



Department
for Education

Economic benefits of meeting the ambitions set out in the Schools White Paper

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Summary

This government's Levelling Up mission for schools is that, by 2030, 90% of children will leave primary school having achieved the expected standard in reading, writing and maths, up from 65% in 2019.¹ In addition, the white paper² sets an ambition to increase the national GCSE average grade in both English language and in maths from 4.5 in 2019³ to 5, for all secondary school pupils by 2030. In this report we estimate the economic returns associated with achieving these ambitions.

To achieve the Levelling Up mission, around one in four pupils will need to make sufficient improvements in Key Stage 2 (KS2) attainment by 2030 to reach the expected standard. We estimate that the size of the attainment improvement will need to be equivalent to 0.87 of a standard deviation, or around 10 months of progress. The associated economic benefits are:

- Increased discounted lifetime earnings of £37,000 - £72,000, for each extra pupil that successfully reaches the expected standard at KS2 in 2030.
- Discounted lifetime earnings benefits of £5.5bn - £10.5bn, for a cohort of pupils in 2030.
- Whole economy benefits of £31.1bn - £59.6bn, associated with the improvement for this cohort of pupils.

Increasing the national GCSE average grade both in English language and in maths by 0.5 is estimated to have the following benefits:

- Increased discounted lifetime earnings of £9,800, for each pupil that improves their attainment in GCSE English language and maths by 0.5 grades in 2030.
- Discounted lifetime earnings benefits of £6.05bn, for a cohort of pupils in 2030.
- Whole economy benefits of £34.3bn, associated with the improvement for this cohort of pupils in 2030.

The earnings estimates exploit existing evidence from Hodge et al. (2021a) which uses the Longitudinal Educational Outcomes (LEO) dataset to value improvements in GCSE attainment. Predicted lifetime outcomes are inherently uncertain and so the estimates above are indicative.

¹ See Mission Five of the Levelling Up White Paper (DLUHC, 2022).

² Department for Education (2022) *Opportunity for all: strong schools with great teachers for your child*.

³ Table 7, DfE (2020) '[Key stage 4 performance 2019 \(revised\)](#)'

This report does not explore the trajectory over time, toward or beyond the 2030 ambition. Benefits would accumulate for successive cohorts, but care would need to be taken to avoid 'double counting' the returns associated with improved KS2 and GCSE attainment.

The whole economy estimates are 5.7 times larger than the earnings benefits, reflecting the contribution of knowledge and skills to long-run economic growth. The magnitude of this illustrative multiplier, derived from different studies, is uncertain due to difficulties in comparing methodologies.

The impacts of improving skills stretch beyond income and GDP. Whilst quantifying wider welfare effects is complex, basic skills could insulate against particularly bad outcomes for personal wellbeing, such as unemployment and low job quality.

We do not estimate the relative benefits associated with Levelling Up the worst performing areas, but these wider welfare effects would be important to consider in that context. Income improves wellbeing at a decreasing rate. Overall, we might reasonably expect that the wellbeing benefits associated with achieving these two ambitions to be larger, in areas of the country with lower earnings and higher levels of disadvantage.

Required improvement in attainment

At KS2, we need a baseline against which to measure the level of improvement required for 90% of primary school children to achieve the expected standard in reading, writing and maths by 2030. In 2019, 65% of pupils reached the expected standard in all of reading, writing and maths.⁴ We use 2019 as our baseline, noting that KS2 exams were cancelled in 2020 and 2021.⁵ We would anticipate some ‘learning loss’ owing to higher levels of pupil absence during the COVID-19 pandemic, but the effect on the 2019 baseline is uncertain. This baseline will therefore suffice for our simple scenario analysis, but not for more detailed analysis of the trajectory toward meeting this ambition.

Table 1 shows the average marks below the expected standard in Grammar, Punctuation and Spelling (GPS), Reading and Maths, for pupils that failed to meet the standard in 2019. We translate these into fractions of a standard deviation: pupils below the standard were, on average, 0.87 standard deviations away from achieving the expected standard, averaging across all three tests. To put this effect size in context, it is equivalent to around 10 months of progress.⁶

Subject	Average marks from the expected standard	Standard deviation of grade distribution	Average SDs from the expected standard
GPS	11.7	14.1	0.832
Maths	21.3	23.9	0.889
Reading	8.8	9.9	0.886

Table 1: Estimating how far, on average, pupils below the expected standard were from meeting the KS2 standard in 2019.

