



Department
for Education

Economic returns to GCSEs: region and disadvantage

**Ad-hoc statistics: The potential value to
the UK economy of improving the GCSE
results of disadvantaged pupils by region**

December 2017

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Introduction

This publication presents estimates of the economic value of reducing the disadvantage attainment gap in each region in England, so that it is the same size as the attainment gap in London and improving the attainment of disadvantaged pupils in all regions to the same level as in London.

For each region in England, an 'attainment gap' is calculated which represents the difference in attainment between disadvantaged pupils and their peers. This attainment gap is smaller in London than it is in other regions in England.

Two scenarios are presented. The first scenario calculates the number of extra disadvantaged pupils who would need to improve their GCSE attainment in each region in order to reduce the attainment gap to the same size as it is in London. This number is combined with published lifetime productivity estimates to generate an overall economic value of reducing the attainment gap for each region.

The second scenario outlines the number of extra disadvantaged pupils who would need to improve their GCSE attainment in each region in order to match the attainment of disadvantaged pupils in London. This number is combined with published lifetime productivity estimates to generate an overall economic value of improving the attainment of disadvantaged pupils to the same level as London.

All returns figures are presented as illustrations only.

Main Findings

- In the academic year 2013/14, a greater percentage of pupils who were not disadvantaged achieved at least five GCSEs at A*-C including English and maths compared to those who were disadvantaged. This was consistent across all regions of England for both boys and girls and is referred to as the attainment gap throughout this publication (see Table 1 and Table 2).
- The size of the attainment gap is smallest in London at 21 percentage points. In some regions, the attainment gap exceeds 30 percentage points (see Table 1 and Table 2).
- If the attainment gap in all regions could be reduced to the same size as London, this would lead to an increase of around 125,000 disadvantaged pupils achieving the equivalent of five or more GCSEs at A*-C including English and maths if effects were replicated for children currently of school age across England.
- Across the country, if the attainment gap could be reduced to the same size as it is in London, some disadvantaged individuals would increase their lifetime productivity by the equivalent of approximately £110,000 in present value terms for

each pupil who improves their attainment. This would lead to an overall economic benefit of around £12 billion in present value terms over the lifetimes of the individuals analysed.

- Similarly, if disadvantaged pupils in all regions performed as well as disadvantaged pupils in London, this would lead to an overall economic benefit of around £20 billion in present value terms.

Methodology

1. The percentage of pupils who achieve at least five GCSEs at A*-C including English and maths is presented in Table 1 and Table 2, based on disadvantage and region for boys and girls in academic year in 2013/14. Data from 2013/14 is used as it is the most recent data for which a regional and disadvantage split is available and is applicable to the published returns estimates. This data was published in January 2015 and is available at <https://www.gov.uk/government/statistics/gcse-and-equivalent-attainment-by-pupil-characteristics-2014>

Scenario 1: Closing the attainment gap to the same size as London

2. Subtracting the percentage of disadvantaged pupils who achieve this measure from the percentage of non-disadvantaged pupils who achieve this measure allows the calculation of an attainment gap by region for boys and girls. The size of the attainment gap compared to London is calculated by subtracting the London attainment gap from a given region's attainment gap. This gives the percentage points increase in disadvantaged pupils achieving at least five GCSEs at A*-C including English and maths required to reduce the attainment gap to the same size as it is in London.

3. For example, in the North West the percentage of non-disadvantaged boys who achieved at least five GCSEs at A*-C including English and maths was 59.2% compared to 29.7% for disadvantaged boys, giving an attainment gap of 29.5 percentage points (Table 1). Subtracting the London attainment gap for boys of 20.7 percentage points from the North West attainment gap for boys gives 8.8 percentage points. Therefore, if the North West increased the percentage of disadvantaged boys achieving at least five GCSEs at A*-C including English and maths by 8.8 percentage points then its attainment gap for boys would be reduced to the same size as London.

4. The same data has also been used to calculate the number of pupils who are disadvantaged as a percentage of the total number of pupils (the disadvantage rate) for each region (Table 3 and Table 4).

