 2004/5 values) for each child, or around £300 per week if we make the illustrative assumption of one full-time and one-half-time place per family on average[42]. But around 40% of this might be the free education element for 2-4 year olds, so the actual average cost might be assumed – purely for the sake of these illustrative calculations – to be around £180 per week per household.

5.24 If we set a target that parental contributions should on average cover 30% of total costs (for non-free elements such as wrap around care for 2-4 year olds), as assumed in the costings in Section 3 above (and broadly in line with the average in other EU states), then we can see that the average parental contribution in our illustrative example might be around £54 per week. But we can consider various different profiles for how the % parental contribution would vary across the household income distribution in such a way as to give an overall average rate of 30%. We can then look at the implications for how the ratio of parental contributions to household disposable income varies across the income distribution, as a rough indicator of affordability. In practice, of course, there are an infinite number of possible profiles of parental contribution rates that could give a 30% average contribution overall, but we have looked at three particular options for illustrative purposes:

(a) **Profile 1** involves zero parental contributions for households with disposable incomes up to £200 per week, with a steadily rising % contribution as income rises above this level, reaching around 80% for those households with disposable incomes over £1000 per week (i.e. the top 5%);
(b) **Profile 2** involves a somewhat higher starting point for contributions (£300 per week of disposable income), but a steeper rise in the % contribution over the income distribution, reaching 100% for households with disposable incomes over £1000 per week; and
(c) **Profile 3** involves an even steeper rise in contribution rates from zero up to £400 per week (around median household disposable income before housing costs) to 100% for households with disposable incomes over £800 per week (the top 10% of the income distribution).

5.25 These three contribution profiles are shown in Figure 2.

5.26 The implied level of parental contributions as a % of household disposable income before housing costs (i.e. a simple measure of affordability) is shown for each possible profile in Figure 3 below.

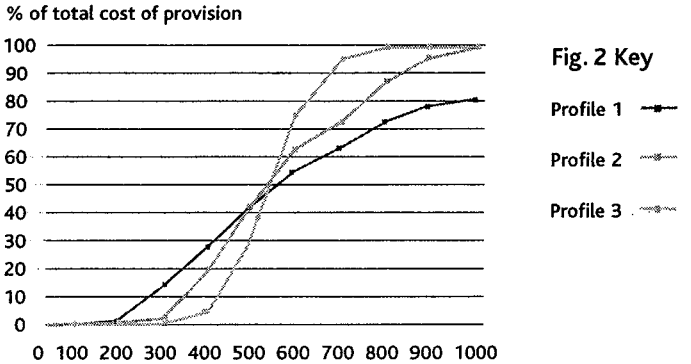
5.27 We can see that, in Profile 1, households at the 20th percentile point start to pay small amounts (around 3% of their disposable income) and this then rises gradually to around 12% of disposable income for the median household and a peak of around 17% of disposable income for the top 20% of households.

5.28 Profile 2 is more progressive, with the bottom 30% paying nothing and the median household paying only around 9% of disposable income. As a consequence, the top 30% of households have to pay more than in Profile 1, with the top 10% paying around 20% of their disposable income in education and care fees.

5.29 Profile 3 is more progressive still, with the bottom half of the household income distribution paying nothing, but with contributions then rising rapidly, so that the top 10% would pay around a quarter of their disposable incomes in education and care fees.

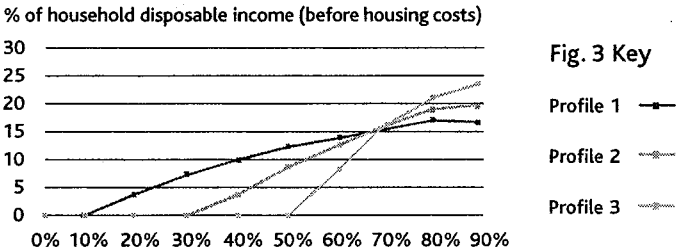
5.30 The choice between these and other profiles would be a matter for policy-makers, following more detailed analysis of household income data by type of family (e.g. also taking into account the number of children) and of likely education and care cost levels. The illustrative profiles in Figures 2 and 3 do give some indication of the way in which a progressive subsidy regime could be designed. This would, however, require the collection of household income data from families applying for government-subsidised childcare places, as well as much better data on the costs of this provision. Working out the details of this would take considerable further research and analysis. In particular, any such scheme for subsidising parental contributions would need to dove-tail with the system of running cost grants to providers. This might require a mechanism whereby these supply-side grants were related to average income levels in the area concerned, with higher grants for more disadvantaged areas (along the lines, for example, of 'equity grants' in New Zealand).

