Eradicating child poverty: the role of key policy areas

Parental qualifications and child poverty in 2020

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This report looks at how the anticipated changes in qualifications and in the occupational and sectoral distribution of employment will impact on the incidence of child poverty by 2020.

The Leitch Review of Skills predicts that the working population should be better skilled by 2020, leading to an increase in the quality and quantity of jobs and a reduction in the risk of household poverty. The report includes:

- initial estimates of how much child poverty can be expected to fall if the anticipated improvements in skills are realised;
- a model of the incidence of child poverty, based on family and household characteristics, and parental jobs;
- a simulation of the impact of anticipated improvements in qualifications and skills, as well as the forecast changes in the occupational and industrial employment structure by 2020;
- analysis of results suggesting that the risk of child poverty will fall between 2 and 5 percentage points as a consequence of the anticipated changes in employment structure, contributing towards the 17 percentage point fall required to meet the government's objective of 'eradicating' child poverty by 2020.

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Foreword

by Donald Hirsch, poverty adviser, Joseph Rowntree Foundation

To meet the hugely ambitious target of eradicating child poverty by 2020, we must envisage a Britain that looks substantially different from today. More generous state protection against poverty, through direct redistribution, is only part of the picture. New working and earning patterns will be fundamental. As long as large numbers of parents have few skills, and many of the jobs on offer are insecure and poorly paid, families are likely to be trapped in lives of low income and low hope. Government job schemes and tax credits can help these families, but will be fighting against the tide without a strong skill base being matched with good quality jobs.

For this reason, many commentators have pointed to skills as the crucial element in a long-term strategy for eradicating child poverty, and have welcomed the Leitch Review's ambitious scenarios for a better-skilled working population by 2020. But supposing that these projections are accurate, how much of a contribution would this make to child poverty eradication?

Calculating the effect of an expansion of skills on child poverty is not easy. It depends on many factors. A crucial one is the distribution of newly acquired skills. To what extent will families at risk of poverty, and most particularly lone parents, benefit? In the past, general improvements in qualifications have tended to benefit already well-off groups disproportionately.

At the request of the Joseph Rowntree Foundation, Andy Dickerson and Jo Lindley have made a first attempt at estimating the potential pay-off for child poverty of a general rise in skill levels. They look at several approaches and estimate that the impact of the Leitch scenario could be to reduce child poverty by between two and five percentage points. To meet the government 'eradication' target, child poverty needs to fall from 22% at present to below 5%[1] by 2020, a fall of 17 percentage points. Thus on these estimates, upgrading skills could make a significant contribution to meeting the target, and possibly do about 30% of the job.

While the Leitch Review suggests that rising school attainment rates and growth in higher-skill sectors of the economy will drive an upgrading of skill levels, the projections made by Dickerson and Lindley cannot be taken for granted. One crucial factor will be the extent to which disadvantaged groups get a proportionate share of this upskilling. Another is the behaviour of employers in refashioning work to make the most of a more-qualified workforce. Thus, these results suggest that there is much to play for, but that a strategy for skills will need to work hard to ensure that its benefits are felt by families at risk of poverty.

This report illustrates how it is possible to estimate the skills effect on child poverty. Its findings need to be considered as preliminary indications, and it points to a number of methodological issues that could be developed further. This is a challenge that researchers inside and outside government might well wish to take up, given the great importance of this issue.

Executive summary

Introduction and background

The government's target of eradicating child poverty by 2020 is an important and ambitious objective (HM Treasury *et al.*, 2008). It can only be achieved with a transformation in the employment and earnings prospects of their parents. Higher levels of employment coupled with higher-quality jobs are required to reduce the incidence of workless households and of in-work poverty, both of which contribute significantly to the risk of child poverty.

The Leitch Review of Skills, published in December 2006, highlighted the anticipated changes in the profile of the working-age population that can be expected by 2020. The most notable transformations regarding employment in 2020 are in the qualifications held by the workforce and in the associated occupational and sectoral distribution of employment. One consequence of having a better-skilled working population by 2020 is that both the quality and quantity of jobs should increase. These anticipated changes in the composition of employment will have an impact on the risk of households being in poverty, and thus on the incidence of child poverty.

This report provides projections for the incidence of child poverty in the UK under a number of scenarios for the structure and composition of employment in 2020. We investigate how the current distribution of jobs and worklessness have an impact on the incidence of child poverty, and provide projections of how this incidence might change as a consequence of the forecasts presented in the Leitch Review of Skills for the future skills composition of the workforce and for the expected occupational and sectoral distribution of employment.

Our estimates thus provide a first approximation of the degree to which child poverty may fall as a consequence of anticipated changes in the skills composition of employment by 2020.

Data and definitions

We utilise sample survey data taken from the Family Resources Surveys (FRS). The FRS is the primary data source used to compile the Department for Work and Pensions' annual households below average income (HBAI) reports. These provide the official measures of child poverty, which is defined as living in a household with income below 60% of contemporary median equivalised income (i.e. household income adjusted for family size and structure). Two different poverty threshold measures are calculated: (i) using measures of income before housing costs (BHC), which is the government's preferred measure; and also (ii) after housing costs (AHC) are deducted, since this latter measure is also widely reported in the literature and is arguably more informative, especially when considering economic well-being for individuals at the lower end of the income distribution.

Incidence of child poverty by family type

We first document the distribution of children by family type and examine the incidence of poverty for each type. Two thirds of children live with married parents, while a quarter live with a lone parent. Most couples with children, married or cohabiting, have at least one adult working. In contrast, as has been well documented elsewhere, only around half of lone parents are in work.

Across the whole of the UK, around 23% of children are living in poverty using the BHC measure, and 29% using the AHC measure. However, these children are not randomly distributed across all households but concentrated in families and households with certain characteristics. While the number of children living with lone parents is around one quarter as noted above, the risk of poverty for these children is very high, such that they comprise nearly half

of all children in poverty on either BHC or AHC measures. If a lone parent is not in employment, then the risk of poverty is particularly high – one third of all children in poverty live with a workless lone parent. However, around half of all children in poverty are living in families where at least one parent is in employment – the so-called working poor.

Modelling

We first calibrate an empirical model for the risk of child poverty in which the likelihood of a child being in poverty is related to key characteristics of their household, family, parent(s) and the job or jobs that their parents do, if any. The results of this exercise broadly confirm our expectations. Children in larger families, in particular with four or more children, those in minority ethnic families, living in rented accommodation, whose parents have low level or no qualifications are significantly more likely to be in poverty. In contrast, children whose parents are well qualified and working, particularly in higher-level occupations and working full time, are less likely to be in poverty, especially if both parents are working.

Various projections regarding the characteristics of the workforce and the future world of work are summarised in the Leitch Review. For example, the proportion of the workforce with low-level or no qualifications is projected to continue to fall rapidly just as the proportion with higher-level qualifications increases – the proportion of the workforce with graduate-level qualifications is expected to increase from 30% in 2004 to 42% in 2020. There is a strong cohort effect at work here, with less-qualified older workers exiting the workforce being replaced by more highly qualified younger individuals. The distribution of employment by occupation reveals a continuation of recent trends towards more highly skilled occupations and a decline in the share of elementary occupations in particular. Similarly, there is projected to be a continuing drift away from employment in the primary and manufacturing sectors towards more service-oriented jobs, particularly in business services.