5. By considering the number of school-aged pupils currently enrolled at schools in England, the number of pupils who will sit GCSEs in the future is calculated. This is shown in Table 5 and Table 6. It is derived by taking the number of pupils in each of the 11 school age cohorts from Year 1 to Year 11. This data was published in June 2017 and

is available at <https://www.gov.uk/government/statistics/schools-pupils-and-their-characteristics-january-2017>

6. In each cohort, we calculate the number of extra disadvantaged pupils required to achieve at least five GCSEs at A*-C including English and maths in order to reduce the attainment gap to the same size as it is in London. This is derived by multiplying the number of pupils who are projected to be in each of the 11 cohorts by the disadvantage rate for each region from Table 3 and Table 4. This figure is then multiplied by the increase in attainment for disadvantaged pupils (the percentage of pupils achieving at least five A*-C grades including English & maths GCSEs) required to match the London Attainment gap from Table 1 and Table 2.

7. For example, in 2018, the overall number of boys projected in Year 11 in the North West is 37, 778 (Table 5). Multiplying this by the disadvantage rate for boys for the North West of 29.8% (Table 3) and then by the 8.8 additional percentage points of disadvantaged boys required to achieve at least five GCSEs A*-C including English and maths from Table 1 yields 991. This means that 991 extra disadvantaged boys in the North West would have to achieve at least five GCSEs A*-C including English and maths in order to reduce the attainment gap to the same size as in London.

8. Across all current school age pupils, this scenario would eventually lead to roughly 125,000 additional disadvantaged pupils achieving at least five GCSEs at grade A*-C including English and maths compared to the counterfactual of the attainment gap remaining at 2013/14 levels.

9. In order to calculate the economic returns of reducing the attainment gap, the number of individuals in each region who achieve this measure (who otherwise wouldn't have) in each year is multiplied by the marginal returns of achieving more than five good GCSEs including English and maths in 2017 prices. These figures are taken from [https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/387160/R398A - Economic Value of Key Qualifications.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/387160/R398A_-_Economic_Value_of_Key_Qualifications.pdf) (DfE, 2014). The reported marginal return figures in the paper are £103,000 for men and £105,000 for women. When GDP deflators are used to uplift to 2017 prices, these become £111,000 for males and £114,000 for females.

10. The returns estimates represent the discounted marginal lifetime productivity benefits for individuals who complete more than five good GCSEs including English and Maths as their highest qualifications, compared to individuals achieving anything less. Future cohorts are discounted according to Green Book standards. The results are presented in Tables 7-10.

11. The per pupil weighted return is therefore calculated by taking the total discounted return in one year and dividing by the number of disadvantaged pupils who improved their attainment. In 2018, the per pupil return is around £110,000 in 2017 prices. Future cohorts have a lower present value due to discounting.

Scenario 2: Improving the performance of disadvantaged children in all regions to the same levels as London

12. A **second scenario** where disadvantaged children perform as well as children in London can also be calculated. Under this scenario, the percentage of disadvantaged children in each region who achieve at least five GCSEs at A*-C including English and maths is set **equal** to that of London (45% for boys and 52.6% for girls, Table 1). This information can then be used to calculate the required increase in performance of disadvantaged pupils in all regions (Table 1). This in turn can then be used to calculate the increased lifetime productivity for future cohorts if all disadvantaged pupils performed as well as disadvantaged pupils in London. This scenario uses the same pupil figures as the first scenario from Table 5 and Table 6.

13. For example, in 2018, the overall number of boys projected in the North West is 37,778. We multiply this by the disadvantage rate for boys for the North West of 29.8% and then by the 15.3 additional percentage points of disadvantaged boys required to match the attainment of disadvantaged boys in London from Table 1. This means that roughly 1,720 extra disadvantaged boys in the North West would have to achieve at least five GCSEs A*-C including English and maths in order to match the attainment of disadvantaged boys in London.

14. By using the attainment returns from DfE 2014 as before, the number of extra disadvantaged individuals who would pass at least five GCSEs at A*-C including English and maths can be multiplied by the associated attainment return to calculate the economic returns. The results are displayed in Tables 11 to 14.

15. The per pupil weighted return is therefore calculated by dividing the total discounted return in one year and dividing by the number of disadvantaged pupils who improved their grade. In 2017, as before the per pupil return is therefore around £110,000 in 2017 prices. Future cohorts have a lower present value due to discounting.

Assumptions

16. The rate of disadvantage will remain constant in each region. The rate of disadvantage in the 2013/14 Key Stage 4 (KS4) cohort is therefore assumed to be a good proxy for future cohorts.