Figure 2: Alternative profiles for parental contributions



Source: PWC assumptions

Figure 3: Parental contributions relative to disposable income in alternative profiles



Source: PwC estimates

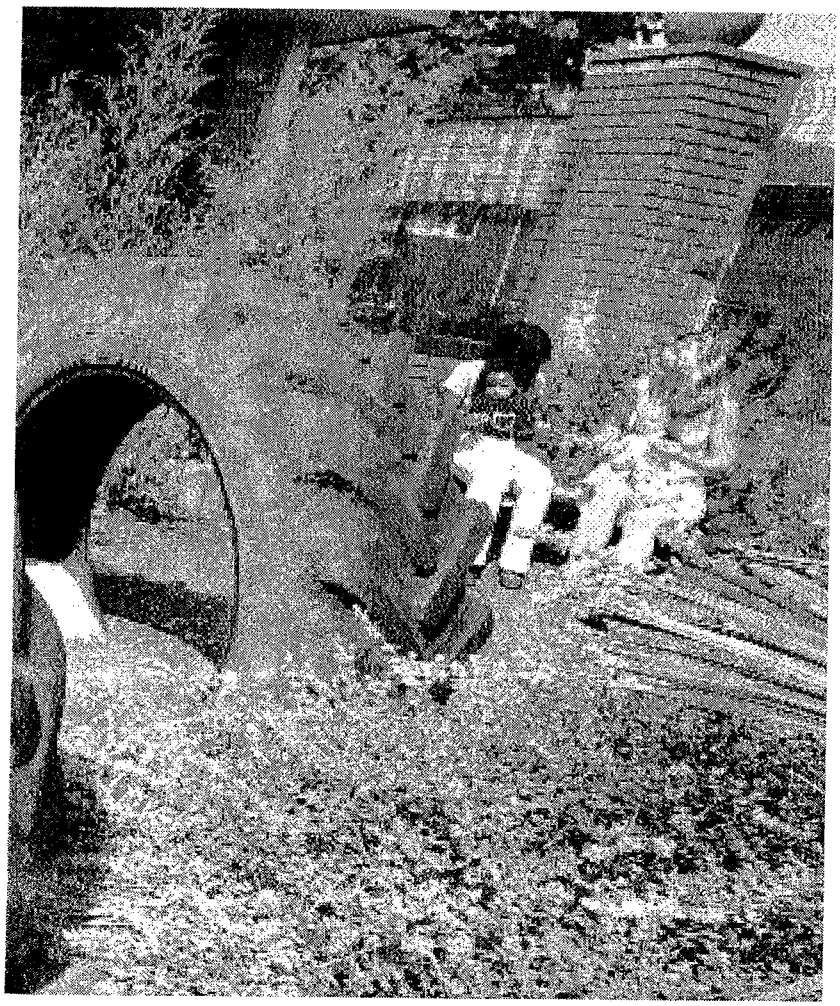
Conclusions on funding

5.31 If the vision for 2020 outlined earlier in this report is to be put on a sustainable, long-term basis, then we believe that the focus should be on providing supply-side funding for running costs, supplemented by capital grants. A system similar to that being introduced in New Zealand, with the amount of grant per child-hour being linked to measurable improvements

in the quantity and quality of staff inputs, would also be worthy of detailed consideration.

5.32 DBFO schemes may also be an option worth considering where a group of new build or major refurbishment projects for children's centres can be batched together to achieve sufficient scale to justify this form of procurement, and where it is clear that there will be a long-term demand for the services provided by these centres.

5.33 The immediate priority should be on increasing levels of supply-side funding for running costs, while retaining the childcare tax credit, but perhaps making this more generous by raising the maximum limits on the amounts paid (particularly for London). In the longer run, a system of parental contributions on a sliding scale linked to income (and the number of children) might be introduced, but the design of this would be complicated and would need to dove-tail with the supply-side funding regime. The latter may need to allow for higher grant levels in more disadvantaged areas, as in the New Zealand system.



6. Conclusions and areas for further research

Summary and conclusions

6.1 Daycare Trust and the Social Market Foundation have jointly developed a vision of universal early education and care provision in 2020 that includes at least 12 months of parental leave, a home care allowance option for parents of 1 year olds, a combination of free education and wrap around care for 2-4 year olds, and enhanced extended school provision for 5-14 year olds. The vision also allows for a significant upskilling of the early years workforce in order to ensure high quality provision, with a target that around 60% of staff looking after children should be graduate-level teachers by 2015. This report has looked at the potential costs, benefits and funding of this policy package.

6.2 We estimate that the total cost of the package to government and parents would be of the order of 2.6% of GDP in 2020 (around £30 billion at 2004/5 GDP values), with this cost building up gradually over time. This is around 1.8% of GDP more than current spending levels. In order to ensure that early education and care provision is affordable for all parents who want it, most of this additional spending (around 1.7% of GDP, or around £20 billion at 2004/5 values) is likely to need to be by government. The cost of the package is comparable to current spending levels in Sweden and Denmark, which is not surprising since it envisages moving to Scandinavian levels of early years provision.