We use these projections together with our empirical model of the risk of child poverty to simulate the proportion of children in poverty in 2020.

Findings

We provide a range of simulations for our model of the risk of child poverty in 2020. We investigate the impact of the anticipated changes in qualifications, and the occupational and sectoral distribution of employment separately and together. We also allow for potential correlations between qualifications and the other covariates included in our model.

Our estimates are for an overall reduction in the risk of child poverty of between 2 and 5 percentage points by 2020. As a proportion, this represents a decrease in the incidence of child poverty of around 7% to 17% for both BHC and AHC measures. Most of the fall in the incidence of child poverty is expected to result from the higher qualifications profile of the working-age population. Higher qualifications have two important effects: one from the associated lower risk of poverty, irrespective of other factors, and the other through their impact on the employment rate. In combination, these two effects of higher levels of qualifications in the workforce account for almost 90% of the anticipated fall in the incidence of child poverty.

We can also undertake our simulation exercises for specific subgroups of the population in order to see the potential reduction in poverty for these subgroups. We pay particular attention to lone parents given that almost half of children in poverty are from within this parental group. For children of lone parents, if their parents were to have the same education attainment and an identical employment profile as the 'average' child in 2020, their poverty risk would fall by some 13 pp BHC and 17 pp AHC. While their risk of poverty would still be above the population average since the distribution of their other attributes would have an adverse impact on their risk of being in poverty, this gives some idea of the potential gains that could be made with respect to the incidence of child poverty amongst population subgroups where it is particularly prevalent. Of course, this is very unlikely to happen without the successful implementation of a range of strategies to engender this outcome. Our purpose here is not to suggest what these strategies might be, but rather to simply indicate the latent gains that

there are to play for amongst groups where poverty risk is greatest.

Number of children

Finally, we provide estimates for the number of children in poverty in 2020 by combining population projections for the number of children in 2020 with our projections for the risk of child poverty. The principal projection is for a rise in the number of children in the UK aged 0-16 between 2006 and 2020 by around 1 million (or 8%) from 12.3 to 13.3 million. As a consequence, the forecast change in the number of children in poverty in 2020 ranges from a small increase through to a fall of around 300,000 BHC (360,000 AHC), which would represent a decline of around 10% from current levels.

A rage of alternative forecasts for the number of children is also presented with different combinations of high/low fertility and high/low migration. At the top of the range of projections for the number of children, there could be significantly more children in poverty in 2020 than there are today, despite the anticipated fall in the incidence of child poverty.

Conclusions

According to the estimates presented in this report, the incidence of child poverty in the UK is projected to fall by between 2 and 5 percentage points by 2020 as a consequence of the changing occupational, sectoral and qualification structure of employment. This will certainly contribute towards, but will certainly not meet, the government's objective which is to 'eradicate' child poverty by 2020.

1 Introduction

This report provides projections for the incidence of child poverty in the UK under a number of scenarios for the structure and composition of employment in the year 2020. We investigate how the current distribution of jobs and worklessness impact upon the incidence of child poverty, and provide projections of how this incidence would change as a consequence of the forecasts presented in the Leitch Review of Skills for the future skills composition of the workforce and for the expected occupational and sectoral distribution of employment.

More specifically, we estimate an empirical model for the risk of child poverty based on sample survey data taken from the Family Resources Surveys (FRS) for 2003/04 and 2004/05.[2] We then use this model to estimate the proportion of children projected to be in poverty in 2020. Various projections regarding the characteristics of the workforce and the future world of work, as summarised in the Leitch Review, are utilised to simulate the risk of child poverty in 2020. Finally, in combination with Office for National Statistics/ Government Actuary's Department (ONS/GAD) population projections, we provide estimates for the number of children in poverty in 2020.

Throughout this report, children in poverty are defined as those living in households with incomes below 60% of contemporary median equivalised income (i.e. household income adjusted for family size and structure). Two different poverty threshold measures are calculated using measures of income before housing costs (BHC), which is the Government's preferred measure, and also after housing costs are deducted (AHC) since this latter measure is also widely reported in the literature and is arguably more informative, especially when considering economic well-being for individuals at the lower end of the income distribution.

The remainder of the report is structured as follows. In section 2, we describe the incidence of child poverty using the FRS datasets. We then construct a model which predicts the likelihood of a child being in poverty according to a range of characteristics of their family, particularly of their parent or parents, and of the jobs that they do, if any. This simple model allows us to readily identify those characteristics that are most strongly and significantly associated with children being in poverty. In section 3, we summarise the relevant projections from the Leitch Review regarding the future distribution of qualifications, skills and employment, and describe how these are used with our predictive model to provide estimates for the proportion of children in poverty in 2020. The estimates derived from our simulation of the model are presented in section 4 together with population projections for the number of children in 2020 as provided by ONS/GAD, these enable us to provide estimates for the number of children in poverty in 2020. Finally, section 5 presents some brief conclusions.

2 Modelling the incidence of child poverty

In common with most analyses of (child) poverty in the UK (e.g. Brewer *et al.*, 2008), we utilise the FRS which is the primary data source used to compile the annual DWP Households Below Annual Income (HBAI) reports.[1] Children are defined as being either under 16 years of age, or aged 16-18, unmarried and in full-time education.

The FRS for 2003/04 and 2004/05 yield samples of just over 16,000 children in each year. Grossing factors enable the sample to be aggregated so as to be representative for the whole of the UK. **Figure 1** depicts the distribution of all children by family type obtained from pooling the two FRS surveys (the statistics differ very little between the two years). Two thirds of children live with married parents, while a quarter live with a lone parent. Most couples with children – married or cohabiting – have at least one adult working. In contrast, as has been well-documented elsewhere, only around half of lone parents are in work.