17. All pupils currently enrolled in Years 1 to Year 11 will go on to complete KS4.

18. This analysis does not take into account the impact of future changes in the distribution of attainment resulting from comparable outcomes. As such, the increase in the number of individuals achieving better GCSE attainment may not be observed in future grade distributions. It thus assumes that increased human capital will nonetheless lead to improved earnings, which equivalent effects to those realised through have improved GCSE grades reported in DfE 2014.

19. It is assumed that the labour market value of GCSEs will remain relatively stable in the future and will not be affected by the change of the grading classification system or impacts resulting from improved overall attainment in our scenarios. The five A*-C including English and maths measure is used in this publication as a proxy for the equivalent level of attainment in the 9-1 grading system.

20. It is assumed that the backwards looking estimates of GCSEs presented in DfE 2014 are a good indicator of the labour market value of GCSEs moving into the future.

Tables

Region	Percentage achieving 5+ A*-C grades inc. English & mathematics GCSEs		Attainment Gap	Additional pts disadvantaged achieving 5+ A*-C grades inc. English & maths needed to	
	Disadvantaged pupils	All other pupils		Match London attainment gap	Match London disadvantaged attainment
East Midlands	28.2	54.6	26.4	5.7	16.8
East	29.2	58.2	29	8.3	15.8
London	45	65.7	20.7	0.0	0.0
North East	28.6	59.2	30.6	9.9	16.4
North West	29.7	59.2	29.5	8.8	15.3
South East	27.9	60.6	32.7	12.0	17.1
South West	29	57.3	28.3	7.6	16.0
West Midlands	31.1	58.4	27.3	6.6	13.9
Yorkshire and the Humber	27.5	57.1	29.6	8.9	17.5

Table 1: Attainment gap for boys

Source: SFR06/2015: GCSE and equivalent attainment by pupil characteristics, Table 6

Region	Percentage achieving 5+ A*-C grades inc. English & mathematics GCSEs		Attainment Gap	Additional ppts disadvantaged achieving 5+ A*-C grades inc. English & maths needed to	
	Disadvantaged pupils	All other Pupils		Match London attainment gap	Match London disadvantage attainment
East Midlands	37.5	66.8	29.3	8.3	15.1
East	38.1	69.2	31.1	10.1	14.5
London	52.6	73.6	21	0	0.0
North East	40.3	70	29.7	8.7	12.3
North West	39.6	70.5	30.9	9.9	13.0
South East	37.8	70.3	32.5	11.5	14.8
South West	36.8	68.7	31.9	10.9	15.8
West Midlands	41.2	68.1	26.9	5.9	11.4
Yorkshire and the Humber	36.1	67.9	31.8	10.8	16.5

Table 2: Attainment gap for girls

Source: SFR06/2015: GCSE and equivalent attainment by pupil characteristics, Table 6

Region	Number of disadvantaged pupils	Number of non-disadvantaged pupils	Disadvantage rate
East Midlands	5,962	19,327	23.6%
East	6,874	25,546	21.2%
London	15,070	23,089	39.5%
North East	4,599	9,619	32.3%
North West	11,718	27,573	29.8%
South East	8,781	36,545	19.4%
South West	5,818	22,132	20.8%
West Midlands	9,443	22,316	29.7%
Yorkshire and the Humber	8,052	20,930	27.8%

Table 3: Disadvantage rate for boys

Source: SFR06/2015: GCSE and equivalent attainment by pupil characteristics, Table 6

Region	Number of disadvantaged pupils	Number of non-disadvantaged pupils	Disadvantage rate
East Midlands	5,716	18,295	23.8%
East	6,661	24,620	21.3%
London	14,481	22,940	38.7%
North East	4,421	9,025	32.9%
North West	11,022	26,679	29.2%
South East	8,516	34,687	19.7%
South West	5,405	21,446	20.1%
West Midlands	9,450	21,114	30.9%
Yorkshire and the Humber	7,840	20,290	27.9%

Table 4: Disadvantage rate for girls

Source: SFR06/2015: GCSE and equivalent attainment by pupil characteristics, Table 6