6.3 It is important, however, to consider costs alongside the significant potential economic and social benefits from the policy package. In the short term, these would include a boost to parental employment rates, particularly for mothers of young children. In the longer term, high quality pre-school provision could also boost the employment and productivity of the children as adults, while avoiding prolonged career breaks could boost the lifetime earnings of the parents. We estimate that these economic benefits could have an equivalent annual value in 2020 of the order of around 1-2% of GDP, broadly offsetting the incremental costs of the package from the perspective of the economy as a whole.

6.4 These calculations, however, do not include potential social benefits that are not readily quantifiable in financial terms. In particular,

they exclude any distributional benefits of universal early years education and care provision in terms of reduced child poverty, a lower gender pay gap and more equal life chances for children. Once these social benefits are taken into account, the balance of argument seems more likely to favour additional early years investment, at least in setting the direction in which policy should move over time, even if not all aspects of the vision are adopted.

6.5 Some of the economic benefits of the vision would flow back to the Exchequer in higher tax revenues and reduced social security benefit payments, so that the net cost to the public finances would be of the order of around 1% of GDP. The fact that universal early years provision is unlikely to be fully self-financing does not imply that it should not be pursued if it can deliver net social and economic benefits. It does, however, mean that the policy needs to be assessed against other competing public investments since, in practice, there will always be limits on the ability of governments to finance higher spending through increased taxation or borrowing.

6.6 The potential benefits from additional early years investment will only be achieved if providers are funded on a stable and sustainable basis. We consider that this requires the bulk of government funding to be in the form of direct grants to providers, as in countries such as Sweden and Denmark. We also see attractions in the proposed New Zealand funding regime, which links the grant per child-hour to factors such as child:staff ratios and staff qualification levels, so giving providers a financial incentive to increase quality levels. But this requires a significant improvement in the data available on the costs of provision and the relationship to key drivers such as child:staff ratios. This requires improved financial accounting, reporting and auditing procedures for early education and care providers.

6.7 Parents can also be expected to make a contribution to the non-free elements of early years provision, but this should be subsidised by the state in a way that is related to income and the number of children in each family. Overall, to make good quality childcare affordable for all families who want it, parental contributions should average no more than around 30% of total costs, but this could vary significantly by income as shown by the illustrative calculations in Section 5 above.

Areas for further research

6.8 This report has set out a high-level analysis of the proposed vision for 2020, but there are clearly many uncertainties surrounding the estimated costs and benefits of the proposals. Key issues to be addressed in further research might include the following:

(a) Does the scale of the assumed increase in parental employment rates seem plausible and how can these assumptions be refined through further research? Would there be any downward impact on average earnings levels, particularly for women?

(b) What evidence should be used to refine the assumption on the impact of good quality pre-school provision on the future productivity (as adults) of the children? For example, could findings from the EPPE study be linked to other research on the long-term benefits from increased education that show significant increases in lifetime earnings from extra years of schooling?

(c) Is there any way of quantifying additional potential benefits of high quality pre-school provision associated with reduced crime, improved health and reduced need for remedial education? Can the impact on child poverty be quantified in some way, even if a financial value cannot be put on this kind of wider social benefit?

(d) What practical steps need to be taken to allow the increase in the size and the average skill/qualification levels of the early years workforce that is an important element in this vision?

(e) What is the scope for existing early years providers to expand their capacity and for new providers to enter the market in response to enhanced public funding? How strong is the market appetite for DBFO schemes for new children's centres?

(f) How best can quality incentives be built into a system of supply-side funding and what would be the information requirements of such a regime (e.g. in terms of detailed data on cost drivers)? In general, our impression is that significant additional research is needed into current and likely future cost levels in the early years sector.

(g) How can a system of subsidies for parental contributions be made to dove-tail with the system of supply-side grants for the running costs of providers? How can the transition be made from the childcare tax credit to this new regime?

Annex A. Model baseline assumptions and data sources

Introduction

Annex A describes the assumptions and data sources which have been used in the model to estimate the benefits and costs of universal early education and care provision.

***Costs* – assumptions and data sources**

We begin by setting out assumptions general to the whole costing model and then list specific assumptions for each element in the 2020[43] policy package. A summary of key assumptions was included in Table 1 above, including 2010 and 2015 assumptions.

General assumptions

Demographic projections on the number of children in 2010, 2015 and 2020 are taken from the latest official Government Actuary's Department (GAD) 2002-based population projections for the UK, as published on the GAD website in December 2003. Below we also show the 2004 projections for comparison. While any projections for the number of young children in a particular year are subject to significant uncertainty, since they depend on future birth rates, these projections are as good a basis as any for the analysis.