Using the standard measure of relative poverty (living in a household with below 60% of median equivalised net household income), we can identify the children that are living in poverty. Across the whole of the UK, around 22.6% of children BHC (28.6% AHC) are living in poverty.[2] Of course, these children are not randomly distributed across all households but concentrated in families and households with certain characteristics. The distribution of children in poverty by family type is shown in **Figure 2**. While the number of children living with lone parents is only around one quarter as shown above, the risk of poverty for these children, especially if living with a workless lone parent, is very high, such that they comprise nearly half of all children in poverty (on either BHC or AHC measures). If the lone parent is not in employment, then the risk of poverty is particularly high – one

Figure 1a: Distribution of all children by family type

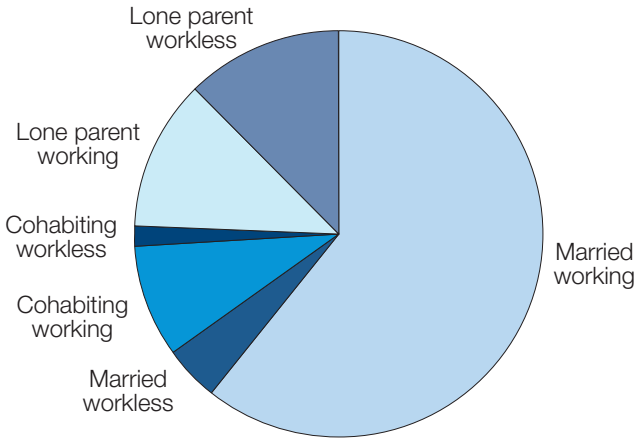


Figure 1b: Proportion of all children by family type

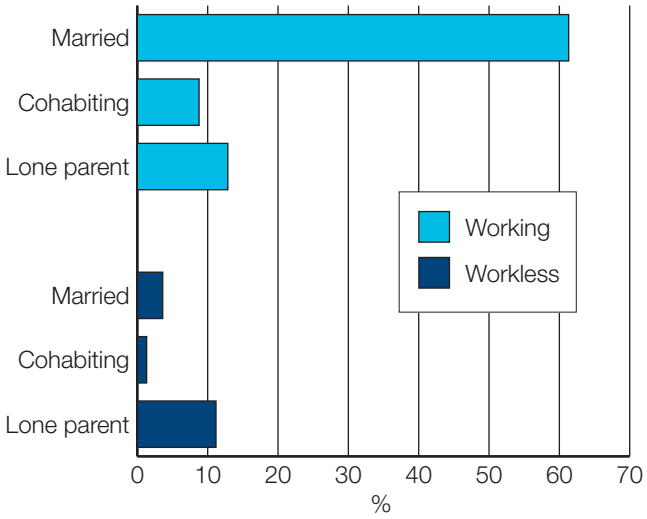


Figure 2a: Distribution of all children in poverty by family type (BHC)

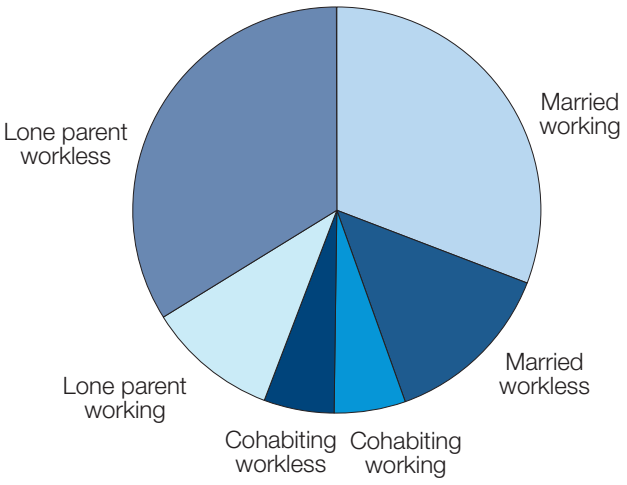


Figure 2b: Distribution of all children in poverty by family type (AHC)

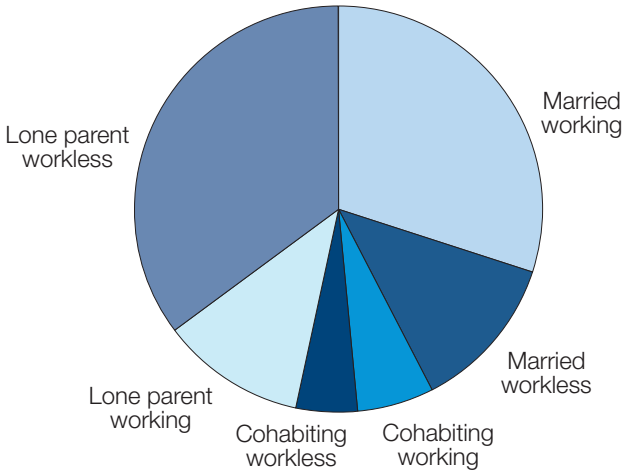
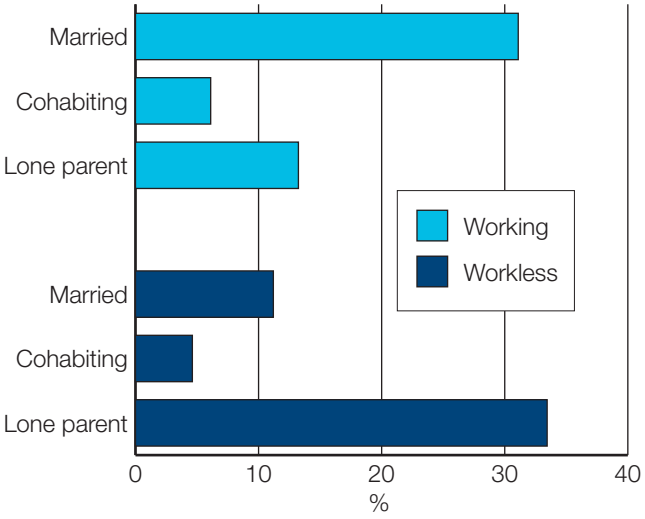


Figure 3b: Proportion of all children in poverty by family type (AHC)

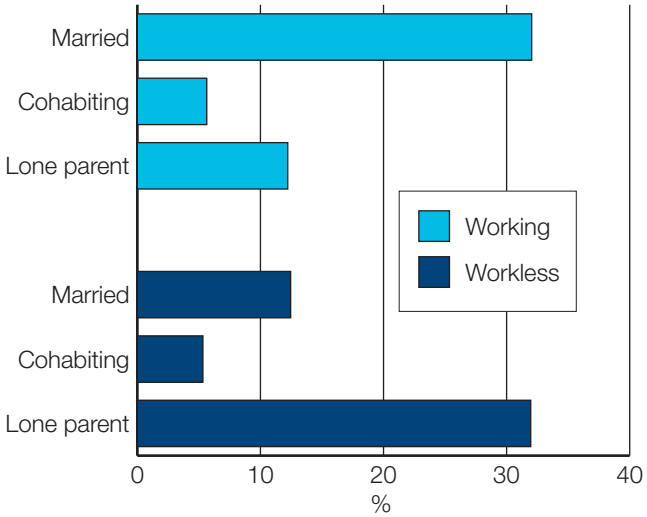


third of all children in poverty live with a workless lone parent.

The disproportionate risk of poverty faced by children of lone parents is perhaps more clearly illustrated in **Figure 3**. This shows, again for both BHC and AHC measures of relative poverty, the proportion of all children in poverty in each family type. It also illustrates another important feature: around half of all children in poverty are living in families where at least one parent is in employment – the so-called working poor.

Of course, family composition and worklessness are not the only two determinants of whether children are in poverty. The annual HBAI reports provide cross-tabulations of a number of other important factors which are strongly correlated with children's poverty risk. We take a range of these factors and estimate a probabilistic model for the likelihood of a child being in poverty conditional on the characteristics of their household, family, parent(s) and the job that their parents do, if any.