Region	Year 11	Year 10	Year 9	Year 8	Year 7	Year 6	Year 5	Year 4	Year 3	Year 2	Year 1
East Midlands	23,749	24,015	24,858	25,369	25,788	26,578	27,388	28,711	28,278	28,697	29,288
East	31,157	31,360	32,295	33,384	33,723	34,253	35,391	37,116	36,592	37,461	38,300
London	39,661	40,106	41,693	42,671	44,119	47,224	49,773	51,459	51,651	53,504	54,081
North East	13,112	13,099	13,551	13,904	14,200	14,671	14,912	15,335	15,255	15,592	15,864
North West	37,778	38,043	39,002	40,242	41,482	42,602	43,467	45,040	44,818	45,323	45,674
South East	43,868	43,627	45,287	46,482	47,109	48,137	50,124	52,277	52,112	53,556	55,005
South West	26,186	26,161	27,332	27,391	27,811	28,406	29,617	30,349	30,450	30,963	31,716
West Midlands	30,668	31,320	32,345	33,554	33,948	34,180	35,518	37,066	36,589	37,136	37,853
Yorkshire and the Humber	27,660	28,069	28,727	29,958	30,293	31,575	32,134	33,542	33,555	34,192	34,244

Table 5: Numbers of boys in each year group, 2017

Region	Year 11	Year 10	Year 9	Year 8	Year 7	Year 6	Year 5	Year 4	Year 3	Year 2	Year 1
East Midlands	22,734	22,604	23,401	24,148	24,604	25,345	26,069	27,107	27,010	27,504	27,793
East	30,265	29,697	30,693	31,777	32,194	32,267	33,818	35,165	35,262	35,669	36,213
London	38,156	39,173	40,572	41,459	42,363	45,259	47,433	50,081	49,676	50,724	51,356
North East	12,482	12,393	12,815	13,224	13,608	14,133	14,159	14,962	14,381	14,796	14,982
North West	36,259	36,093	37,193	38,673	39,260	40,411	41,257	42,688	42,831	42,967	43,658
South East	41,245	41,367	42,940	43,988	44,687	46,056	47,904	49,870	49,571	50,941	51,955
South West	24,991	24,920	25,809	26,242	26,977	27,066	27,980	29,202	28,998	29,619	30,115
West Midlands	29,783	29,663	30,558	31,660	32,266	33,190	34,045	35,146	34,887	34,821	36,258
Yorkshire and the Humber	26,493	26,486	27,486	28,430	29,243	30,171	30,724	31,887	31,796	32,531	32,397

Table 6: Numbers of girls in each year group, 2017

Source: SFR28/2017: Schools, Pupils and their Characteristics (includes part time and full time pupils, excludes independent schools and non-maintained schools)

Region	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
East Midlands	£35m	£35m	£35m	£34m	£34m	£33m	£33m	£34m	£32m	£31m	£31m
East	£61m	£59m	£59m	£59m	£57m	£56m	£56m	£57m	£54m	£54m	£53m
North East	£47m	£45m	£45m	£45m	£44m	£44m	£43m	£43m	£41m	£41m	£40m
North West	£110m	£107m	£106m	£106m	£105m	£105m	£103m	£103m	£99m	£97m	£94m
South East	£113m	£109m	£109m	£108m	£106m	£105m	£105m	£106m	£102m	£102m	£101m
South West	£46m	£44m	£45m	£43m	£43m	£42m	£42m	£42m	£41m	£40m	£40m
West Midlands	£67m	£66m	£66m	£66m	£65m	£63m	£63m	£64m	£61m	£59m	£59m
Yorkshire and the Humber	£76m	£75m	£74m	£74m	£73m	£73m	£72m	£72m	£70m	£69m	£67m

Table 7: Discounted lifetime benefit for boys from reducing the attainment gap to the same size as London, by year

Region	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
East Midlands	£51m	£49m	£49m	£49m	£48m	£48m	£48m	£48m	£46m	£45m	£44m
East of England	£74m	£70m	£70m	£70m	£69m	£67m	£67m	£68m	£66m	£64m	£63m
North East	£41m	£39m	£39m	£39m	£39m	£39m	£38m	£38m	£36m	£35m	£35m
North West	£120m	£115m	£114m	£115m	£113m	£112m	£111m	£111m	£107m	£104m	£102m
South East	£106m	£103m	£103m	£102m	£101m	£100m	£101m	£101m	£97m	£96m	£95m
South West	£62m	£60m	£60m	£59m	£59m	£57m	£57m	£57m	£55m	£54m	£53m
West Midlands	£62m	£60m	£59m	£59m	£58m	£58m	£58m	£57m	£55m	£53m	£53m
Yorkshire and the Humber	£91m	£88m	£88m	£88m	£87m	£87m	£86m	£86m	£83m	£82m	£79m