The average improvement required to meet the expected standard is informative, but it is best treated as a thought experiment, describing a minimum level of improvement required to meet the ambition. It is difficult to imagine a reform program that would be so precisely targeted, for pupils to just reach this threshold level.

If the ambition was achieved in practice, then we would expect some ‘overshoot’, with some pupils not just meeting but exceeding the threshold level. We would also anticipate spill-over benefits for the 65% of pupils who are already above the expected standard in

⁴ DfE (2019) [‘National curriculum assessments at key stage 2 in England, 2019 \(revised\)’](#). The figure was 64% in 2018 suggesting a reasonably stable baseline. DfE (2018) [‘National curriculum assessments at key stage 2 in England, 2018 \(revised\)’](#). Comparisons with earlier years are difficult due to changes in the KS2 tests.

⁵ In response to the COVID-19 pandemic, the Department for Education cancelled the subsequent KS2 national curriculum assessments and associated data collections. See <https://www.gov.uk/government/statistics/announcements/national-curriculum-assessments-at-key-stage-2-2020-revised>

⁶ Based on the translation of effect sizes into the months’ progress used by the Education Endowment Foundation (2021).

our 2019 baseline. These pupils would benefit from reforms designed to meet the ambition, and from peer-effects as their fellow pupils' standards improve.⁷ We do not include these effects in the economic analysis below but note that achieving the ambition would, in reality, require a greater overall level of improvement with larger benefits.

At Key Stage 4 (KS4) the required level of improvement is relatively straightforward. The ambition is to lift the national GCSE average grades by 0.5 points in both English language and in maths, increasing from 4.5 in 2019⁸ to 5 by 2030. Again, we disregard spill-over effects. For example, we might anticipate that the improvement in literacy and numeracy skills required to meet this ambition would raise grades in other GCSE subjects.

⁷ The same would be true of the 10% of pupils that remain below the expected standard, even if the ambition is achieved – to a certain extent our model already factors in improvements for this group, as the average effect size improvement above is based on all pupils below the threshold.

⁸ Table 7, DfE (2020) ['Key stage 4 performance 2019 \(revised\)'](#)

Lifetime earnings benefits

Next, we estimate the direct economic benefits associated with the required improvement in KS2 and KS4 attainment, described above. We use a microeconomic approach, aggregating predicted changes in lifetime earnings. We discuss an alternative, macroeconomic approach below – this captures productivity growth across the whole economy.

Since Mincer (1958), there has been extensive use of regression specifications to estimate the wage returns associated with educational attainment. We can however quickly reduce the number of relevant research papers that could directly inform our analysis. Indeed, to the best of our knowledge, there are no estimates of lifetime wage returns (or wider macroeconomic benefits) associated with test scores at the end of primary school in England.⁹

Hodge et al. (2021a) provide estimates of the lifetime earnings returns associated with GCSE performance. The analysis exploits the Longitudinal Educational Outcomes (LEO) dataset, linking education records with income and employment records, for every child in the state school system in England. The advent of LEO has transformed what is possible in the measurement of earnings linked to attainment.¹⁰ Given the richness of the data, Hodge et al. are able to estimate returns across the full distribution of attainment, not just pupils crossing certain ‘threshold’ levels, such as five A*-C grades.

Whilst they are careful not to infer causality, extensive controls for observed pupil characteristics are included in the model. The underlying model is quality assured to a high standard, based in part on methodological advice from leading academics. This gives reasonable assurance on the model’s validity, although we still recognise that any predictive model of earnings is inherently uncertain – we can only offer rough estimates.

Hodge et al. (2021a) report a one standard deviation (11.2 grades) improvement in overall GCSE performance is associated with an increase in discounted lifetime earnings of approximately £100,000.¹¹ These returns are sizable, representing nearly 20% of average discounted lifetime earnings.

⁹ Much of the literature focuses on education in later life, often based on the highest level of qualification achieved or total years of schooling (the extrinsic margin), rather than changes in test scores (the intrinsic margin). Most estimates only consider wage returns at specific ages, rather than the cumulative returns up to retirement.

