Assessing value for money in Sixth Form education

Final Report for the Sixth Form Colleges' Association

London Economics

Sixth Form Colleges Association

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About London Economics

London Economics is one of Europe's leading specialist economics and policy consultancies and has its head office in London. We also have offices in Brussels, Dublin and Cardiff and associated offices in Budapest, Paris and Valletta.

We advise clients in both the public and private sectors on economic and financial analysis, policy development and evaluation, business strategy, and regulatory and competition policy. Our consultants are highly-qualified economists with experience in applying a wide variety of analytical techniques to assist our work, including cost-benefit analysis, multi-criteria analysis, policy simulation, scenario building, statistical analysis and mathematical modelling. We are also experienced in using a wide range of data collection techniques including literature reviews, survey questionnaires, interviews and focus groups.

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Glossary

Terminology abbreviations

APS	Average Point Score per student
DfE	Department for Education
EFA	Education Funding Agency
FSM	Free School Meal
HEI	Higher Education Institution
PPE	Average Point Score per entry
SFC	Sixth Form College

Executive summary

London Economics were commissioned by the Sixth Form Colleges' Association to undertake a detailed analysis of the value for money achieved by different educational providers in relation to academic provision for young people aged between 16 and 19.

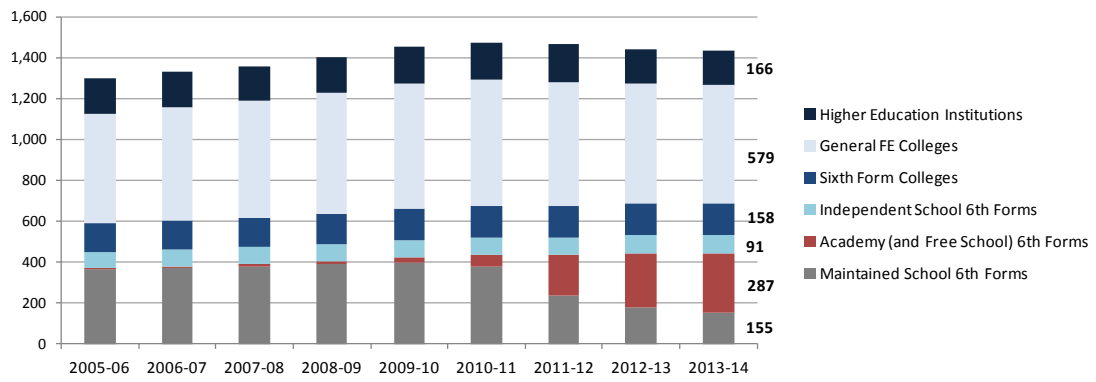
Context

Since 2005-06, there has been an **11%** increase in the number of students aged between 16 and 18 enrolled on a Level 3 course within the National Qualifications Framework. In addition to the increase in the number of young people undertaking qualifications at this level, there has also been a dramatic shift in provision over time. In 2013-14, approximately **11%** of students aged between 16 and 18 in England attended a standalone Sixth Form College, which corresponded to **158,000** students across **93** institutions[1]. In 2005 there were **103** Sixth Form Colleges – there has been a **10%** decline in the number of institutions over the past 10 years. However, the proportion of students attending Sixth Form Colleges has remained essentially unchanged since 2005-06 (see Figure 1); and given the increase in the size of the cohort remaining in post-compulsory education, this equates to an increase in the number of students educated by Sixth Form Colleges by **18,000**.

Change elsewhere in 16-18 provision

Reflecting the fundamental shift in the nature of provision of secondary education in England, approximately **20%** of 16-18 students now attend an Academy or a Free School Sixth Form[2] compared to less than **1%** of 16-18 year old students in 2005-06.

Figure 1: Evolution of 16-18 student numbers between 2005-06 and 2013-14, in '000s



Source: London Economics' analysis of Department for Education data.

Correspondingly, the proportion of 16-18 year olds attending Local Authority Maintained School Sixth Forms has declined from **28%** to **11%** over the period. Amongst all students attending either Academy or Maintained School Sixth Forms in 2013-14, **11%** attended selective (Grammar) schools, with the remaining **89%** attending non-selective schools. Approximately **40%** of 16-18 students have attended a General FE College since 2005-06. The remaining **18-19%** of students aged 16-18 are either enrolled at Independent School Sixth Forms (**6%** in both 2005-06 and 2013-14) or have already entered higher education (approximately **13%** in 2005-06 and **12%** in 2013-14).

[1] For a complete list of Sixth Form Colleges, please refer to Annex 1.
[2] In 2013-14, approximately **99%** of these students attended either a Converter or Sponsored Academy Sixth Form, while the remaining **1%** attended a Free School Sixth Form.

Better performance outcomes

Sixth Form Colleges serve their students well - both in terms of the academic outcomes achieved and the degree of certainty associated with those outcomes. Students in Sixth Form Colleges are more likely to achieve higher levels of attainment than their peers in non-selective[3] Maintained School Sixth Forms and Academy Sixth Forms.

For example, the Average Point Score per student (APS) achieved by Sixth Form College students undertaking A Levels stands at **772**. This compares favourably to the APS achieved by students in non-selective Maintained School Sixth Forms (**706**) and Academy Sixth Forms (**686**). In terms of **Average Point Scores per *entry* (PPE)**, Sixth Form College students achieve an average PPE score of almost **206** points per entry, which is, on average, between **6** and **13** points higher than non-selective Maintained School Sixth Forms or Academy Sixth Forms, respectively[4]. These higher quality outcomes achieved by students attending Sixth Form Colleges occur despite the fact that the proportion of students eligible for Free School Meals is *higher* in Sixth Form Colleges (**11.4%**) than for students attending Maintained School Sixth Forms (**10.8%**) or an Academy Sixth Form (**8.2%**).

These positive outcomes are not simply restricted to Key Stage 5 outcomes. The combination of high conversion rates between 'AS' and 'A' Levels and high levels of academic achievement (and high value-added measures) results in substantially better than average progression rates to higher education. Compared to approximately **63.5%** of students in Academy or Maintained School Sixth Forms going on to enter higher education, the corresponding estimate for Sixth Form College students stands at **65.1%.** This difference equates to approximately **2,500** additional students entering higher education per annum and results in significant additional economic and financial benefits to the economy (approximately **£418 million** per annum in present value terms).

Some economic terms

From an economic perspective, and especially in a period where all sectors of the economy in receipt of government funding face fiscal constraints, it is imperative to make the most efficient and cost effective use of the limited resources available. ***Efficiency*** normally refers to reducing the average cost of provision (per student) and is often achieved through increasing the scale of provision (i.e. larger educational institutions such as Sixth Form Colleges); however, efficiency does not imply anything in relation to the **quality of provision**. In contrast, ***cost effectiveness*** incorporates the quality of provision into the analysis. Improving cost effectiveness relates to reducing the financial costs associated with achieving specific (educational) outcomes (i.e. the cost per 'point').

Funding arrangements

The recent fundamental re-organisation of 16-19 education funding has resulted in educational institutions receiving a specific level of financial resource ***per student*** irrespective of the breadth of education provided by that educational institution[5]. Although the new 16-19 Education Funding Agency's funding formula, under which all state-funded providers are funded using the same methodology, provides the *appearance* of both fairness and transparency across the sector, a number of issues remain in relation to:

- the ***gap*** between headline funding and the actual or effective funding available for front line services, and

[3] To ensure comparability across providers, the analysis focuses on non-selective providers.
[4] Note that both Average Point Scores per student and Average Point Scores per entry stated here refer to students undertaking A-Levels.
[5] Subject to a number of amendments in relation to local deprivation and area cost adjustments.

- the potential for ***cross-subsidies*** to Sixth Forms for those institutions offering 11-16 education

These factors have significant detrimental consequences on Sixth Form Colleges, which are the educational institutions that have consistently demonstrated their ability to deliver high quality academic outcomes and opportunities for their students.

Headline funding

Information from the **Education Funding Agency** suggests that the average funding per student in a Sixth Form College stands at **£4,560**. Excluding Grammar schools, this compares to **£4,747** in an Academy Sixth Form and **£4,742** in a Maintained School Sixth Form.

Effective funding – potential cross subsidies

However, for those Maintained School and Academies with Key Stage 5 provision, the opportunity exists to cross subsidise their 16-19 education provision using the budget which they receive for their 11-16 students. Having undertaken a detailed analysis of the funding received by all non-selective state funded secondary schools, and ensuring comparability in terms of Free School Meal eligibility, we have assessed that the **maximum potential cross-subsidy** available to Maintained School Sixth Form students stands at **£810** per student per annum (**18%** of total headline funding) and **£2,202** per student per annum in Academy Sixth Forms (**48%** of total funding)[6].

In other words, the financial resources available to Maintained School and Academy Sixth Forms is significantly greater than for Sixth Form Colleges *before* any assessment of how expenditure is treated and what rebates might be available to different 16-19 educational providers.

Effective funding – issues relating to value-added tax, borrowing and insurance costs

For a given level of actual resource, the **purchasing power or effective resource** available to different educational institutions is dependent on their specific status. In particular:

- In relation to expenditure on value-added tax (VAT), Maintained Schools fall outside the scope of VAT as they are not regarded as taxable entities even when conducting activity that would normally be regarded as subject to VAT. In addition, Maintained Schools are able to reclaim VAT on all of their purchases (stationery, heat and light, contracted staff etc). Although Sixth Form Colleges do not have to charge VAT on sales of educational services (to adults), some services offered will attract VAT, and Colleges are unable to reclaim VAT on bought-in services. Recent estimates suggest that the VAT charges incurred by Sixth Form Colleges stand at **£30 million**, which implies that compared to Maintained and Academy Sixth Forms, approximately **£190 per student** per annum (approximately **4%** total headline

[6] To achieve this analysis, we estimated the average funding level for students aged **11-16** in Maintained Schools ***without*** a Sixth Form with the equivalent FSM eligibility as Sixth Form Colleges (**£5,265**). The average funding level for students aged **11-19** in Maintained Schools ***with*** a Sixth Form with the equivalent FSM eligibility as Sixth Form Colleges stands at **£5,273**.
To understand the level of potential cross-subsidy available to Maintained School Sixth Forms, we deducted the funding allocated to **11-16** students from total **11-19** funding for these institutions, based on the consideration that the remainder would be available for spending on front-line provision of Sixth Form (i.e. **16-19**) students. We then compared this potential 16-19 funding per student to the Sixth Form funding allocated by the EFA, thus calculating what Maintained School Sixth Forms have at their discretion to spend on Sixth Form pupils **in excess of** headline funding. Removing the estimated **11-16** funding from total funding for **11-19** Maintained Schools and dividing the remainder by the number of Sixth Form students suggests a funding per head of **£5,309**, which is **£810** (approximately **18%**) more than the FSM adjusted headline EFA level of funding of **£4,499**.
Considering Academies, the average funding level for students aged **11-16** in Academies ***without*** a Sixth Form with FSM eligibility comparable to Sixth Form Colleges is estimated at **£5,715**. The average funding level for students aged 11-19 in Academies ***with*** a Sixth From with the equivalent FSM eligibility as Sixth Form Colleges stands at **£5,920**. Again removing the estimated 11-16 funding from these **11-19** Academies and dividing the remainder by the number of Sixth Form students suggests a funding per head of **£6,799**, which is **£2,202** (approximately **48%**) more than the FSM adjusted headline EFA level of funding for Academy Sixth Forms of **£4,597**.

funding per student) is stripped out of Sixth Form College's funding for front line teaching activity.