Figure 3a: Proportion of all children in poverty by family type (BHC)



More formally, we estimate a probit regression model which determines the probability of a particular child being in poverty according to a wide range of predictors. The results of this exercise are reported in **Table 1**. Columns (1) to (3) report results for the BHC measure of relative poverty while columns (4) to (6) are for the AHC measure. Separate results are shown for each FRS survey, and for the two survey years combined (pooled). The coefficients reported are 'marginal effects' – i.e. the change in the probability of being in poverty relative to the base category for each of the characteristics. The base category is a single child (i.e. no siblings) living in an owner-occupied workless household outside London and the rest of the South East, with two married, white, non-working parents who have some qualifications but not a degree.

The results broadly confirm our expectations. Relative to the base category, children in larger families, in particular with four or more children, those in minority ethnic group families, living in rented accommodation, or whose parents have low level or no qualifications, are significantly more likely to be in poverty. In contrast, children whose parents are well qualified and working (in any job

Table 1: Marginal effects on the risk of child poverty

	BHC			AHC		
	2003/04	2004/05	Pooled	2003/04	2004/05	Pooled
	(1)	(2)	(3)	(4)	(5)	(6)
Lone parent$	–0.081*** (0.007)	–0.072*** (0.008)	–0.077*** (0.005)	–0.096*** (0.010)	–0.082*** (0.010)	–0.088*** (0.007)
Cohabiting$	0.015 (0.012)	0.028** (0.012)	0.021** (0.008)	0.002 (0.014)	0.007 (0.014)	0.003 (0.010)
Age of child	0.005*** (0.001)	0.006*** (0.001)	0.005*** (0.001)	0.004*** (0.001)	0.005*** (0.001)	0.004*** (0.001)
Age of mother	–0.000 (0.001)	–0.001 (0.001)	–0.000 (0.000)	–0.002*** (0.001)	–0.002*** (0.001)	–0.002*** (0.000)
2 children$	0.033*** (0.008)	0.031*** (0.009)	0.032*** (0.006)	0.039*** (0.010)	0.041*** (0.010)	0.040*** (0.007)
3 children$	0.055*** (0.010)	0.072*** (0.011)	0.063*** (0.008)	0.038*** (0.012)	0.051*** (0.013)	0.044*** (0.009)
4+ children$	0.169*** (0.015)	0.183*** (0.015)	0.175*** (0.011)	0.156*** (0.017)	0.186*** (0.017)	0.171*** (0.012)
Minority ethnic group$	0.124*** (0.014)	0.084*** (0.013)	0.103*** (0.009)	0.147*** (0.016)	0.062*** (0.015)	0.101*** (0.011)
Rented$	0.066*** (0.008)	0.040*** (0.009)	0.053*** (0.006)	0.178*** (0.010)	0.158*** (0.011)	0.166*** (0.007)
London$	–0.059*** (0.008)	–0.039*** (0.009)	–0.049*** (0.006)	–0.017 (0.013)	0.043*** (0.014)	0.013 (0.010)
South East$	–0.072*** (0.008)	–0.039*** (0.009)	–0.056*** (0.006)	–0.045*** (0.011)	0.002 (0.012)	–0.021** (0.008)
Full-time worker$	–0.212*** (0.009)	–0.202*** (0.009)	–0.208*** (0.006)	–0.250*** (0.010)	–0.258*** (0.010)	–0.255*** (0.007)
Two earners$	–0.141*** (0.008)	–0.130*** (0.008)	–0.136*** (0.006)	–0.166*** (0.009)	–0.162*** (0.009)	–0.164*** (0.007)
High qualifications$	–0.037*** (0.010)	–0.028*** (0.011)	–0.032*** (0.007)	–0.060*** (0.012)	–0.035*** (0.013)	–0.047*** (0.009)
Low qualifications$	0.039*** (0.007)	0.022*** (0.007)	0.031*** (0.005)	0.060*** (0.009)	0.026*** (0.009)	0.043*** (0.007)
Managers$	–0.088*** (0.020)	–0.130*** (0.018)	–0.110*** (0.014)	–0.128*** (0.026)	–0.152*** (0.026)	–0.141*** (0.018)
Professionals$	–0.127*** (0.014)	–0.134*** (0.015)	–0.131*** (0.010)	–0.159*** (0.021)	–0.179*** (0.020)	–0.170*** (0.015)
Associate Profs$	–0.117*** (0.015)	–0.117*** (0.017)	–0.118*** (0.012)	–0.159*** (0.021)	–0.147*** (0.024)	–0.155*** (0.016)
Admin & Clerical$	–0.080*** (0.019)	–0.084*** (0.021)	–0.082*** (0.014)	–0.121*** (0.024)	–0.099*** (0.028)	–0.109*** (0.019)
Skilled Trades$	–0.059** (0.023)	–0.062** (0.025)	–0.061*** (0.017)	–0.095*** (0.029)	–0.090*** (0.031)	–0.093*** (0.021)
Personal Service$	–0.052** (0.023)	–0.020 (0.031)	–0.036* (0.019)	–0.036 (0.035)	0.005 (0.041)	–0.016 (0.027)
Sales$	–0.078*** (0.019)	–0.043 (0.028)	–0.061*** (0.017)	–0.116*** (0.024)	–0.058* (0.034)	–0.090*** (0.021)
Operatives$	–0.065*** (0.021)	–0.076*** (0.022)	–0.070*** (0.016)	–0.100*** (0.027)	–0.079** (0.031)	–0.089*** (0.021)
Elementary$	–0.036 (0.025)	–0.055** (0.025)	–0.045** (0.018)	–0.035 (0.034)	–0.049 (0.034)	–0.042* (0.024)
Primary$	–0.030 (0.029)	–0.082*** (0.022)	–0.059*** (0.018)	–0.090*** (0.030)	–0.131*** (0.024)	–0.112*** (0.019)
Manufacturing$	–0.077*** (0.021)	–0.095*** (0.021)	–0.087*** (0.015)	–0.121*** (0.025)	–0.123*** (0.027)	–0.122*** (0.018)

(continued)

Table 1: Marginal effects on the risk of child poverty (continued)

	BHC			AHC		
	2003/04	2004/05	Pooled	2003/04	2004/05	Pooled
	(1)	(2)	(3)	(4)	(5)	(6)
Construction$	–0.101*** (0.016)	–0.087*** (0.021)	–0.095*** (0.013)	–0.147*** (0.020)	–0.113*** (0.027)	–0.130*** (0.017)
Distribution$	–0.028 (0.026)	–0.032 (0.028)	–0.031 (0.019)	–0.068** (0.031)	–0.073** (0.032)	–0.070*** (0.022)
Private Services$	–0.078*** (0.021)	–0.050* (0.026)	–0.065*** (0.017)	–0.130*** (0.025)	–0.091*** (0.030)	–0.111*** (0.020)
Public Services$	–0.079*** (0.022)	–0.089*** (0.024)	–0.084*** (0.016)	–0.156*** (0.024)	–0.129*** (0.029)	–0.142*** (0.019)
Observations	16,396	16,012	32,408	16,396	16,012	32,408
Pseudo R^2	0.3797	0.3445	0.3598	0.4549	0.4059	0.4277

1. The table reports the marginal effects from a probit model of the probability of a child living in poverty BHC (columns (1)-(3)) and AHC (columns (4)-(6)) for FRS 2003/04 and FRS 2004/05.