¹⁰ Although LEO provides detailed histories of education and earnings, it is limited by the fact linked records only exist for the 1985/86 birth cohort onwards; hence, we only observe individuals’ annual earnings through their twenties. Hodge et al. (2021a) used additional information from the UK Labour Force Survey (LFS) to complete each individual’s earnings trajectory, up to retirement age.

¹¹ Hodge et al. (2021a) report a £96,000 increase per standard deviation. This estimate is based on the returns for pupils who took their GCSEs between 2002 and 2004, and so we make further adjustments based on the distribution of attainment in 2019 and setting the present value to 2022. Accounting for modelled uncertainty, this gives a central value of £100,000 with confidence range between £94,000-£106,000.

KS2 Levelling Up mission

First, we consider the present value associated with meeting the Levelling Up mission at KS2. The cohort of pupils taking KS2 exams at the end of primary school in 2030 will take their GCSEs in 2035. Discounting to 2035, the per pupil present value of lifetime earnings associated with a one standard deviation improvement in GCSE attainment is £82,000.¹²

Our scenario assumes a 0.87 effect size improvement at KS2, but we need to consider the effect size on GCSE performance, to apply the above lifetime earnings predictions. The underlying model of human capital formation and productivity is complex. *Skills beget skills* and so the effects of raising standards in early literacy and numeracy are likely to be long lasting. Conversely, in a policy context, even effective interventions in primary school can ‘fade out’ if these are not supported by further investments in later life. GCSEs are also a broader based assessment of multiple subjects and so we cannot assume that reading, writing and maths will necessarily have the same effect on overall GCSE performance.

The balance of these factors is uncertain. A simple assumption is that the KS2 effect size holds constant at KS4, at 0.87. We use this assumption to compute our ‘higher’ estimate.

Analysis by Ofqual showed that the median correlation coefficient between KS2 scores in English and maths, and GCSE grades was 0.522 in 2013 (Benton and Sutch, 2014).¹³ This suggests that the effect size at KS4 might be closer to $(0.87 \times 0.522 =) 0.45$. We use this effect size to calculate a more conservative ‘lower’ estimate. Intuitively, this scenario might suggest that literacy and numeracy skills drive nearly half of the improvement across all GCSE subjects taken but leaves scope for the other half to be driven by other cognitive and non-cognitive skills.

These scenarios suggest an increase in average discounted earnings of between £37,000 to £72,000 for each extra pupil that successfully reaches the expected standard.

The size of the 2030 cohort is projected to be 586,000 pupils¹⁴ based on DfE forecasts and accounting for demographic trends. Achieving the ambition would directly benefit

¹² Based on 13 years of additional discounting between 2022 and 2035, at 3.5% per annum. We also assume 2% real earnings growth over the same period, which counteracts part of the discount.

¹³ This median correlation based on test scores in KS2 English and Maths in 2013, and GCSE grade for subjects with entry of at least 400 candidates. The correlations are similar using different specifications, e.g., based on rank positions rather than test scores. To our knowledge, there are no published correlation coefficients based on more recent data. Our internal analysis suggests the correlation coefficient could be slightly higher in 2019 although this analysis is not published, nor quality assured. A higher correlation would imply an earnings impact between our ‘high’ and ‘low’ estimates – as such, uncertainly in this assumption is covered within the range of estimates provides.

¹⁴ State funded pupils in England, age 10, projected FTE. Headcount projection is unavailable. DfE (2021) [‘National pupil projections’](#)

25% of this cohort, the difference between 65% achieving the expected standard in our baseline (2019) and 90% in the stated ambition.