- In relation to insurance costs, Maintained Schools receive approximately **£25 per student** per annum from their Local Authority to cover insurance costs. Academies receive per student funding for insurance as part of their general annual grant, which is made up of two elements: the first being an amount equivalent to that received by Maintained Schools (i.e. **£25 per student**) plus a supplementary **£20 per student** to 'reflect the fact that, on average, insurance premiums are higher for Academies than they are for Maintained Schools' (Education Funding Agency, 2014a). There is no such allowance for Sixth Form Colleges, creating further discrepancies in relative funding arrangements across 16-18 educational providers.

- Sixth Form Colleges (and General FE Colleges) have been provided with the *freedom* to borrow in the wider capital markets to fund their activities. In most cases, this borrowing is undertaken to finance building and capital costs, which in the case of Maintained or Academy schools is entirely funded by the Government. An assessment of actual expenditure suggests that almost **£9 million**[7] per annum is spent by Sixth Form Colleges in relation to finance and borrowing costs, which is equivalent to **£56 per student** diverted away from front line teaching activity.

The aggregate impact of the differential treatment of these elements of expenditure is to reduce the available resources for front line teaching activities in Sixth Form Colleges by approximately **£271 per student** (**6%**) compared to Maintained School Sixth Forms and approximately **£291 per student** (**6%**) compared to Academy Sixth Forms. Combining this leakage in effective resources available to Sixth Form Colleges with a ***conservative* estimate of the potential cross-subsidies** available to alternative providers suggests that the overall potential gap in funding between Sixth Form Colleges and Maintained School Sixth Forms stands at **£951** per student per annum (**21%**) and **£1,598** per student p.a. compared to Academy Sixth Forms (**35%**)[8].

What does all this mean in relation to value for money and certainty of provision?

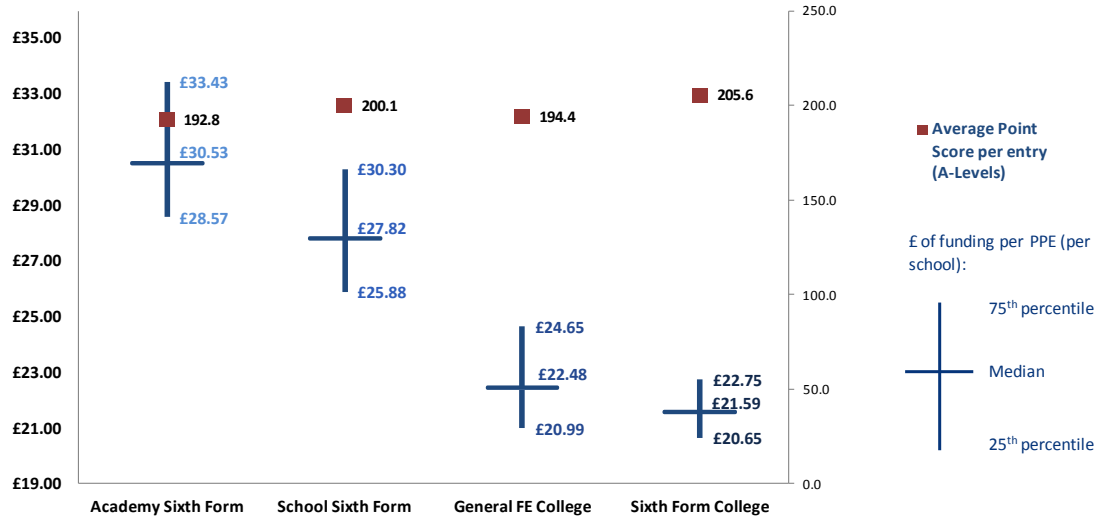
Combining the various elements of the analysis demonstrates the exceptional value for money achieved by Sixth Form Colleges compared to other 16-18 providers. Taking an example in relation to Average Point Scores per entry, the analysis indicates that Sixth Form Colleges outperform other providers in terms of outcomes (**206** compared to **201** and **193** for Maintained Schools and Academies respectively), but also achieve these outcomes at a lower cost to the Exchequer. Compared to an Academy Sixth Form or Maintained School Sixth Form that requires **£30.53** or **£27.82** per point respectively, a representative Sixth Form College requires approximately **£21.59** per point.

Furthermore, Sixth Form Colleges offer a significantly better degree of **certainty** in relation to the outcomes achieved by their students. The spread in cost effectiveness between Sixth Form Colleges

[7] This is based on total expenditure on interest and other financing costs incurred by Sixth Form Colleges, in the 2012-13 academic year.
[8] Note that these differences only take account of the funding items which Maintained School and Academy Sixth Forms receive *in addition to* the headline funding received by the Education Funding Agency, as it is these additional items that generate a gap between the effective purchasing powers of Sixth Form Colleges as compared to other providers. In contrast, the 16-19 Funding Formula is based on the principle that all Sixth Form providers should be funded using the same methodology, providing for fairness and transparency in the allocation of headline funding. As a result, the stated differences in funding between Sixth Form Colleges compared to Maintained School and Academy Sixth Forms do not include the (small) initial differences in headline funding across these providers.

on the 25th compared to the 75th percentile stands at **£2.10** per point compared to **£4.86** for Academy Sixth Forms and **£4.42** for Maintained School Sixth Forms. In addition, the analysis demonstrates that the 'worst' performing Sixth Form Colleges (**£22.75** per point) are more cost effective than even the 'best' performing Academy Sixth Forms (**£28.57** per point) and Maintained School Sixth Forms (**£25.88** per point).

Figure 2: Value for money amongst Sixth Form education providers



Source: London Economics' analysis of Education Funding Agency (2014b) and Department for Education (2013c).

What are the long term economic consequences of better educational outcomes?

Using the current numbers of students attending Sixth Form Colleges, this difference in progression rate across 16-19 providers suggests that there are approximately **2,500** more students entering to higher education than might otherwise be the case (despite the fact that the average level of FSM eligibility in Sixth Form Colleges is higher than in Maintained School or Academy Sixth Forms).

Based on a detailed analysis of the Labour Force Survey (and student support arrangements), the analysis suggests that the total **additional net economic benefit** generated as a result of the superior progression rates from Sixth Form Colleges stands at approximately **£418 million** per annum, of which approximately **£203 million** is accrued by the individual and **£215 million** is accrued by the Exchequer.

Concluding remarks

Sixth Form Colleges have consistently demonstrated the exceptional outcomes they achieve for their students on behalf of the Exchequer. Although more has been achieved with less, the on-going erosion of headline resources available to Sixth Form Colleges, and the asymmetry in the effective funding levels between different 16-19 education providers, is already starting to limit the ability of Sixth Form Colleges to maintain the current depth and breadth of provision. Further funding cuts would inevitably limit the ability of Sixth Form Colleges to deliver the current scale of opportunity to students.

Given the clear evidence relating to the outcomes achieved by Sixth Form Colleges, along with the cost effectiveness and certainty associated with those outcomes, this economic analysis strongly suggests that additional resources should be made available to Sixth Form Colleges to support the highly effective education activities currently undertaken across the sector.

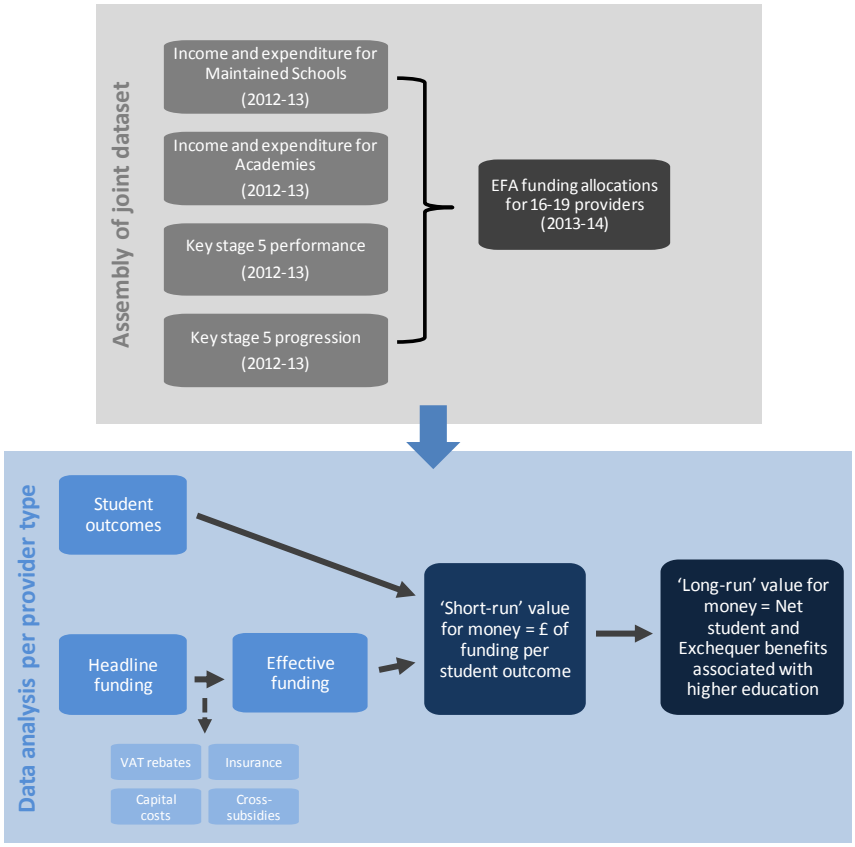
1 Methodological approach and data description

Undertaking a comparative assessment of value for money in 16-19 education in England necessitates an understanding of both the **benefits** associated with Sixth Form provision, measured in terms of student outcomes achieved by Sixth Form students (by 16-19 provider), as well as the **costs** to the Exchequer associated with this educational provision. Based on the variety of information items required, this analysis consisted of a number of key elements:

- Collecting **school-level characteristics, funding** and **student outcome data** from a variety of public sources (i.e. Department for Education and Education Funding Agency);
- Generating a **comprehensive merged dataset** containing school level characteristics, funding and outcomes information for every type of 16-19 education provider;
- Establishing the **student outcomes** associated with different providers;
- Analysing the **headline funding** allocated to providers by the Education Funding Agency;
- Calculating the **effective funding** available to 16-19 education providers;
- Calculating the **effective funding** available to 16-19 education providers per student per annum;
- Comparing **short-run and long-run value for money** in 16-19 education.

Figure 3 provides a graphical overview of our methodology.

Figure 3: Overview of methodology to assess value for money in 16-19 education



Source: London Economics

1.1 Assembling a joint dataset

To cover all data requirements necessary to undertake the analysis, we collected data from a range of publicly accessible sources. In particular, we retrieved school-level data[9] on:

- The **costs** of 16-19 education provision, in terms of:
  - Funding allocations for all 16-19 providers granted by the Education Funding Agency (EFA) in the academic year 2013-14[10];
  - Income and expenditure accounts for Academies in England for the academic year 2011-12[11],
  - Income and expenditure accounts for Maintained Schools in England for the academic year 2012-13[12];
  - College accounts for the academic year 2012-13[13];
- **Student outcomes** associated with 16-19 education, using:
  - Performance data for Key Stage 5 students in England, 2012-13[14];
  - Progression data on destinations for Key Stage 5 students in England for the academic year 2010-11[15].

Following the collection of information from the above datasets, we then merged these 'raw' data[16] into a comprehensive dataset containing key school characteristics (i.e. number of students, Free School Meal eligibility, nature of school (Maintained, Academy etc)), total funding allocated, and student outcomes at the individual school level.