Age at last birthday	2004 projection (000s)	2010 projection (000s)	2015 projection (000s)	2020 projection (000s)
0	681	683	699	708
1	679	681	695	708
2	660	679	691	706
3	661	677	688	704
4	678	678	685	702
5-14	7441	6896	6755	6854

Source: GAD

We also make the following general economic assumptions:

- Real earnings growth of 2% per annum in real terms (in line with standard Treasury assumptions for trend UK labour productivity growth in the long run)
- Real GDP grows slightly faster at 2.25% per annum due to assumed average employment growth of 0.25% per annum (again broadly in line with standard Treasury assumptions for this period).

Earnings for early years education and care staff qualified to level 4/5 (graduate) are assumed to be in line with a weighted average of salaries for maintained primary classroom teachers in England, which is around £27,500 according to latest available data from DfES. This average salary estimate takes into account Inner and Outer London and Fringe allowances, as well as allowances for management roles for some teachers and recruitment and retention allowances.

Earnings for early years education and care staff qualified to level 3 (NVQ3) are assumed to be 60% of teacher-level staff in this analysis, or around £16,500 in 2004/5. Note that this automatically takes account of the London premium factored into teacher salary assumptions.

Earnings for both grades of staff are assumed to grow on average by 2% per annum in real terms up to 2020/21, in line with assumed national average earnings growth.

Total staff costs are assumed to be 22% higher than salary costs to take account of on-costs (i.e. employer NICs, pensions costs and other staff benefits). This assumption is based on DfES estimates for teaching staff.

Staff costs are estimated to be around 65% of total costs at present, but this is assumed to rise gradually to 68% by 2010, 71% by 2015 and 74% by 2020 as labour costs increase with the rise in the average qualification levels of staff, and as businesses become more mature and reach minimum efficient scale. The 74% assumption for 2020 is in line with the estimated ratio of staff costs to total costs for Swedish daycare providers in 2002 (National Agency for Education, 2003).

Allowance for lower cost of childminders

The costings in this study are based around a daycare model of provision, but we also make an allowance for 30% of provision to be through individual childminders or childminder networks, at an estimate unit cost reduction of 15%. Overall, therefore, weighted average costs for all providers are reduced by around 5% due to these assumptions. This reflects the fact that accommodation and support staff costs in particular will be lower for childminders[44]. We do, however, assume that childminder salaries are increased in line with the upskilling assumed for the early years workforce as a whole.

Assumptions for parental leave costings

Statutory parental leave pay is assumed from 2015 onwards to be:

- 90% of female[45] average earnings for 6 weeks; and
- 100%[46] of national minimum wage

43 Our model calculations relate to the government financial year 2020/21, but we sometimes refer to this as 2020 in the text for short. Transitional assumptions for 2010 and 2015 are also discussed where relevant.

44 Although the costs of running a childminder network (estimated at around £40-45,000 per network by the National Childminding Association) as well as training, information and support costs currently paid for through the general Childcare Grant need to be taken into account. Business start-up grants are also considered to be important in maintaining supply. We have not, however, attempted to model these costs in detail in this study.

45 Since, realistically, most recipients will probably either be women, or men on comparable earnings levels.

46 This compares to around 60% of national minimum wage for statutory maternity leave after the first 6 weeks at present. We assume this is increased to 80% of national minimum wage by 2010 and 100% by 2015.

thereafter (both for the 12 month and the 18 month parental leave policy options).

Female average earnings from the April 2003 New Earnings Survey are estimated at £15,023 per annum (allowing for both full-time and part-time workers). Uprating this to 2004/5 rates (assuming 4.4% per annum average earnings growth) gives a base year estimate of £16,025 for 2004/5, which is increased by 2% per annum in real terms up to 2015/16.

The national minimum wage is estimated based on a 37.5 hour average working week at the equivalent of £9,458 per annum in 2004/5 (October values), increasing by 2% per annum in real terms up to 2015/16.

We assume one potential claimant per child in each age category, with take-up rates for parental leave assumed to be:

- 100% for the first 6 months
- 80% for the second 6 months
- 50% for the third six months (in the 18 month option).

These assumptions are necessarily rather arbitrary, but reflect the expectation that an increasing proportion of mothers (or fathers where they are the primary carer) would opt to go back to work as their children get older, even if paid parental leave were to be available.

We assume in the model that government meets the full cost of parental leave. In practice, larger employers may make a small contribution (8% is the current employer contribution above a certain size threshold). But this is unlikely to have a material impact on the results of the analysis, relative to the other uncertainties surrounding any such projections.

Home care allowance for parents with 1 year olds

This is assumed to be set at half the national minimum wage[47] (only applies in the 12 month parental leave option), so as to give a reasonable incentive to return to work. At present, we assume this is available to all parents although, in practice, there could be higher levels for those on lower incomes, as in the Finnish system.