Based on these assumptions, the discounted lifetime earnings benefits of achieving the ambition would be between £5.5bn and £10.5bn.¹⁵ Again, this represents the returns for just one cohort of pupils in 2030, these benefits would rapidly accumulate if this success was sustained for each successive cohort.¹⁶

Improvement in KS2 attainment (in standard deviations):	
The average standard deviation distance from the expected standard, for pupils below the standard in 2019	0.87
Improvement in GCSE attainment (in standard deviations):	
High scenario: assume same effect size at KS2 and KS4	0.87
Low scenario: assume 0.522 correlation between English/Maths KS2 and GCSE scores (Benton and Sutch, 2014)	0.45
Lifetime earnings return per pupil (discounted, 2019 prices):	
Benefits of a 1 standard deviation change in GCSE attainment, for pupils taking their GCSEs in 2022	£100,000
Benefits of a 1 standard deviation change with additional discounting as ambition met by 2030 KS2 cohort, who will sit GCSEs in 2035	£82,400
High scenario: 0.87 of a standard deviation change in GCSE attainment	£71,600
Low scenario: 0.45 of a standard deviation change in GCSE attainment	£37,400
Number of pupils benefitting from improved attainment	
Total cohort size: state funded pupils in England, age 10, projected FTE in 2030	586,000
25% pupils moving from below to above the expected standard (90% minus 65%)	146,500
Estimated lifetime earnings benefit associated with meeting the ambition in 2030 (Present Value)	
High scenario	£10.5bn
Low scenario	£5.5bn

Table 2: Estimated lifetime earnings benefit associated with achieving the ambition, that 90% of primary school children will achieve the expected standard in reading, writing and maths by 2030

¹⁵ We use the 2019 price year for consistency with other income-equivalent benefits described in the Levelling Up White Paper (see Table 1.6, DLUHC, 2022). Present values in 2022 and 2019 prices. We apply the standard HM Treasury discount rate of 3.5% over years 1 to 30, and 3% thereafter (HM Treasury, 2020). This differs from many of the illustrative, income-equivalent benefits described in the Levelling Up White Paper, most of which were undiscounted. It is, however, consistent with income-equivalent benefits associated to the mission to improve NVQ level 3 qualifications, described in the Levelling Up White Paper, which were expressed in present values.

¹⁶ The present value benefits for each subsequent cohort would differ due to further discounting and population change.

GCSE ambition

Next, we consider the present value associated with the ambition to increase the national GCSE average grade in both English language and in maths from 4.5 in 2019¹⁷ to 5 by 2030. Based on Hodge et al. (2021), a one-grade improvement in maths is associated with a discounted return of £14,200, whereas in English language the return is £7,800.¹⁸ We aggregate the independent returns associated with a 0.5 grade change in both subjects. In practice, there will be complex interactions between improved performance in English and maths, and performance in other GCSE subjects.

We estimate a £6.05bn present value return, for a cohort of pupils taking their GCSEs in 2030. This estimate is similar in scale to the ‘low’ estimate associated with meeting the KS2 ambition (£5.5bn); however, the required level of improvement associated with each ambition differs, as do the forecast sizes of the KS2 and KS4 cohorts in 2030, and so the estimates are not directly comparable.

Importantly, we also disregard interactions between the KS2 and KS4 missions. This is not a significant issue in our scenarios, where the earnings benefits accrue to different pupil cohorts in 2030, one taking their GCSEs, and the other in their last year of primary school. If we were to explore the trajectory of improvement over time - toward or beyond the 2030 ambitions - then care would need to be taken to avoid ‘double counting’, particularly where pupil cohorts benefit from additional progress at both KS2 and KS4.

Improvement in GCSE attainment:	
Average grade point improvement, in maths and English language	0.5
Lifetime earnings return per pupil (discounted, 2019 prices):	
Benefits of 1 grade change in maths GCSE scores, for pupils taking their GCSEs in 2022	£14,200
Benefits of 1 grade change in English language GCSE scores, for pupils taking their GCSEs in 2022	£7,800
Benefits of 0.5 change in GCSE maths and English language, for pupils taking their GCSEs in 2022	£11,000
Additional discounting: mission met by 2030 cohort	£9,800

¹⁷ Table 7, DfE (2020) [‘Key stage 4 performance 2019 \(revised\)’](#)

¹⁸ Hodge et al. (2021) report that the grade improvements in maths and English are £14,500 and £7,300. Note that these differ from those used in our analysis (£14,200 and £7,800). Hodge et al. (2021) report estimates associated with cohorts who sat their GCSE exams in the early 2000’s. The GCSE grade distribution has changed somewhat in the intervening period, and 2017 saw the phased introduction of a number grading system, replacing ‘letter’ grades. We abstract from this problem as Hodge et al. (2021) estimate the earning return of a standardised effect size attainment increase, for each subject. We make an adjustment to the marginal return per grade, based on the number grade distributions observed for the 2019 cohort. This assumes that the standardised return holds constant over time: again, this introduces uncertainty as we cannot observe the earnings return for recent pupil cohorts.