The merging process was based on 2013-14 Education Funding Agency allocations as the central dataset, i.e. all other databases were merged *into* EFA funding allocations, thus ensuring that the analysis was based on the current profile of all Sixth Form providers in receipt of EFA funding. To establish the optimal accuracy of the merging process (i.e. that provider-level data were retrieved from the different sources consistently and for as many schools as possible), we used individual school level identifiers to 'pick up' information for each school across the different sources[17]. Where

[9] For all data sources, we focused on the latest information available. Due to differences in collection processes across these different types of datasets, this forced us to merge datasets from, at points, different academic years. However, as explained below, EFA funding allocations data constituted the basis of the data merging process (so that all other datasets were merged *into* the EFA information), ensuring that the list of Sixth Form providers included in the analysis is current and accurate.
[10] See Education Funding Agency (2014).
[11] See Department for Education (2013a).
[12] See Department for Education (2013b).
[13] See Skills Funding Agency and Education Funding Agency (2014).
[14] See Department for Education (2013c).
[15] See Department for Education (2013d). Note that, in contrast to the other key datasets used for the purpose of this analysis, the progression / destination data are published by the Department for Education as experimental statistics, noting that 'they are still being evaluated and remain subject to further testing to determine their reliability and ability to meet customer needs. The figures should be treated with caution'. Further, the data include students (on average, 19% of students in Sixth Form Colleges) whose activity was not captured in the data, i.e. the individual was not found in education, employment, or another destination that would have been recorded as 'Not in Education, Employment, or Training' (NEET). For example, the individual might have been attending an independent college or school, a college or school in Wales or Scotland, or have moved to a different country; these possibilities are not covered by the available progression measures.
[16] All data except for the College accounts for 2012-13.
[17] Note that the EFA's (2014) funding allocation data use a different school-level identifier (a Unique Provider Identification Number) than all other data sources (which use a School DfE Number assigned to each individual school in the set). To employ consistent school-level identifiers across the piece, we used data provided to us by the Education Funding Agency matching the two types of identifiers.

possible, we excluded from the merging process those 16-19 education providers which, due to some of the data covering different academic years, were inconsistently categorised across sources[18].

Table 1 summarises the results of the data merging process. As the central spine of the data set relates to EFA funding information, information is available on **all** institutions providing education and training to young people undertaking sixth form studies. In addition, considering Academy Sixth Forms, income and expenditure data is available on 65% (806) of the total of 1,244 Academy Sixth Forms receiving funding from the EFA in 2013-14[19]. Further, the merging process allowed us to match income and expenditure data into the EFA funding data for 99% (743) of the total of 751 Maintained School Sixth Forms.

The Key Stage 5 performance and progression data are also available for similarly high numbers of 16-19 providers, with between 89% and 100% of providers covered in the Key Stage 5 performance data, and between 78% and 98% in terms of progression data.

[18] Specifically, we identified a total of 58 providers which were classified as Maintained Schools in the 2012-13 Income and Expenditure data but categorised as Academies in the 2013-14 EFA funding data. In addition, we excluded from the joint dataset another 13 providers classified as Academies in 2011-12 which were re-classified between then and the current academic year, as well as a total of 104 providers categorised as Academies in 2013-14 but previously classified differently (as either Special Academies, City Technology Colleges, or Maintained Schools) in the performance data for England for the 2012-13 academic year. In total, we excluded 178 providers from the merged dataset.

[19] Note that it is not possible to indicate with complete certainty to what extent the analysis would change if Academy Income and Expenditure information was available for *all* Academy Sixth Forms receiving EFA funding in the 2013-14 academic year. This is due to the fact that the 'unmatched' data do not provide an indication of FSM eligibility in these 438 'unmatched' Academies; and as a result, we cannot determine whether 'unmatched' Academies display significantly different characteristics (in terms of socioeconomic deprivation for instance) compared to those Academies where we were successful at merging into the Education Funding Agency data.
The EFA data do, however, provide evidence that matched and unmatched Academies are not significantly different from each other, and that the results would not change to a significant extent if income and expenditure data were available for a larger share of Academy Sixth Forms. In particular, an analysis of total EFA funding per student indicates that on average, matched Academy Sixth Forms receive funding of £4,745 per student per year, with the comparable estimate for unmatched Academy Sixth Forms standing at £4,707. Hence, funding for unmatched Academies is only 1% different than funding for matched Academies. In terms of the number of Sixth Form students per institution, the differences are similarly small, with the average unmatched Academy educating 216 Sixth Form students per year, compared to 238 students in matched Academies (i.e. a 9% difference).

Table 1: Summary statistics for merged database of 16-19 providers

Type of provider	EFA funding allocations data, #	Income and expenditure for Maintained Schools		Income and expenditure for Academies		KS5 performance data		KS5 progression data	
		# (%) matched	# (%) unmatched	# (%) matched	# (%) unmatched	# (%) matched	# (%) unmatched	# (%) matched	# (%) unmatched
Academy Sixth Forms	1,244 (100%)			806 (65%)	438 (35%)	1105 (89%)	139 (11%)	970 (78%)	274 (22%)
Maintained School Sixth Forms	751 (100%)	743 (99%)	8 (1%)			743 (99%)	8 (1%)	671 (89%)	80 (11%)
General FE Colleges[1]	219 (100%)					217 (99%)	2 (1%)	214 (98%)	5 (2%)
Sixth Form Colleges	93 (100%)					93 (100%)	0 (0%)	91 (98%)	2 (2%)

Note: Cells shaded in grey indicate areas where the dataset did not cover any information for the respective provider type.
[1] General FE Colleges include Tertiary Colleges.
Source: Source: London Economics' analysis of Department for Education (2013a, 2013b, 2013c, 2013d), Education Funding Agency (2014b) and Skills Funding Agency and Education Funding Agency (2014).

1.2 Data description

Following the merging of the above provider level information into a joint comprehensive database of 16-19 providers, we conducted a **comparative analysis** between Academy Sixth Forms, Maintained School Sixth Forms, General FE Colleges[20] and Sixth Form Colleges, focusing on:

- Student **outcomes** (in terms of Average Point Scores per student, Average Point Scores per entry, and Value Added, each for GCE A-Level students and those undertaking A-Levels and equivalent academic qualification(s)[21]; as well as progression into UK (and top-third UK) Higher Education Institutions;
- **'Headline' funding** allocated by the Education Funding Agency in the 2013-14 academic year per student;
- **'Effective' funding** per 16-19 student - taking account of
  - Differential treatment of value-added tax and rebates;
  - Differential funding of insurance costs;
  - Capital costs and associated financing costs, and
  - Potential funding cross-subsidies across different Key Stages.
- **Short-run value for money**, analysing the ratio of 'headline' and 'effective' funding costs per student over different student outcomes; and
- **Long-run value for money**, combining student outcomes in terms of progression into UK higher education by provider type with net student and Exchequer benefits of acquiring a higher education qualification.

To ensure comparability across the 16-19 providers of interest, the data analysis focuses on **non-selective** providers only. As outlined in Table 2, we thus exclude **134** selective Academy Sixth Forms and **25** selective Maintained School Sixth Forms that are selective Grammar schools, leaving a total of **2,148** non-selective providers.

Education provision – institutions and students

Considering the *number of institutions* by type of non-selective education provider, the analysis includes **1,110 Academy Sixth Forms** (i.e. **52% of institutions**), **726** Maintained School Sixth Forms (**34%**), **219** General FE Colleges (**10%**), and **93** Sixth Form Colleges (**4%**). In contrast, an analysis of the *number of students* by provider type shows that the majority of 16-19 students attend General FE Colleges (**51%**), followed by Academy Sixth Forms (**22%**), Sixth Form Colleges (**14%**), with the remaining **13%** attending Maintained School Sixth Forms. This reflects the considerable differences in the scale of 16-19 provision across different types of institutions.

Whereas non-selective General FE Colleges and Sixth Form Colleges operate on a significantly larger scale, with approximately **2,650** and **1,700** Sixth Form students per institution, Academies and Maintained Schools cater for significantly lower numbers of 16-19 students, with an average of approximately **200** students per Academy Sixth Form and **220** students per Maintained School Sixth Form.

[20] Note that General FE Colleges include Tertiary Colleges.
[21] Academic qualifications include the International Baccalaureate, Pre-U, AQA Baccalaureate, Free Standing maths qualifications, Advanced Extension Awards and Extended Projects.

Table 2: Selective and non-selective 16-19 education providers in 2013-14 academic year

Provider type	Non-selective providers		Selective providers		Total	
	# of providers	# of 16-19 students	# of providers	# of 16-19 students	# of providers	# of 16-19 students
Academy Sixth Forms	1,110	246,728	134	39,788	1244	286,516
Maintained School Sixth Forms	726	148,142	25	7,238	751	155,380
General FE Colleges[1]	219	579,438	-	-	219	579,438
Sixth Form Colleges	93	157,904	-	-	93	157,904
Total	**2,148**	**1,132,212**	**159**	**47,026**	**2,307**	**1,179,238**

[1] General FE Colleges include Tertiary Colleges.

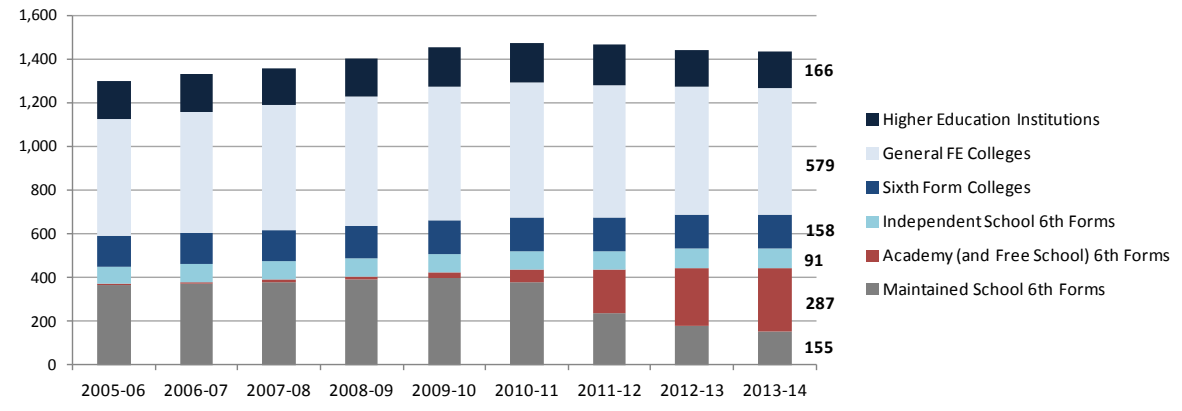
Source: London Economics' analysis of Department for Education (2013a, 2013b, 2013c, 2013d), Education Funding Agency (2014b) and Skills Funding Agency and Education Funding Agency (2014).

Change in historical provision of 16-19 education

Since 2005-06, there has been an **11%** increase in the number of students aged between 16 and 18 enrolled on a Level 3 course within the National Qualifications Framework. In addition to the increase in the number of young people undertaking qualifications at this level, there has also been a dramatic shift in provision over time.

As previously described, in 2013-14, approximately **11%** of *all* students aged between 16 and 18 in England attended a standalone Sixth Form College, corresponding to **158,000** students across **93** institutions[22]. The proportion of students attending Sixth Form Colleges has remained essentially unchanged since 2005; however, given the increase in the size of the cohort remaining in post-compulsory education, this equates to an increase in the number of students educated by Sixth Form Colleges by **18,000** since 2005-06. Combining the information on the increased numbers of students attending Sixth Form Colleges since 2005-06 with the decline in the number of Sixth Form Colleges over the period (from **103** to **93**) suggests an increase in the scale of Sixth Form College operations (from approximately **1,360** students per institution to almost **1,700** per institution, on average).