2. For the dummy variables (indicated with $), the marginal effect is for a discrete change of the dummy variable from 0 to 1.

*3. *** p < 0.01, ** p < 0.05, * p < 0.1. Standard errors in parentheses.*

4. The base category is single children (i.e. no siblings) living in an owner-occupied workless household not in London or the South East with a white non-working married couple who have some qualifications but not a degree.

5. Columns (3) and (6) for the pooled estimates also include a dummy for survey year.

as opposed to the base category of not working), particularly in higher level occupations and/or in construction and the public sector, and working full-time, are less likely to be in poverty, especially if both parents are working.[3] There are few, if any, substantive differences between the two survey years, and hence for the purpose of the simulation exercises, we also pool the data sets.

3 The skills composition of employment in 2020

The purpose of the modelling exercise is to provide projections of the proportion and number of children in poverty in 2020. As seen above, children's risk of poverty is significantly affected by the characteristics of their households and their parents, and the jobs that their parents do. Changes in these characteristics and jobs can therefore be expected to impact upon the risk of poverty. Thus, for example, the qualifications that adults possess are important determinants of their labour market status – i.e. whether working or not – and, if working, the 'quality' of the job that they hold. This in turn is important for family incomes and hence children's risk of poverty. Hence, changes in the qualifications profile of the adult population can be expected to have an impact on child poverty, and it is this change in poverty risk that we wish to estimate.

In this section, we document the anticipated changes in the skills composition of employment as reported in the Leitch Review of Skills. The most notable transformation regarding employment in 2020 is in the qualifications held by the workforce, and in the associated occupational and sectoral distribution of employment. The projections for employment presented in the Leitch Review are based largely on a background research paper by Beaven *et al.* (2006). This provides estimates for the distribution of employment in 2020 by National Qualifications Framework (NQF) qualification level, occupation, and industrial sector. **Table 2** summarises these key changes. As can be seen, the proportion of the workforce with low level or no qualifications is projected to continue to fall rapidly just as the proportion with higher level qualifications increases. There is a strong cohort effect at work here, with older, less-qualified workers exiting the workforce being replaced by younger, more highly qualified individuals. The distribution of employment by Standard Occupational Classification (SOC) Major Groups reveals a continuation of recent trends towards more highly skilled occupations and

Table 2a: Projected highest qualification held by those in employment

	Share of employment (%)		
NQF levels	**2004**	**2014**	**2020**
NQF5	6.0	9.5	11.1
NQF4	23.9	29.3	31.0
NQF3	19.7	24.5	26.2
NQF2	22.1	20.2	18.6
NQF1	17.8	13.8	11.3
NQF0	10.5	2.6	1.8
	100	100	100

Table 2b: Projected occupational distribution of employment

	Share of employment (%)		
SOC Major Group	**2004**	**2014**	**2020**
1. Managers and Senior Officials	15.3	16.6	17.0
2. Professional Occupations	11.8	13.5	14.0
3. Associate Professional and Tech	14.3	15.1	15.4
4. Administrative, Clerical and Secretarial	12.6	11.1	10.6
5. Skilled Trades Occupations	11.4	10.3	10.1
6. Personal Service Occupations	7.5	8.6	8.9
7. Sales & Customer Service Occupations	8.0	8.9	9.2
8. Transport and Machine Operatives	7.9	7.1	6.9
9. Elementary Occupations	11.3	8.7	7.9
	100	100	100

Table 2c: Projected sectoral distribution of employment

	Share of employment (%)		
Industry groups	**2004**	**2014**	**2020**
1. Primary	2.0	1.6	1.5
2. Manufacturing	11.7	10.0	9.1
3. Construction	6.9	6.2	5.9
4. Distribution	29.1	29.6	29.7
5. Business and Private Services	25.8	27.7	29.3
6. Public Services	24.4	24.9	24.5
	100	100	100

Source: Beaven et al. *(2006).*

a decline in the share of Elementary Occupations in particular. Similarly, there is projected to be a continuing drift away from employment in the Primary and Manufacturing sectors towards more service-oriented jobs, particularly in business services.

The way in which these projections are utilised in the simulation exercises presented below is as follows:

Occupational distribution of employment

- First, the occupational distribution of all those of working age in employment in the FRS was compared to the 'Leitch' distribution for 2004 as presented in Table 2b. These were found to be (remarkably) consistent (all shares were within 0.5 percentage points [pp] for all nine SOC Major Groups), and hence the Leitch occupational shares were adopted as the base for the simulations.

- Second, the FRS occupational distribution of parents was derived and the Leitch shares rescaled to match the patterns of differences between all adults, and adults who are parents (for example, parents are more likely to be Managers and in Personal Services, and less likely to be in Sales and Elementary Occupations than non-parents).

- Third, using the Leitch occupational shares for 2020 as the base, the same scaling factors were employed to derive the expected occupational distribution of parents' employment in 2020.

Sectoral distribution of employment

- The same methodology used to project the parental occupational distribution of employment in 2020 was used for the future sectoral distribution of employment as shown in Table 2c.

- Parents are more likely to be employed in Public Services, and less likely to be employed in Private Services than non-parents, and these differences are therefore explicitly taken into account when projecting the sectoral distribution of parents' employment in 2020, using the Leitch shares as the base.

Qualifications

- A similar set of calculations was undertaken for projecting the qualifications distribution of the workforce in 2020. Here, however, there are two additional complications. First, because the FRS does not record detailed NQF levels, no initial formal comparison between the FRS and Leitch shares in 2004 as presented in Table 2a is possible. In this case, the Leitch proportion of employment with NQF level 4 or NQF level 5 as their highest qualification was proportionally scaled to the FRS category of having a 'degree' as the highest qualification – this is termed 'high qualifications' in the analysis in this report. Similarly, at the other end of the scale, the proportion with NQF level 0 or NQF level 1 was proportionally scaled to the FRS category of 'no qualifications' – this is termed 'low qualifications'.[1]

- Secondly, the Leitch qualifications projections are for individuals in employment, while we require qualifications projections for all individuals of working age irrespective of their working status. Those with higher (lower) qualification levels are more (less) likely to be in employment. Thus, in order to provide estimates of the qualifications shares for all of working age in 2020 regardless of working status, the projections for those in employment in 2020 need to be rescaled using the FRS employment rates for different qualification levels.

- Projecting the shares of parents with high and low level qualifications in 2020 then uses a similar method to the rescaling of the occupational distribution – parents are distinguished from non-parents (parents tend to be less well qualified than non-parents), and the appropriate scaling factors then used to derive estimates for the proportion of parents with high and low level qualifications in 2020 using the adjusted Leitch shares for 2020 as the base.