Table 8: Discounted lifetime benefit for girls from reducing the attainment gap to the same size as London, by year

Source: Calculated from SFR28/2017, SFR06/2015 and DfE 2014

Region	Total
East Midlands	£894m
East	£1,374m
North East	£894m
North West	£2,360m
South East	£2,273m
South West	£1,102m
West Midlands	£1,330m
Yorkshire and the Humber	£1,738m
Total	£11,964m

Table 9: Total lifetime benefit for boys and girls from reducing the attainment gap to the same size as London for all school-age children by region

Source: Calculated from SFR28/2017, SFR06/2015 and DfE 2014

Region	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
England	£1,162m	£1,124m	£1,122m	£1,117m	£1,100m	£1,089m	£1,082m	£1,087m	£1,045m	£1,027m	£1,008m

Table 10: Total lifetime benefit for boys and girls from reducing the attainment gap to the same size as London for all school-age children by KS4 cohort

Source: Calculated from SFR28/2017, SFR06/2015 and DfE 2014

Region	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
East Midlands	£105m	£102m	£102m	£101m	£99m	£98m	£98m	£99m	£95m	£93m	£91m
East	£116m	£113m	£112m	£112m	£109m	£107m	£107m	£109m	£103m	£102m	£101m
North East	£77m	£75m	£75m	£74m	£73m	£73m	£72m	£71m	£68m	£67m	£66m
North West	£192m	£186m	£185m	£184m	£183m	£182m	£179m	£180m	£173m	£169m	£164m
South East	£161m	£155m	£156m	£154m	£151m	£149m	£150m	£151m	£146m	£145m	£144m
South West	£97m	£94m	£94m	£91m	£90m	£89m	£89m	£88m	£86m	£84m	£83m
West Midlands	£141m	£139m	£139m	£139m	£136m	£132m	£133m	£134m	£128m	£125m	£123m
Yorkshire and the Humber	£149m	£147m	£145m	£146m	£143m	£144m	£141m	£142m	£138m	£136m	£131m

Table 11: Discounted lifetime benefit from all disadvantaged boys performing as well as disadvantaged boys in London, by year

Region	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
East Midlands	£93m	£89m	£89m	£89m	£88m	£87m	£87m	£87m	£84m	£83m	£81m
East	£106m	£101m	£101m	£101m	£99m	£96m	£97m	£97m	£94m	£92m	£90m
North East	£57m	£55m	£55m	£55m	£55m	£55m	£53m	£54m	£50m	£50m	£49m
North West	£157m	£151m	£150m	£151m	£148m	£147m	£145m	£145m	£141m	£136m	£134m
South East	£137m	£133m	£133m	£132m	£129m	£129m	£129m	£130m	£125m	£124m	£122m
South West	£91m	£87m	£87m	£86m	£85m	£83m	£82m	£83m	£80m	£79m	£77m
West Midlands	£120m	£115m	£114m	£115m	£113m	£112m	£111m	£111m	£106m	£103m	£103m
Yorkshire and the Humber	£139m	£134m	£134m	£134m	£133m	£133m	£131m	£131m	£126m	£125m	£120m

Table 12: Discounted lifetime benefit from all disadvantaged girls performing as well as disadvantaged girls in London, by year

Source: Calculated from SFR28/2017, SFR06/2015 and DfE 2014

Region	Total
East Midlands	£2,040m
East	£2,266m
North East	£1,379m
North West	£3,582m
South East	£3,086m
South West	£1,905m
West Midlands	£2,691m
Yorkshire and the Humber	£3,003m
Total	£19,952m

Table 13: Total lifetime benefit from all disadvantaged pupils performing as well as disadvantaged children in London for all school-age children by region

Source: Calculated from SFR28/2017, SFR06/2015 and DfE 2014

Region	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
England	£1,938m	£1,875m	£1,872m	£1,864m	£1,834m	£1,816m	£1,805m	£1,813m	£1,742m	£1,712m	£1,681m

Table 14: Total lifetime benefit from all disadvantaged pupils performing as well as disadvantaged children in London for all school age by KS4 cohort

Source: Calculated from SFR28/2017, SFR06/2015 and DfE 2014



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