Figure 4: Evolution of 16-18 student numbers between 2005-06 and 2013-14, in 000s



Source: London Economics' analysis of Department for Education data.

[22] Note that the slight discrepancy between the proportions of the cohort attending Sixth Form Colleges is a result of the inclusion or exclusion of those students aged between 16 and 18 attending higher education institutions.

Reflecting the fundamental shift in the nature of provision of secondary education in England, compared to less than **1%** of 16-18 year old students attending an Academy Sixth Form in 2005-06, approximately **20%** of students now attend an Academy or a Free School Sixth Form[23]. Correspondingly, the proportion of 16-18 year olds attending Local Authority Maintained School Sixth Forms has declined from **28%** to **11%** over the period. Amongst all students attending either Academy or Maintained School Sixth Forms in 2013-14, **11%** attended selective (Grammar) schools, with the remaining **89%** attending non-selective schools.

Approximately **40%** of 16-18 students have attended a General FE College since 2005-06. The remaining **18-19%** of students aged 16-18 are either enrolled at Independent School Sixth Forms (**6%** in both 2005-06 and 2013-14) or have already entered higher education (approximately **13%** in 2005-06 and **12%** in 2013-14).

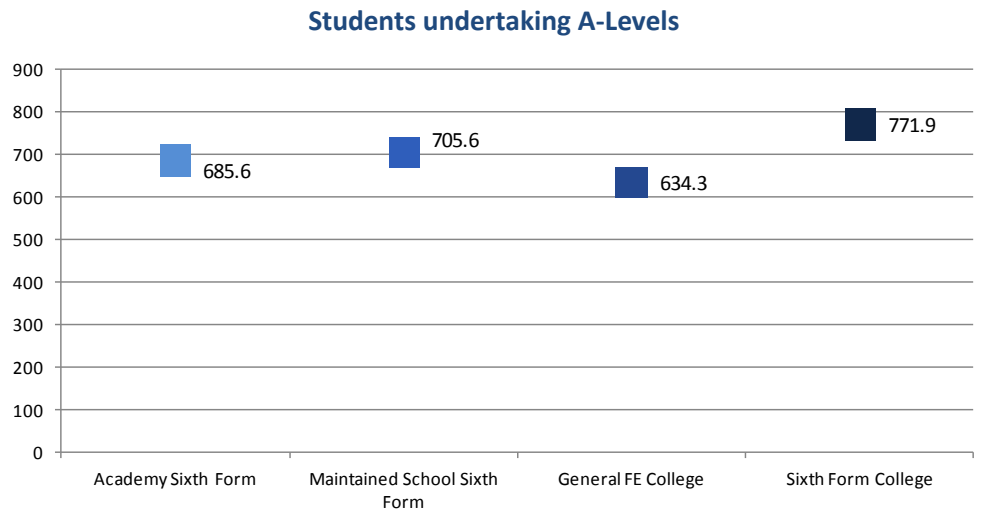
[23] In 2013-14, approximately **99%** of these students attended either a *Converter* or *Sponsored* Academy Sixth Form, while the remaining **1%** attended a Free School Sixth Form.

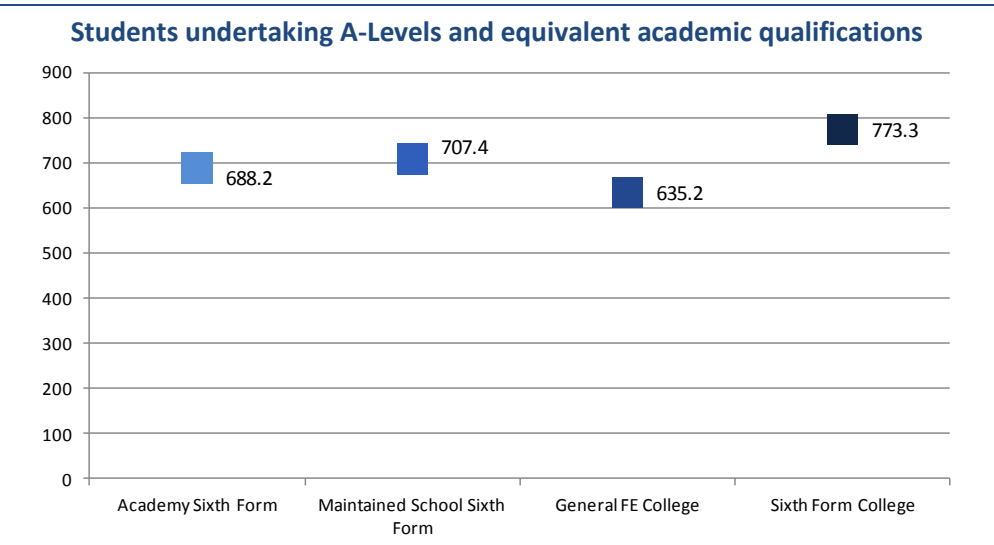
2 Measuring student outcomes by 16-19 education provider

2.1 Average Point Score per student

For completeness, we have presented a range of key outcome measures associated with Sixth Form education. In Figure 5, we present information on the **Average Point Scores per student** (APS) achieved by students attending different educational providers – split according to whether the student in question is undertaking GCE 'A' Levels (upper panel) or pursuing GCE 'A' Levels and equivalent academic qualifications (lower panel)[24].

Figure 5: Average Point Score per student, average by provider type





Note: Analysis is based on non-selective 16-19 education providers only.
Source: London Economics' analysis of Department for Education (2013c)

[24] Please note that according to the guidance on the performance tables for Key Stage 5 students in England, 'to be included in the 'A' level cohort a student must have entered for at least one 'A' level, but it can include students who took other qualifications alongside an 'A' level. To be included in the academic cohort a student must have entered for at least one 'A' level or an International Baccalaureate, Pre-U, or AQA Baccalaureate, but it can include students who took a vocational qualification alongside an academic qualification' (Department for Education (no date)).

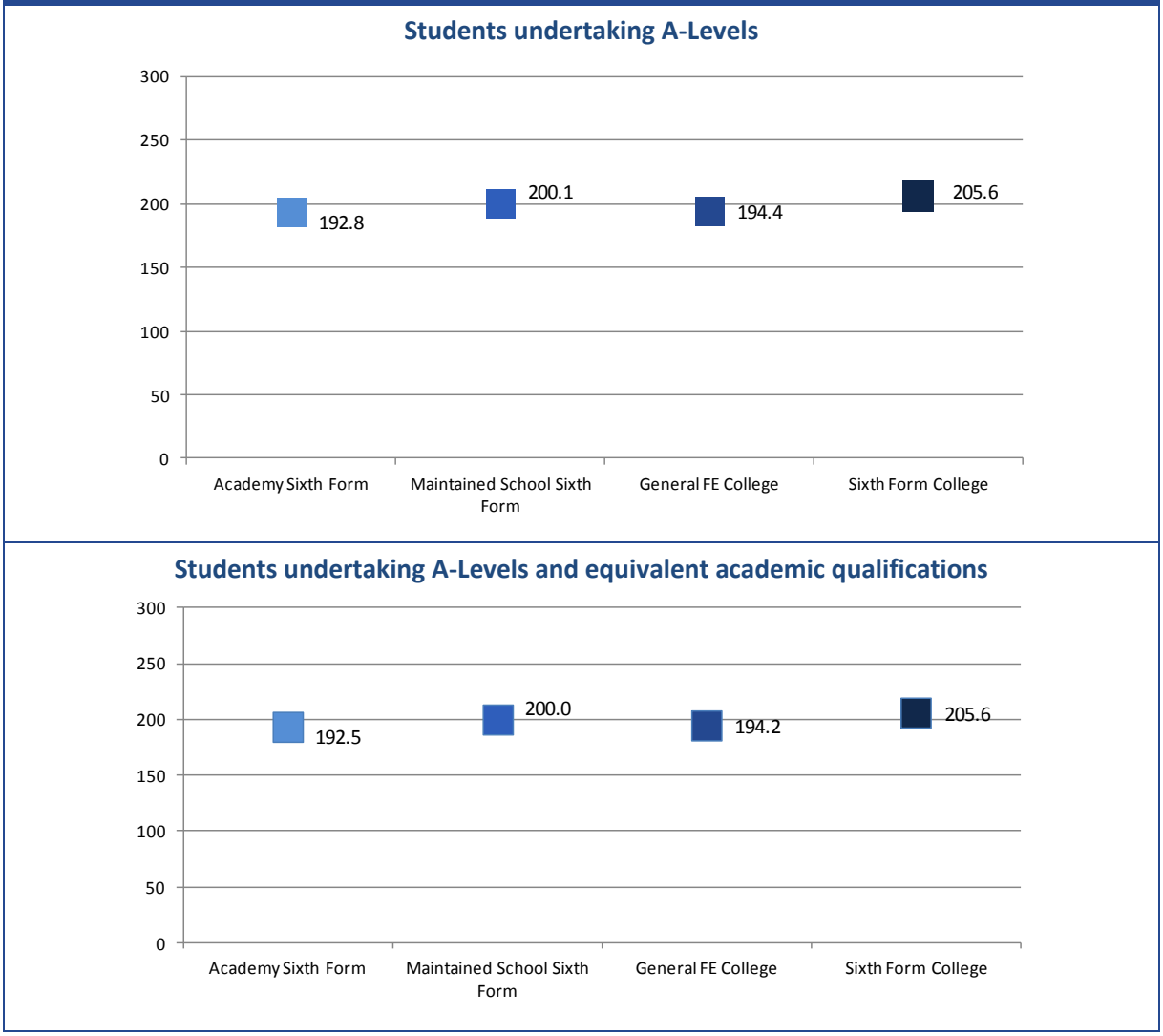
Given the slightly wider classification of (GCE 'A' Levels and equivalent) academic qualifications compared to GCE 'A' Levels (only), as expected, across each of the education providers, the Average Point Score achieved by students pursuing GCE 'A' Levels and equivalent academic qualifications is marginally higher than the Average Point Score associated with GCE 'A' Level attainment (by between 2 and 3 points).

Demonstrating the depth as well as the breadth of the provision received in Sixth Form Colleges, amongst students attending non-selective schools, compared to an **Average Point Score per student** of approximately **706** (per FTE) in Maintained School Sixth Forms or **686** (per FTE) in Academy Sixth Forms, the Average Point Score achieved by Sixth Form College students stands at **772.**

2.2 Average Point Score per entry

Again demonstrating the exceptionally high performance associated with Sixth Form College attendance, in terms of **Average Point Scores per entry (PPE)**, Sixth Form College students achieve an average PPE of almost **206**, which is, on average, between approximately **6** and **13** points higher than for students in non-selective Maintained School Sixth Forms or Academy Sixth Forms, respectively.