The take-up rate for the home care allowance is assumed to be 50% of the maximum possible (although this would include some taking up a reduced home care allowance and working part-time). Other parents would have access to subsidised care for up to 50 hours per week.

Child:staff ratios and staff qualification levels

Average child:staff ratios for early years education and care are assumed to be at current standard Ofsted levels[48]:

- 3:1 for 1 year olds
- 4:1 for 2 year olds
- 8:1 for 3-4 year olds

For early years education and care, the staff split from 2015 onwards is assumed to be significantly above current levels in terms of average qualifications (reflecting desired quality improvements):

- 60% graduate level staff
- 40% level 3 staff

In addition to staff involved in looking after children, and so included in these ratios, we assume:

- one senior manager per 50 full-time-equivalent places (earnings £35,000 per annum at 2004/5 values, excluding on-costs);
- three support staff per 50 full-time-equivalent places (earning an average of £6 per hour at 2004/5 values, excluding on-costs).

Specification of early years education and care provision

By 2020, this is assumed to be 20[49] hours per week, 48 weeks per annum for the free education and care component for 2-4 year olds. This is compared to an assumed standard working week for staff of 37.5 hours for 48 weeks a year (allowing for 4 weeks holiday) in calculating staff costs using the above ratios and salary data. This same standard working week is assumed throughout the analysis.

The wrap-around care component for 2-4 year olds is assumed to be 6 hours per weekday, 48 weeks per year. This is to allow for 8am-6pm coverage wrapped around the 4 hours per weekday of free education and care provided. This is in line with current norms in some private sector daycare providers, but would require an extension of the typical services offered by voluntary and maintained sector daycare providers. However, government guidance for children's centres (Sure Start Unit, 2003) specifies 10 hours per day, 48 weeks per year of daycare as part of the desired 'core offering', so our assumption here seems broadly consistent with current government policy.

For 1 year olds, care is assumed to be provided 10 hours per weekday (8am-6pm) for 48 weeks per year. Parents are assumed to be on holiday and looking after children for the other 4 weeks of the year (the same as for 2-4 year olds).

Parental contributions

These are assumed to account for 30% of total

47 In the 18 month leave option, we assume payment at national minimum wage levels for a further 6 months, which is comparable with paying 50% of the minimum wage for 12 months in the home care allowance option. We assume the home care allowance is 40% of the minimum wage in 2010, rising to 50% from 2015 onwards.

48 Better (i.e. lower) child:staff ratios are considered as a sensitivity test in Section 3 above, but this would require a further increase in workforce numbers, over and above the very considerable increase implied by the move towards universal early years education and care provision. Since this may not be realistic, we focus here on the costs of improving the quality of the workforce, rather than further increasing the quantity of staff.

49 In 2010 and 2015, the free education element is assumed to still be only 12.5 hours per week, rising to 20 hours between 2015 and 2020.

50 See also various studies in the UK and other countries that illustrate the impact of increased childcare provision on female employment rates, as summarised in Waldfogel (2002). See also the other references listed in Annex B below, notably Del Boca (OECD, 2002), Gray and McDonald (OECD, 2002) and Paull et al. (IFS, 2002).

costs of the wrap-around childcare for 2-4 year olds and the state-subsidised care for 1 year olds.

The question of how these contributions might vary with income is considered in Section 5 above, but from a costing perspective it is the average % contribution of parents to total costs that matters.

Take-up rates for early years education and subsidised childcare

As a proportion of the maximum possible hours of provision per annum, take-up rates are assumed to be:

- 50% for 1 year olds in Policy Package 1, given that 50% are assumed to take up the home care allowance in this scenario (similar take-up assumptions are made for 1 year olds in the 18 month parental leave option)
- 80% for 2 year olds for the free education element and 50% for the wrap-around childcare element; these take-up rates are assumed to build up over time as the programme is rolled out (see Table 1 in Section 3 above for details);
- 100% for 3-4 year olds for the free education element and 70% for the wrap-around education and care element (with the latter building up over time as shown in Table 1 above as the programme is rolled out).

Alternative assumptions are considered in the sensitivity tests shown in Section 3 above.

Holiday/after-school provision for 5–14 year olds

This is assumed to be 2.5 hours per day of after-school provision for 38 weeks of the year, plus 10 hours a week full-time provision for 10 non-term-time weeks. Average provision is therefore around 4 hours per week over the whole 48 weeks.