Number of pupils benefitting from improved attainment	
Cohort size: state funded pupils in England, age 15, projected FTE in 2030	619,000
Estimated lifetime earnings benefit associated with meeting the ambition in 2030 (Present Value)	
	£6.05bn

Table 3: Estimated lifetime earnings benefit associated with achieving the ambition to increase the national GCSE average grade in English language and in maths to 5 by 2030

Triangulation

It is useful to use different sources of data and approaches, to test the reliability of our estimates above. In this section we use alternate data to derive another estimate of the associated earnings returns of meeting the Levelling Up ambition at KS2, before turning to a macroeconomic approach in the next section.

Crawford and Cribb (2013) explore the association between reading and maths test scores at age 10, and earnings in later life. One advantage over Hodge et al. (2021a) is they observe the relationship between performance at age 10 and later earnings, so we do not need to make any additional ‘bridging’ assumptions on the association between attainment at KS2 and KS4.

Test scores at age 10 are also, arguably, less open to the criticism of signalling effects, when compared to a GCSE-based model. Employers and educational institutions do not generally screen candidates based on primary school tests, whereas many do consider their GCSE results, for example, as minimum entry requirements. We do not consider signalling to be a major concern with our preferred approach, for the reasons outlined in Hodge et al. (2021b). It is nevertheless useful to use Crawford and Cribb’s estimates as a sense check, for any biases that our use of a GCSE-based model above might introduce.

There are drawbacks in using the Crawford and Cribb estimates, justifying our preference for the GCSE-based model, even in estimating the benefits associated with improved KS2 performance. First, Crawford and Cribb’s research is based on tests taken in 1980, which are not directly comparable with contemporary KS2 tests.¹⁹ Second, their report does not simulate earnings effects over a lifetime, instead modelling earnings at ages 30, 34 and 38. Third, their estimates are based on a smaller sample from one birth cohort, when compared to Hodge et al. which utilises large administrative data.

Other things being equal, a one standard deviation increase in reading and maths scores at age 10 was found to be associated with earning 4.4% and 10.5% more per week, by age 30. The returns were similar at ages 34 (4.8% and 10.8%) and 38 (4.8% and 10.2%).²⁰

The estimates in this model specification are additive and so we can roughly assume a 15% increase in earnings, associated with a one standard deviation improvement in both reading and maths.²¹ Recall that our scenario implied one in four pupils would require a

¹⁹ They are based on scores from the Edinburgh Reading Test and Friendly Maths Test respectively.

²⁰ Machin and McNally (2008) used the same data from the British Cohort Study to investigate the relationship between reading at age 10 and weekly earnings at age 30. Crawford and Cribb’s analysis is preferable, in our context, as they extended the analysis to estimate returns to maths, and at ages 34 and 38.

²¹ Crawford and Cribb (2013) report several model specifications. These results refer to a specification in includes both maths and reading scores at the same time. This specification does not control for the effect of later qualifications (also included in the report) and so includes benefits that are mediated through later educational pathways.

0.87 effect size improvement in KS2 attainment to achieve the ambition. Assuming wage returns remain constant through the life course, this suggests lifetime earnings returns of 13% for affected pupils.

The Levelling Up White Paper notes that, on average, individuals in 2020 are estimated to earn around £500,000 over a lifetime (DLUHC, 2022. p.59). We might therefore expect a £65,000 increase in earnings per affected pupil. For a cohort of pupils in 2030, the total benefits would be £9.6bn.

This estimate sits within the range estimated using our preferred modelling approach above, which implied benefits of £5.5bn - £10.5bn. As a basic sensitivity check, this provides some assurance that our preferred estimates are not biased by our specific choice of data and methods.