Figure 6: Average Point Score per entry, average by provider type



Note: Analysis is based on non-selective 16-19 education providers only.
Source: London Economics' analysis of Department for Education (2013c)

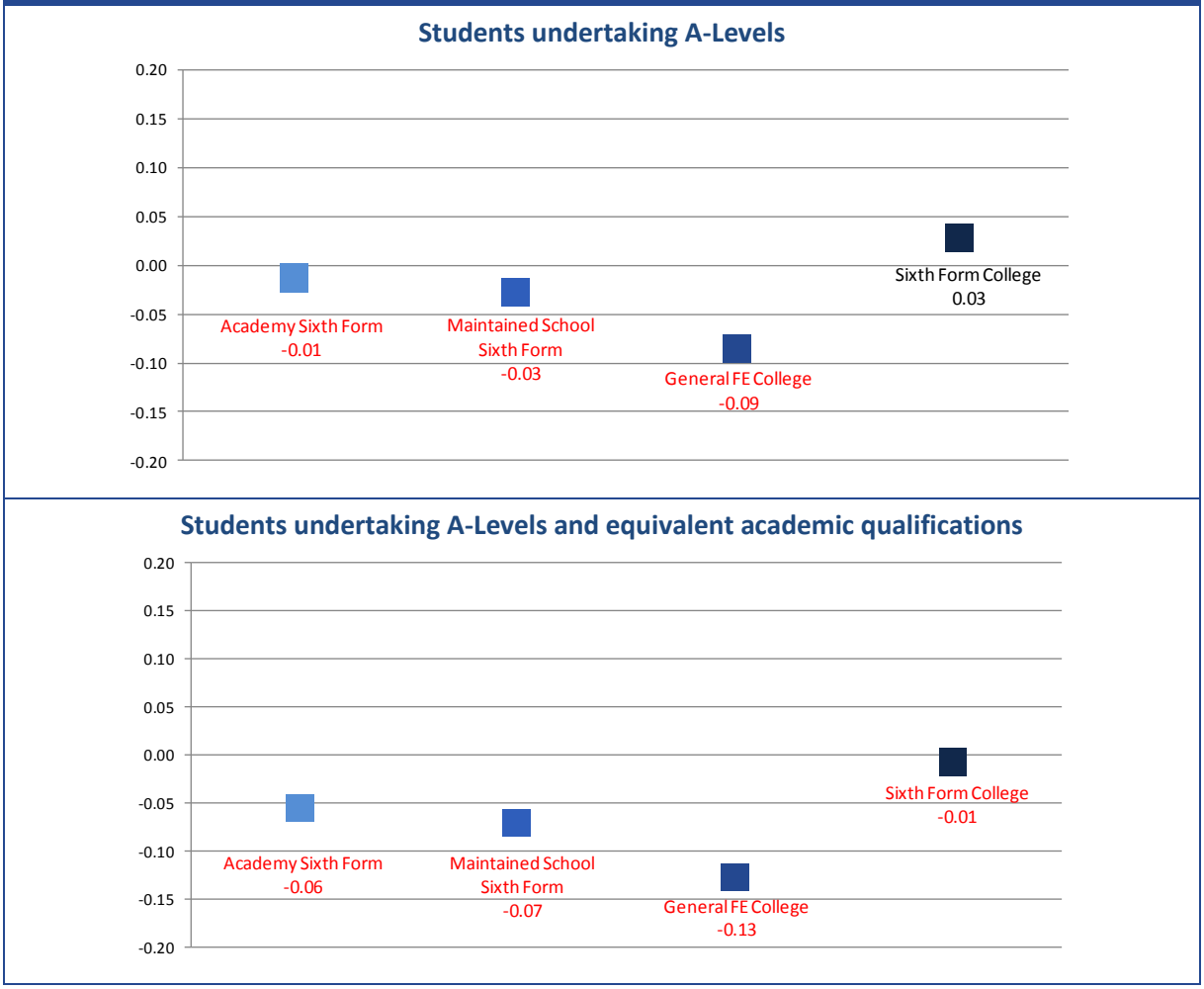
2.3 Value Added

In a further contextualised measure of the academic performance of Sixth Form Colleges, in Figure 7, we have presented information on the Level 3 Value Added scores achieved by different providers' students. This measure demonstrates the extent to which Sixth Form students make the degree of expected academic progress controlling for prior educational attainment[25]. In relation to GCE 'A' Levels, the analysis indicates that Sixth Form Colleges outperform expectations (given the fact that the Value Added scores are greater than zero), whilst both Maintained School and Academy Sixth

[25] Value Added measures the progress which students make throughout their education in relation to their peers nationally. Level 3 Value Added scores consider the results achieved by each student in advanced level qualifications compared to the grades achieved by similar students nationally who have the same level of ability (based on their results at the end of Key Stage 4). More specifically, Value Added scores are given as a number of grades above or below the national average. Hence, positive scores indicate students made more progress than the national average, and negative scores indicate students made less progress than the national average (DfE, no date).

Forms underperform relative to expectations based on the prior attainment of their student population.

Figure 7: Level 3 Value Added, average by provider type



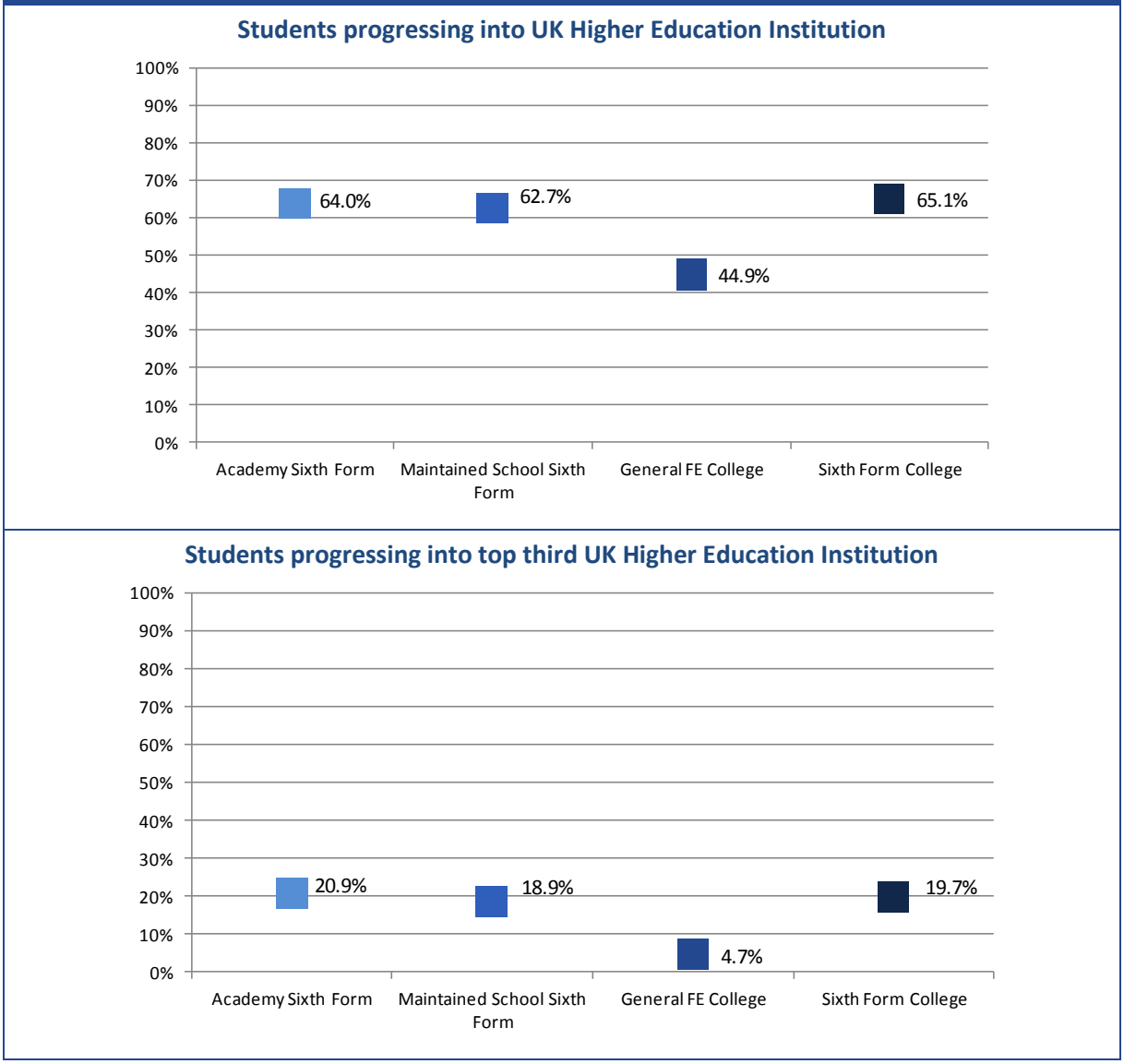
Note: Analysis is based on non-selective 16-19 education providers only.
Source: London Economics' analysis of Department for Education (2013c)

2.4 Progression into higher education

Finally in this section, we consider the activity in the year after the young person took their GCE 'A' levels or other Level 3 qualification. The analysis is based on the proportion of Key Stage 5 students (in the academic year 2009-10) who undertook a GCE A-Level or other qualification at Level 3 going on to a UK Higher Education Institution (HEI) in 2010-11 for a sustained period of time[26] [27].

[26] For the purpose of comparison, the percentages presented here exclude any students whose activity was not captured in the data, i.e. the individual was not found in education, employment, or another destination that would have been recorded as 'Not in Education, Employment, or Training' (NEET). For example, the individual might have been attending an independent college or school, a college or school in Wales or Scotland, or have moved to a different country.
[27] A sustained education destination is defined as being sustained for the first 2 terms of the year, i.e. October to March. See DfE (2013d).

Figure 8: Proportion of students going into UK Higher Education, average by provider type



Note: Analysis is based on non-selective 16-19 education providers only. ***Source: LE analysis of Department for Education (2013d)***

The analysis presented in Figure 8 suggests that approximately **65.1%** of Sixth Form College students progress into higher education, with approximately **19.7%** of all students entering a 'top third' UK Higher Education Institution. In contrast, amongst Academy Sixth Form students, approximately **64%** of Key Stage 5 students enter higher education, with approximately **20.9%** entering a 'top-third' HEI. The analysis indicates that **62.7%** of students attending Maintained School Sixth Forms enter higher education, with **18.9%** entering a 'top third' Higher Education Institution.

These higher quality outcomes achieved by students attending Sixth Form Colleges occur despite the fact that the proportion of students eligible for Free School Meals in Sixth Form Colleges (**11.4%**) is higher than for students attending Maintained School Sixth Forms (**10.8%**) or an Academy Sixth Form (**8.2%**)[28].

[28] Based on Department for Education data on FSM eligibility for 16-18 year old students in England in the 2012-13 academic year.

3 Funding and value for money in 16-19 education

3.1 The funding of 16-19 education

The recent fundamental re-organisation of 16-19 education funding has resulted in educational institutions receiving a specific level of financial resource **per student** irrespective of the breadth of education provided by that educational institution[29]. Although the new 16-19 Education Funding Agency's funding formula, under which all state-funded providers are funded using the same methodology, provides the *appearance* of both fairness and transparency across the sector, a number of issues remain in relation to:

- the **gap** between headline funding and the **actual or effective funding** available for front line services, and
- the potential for **cross-subsidies** to Sixth Forms for those institutions offering 11-16 education.

These factors have significant detrimental consequences on Sixth Form Colleges, which, as demonstrated in Chapter 2, are the educational institutions that have consistently demonstrated their ability to deliver high quality academic outcomes and opportunities for their students.

3.2 Defining 'value for money'

From an economic perspective, and especially in a period where all sectors of the economy in receipt of government funding face fiscal constraints, it is imperative to make the most efficient and cost effective use of the limited resources available. In an economic sense, **efficiency** normally refers to reducing the average cost of provision (per student) and is often achieved through increasing the scale of provision (i.e. larger educational institutions such as Sixth Form Colleges). However, efficiency does not imply anything in relation to the **quality of provision**. In contrast, **cost effectiveness** or **value for money** incorporates the quality of provision into the analysis. **Improving cost effectiveness relates to reducing the financial costs associated with achieving specific (educational) outcomes** (i.e. the cost per 'point').