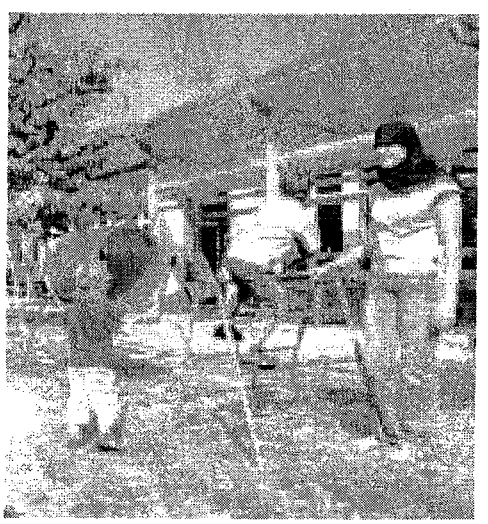
We assume (as a proportion of the maximum possible hours per annum) a 70% take-up rate for all 5-7 year olds, falling to 40% for 8-10 year olds and 15% for 11-14 year olds, since many parents may not need this service, particularly for older children. We assume an average parental contribution to costs of 30%, the same as for the wraparound care element for 2-4 year olds (in practice, this contribution would vary by income levels).

The child:staff ratio is assumed to be 8:1 for 5-7 year olds (the Ofsted required ratio), 15:1 for 8-10 year olds, and 25:1 for 11-14 year olds. For 5-7 year olds, we assume 60% of the staff are qualified to teacher level and 40% to level 3, with corresponding salary levels as specified above. For older children, particularly those aged 11-14, we assume a somewhat higher proportion of level 3 youth workers, rather than fully qualified teachers.

Benefits: assumptions and data sources

Increase in female employment rates: as discussed in more detail in our August 2003 report on the costs and benefits of universal pre-school provision (see Annex C of that report in particular[50]), female employment rates for women in the main child-rearing age band are significantly higher in Sweden and Denmark than in the UK, while male employment rates are similar in the three countries. Whilst this may not be entirely linked to relative early years education and childcare provision, this is likely to be one of the most important factors explaining the variation between countries. One possible scenario would, therefore, be to assume that the UK female employment rate rises to the average of the Swedish and Danish rates. This would imply an increase of over 1 million in total female employment in the UK.

However, there are other factors in the two economies that are likely to explain differing levels of employment (e.g. differences in working culture), so this would be a relatively optimistic assumption. As discussed in our 2003 report, a more detailed examination of UK labour market data suggests that a more plausible assumption would be that UK female employment rates would rise towards but not reach Swedish/Danish average rates. More specifically, as the table below shows, we assume that UK female employment rates move up to around 7% below male rates in the three relevant age groups (18-24, 25-34, and 35–49), with no change for other age groups.



Actual and assumed female employment rate			
Age group	Current female employment rate	Current male employment rate	Assumed female employment rate with universal pre-school provision
16 – 17	44.8%	41.7%	44.8%
18 – 24	64.8%	71.2%	66.2%
25 – 34	71.6%	88.1%	81.0%
35 – 49	75.6%	88.2%	81.0%
50 – 59	65.1%	69.9%	65.1%

Source: Labour Force Survey for current rates and PwC assumption for final column

These assumptions imply an increase in female employment of 737,000 over the ten-year period during which we assume universal early years provision is phased in. This represents a rise of around 5.7% on current total levels of UK female employment. As a cross-check, we have also compared the implied increase in female employment with the number of mothers potentially released from childcare responsibilities as a result of the additional provision. We estimate these at around 1.3 million (assuming that mothers with at least one child aged 1-4 have on average 1.5 children in this age range). Our baseline employment increase assumptions, therefore, imply that around 56% of the mothers whose children would be covered by the additional provision would return to work. This does not seem unreasonable as a baseline assumption, as discussed in more detail in Annex C of our 2003 report, and we have not changed it in this study. As discussed in Section 4 above, this reflects the fact that extended parental leave and enhanced childcare for school age children, which were not considered in our 2003 study, will tend to have offsetting employment effects.

Share of full-time and part-time jobs in additional female employment: published data from the Labour Force Survey suggest that the current shares of full-time and part-time employment for women are around 56% and around 44% respectively. We assume that this split will not change in future. Note that a higher full-time employment rate would boost benefits, but would also require more full-time early education and care provision, with associated cost increases, so the net effect of this change on the cost-benefit analysis is not clearcut. Earnings are assumed to be at the average levels for the respective categories of female employees.

Effects of avoiding career breaks for mothers: In line with the results of Mincer and Polachek (1974), we assume that by avoiding a typical average career break when their children are young, the average gain in subsequent lifetime earnings might be around 1.5% for each year that mothers were able to work full-time when the children are below age 8 and 0.5% if they work only part-time during this period. This is due to their human capital not depreciating during a career break. We assume on average two additional working years, so that the total effect is to boost lifetime earnings of the women affected by 3% if they work full-time (assumed to be 56% of additional employment)[51] and 1% if they worked only part-time (assumed to be 44% of additional employment). This effect is small initially but accumulates in the long run as more and more of the female workforce at a given point in time will have benefited from the opportunity to avail itself of the extra early years provision under the proposed policy package. We assume this effect starts five years after universal provision is phased in and rises gradually to its peak level after a further 47 years (by which time a woman who had her first child at age 18 would be ready to retire).