Employment/non-employment rate

- One important consequence of increasing qualification levels is likely to be a higher aggregate employment rate. Moreover, further increases to the current (internationally and historically high) aggregate employment rate in the UK are also a stated Government objective. Within our data, the current employment rate of working-age adults is approximately 76% (for both parents and non-parents). But, as noted above, individuals with higher level qualifications are more likely to be in work. Thus it can be anticipated that as well as a lower risk of poverty because of the higher qualifications held, the upward shift in the qualifications distribution of the working-age population will also result in a lower non-employment rate.

- We simulate this increase in the aggregate employment rate as follows. Using the FRS employment rates for each qualification level in 2004, we estimate the aggregate employment rate in 2020 by combining these employment rates with the projected qualification shares as described above. This yields an expected employment rate in 2020 of 79%, some 3 percentage points higher than in 2004.

- We then assume that this additional employment is equally (i.e. proportionately) distributed across all occupations and sectors, and thus we rescale the projected occupational and sectoral distributions of employment accordingly.

4 Estimating the risk of child poverty in 2020

Given these projected new qualifications shares and the occupational and sectoral distributions of employment in 2020, the coefficients reported in Table 1 can be used to derive the *ceteris paribus* impact of these changes on the probability of a child being in poverty. The results of these calculations are reported in **Table 3**.

The first row in the table presents the aggregate child poverty rate (BHC in the upper panel and AHC in the lower panel of the table), separately for each year and for the two years of the data pooled. Row 2 shows the expected change in the child poverty rate as a result of the projected change in the qualifications structure of the workforce, evaluated at the sample means of all other variables. As can be seen, this results in a statistically significant fall in the projected child poverty level of 0.74 percentage points (pp) BHC and 1.05 pp AHC for the pooled data. This effect comes about because of the relatively large changes in the proportions with high level and low level qualifications even though the marginal effects of these characteristics on the incidence of poverty are relatively small.

Row 3 considers the impact of the projected parental occupational distribution in 2020 together with the changes in qualifications as in row 2. This results in a further fall in child poverty of 0.32 pp and 0.36 pp for the BHC and AHC measures, respectively. The shift in employment towards high level occupations (Managers, Professionals and

Table 3: Simulating changes in the incidence of child poverty

Row	Scenario	2003/04	2004/05	Pooled
BHC				
1	Base: risk of poverty	22.9%	22.2%	22.6%
2	As row 1 plus projected 2020 higher qualification profile	–0.89 pp [–1.14,–0.65]	–0.59 pp [–0.85,–0.33]	–0.74 pp [–0.92,–0.56]
3	As row 2 plus projected 2020 distribution by SOC	–1.22 pp [–1.46,–0.99]	–0.87 pp [–1.13,–0.62]	–1.06 pp [–1.23,–0.89]
4	As row 3 plus projected 2020 distribution by SIC	–1.19 pp [–1.42,–0.95]	–0.68 pp [–0.93,–0.43]	–0.95 pp [–1.12,–0.77]
5	As row 4 plus projected 2020 higher employment rate	–1.72 pp [–1.95,–1.49]	–1.26 pp [–1.51,–1.02]	–1.50 pp [–1.67,–1.33]
AHC				
1	Base: risk of poverty	28.7%	28.4%	28.6%
2	As row 1 plus projected 2020 higher qualification profile	–1.39 pp [–1.70,–1.08]	–0.71 pp [–1.02,–0.39]	–1.05 pp [–1.27,–0.83]
3	As row 2 plus projected 2020 distribution by SOC	–1.73 pp [–2.03,–1.43]	–1.07 pp [–1.37,–0.76]	–1.41 pp [–1.62,–1.19]
4	As row 3 plus projected 2020 distribution by SIC	–1.71 pp [–2.00,–1.41]	–0.92 pp [–1.22,–0.61]	–1.32 pp [–1.54,–1.11]
5	As row 4 plus projected 2020 higher employment rate	–2.53 pp [–2.82,–2.23]	–1.67 pp [–1.97,–1.37]	–2.11 pp [–2.32,–1.90]

1. In each scenario, the marginal effects are calculated at the means of all other variables.

2. The percentage point (pp) changes are measured relative to the base (line 1) in each line (i.e. they should not be cumulated).

3. 95% confidence intervals for the change in the incidence in child poverty are given in square brackets below the estimates. These confidence intervals are calculated by the delta method.

Associate Professionals) which have the lowest risk of poverty of all occupational groups, and away from Elementary Occupations which has the highest risk of poverty of all those in employment, serves to decrease the projected poverty rate. However, the effects of the changing occupational distribution of employment are relatively small because of the comparatively small shifts in employment shares between the SOC Major Groups.

Row 4 incorporates the anticipated change to the sectoral distribution of employment in 2020. This serves to marginally offset some of the reduction in child poverty resulting from changes in the qualifications shares and occupational distribution of employment. This is because the shift in sectoral employment shares is towards Distribution (including retail) and Private Services in particular, and employment in these two sectors has a higher risk of child poverty than the sectors which are anticipated to experience falls in employment shares.

Finally, in row 5, the additional implication of the projected increase in the employment rate from the higher qualifications profile of the workforce is considered. This results in a rather greater fall in the expected incidence of child poverty than the changing occupational and sectoral structure of employment considered in the previous two rows of the table. This is a reflection of the fact that being in work at all (i.e. in any job) has a more significant impact on the risk of child poverty than the exact nature of the job undertaken.

In total, the changes considered result in a fall in the incidence of child poverty by 1.50 pp BHC and 2.11 pp AHC for the pooled data. As a proportion, this represents a decrease in the incidence of child poverty of (1.50/22.6=) 6.6% BHC and (2.11/28.6=) 7.4% AHC. Clearly, most of the fall in the incidence of child poverty is expected to result from the higher qualifications profile of the working-age population. Higher qualifications have two important effects – one from the associated lower risk of poverty, irrespective of other factors, and the other through their impact on the employment rate. In combination, these two effects of higher levels of qualifications in the workforce account for almost 90% of the anticipated fall in the incidence of child poverty.[1]

Alternative simulations

The estimates presented in Table 3 suggest that only a comparatively small fall in the risk of child poverty is likely to result from the qualifications and skills upgrading that are projected to take place by 2020. This subsection explores the underlying reasons for the size of the estimated effect and considers a number of alternative simulations.

First, note that there are sizable differences in the *underlying* incidence of child poverty according to parental education. For example, in the pooled data, a simple cross-tabulation reveals that for children whose parents have a degree, 7.7% are in poverty BHC (9.6% AHC) as compared to 28.0% (35.1%) of children whose parents do not have a degree. It might therefore be expected that the anticipated qualifications upgrading as shown in Table 2a would have a larger effect on the estimated incidence of child poverty. One major reason that it does not is that the empirical model presented in Table 1 – and subsequently used for the simulations reported above – incorporates a number of other correlates of educational attainment, such as labour market status, family composition and occupation. Thus the simulations reported in Table 3 for the impact of higher qualifications are effectively *net* of these other influences on the risk of poverty, and hence the impact of educational upgrading is diluted. That is, much of the impact of parental education on the risk of child poverty is not a direct effect through qualifications *per se*, but is indirect through the influence that parental education has on their employment status, family composition etc. With the exception of changes in industrial and occupational composition and the higher employment rate associated with the higher qualification structure, these other factors are held constant in the simulations reported in Table 3 – in this sense, we have controlled for too much in our *ceteris paribus* simulation exercise.