In this analysis we consider two measures of value for money:

- Value for money in Sixth Form education focusing on the resources (i.e. costs) required to achieve **short-term academic outcomes** of 16-19 students - in terms of Average Point Scores per student (APS), Average Point Scores per entry (PPE), Value Added and progression into higher education; and
- Value for money focusing on student outcomes associated with the quality of their Sixth Form education **in the long run**, in terms of the net lifetime benefits of higher education accrued by the Exchequer and students themselves.

3.3 Headline funding

The Education Funding Agency's recently introduced 16-19 funding formula is based on the principle that all state-funded providers of 16-19 education (including, among others, Maintained School and

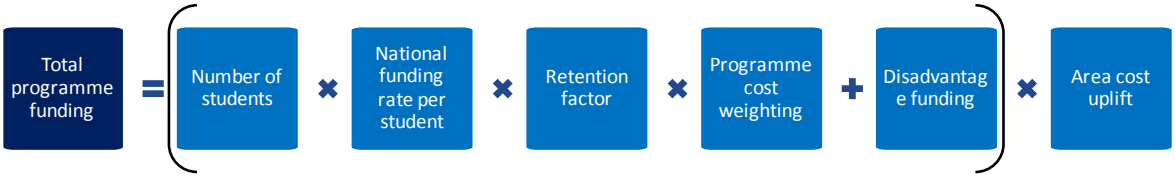
[29] Subject to a number of amendments in relation to local deprivation and area cost adjustments.

Academy Sixth Forms, General FE Colleges, and Sixth Form Colleges) should be funded using the same methodology, to 'provide a nationally consistent method of calculating funding for all institutions delivering 16 to 19 provision' (Education Funding Agency, 2013). Under the new regime, the **headline funding** allocated by the EFA to each provider is based on:

- The number of students;
- A national funding rate per student;
- A retention factor;
- A weighting for programme costs;
- An Area Cost Allowance and;
- Disadvantaged students.

Figure 9 provides a graphical overview of the 16-19 funding formula.

Figure 9: The Education Funding Agency's 16-19 funding formula



Source: Education Funding Agency (2013)

The resulting average levels of funding per student for 16-19 education thus allocated to Academy and Maintained School Sixth Forms, General Further Education Colleges and Sixth Form Colleges in the 2013-14 academic year are displayed in the top panel of Figure 10. The analysis of the merged EFA funding data indicates that the average funding per student for Sixth Form Colleges stands at **£4,560** per student per academic year. Excluding non-selective Grammar schools, the level of headline funding available to Sixth Form Colleges compares to an average of **£4,747** per student received by Academy Sixth Forms, **£4,742** for Maintained School Sixth Forms, and **£4,570** for General Further Education Colleges[30].

Combining the information on the resource cost made available to the different educational providers with the information on the outcomes achieved by students attending different types of education establishment (see, for example, Figure 6 in relation to **Average Point Scores per entry** by 16-19 provider), the bottom panel of Figure 10 illustrates the financial cost associated with achieving a single point (using the Average Point Scores per entry metric), for students undertaking A-Levels[31].

The **lower** the measure of financial costs per Average Point Score per entry, the **more** cost-effective a particular provider.

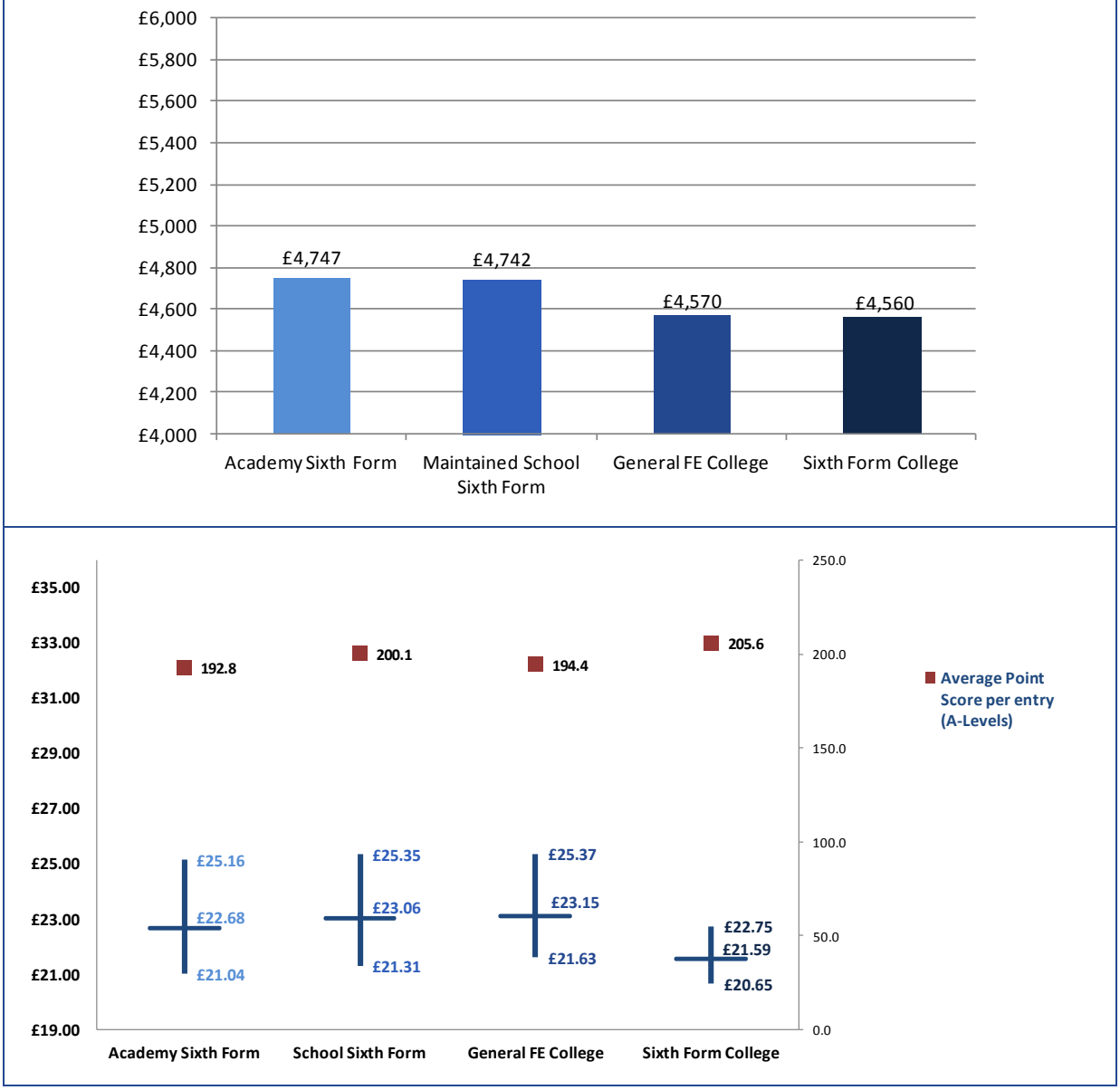
[30] Considering Independent School Sixth Forms, since these providers are not publicly funded, the Education Funding Agency data used throughout the analysis do not provide any information on the costs of funding per Sixth Form student for these providers. According to the Independent Schools Council (2014), the average day fee per Sixth Form student in independent day (i.e. non-boarding) schools amounts to £4,459 per term, i.e. **£13,377** per year. Hence, the (private) funding that Independent Schools have at their disposal to fund frontline teaching activities amounts to almost 3 times the public funding per student received by Sixth Form Colleges.

[31] A respective cost effectiveness analysis based on Average Point Scores per entry for students undertaking A-Levels *and* equivalent academic qualifications is presented in the Annexes.

The analysis indicates that for the median Academy Sixth Form, the resource cost required to achieve a single point within this metric stands at **£22.68**, while the resource cost associated with a (relatively) strongly performing Academy Sixth Form (i.e. only 25% of Academy Sixth Forms are more cost effective) stands at **£21.04** per point. In contrast, the cost-effectiveness of a relatively weak Academy Sixth Form stands at **£25.16** per point (i.e. 75% of Academy Sixth Forms are more cost effective). Illustrating the degree of variation or dispersion in cost effectiveness, the spread between the 25th and 75th percentile stands at **£4.12** per point and illustrates the certainty with which academic outcomes might be achieved within Academy Sixth Forms[32].

[32] As outlined above, the private funding per Sixth Form student received by Independent Schools stands at **£13,377** per year (on average; see Independent Schools Council (2014)). Considering outcomes for students in Independent Sixth Forms, the Key Stage 5 performance data (see Department for Education (2013c)) provide outcome information for a total of 578 private providers. The data suggest that students attending Independent School Sixth Forms achieve a mean Average Point Score per student of **842.4** for students undertaking GCE 'A' Levels, and **852.1** for students undertaking GCE 'A' Levels and equivalent academic qualifications. In terms of Average Point Scores per entry, Sixth Form students undertaking A-Levels in Independent Schools achieve an average of **234.6**, with the comparable estimate for students undertaking A-Levels or equivalent academic qualifications standing at **233.2**.
In spite of outcomes being considerably higher for Independent School Sixth Forms than for the state-funded providers analysed, the significantly larger resources associated with education provision by private providers implies low cost effectiveness. Comparing the costs per student with different performance outcomes, the average resource costs required to achieve a single Average Point Score per **student** stand at **£15.88** (A-Levels) and **£15.70** (A-Levels and equivalent academic qualifications). For Average Point Scores per **entry**, the comparable estimates stand at **£57.03** (A-Levels) and **£57.36** (A-Levels and equivalent academic qualifications).

Figure 10: Headline funding per student, total and per Average Point Score per entry, by provider type



Note: Analysis is based on non-selective 16-19 education providers only.
Source: London Economics' analysis of Education Funding Agency (2014b).

For Maintained School Sixth Forms, the median cost-effectiveness stands at **£23.06**, while the resource cost associated with a (relatively) strongly performing Maintained School Sixth Form stands at **£21.31** per point. In contrast, the cost-effectiveness of a relatively weak-performing Maintained School Sixth Form stands at **£25.35** per point. Comparable to Academy Sixth Forms, the spread between the 25th and 75th percentile stands at **£4.04** per point, thus illustrating the degree of certainty with which academic outcomes might be achieved.

In stark contrast, even considering the headline funding per student (i.e. before adjusting funding for additional items generating funding inequalities between providers), the analysis indicates that Sixth Form Colleges are the most cost effective education providers at Key Stage 5. The analysis demonstrates that the median cost per Average Point Score per entry stands at just **£21.59**, while for the top performing Sixth Form Colleges, the cost stands at **£20.65** per point. In addition to the greater cost effectiveness achieved by Sixth Form Colleges, the spread in cost effectiveness between those Sixth Form Colleges on the 25th and 75th percentiles is significantly tighter or less dispersed (**£2.10**) than for other 16-19 providers, and accurately demonstrates the greater degree of certainty associated with Sixth Form College provision.

3.4 Effective funding

Though the funding granted to providers as part of the new 16-19 funding formula is allocated using an equal and consistent methodology across all schools, there exists a number of funding items that certain 16-19 providers receive *in addition* to the headline funds allocated to them under the formula, creating a gap between **headline funding** and the actual or **effective funding** available for front line services. These items relate to:

- Value-added tax rebates provided to some providers, but not others;
- Differential insurance rates across schools; and
- Differences in capital cost funding regimes.