The present value of these benefits from avoiding career breaks is calculated for a 65 year period and expressed in annual equivalent terms for the purposes of the analysis in Section 4 above.

Additional earnings, as adults, for children who benefit from the additional early years provision: it can be argued that those children who benefit from high quality, universal pre-school provision will develop greater cognitive and non-cognitive skills early in life that will persist over their school and work careers (Esping-Andersen, 2003). Therefore, they will experience a productivity increase that will boost their future earnings. The model assumes that these productivity gains will increase earnings by an average of 3% [52] for the children receiving pre-school education and care under the proposed vision for 2020 who

51 As explained in Section 4, these assumed effects have been increased relative to our 2003 study to allow for the extra benefits from enhanced parental leave and greater provision for school age children. Feedback on our 2003 study suggests that our assumptions on benefits from this source may, in any event, have been rather too low.

52 As explained in Section 4 above, we have increased this assumption from 2% in our 2003 study to 3% in the present report in order to allow for the effects of higher quality provision implied by the workforce upskilling that is included in the costings in this report, but not in our 2003 study.

53 See Carneiro and Heckman (2003).

54 See Harmon, Oosterbeek and Walker (2000).

55 See 'Taxes and benefits - the effect on household income' Economic Trends, May 2003.

would not do so at present. This will, of course, vary greatly from child to child and might be much higher for disadvantaged children, where US studies suggest effects of 10% or more on future earnings potential[53]. On the other hand, for the top half of the income distribution, the effects may be minimal. The 3% assumption should, therefore, be interpreted as a weighted average of different values across the income distribution. It is also relatively modest compared to estimates that a year of additional schooling might on average add around 5–10% to lifetime earnings potential[54].

The present value of these benefits from boosts to the lifetime earnings of children benefiting from better pre-school provision is calculated for a 65 year period (with benefits starting from age 20) and expressed in annual equivalent terms for the purposes of the analysis in Section 4 above.

Proportion of children who will enter employment in the future: it is likely that not all the children who benefit from universal early years provision will enter employment. This will reduce the potential long-term economic benefits. The model currently assumes that 78% of the affected children will find employment in the future. This is in line with projected future average UK employment rates (including the boost to female employment assumed in the model).

Share of earnings from additional employment going to Exchequer: the model assumes that, for each additional employee in employment, 40% of their income will go to the Exchequer, regardless of whether it is from full-time or part-time employment. This assumption, which assumes that the tax system remains unchanged over time, is based on analysis by the Office of National Statistics showing that, for all non-retired households, the proportion of gross income paid in tax is 36.1% on average, broken down as follows:

- 14.6% in income tax;
- 4.3% in employee National Insurance Contributions (NIC);
- 2.6% in local taxes (council tax etc); and
- 4.6% in indirect taxes[55].

The middle three income quintiles face a fairly constant tax burden of c.36-37%, while the lowest quintile pays 42.7% and the highest 34.2% (so the tax system as a whole is not very progressive, although the benefits system is of course). But the above analysis excludes employer NIC payments, which will increase automatically with incomes. These are generally at a somewhat higher rate than employee NICs (particularly for better off workers), so they could add more than 4.3% to the total. This would, therefore, take the total tax share of additional household income to around 40%.

Level of benefit savings: we assume that benefit savings would result from lower levels of demand for welfare support, including income support and unemployment benefit. The value of savings has been set at £1,000 for each additional full-time job and £500 for each additional part-time job. This may be rather low, particularly for lone parents who might have income-related benefits (including housing benefit) when out of work of up to around £150 per week (£7,800 pa). But this is an extreme case, and for some other parents the benefit savings would be zero. It is difficult to estimate the average saving since it will vary with household circumstances and would need to take into account the complexities not only of the benefit system but also of in-work tax credits.

This assumption only affects the fiscal impact analysis, however, rather than the economic impact analysis, since these benefits are transfer payments. Sensitivity analysis in our 2003 report suggests that doubling these assumed benefit savings would have little material impact on the results of the fiscal impact analysis.

Data sources

Earnings data (New Earnings Survey, 2003): these data provide average earnings figures for females in both full-time and part-time employment.

Employment rates by gender (Labour Force Survey, Table B2, Labour Market Trends): these data provide employment rates for both males and females across five separate age bands.