One way of getting some idea of the *gross* impact of educational upgrading is to estimate a specification in which *only* parental education is allowed to impact upon the risk of child poverty. This crude model then attributes all of the difference in the risk of poverty by parental education to qualifications. Simulating the anticipated qualifications upgrading then, in effect,

gives an upper bound for the impact of parental education on the risk of child poverty. The result of this exercise is that child poverty is predicted to fall by 3.90 pp BHC (4.86 pp AHC) as a result of the projected educational upgrading by 2020. This represents a fall of some (3.90/22.6=) 17% BHC and (4.86/28.6=) 17% AHC, a rather larger impact than the around 7% reported in Table 3 above for both poverty thresholds.[2]

The actual outcome is likely to be somewhere between these two extremes. For example, while higher qualifications are strongly associated with full-time employment, it is not obvious that the existing relationship between qualifications and the probability of full-time employment will continue to hold in an age where there is greater flexibility in employment and, indeed, increasing spread of part-time jobs.

Second, our simulations are undertaken for a child with 'average' parental and family characteristics which are simulated to change according to the Leitch projections for 2020. That is, for a child with mean characteristics, we report the change in the probability they will be in poverty by 2020 given the expected change in the means of these characteristics. But this 'mean' effect conflates the potential changes in poverty risk for very different subgroups in the population. In particular, children of lone parents are much more likely to be in poverty as seen in section 2 above. As a consequence, the potential for reducing the poverty risk for this group is much greater than for the average child.

We can undertake our simulation exercises for specific subgroups of the population in order to see the potential reduction in poverty for these subgroups. For example, for children of lone parents, if their parents were to have the same education attainment and an identical distribution of employment (SOC and SIC) as the 'average' child in 2020, their poverty risk would fall by 13 pp BHC (17 pp AHC).[3] This gives some idea of the potential gains that could be made with respect to the incidence of child poverty amongst population subgroups where it is particularly prevalent. Of course, this is very unlikely to happen without the successful implementation of a range of strategies to engender this outcome. Our purpose here is not to suggest what these strategies might be, but rather to simply indicate the latent gains that there are to play for amongst groups where the poverty risk is greatest.

Estimating the number of children in poverty in 2020

In order to estimate the number of children in poverty in 2020, the projected risk of child poverty needs to be combined with the expected number of children in 2020. The latest GAD/ONS 2006-based population projections are shown in **Figure 4**. The principal projection is for a rise in the number of children in the UK aged 0-16 between 2006 and 2020 by around 1 million (or 8%) from 12.3 to 13.3 million.

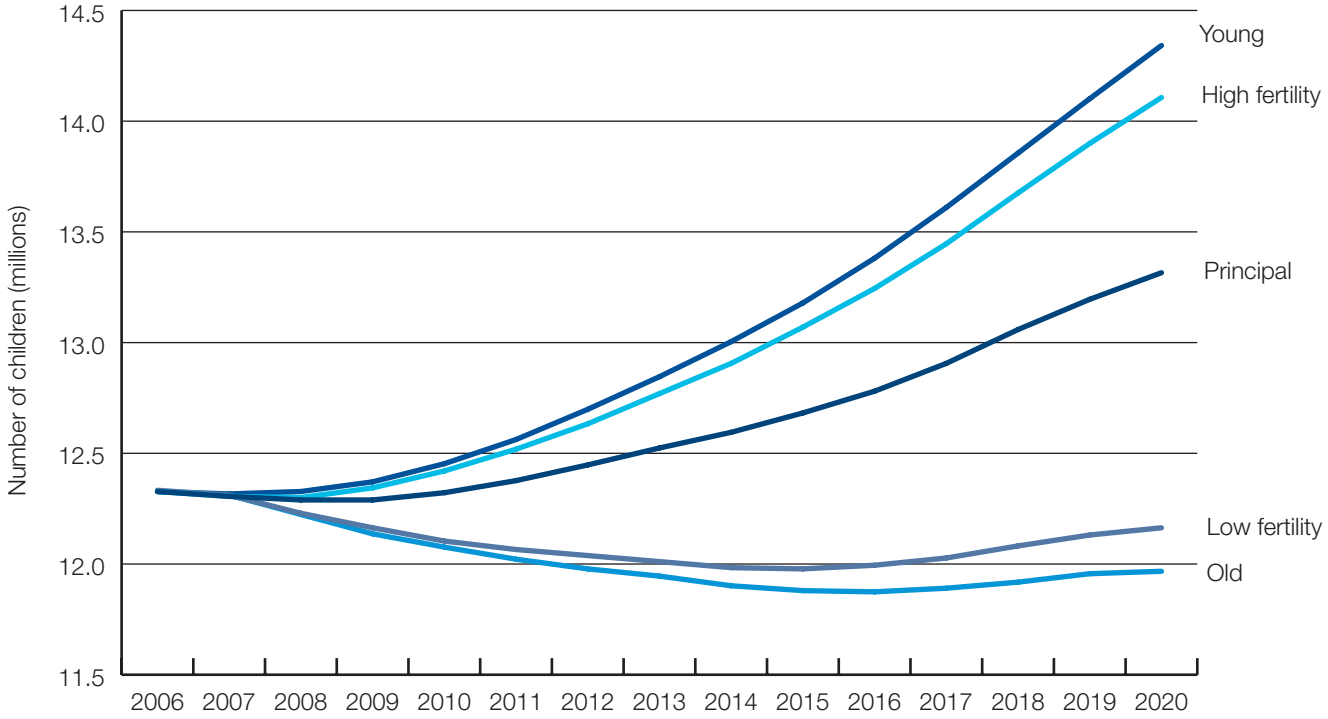
Table 4 imposes the poverty risks on these population projections in order to estimate the number of children anticipated to be in poverty in 2020. As can be seen from the final column in Table 4, the forecast change in the number of children in poverty in 2020 ranges from a small increase through to a fall of around 300,000 BHC (360,000 AHC), which would represent a decline of around 10% from current levels.

A range of alternative forecasts for the number of children is also presented in Figure 4 with different combinations of high/low fertility and high/low migration. These variants give a projected range for the number of children in the UK in 2020 of between 12.0 million and 14.3 million, which represent a fall of 0.3 million (3%) and an increase of 2.0 million (16%) respectively from current numbers.

Table 4: Estimating the number of children in poverty in 2020

	Millions		
	2006	2020	Change from 2006
All children	12.3	13.3	
Number of children in poverty BHC			
Poverty rate 22.6%	2.78	3.01	
reduction of 6.6% or 1.50pp		2.81	+0.03
reduction of 17% or 3.90pp		2.49	–0.29
Number of children in poverty AHC			
Poverty rate 28.6%	3.52	3.80	
reduction of 7.4% or 2.11pp		3.52	+0.01
reduction of 17% or 4.86pp		3.16	–0.36

Figure 4: ONS child population projections 2006-20



Note: The principal projection for the number of children in the UK aged 0-16 is shown together with a number of variants based on alternative assumptions regarding fertility and migration: high fertility; low fertility; young population (high fertility and high migration); and old population (low fertility and low migration).