We discuss each of these in turn, and their impact on relative cost effectiveness, below.

3.4.1 VAT rebates

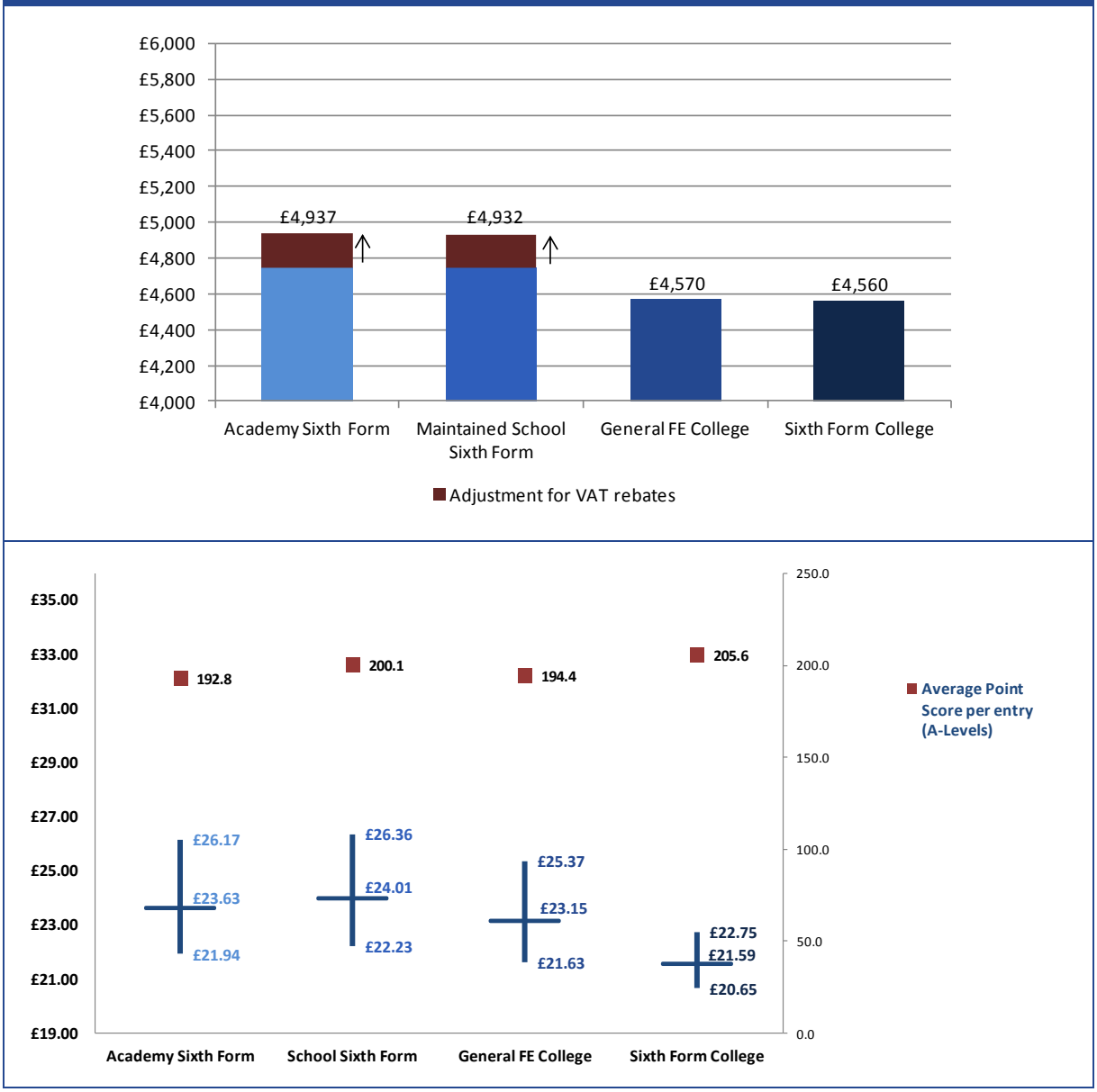
The first item creating a gap between effective funding received by Academy and Maintained School Sixth Forms, General Further Education Colleges and Sixth Form Colleges relates to the treatment of expenditures on VAT. Maintained Schools, due to their status as non-taxable public bodies, are able to recover their expenditure on VAT on all of their purchases (e.g. stationery, heat and light, contracted staff, etc.) through the Local Authority VAT refund scheme. Academies were granted a similar privilege with the passing of the 2011 Finance Bill, introducing a designated VAT refund scheme for Academies[33].

In contrast, Sixth Form Colleges (and General Further Education Colleges), though not required to charge VAT on sales of educational services (to adults), are obliged to charge VAT on other services which they offer (such as sales from vending machines, sales of confectionary, coffee, hot food to non-students, etc.). In addition, Colleges have to pay VAT on their purchases of goods and supplies[34] and are, in general, unable to reclaim these payments. Historically, this differential treatment of VAT for Sixth Form Colleges was justified by the fact that an allowance for these VAT costs was taken into account in the up-front funding allocation paid to these Colleges. However, as demonstrated by the low headline level of funding received by Sixth Form Colleges, these considerations were removed with the introduction of the new 16-19 funding formula.

[33] The VAT refund scheme for Academies applies to all variants of this type of educational provider, including Free Schools.
[34] This applies to all purchases apart from some areas in which concessions have been made, such as advertising or reduced rates for heat and light.

Recent estimates suggest that it would cost around **£30 million** each year to refund the VAT costs of Sixth Form Colleges (HC Deb., 2014). In terms of actual purchasing power, this implies that compared to Sixth Form Colleges, Maintained School Sixth Forms and Academy Sixth Forms have an ***additional*** resource of **£190 per student** at their disposal to direct to front line teaching activities during the academic year. As shown in Figure 11, this results in an effective funding level (after VAT rebate adjustments) of **£4,937** for Academy Sixth Forms, and **£4,932** for Maintained School Sixth Forms.

Figure 11: Effective funding per student, total and per Average Point Score per entry, after adjusting for VAT rebates, by provider type



Note: Analysis is based on non-selective 16-19 education providers only.

Source: London Economics' analysis of Education Funding Agency (2014b) and HC Deb (2014).

Adopting the same approach as before to illustrate cost effectiveness (using Average Point Scores per entry), the analysis demonstrates the impact of the differential treatment of VAT on different educational providers. There is no difference to the funding arrangements of Sixth Form Colleges or General FE Colleges; however, the increase in the level of effective resource available to Academy and Maintained School Sixth Forms further reduces the cost effectiveness of these providers. Compared to a headline (median) cost effectiveness estimate of **£22.68** and **£23.06** for Academy and Maintained School Sixth Forms (respectively), this has now increased to **£23.63** and **£24.01** (a decline in cost effectiveness of about **4%**).

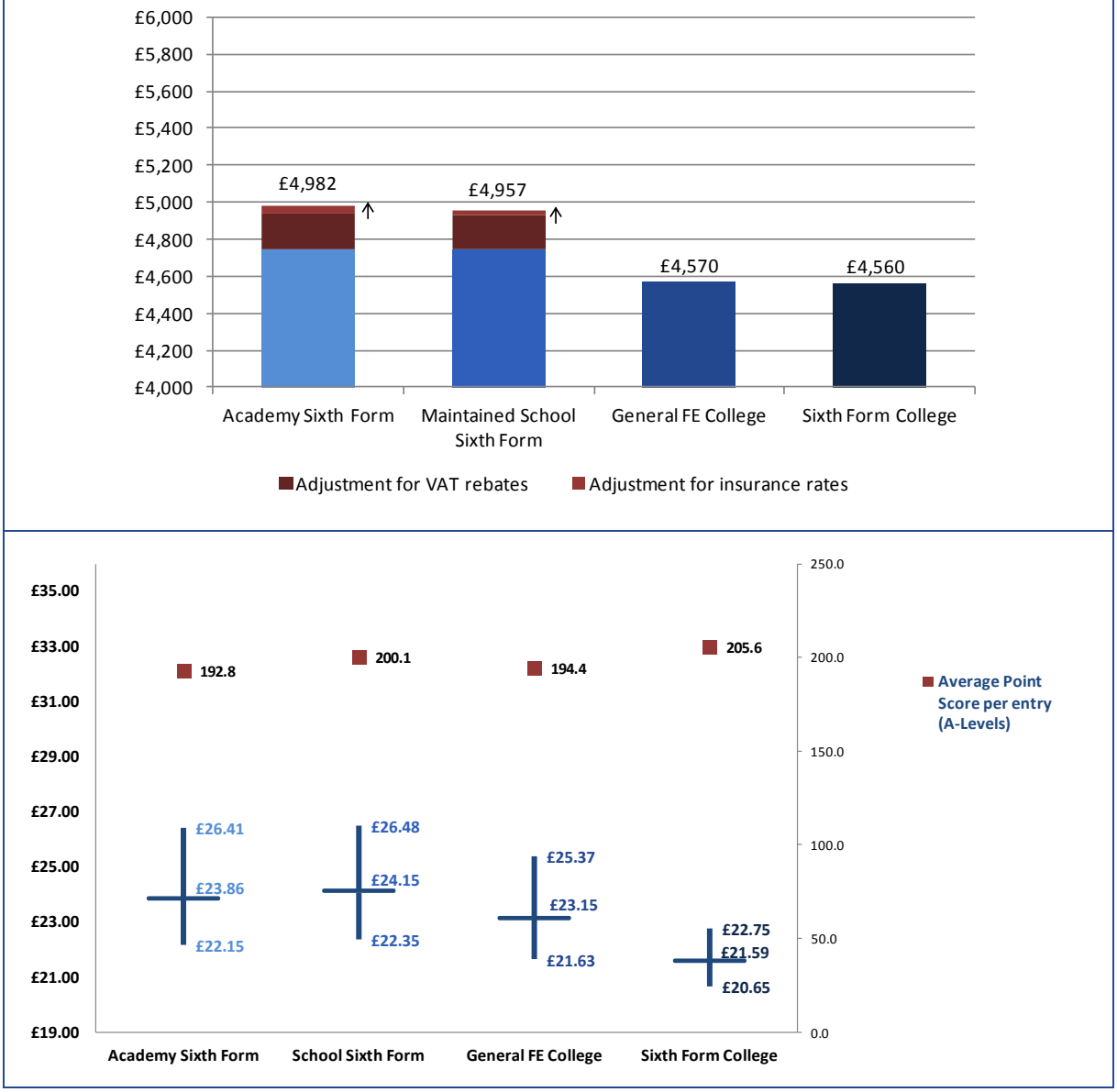
3.4.2 Differential insurance rates

In addition to VAT rebates, some 16-19 providers benefit from state-funded insurance rate payments, generating further inequalities in the effective funding received throughout Sixth Form education. Again, it is Maintained School Sixth Forms and Academy Sixth Forms which receive favourable treatment with respect to insurance rates, receiving additional funding from the Exchequer to cover their insurance costs. In particular, while Maintained School Sixth Forms benefit from insurance rates of £25 per student per year paid to them by their Local Authority, Academy Sixth Forms, as part of their general annual grant, receive a basic amount that is equal to that for Maintained School Sixth Forms, as well as an additional £20 for every student, 'to reflect the fact that insurance premiums are usually higher for Academies than for Maintained Schools' (Department for Education, 2014). These differential insurance rates again imply that compared to Sixth Form Colleges (and General Further Education Colleges), Maintained School Sixth Forms and Academy Sixth Forms have a **higher effective purchasing power**.