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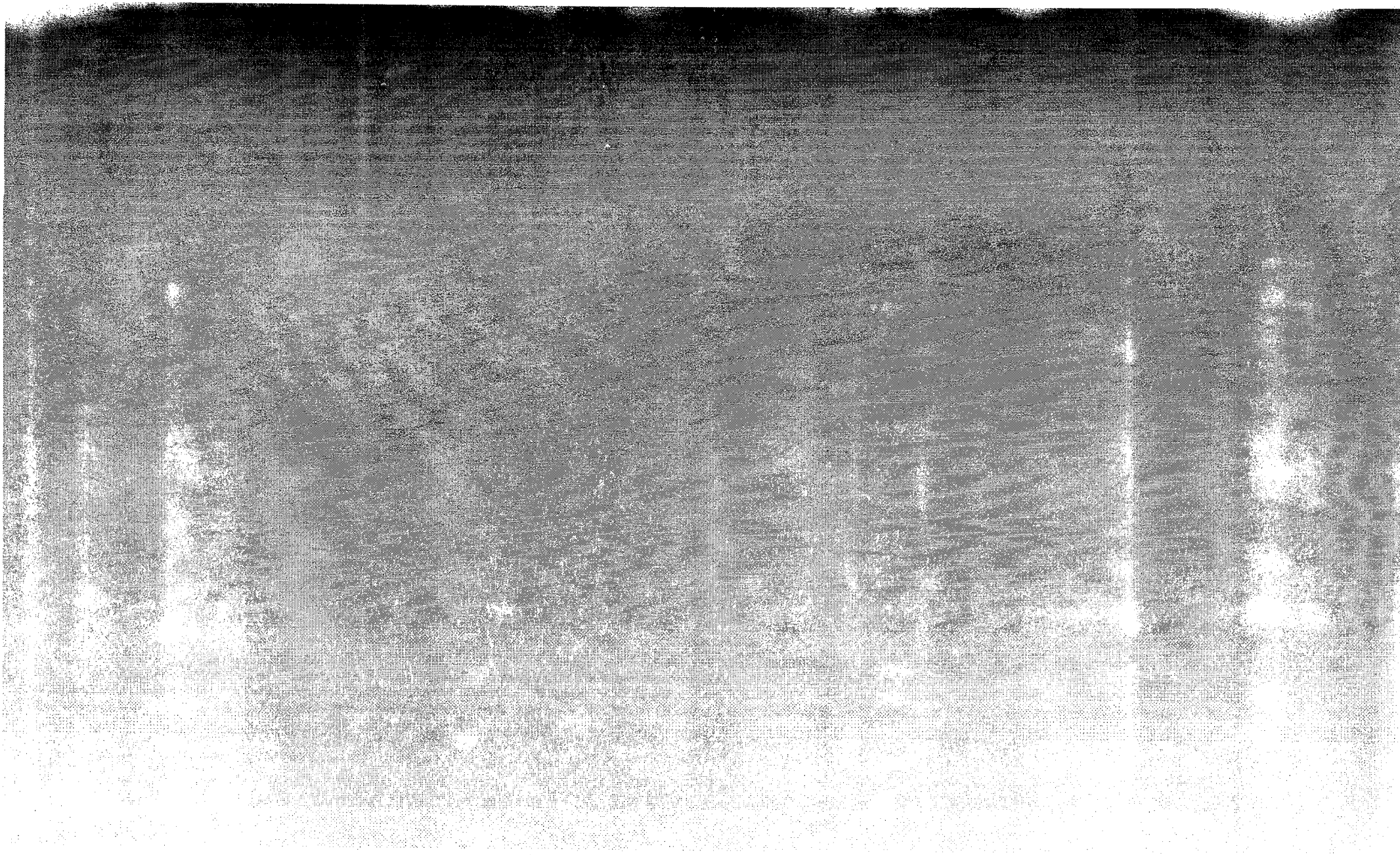

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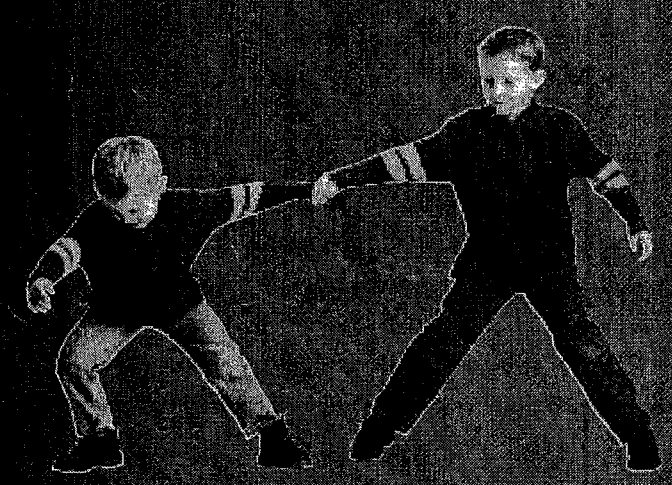

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