Percentage change in earnings:	
The percentage change in earnings associated with a 1 standard deviation improvement in age 10 scores (Crawford and Cribb, 2013)	15%
Improvement in KS2 attainment (in standard deviations):	
The average standard deviation distance from the expected standard, for pupils below the standard in 2019	0.87
Percentage change in earnings	
The percentage change in earnings associated with a 0.87 standard deviation improvement in age 10 scores	13%
Lifetime earnings	
Average total lifetime earnings (DLUHC, 2022. p.59)	£500,000
Lifetime earnings return per pupil	
Assuming lifetime returns of 13%	£65,000
Number of pupils benefitting from improved attainment	
Total cohort size: state funded pupils in England, age 10, projected FTE in 2030	586,000
25% pupils moving from below to above the expected standard (90% minus 65%)	146,500
Estimated lifetime earnings benefit associated with meeting the ambition in 2030 (Present Value)	
	£9.6bn

Table 4: Estimated lifetime earnings benefit associated with the Levelling Up ambition using an alternative approach

Macroeconomic benefits

In contrast to our microeconomic approach above, macroeconomic estimates give much larger estimates of the economic benefits across the whole economy. Hanushek and Woessmann advanced the argument that long-run growth is overwhelmingly caused by “knowledge capital”.²² Their growth regressions have been prominent in education policy for many years, particularly within the European Union and the OECD. These estimates explore cross-country variation in growth, education, and other factors at national level. The consequences of higher cognitive skills reportedly represent multiples of GDP (Hanushek and Woessmann, 2015).

DfE commissioned the Institute for Fiscal Studies to consider how we might best reconcile microeconomic and macroeconomic approaches, when estimating economic benefits in policy appraisal. Overall, they concluded that:

“...the macroeconomic approach in theory offers the potential to estimate the total benefits of education – via both private and social returns. However, in practice, current data limitations mean that this approach may not produce an estimate of the true causal effect of education on economic growth; instead this approach is likely to produce an upper bound.” (Crawford and Cattan, 2013)

Micro models can explore detailed changes in measurable attainment, controlling for more individual-level characteristics. They can take advantage of longitudinal data to control for time invariant unobserved factors, such as school attended and region of residence. Such controls are important in the context of our scenario, where we wish to isolate, as best we can, the causal effect of improving standards in primary school.

Despite the current lack of a robust identification strategy in macro approaches, they retain the intuitive appeal in capturing wider social benefits, especially for scenarios that would see large scale changes in the workforce’s stock of human capital.

The closest precedent in the literature, for the ambitions we consider in this report, is provided by Hanushek and Woessmann (2020a). They consider the macroeconomic benefits of achieving “universal basic skills”. Their scenario explores the benefits of compensatory policies that successfully target improvements at the bottom of the achievement distribution. They define ‘low achievers’ as those who scored below proficiency level 2 on the PISA tests at age 15.

The scenario assumed all children would achieve at least these baseline skills by 2035. It assumes that some students, starting just above the level 2 boundary, receive half of the impact that those starting below level 2 received. This accounts for spillovers, which we

²² See Hanushek and Woessmann (2015).

do not consider in our microeconomic estimates above, largely because it would involve making arbitrary assumptions. It also assumes that improvements in skills occur linearly over 15 years and so benefits accrue for cohorts between 2020 and 2035. Benefits are then estimated over the next 80 years. Increasing skills of the labour force are modelled by assuming cohorts of new, better-trained people enter the labour market, replacing individuals who retire.²³

Hanushek and Woessmann (2020a) estimate that the UK would require a 12.9 PISA point improvement in meet achieve this level of universal basic skills. It would add €4.8 trillion in present value to UK GDP, over the status quo. That was equivalent to 169% of current GDP, at the time of estimation in early 2020. It represents an increase in the long-run growth rate of 0.26%.

There are several differences between these estimates and those that we derive using a micro model: the required level of achievement is different; the estimates are based on the UK rather than England; and the benefits are cumulative rather than for a single cohort. From the information in Hanushek and Woessmann (2020a) it is not possible to extract a unit benefit (per pupil) from which to make more direct comparisons.

Further, to model macro impacts accurately, we would need to go beyond the simplifying assumptions made by Hanushek and Woessmann. For example, the model does not capture how a sizable expansion in the supply of basic skills might affect the price of these skills in the labour market. Several general equilibrium effects of this type are likely to be important.

We can, however, conclude that the macroeconomic growth benefits associated with meeting the ambition would be multiple times higher than those implied by our microeconomic models of earnings.