Source: www.gad.gov.uk/Population/index.asp. For further details see ONS (2008).

Clearly any outcome in the top half of this range of projections could actually result in significantly more children in poverty in 2020 than there are today, despite the anticipated fall in the incidence of child poverty. At the very top end of the range, there could be up to 250,000 more children in poverty in 2020 than at present.

5 Commentary, caveats and conclusions

<According to the estimates presented in this report, the incidence of child poverty in the UK is projected to fall by between 2 and 5 pp by 2020 as a consequence of the changing occupational, sectoral and qualification structure of employment. This will contribute towards, but will certainly not meet, the Government's objective which is to 'end child poverty' in the UK by 2020. Coupled with the forecast increase in the number of children in the UK by 2020, we predict that the number of children in poverty will range between 2.49 and 2.81 million BHC (3.16 to 3.52 million AHC).

There are a number of important caveats regarding the analysis presented above. First is the fact that the projections for 2020 presented in the Leitch Review and used as the basis for the simulations reported in this study are for employment (i.e. numbers of jobs) rather than for the numbers of individuals in employment. Thus 'double-jobbing' whereby an individual has two jobs has been ignored in computing the projections presented above. Second, throughout the analysis, we have presumed that other things remain 'constant' so that there are no feedback effects from the changes that we investigate. One potentially important consideration is that we have necessarily assumed that employment probabilities do not fall as the supply of qualifications in the workforce increases. Third, the Leitch projections for the qualifications of the labour force are essentially forecasts of the changes in the *supply* of skills based on the fact that those leaving the labour force through retirement are typically less well qualified than those who are joining the labour force having just completed their formal education.[1] That is, the projections are based on new cohorts adding to the average qualification level rather than existing workers upskilling to any great degree. The importance of this observation for the modelling exercise is that the most significant effect derives from the continued qualifications upgrading of the workforce, and we have assumed that the demand for these additional skills will result in (wage) returns which give rise to the associated lower incidence of poverty than is experienced today. Similarly, the projections of the occupational distribution of parental employment are extrapolations of the existing patterns in combination with the Leitch projections about how employment and skills patterns might change between occupations and sectors. We have assumed that these changes will affect parents and non-parents equally and according to the current employment distribution.

Finally, while the focus above is only on the changing skills, occupational and sectoral distribution of employment, the probit regressions reveal that a number of other factors are important in explaining the incidence of child poverty, and hence potential changes in these factors will also have consequences for child poverty in 2020. For a number of the socio-demographic factors considered in the probit regressions, Parsons and Rees (2006) have usefully provided projections based on census and other data. There would appear to be some changes of significance which might serve to assist in reducing child poverty (e.g. an anticipated large fall in the proportion of lone-parent households), while other factors are expected to change little (e.g. the number of dependent children).

In conclusion, the implications of the continuing growth in the average qualification levels in the workforce, together with projected further increases in the skills composition of employment, can be expected to impact on the jobs that parents hold and consequently on household income and thus the incidence of child poverty. Assuming that existing employment patterns associated with different qualification levels are maintained, and that the labour market returns to different jobs remain unchanged, the increasing skills composition of employment will mean that the proportion of children in poverty should fall. The simulation exercise conducted in this report is

designed to produce some first-order estimates of the magnitude of this expected change. Our results suggest that the impact will be comparatively small in magnitude, and thus the forecast improvement in the skills composition of employment will contribute relatively little towards the Government's objective of ending child poverty by 2020.

Notes

1 Introduction

1 This assumes that full 'eradication' is not technically feasible, but the Joseph Rowntree Foundation's definition of 'eradication' is taken as the target. See Hirsch, D. (2008) *Roundup: What is needed to end child poverty in 2020*, York: JRF.

2 These two FRS surveys are used rather than the most recently available 2005/06 FRS since they span the period of the baseline projections for 2004 provided in Beaven *et al.* (2006) as summarised in the Leitch Review, and it is these projections which are used to calibrate the simulation exercises undertaken in this report.

2 Modelling the incidence of child poverty

1 www.dwp.gov.uk/asd/hbai.asp

2 Note that these figures are both slightly higher (by 2 percentage points [pp] BHC and 1 pp AHC) than the figures reported in Brewer *et al.* (2008) even when recorded on a GB basis as in Brewer *et al.* rather than a UK basis as used here. We are using the FRS data deposited at the Data Archive rather than the HBAI data that are derived from it and used to compile the official statistics and the IFS commentaries. Our measure of net household income is simply based on what individuals report (adding up values from various questions on sources of income and benefits received, and subtracting [reported] council tax payments), while the HBAI net income measure has been subjected to a number of tests and imputation procedures in an effort to minimize misreporting and noise. For the analysis which follows, these comparatively small differences in measured poverty are relatively unimportant since our focus is on estimating changes from the baseline rather than on the absolute level of poverty.

3 That children of lone parents appear to have a significantly lower risk of being in poverty, *ceteris paribus*, than those of married couples is somewhat surprising. Further investigation reveals that this is because the higher poverty risk associated with children of lone parents derives substantially from the fact that lone parents are less likely to work full time, and cannot (by definition) be in two-earner households. Once we take into account these two critical differences between lone parents and couples, then the higher poverty risk associated with children of lone parents disappears.

3 The skills composition of employment in 2020

1 The weakness in the recording of qualification levels in the FRS is perhaps not too restrictive since it is well known that qualifications and occupations are closely correlated, and we take account of the qualifications distribution of employment throughout this exercise.

4 Estimating the risk of child poverty in 2020

1 Since the scenarios in Table 3 include additional changes sequentially, the order in which they are added will affect the magnitudes of the changes. However, in practice, we find that the magnitudes change little, and the employment and qualifications effects always dominate the SOC and SIC changes.

2 Note that these estimates are also larger than the overall impacts in line 5 in Table 3. This is because Table 3 holds constant all of the other effects not listed in lines 1 to 5 (such as family composition, full-time status, region etc), whereas to the extent these are correlated with education attainment, they impact on the risk of child poverty in the 'only education matters' specification. Put another way, in Table 3 we have allowed for the correlation between parental education, SOC, SIC and the

employment rate, but have still not allowed for the relationship between parental education and family composition, employment status etc since we are uncertain how these might be affected.

3 The rates would decline from 39% to 26% BHC (54% to 37% AHC). Their poverty risk would still be above the population average since the distribution of their other attributes adversely impacts upon their risk of being in poverty.

5 Commentary, caveats and conclusions

1 One consequence that is often cited is that there will only be 2% of jobs for unskilled workers in 2020 but, in fact, the correct interpretation is that only 2% of jobs will be held by those with no qualifications – everyone else in employment will have qualifications at NQF level 1 or above.

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