To give a rough comparison, we compare two micro and macro estimates of the returns to education. Both relate to overall levels of lost learning during the pandemic, in the United States. Hanushek and Woessmann's (2020b) macro estimate suggests an impact of US\$14.2tn associated with a third of a year of lost learning. Psacharopoulos et al. (2021) provide a micro estimate of US\$2.5tn for 4 months of lost learning. Indicatively this suggests using a multiplier of 5.7²⁴, when considering a conversion from micro to macro estimates of the economic returns to education.

Illustratively, if we apply this multiplier to our £5.5bn to £10.5bn estimates of the microeconomic earnings returns then the macroeconomic growth benefits of achieving

²³ The analysis assumes that each worker remains in the labour force for 40 years, implying that the labour force will not be made up of fully skilled workers until 55 years have passed - 15 years of reform and 40 years of replacing less-skilled workers as they retire).

²⁴ \$14.2bn/\$2.5bn

the KS2 ambition would be £31.1bn to £59.6bn, for the cohort of pupils in 2030. Similarly, applying the multiplier to the £6.05bn earnings return, associated with a 0.5 grade improvement in GCSE maths and English language, suggests a whole economy benefit of £34.5bn. There are, of course, many issues with the validity of this conversion, as the two studies above are not directly comparable.

Wellbeing and sub-national effects

The overarching mission in the Levelling Up White Paper is to improve wellbeing:

“Taken together, these [twelve] missions will help achieve the overarching ambition to improve well-being in every area of the UK, with the gap between top performing and other areas closing (Mission Eight)” (DLUHC, 2022. Executive Summary, p.12)

It is important to consider how the educational ambitions described above might a) contribute to Mission Eight on wellbeing, and b) affect social welfare in areas with poorer educational performance.

Income generally improves subjective wellbeing at a decreasing rate (Layard et al., 2008). That is, the value of an extra pound is worth more to people on lower incomes than to those on higher incomes (HM Treasury, 2020). The economic benefits in our analysis are ‘unweighted’, meaning that we implicitly assume that a pound in additional earnings has the same value for all pupils, no matter their socio-economic background or where they live.

Welfare weighting would have a significant effect on our estimates above, in which we adjust the value of additional income to account for its effect on personal wellbeing. The DfE’s *Schools Policy Appraisal Handbook* (Hodge et al., 2021b) gives an illustrative example of welfare weighting, applied to pupil’s lifetime earnings. Tentatively, they propose a mean average welfare weight for Free School Meal (FSM) eligible pupils of between 1.53 and 1.71. This would more than offset the 9% lower earnings return reported for those who are eligible for FSM, associated with marginal improvements in GCSE grades (Hodge et al., 2021a).

Weighting would need to be undertaken carefully. It is perhaps less important to weight the total income effects at the national level, but the implications would be important to consider at pupil subgroup or area level.

The HM Treasury’s (2021) *Wellbeing Guidance for Appraisal* highlights several other factors that could be considered, in a more detailed analysis of these wellbeing effects. For example, wellbeing research suggests that individuals’ relative position can matter more than their absolute position.²⁵ An increase in someone else’s income can reduce the sense of wellbeing of a person whose income does not rise (Clark et al., 2018). As such, we would ideally consider how income comparisons affect life satisfaction, before and after the ambition is met.

²⁵ See Di Tella, Haisken-De New and MacCulloch (2010), Clark and Oswald (1996) and Easterlin (1974)

Further, by focussing on changes in income, we are liable to miss some of the main effects associated with the ambition to raise basic literacy and numeracy skills. These skills could plausibly reduce the risk of:

- being on very low income, sufficient to meet basic needs;
- spells of unemployment; and
- poor job quality.

These effects are known to be important influences on life satisfaction, as people generally do not adapt to such negative outcomes.²⁶

We cannot do full justice to these wellbeing effects through our blanket analysis of total changes in income and GDP, but they are important at a sub-national level. Overall, we might reasonably expect that the wellbeing benefits associated with achieving the ambition will be larger, in areas of the country with lower earnings and higher levels of disadvantage.

²⁶ See for example Clark et al. (2018) and De Neve and Ward (2017).

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