Adding VAT rebates and additional insurance rates to headline funding for Academy and Maintained School Sixth Forms, the adjustment of the level of effective resources (by **£45** per student per annum in the case of Academies and **£25** per student per annum in the case of Maintained School Sixth Forms) implies that compared to Sixth Form Colleges, Maintained School Sixth Forms and Academy Sixth Forms have an effective funding level of **£4,957** and **£4,982**, respectively (see Figure 12).

Adopting the same approach as before to illustrate cost effectiveness (using Average Point Scores per entry), the analysis again demonstrates the impact of the differential treatment in relation to insurance costs. As before, there is no difference to the funding arrangements of Sixth Form Colleges or General FE Colleges; however, the increase in the level of effective resource available to Academy and Maintained School Sixth Forms further reduces the cost effectiveness of these providers. Compared to the original (median) headline cost effectiveness estimate of **£22.68** and **£23.06** for Academy and Maintained School Sixth Forms (respectively), this has now increased to **£23.86** and **£24.15** (a decline in overall headline cost effectiveness of approximately **5%**).

Figure 12: Effective funding per student, total and per Average Point Score per entry, after adjusting for VAT rebates and insurance rates, by provider type



Note: Analysis is based on non-selective 16-19 education providers only.

Source: London Economics' analysis of Education Funding Agency (2014b), HC Deb (2014) and Education Funding Agency (2014a).

3.4.3 The costs of capital

Following the passing of the Further and Higher Education Act 1992, Sixth Form Colleges left Local Authority control and were granted the autonomy to operate as incorporated institutions. This change of status provided Sixth Form Colleges and General FE Colleges with the ability to borrow on the open market, with the expectation that these institutions would raise a significant proportion of their capital financing through borrowing. As a consequence, Sixth Form Colleges generally carry

large debts[35] and are committed to interest payments and principal repayments each year. In contrast, Maintained Schools and Academies receive *all* of their capital funding through public grants, with no requirement to fund any proportion from their own resources. These differences effectively reduce the funding available for front line provision for Sixth Form Colleges as compared to Maintained Schools and Academies.

The differences in capital funding regimes across different providers are emphasised further when considering the source and scope of the capital grants available to them. Since the re-instatement of sponsorship of Sixth Form Colleges by the Department for Education in 2010, Sixth Form Colleges have been included in the Education Funding Agency's capital allocation system. The system supports a number of capital streams, including a **Devolved Formula Capital Fund** aimed at covering basic maintenance by providers. The Fund is based on student numbers, and constitutes a relatively small allocation applied across all institutions.

In addition, the EFA provides a separate **Building Condition Improvement Fund** for Sixth Form Colleges, which, to access the fund, bid against criteria based on the relative condition of their estate. Whereas the Building Condition Improvement Fund provides Sixth Form Colleges with *some* of the capital they require for their projects, in general, they have to add to any allocations received by borrowing additional capital from the wider capital markets in order to be able to complete the project. Equivalent funds are available to Maintained Schools (through their Local Authorities) and Academies (funded by the Education Funding Agency), with the notable difference that any projects accepted under these funds are fully financed (i.e. no additional resources are required to complete the project).

Finally, major capital refurbishment and rebuilding requirements of different providers are met by the **Priority School Building Programme**. However, whereas Sixth Form Colleges are covered by the scope of the programme, to date, no Sixth Form College has been successful in bidding for resources from the fund[36].

To develop an understanding of the resulting additional costs of capital faced by Sixth Form Colleges (and General FE Colleges) in comparison to Academy and Maintained School Sixth Forms, we undertook an analysis of total expenditure on interest and financing costs for colleges, as outlined in the 2012-13 college financial accounts (Skills Funding Agency and Education Funding Agency, 2014). In the 2012-13 academic year, Sixth Form Colleges spent a total of almost **£9 million**[37] per annum in relation to finance and borrowing costs, which is equivalent to approximately **£56 per student**[38], diverted away from front line teaching activity. Further, General FE Colleges' expenditure on finance and borrowing costs amounted to a total of almost **£108m**, equivalent to approximately **£186** per student per annum.

[35] Adding total short-term and long-term liabilities per Sixth Form Colleges in the 2012-13 College Accounts data (see Skills Funding Agency and Education Funding Agency, 2014) and dividing this by total income per institution, we estimate an average **debt to income ratio** for Sixth Form Colleges of **26%**. In terms of net debt (i.e. after netting each institution's liabilities with cash and cash equivalents), this implies an average **net debt to income ratio** for Sixth Form Colleges of **12%**.

[36] For further information on capital cost funding regimes for different providers, please refer to Education Funding Agency (2014c) and Department for Education (2014).

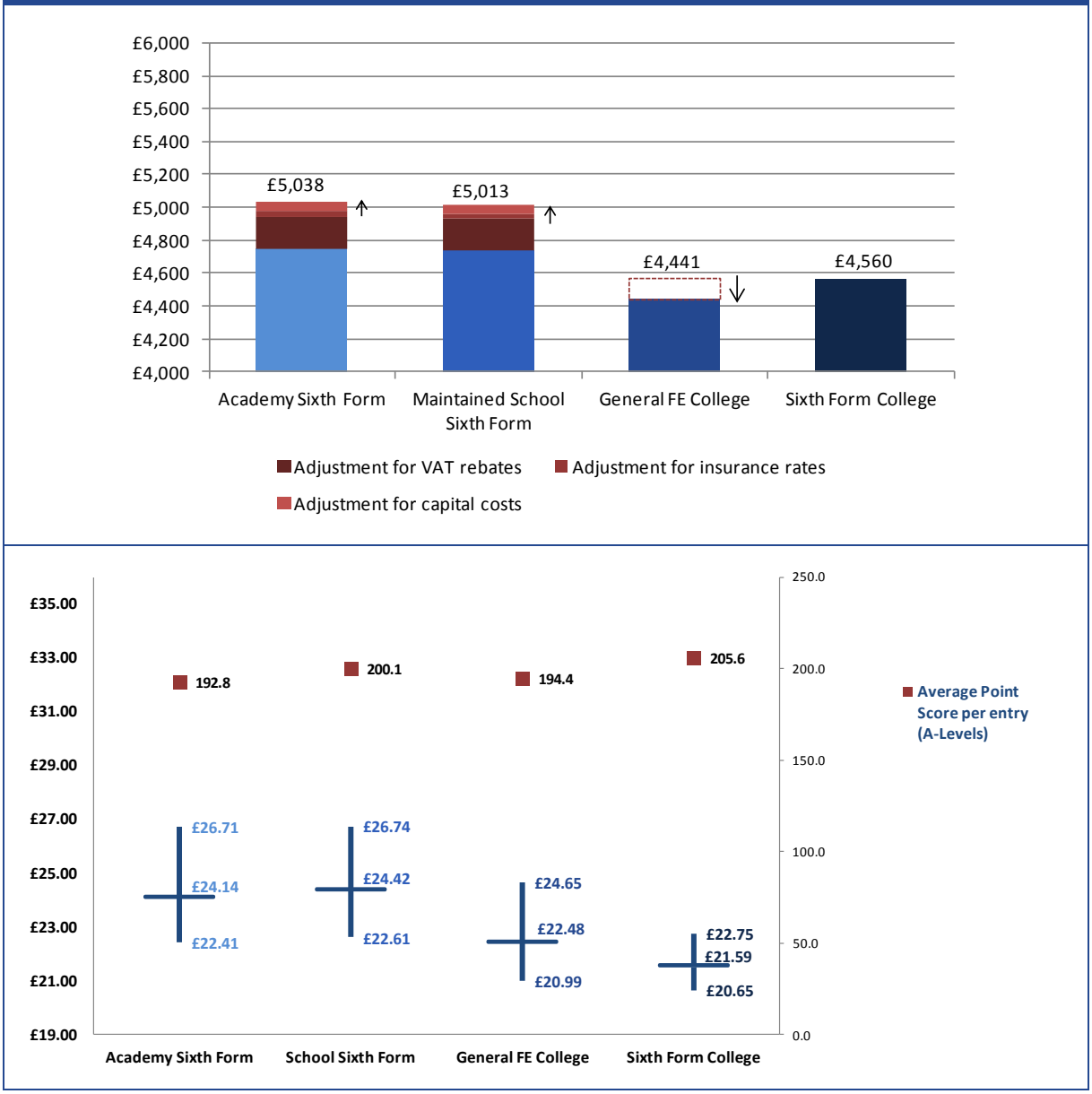
[37] This is based on total expenditure on interest and other financing costs incurred by Sixth Form Colleges, in the 2012-13 academic year.

[38] The per student amount is calculated by dividing a total of £8.9m financing costs for Sixth Form Colleges in 2012-13 by a total of 157,904 students attending these institutions in 2013-14.

Taking account of these differences to analyse the effective purchasing power of different 16-19 providers *compared to* Sixth Form Colleges, the capital grant system implies that Academy and Maintained School Sixth Forms receive **additional** effective resources of **£56** per student per annum. In contrast, due to their higher total financing and borrowing costs, effective funding for General FE Colleges is **£130** (i.e. **£186** minus **£56**) per student **lower** compared to Sixth Form Colleges (see the top panel of Figure 13).

Adding these additional effective resources available to Academy Sixth Forms and Maintained School Sixth Forms further reduces the cost effectiveness of these educational providers (see the bottom panel of Figure 13). While there is again no difference to the funding arrangements of Sixth Form Colleges, the increase in the level of effective resource available to Academy and Maintained School Sixth Forms has increased (i.e. worsened) the median cost effectiveness estimate to **£24.14** and **£24.42** for Academy and Maintained School Sixth Forms (respectively) compared to **£21.59** for Sixth Form Colleges. Note further that the decrease in effective resources available to General FE Colleges results in improved cost effectiveness for these providers, with the median costs per Average Point Score per entry now amounting to **£22.48**.

Figure 13: Effective funding per student, total and per Average Point Score per entry, after adjusting for VAT rebates, insurance rates and costs of capital, by provider type



Note: Analysis is based on non-selective 16-19 education providers only.

Source: London Economics' analysis of Education Funding Agency (2014b), HC Deb (2014), Education Funding Agency (2014a) and Skills Funding Agency and Education Funding Agency (2014).

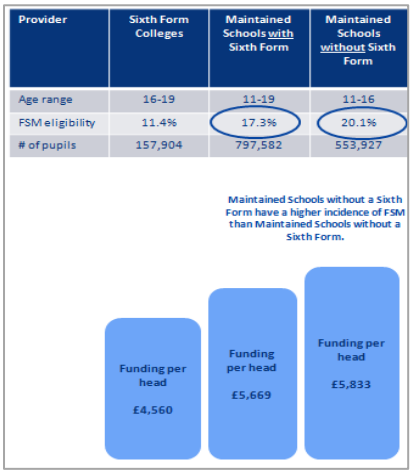
In addition to the comparison of median cost effectiveness, following the adjustment of the estimates to reflect the difference in treatment in relation to VAT, insurance and costs of capital, the analysis suggests that the median performing Sixth Form College is now more cost-effective than (relatively) high performing Academy Sixth Forms and Maintained School Sixth Forms. In addition, the analysis also demonstrates that even the (relatively) less well performing Sixth Form Colleges are more cost effective than the median Academy or Maintained School Sixth Form.

3.4.4 Potential cross subsidies

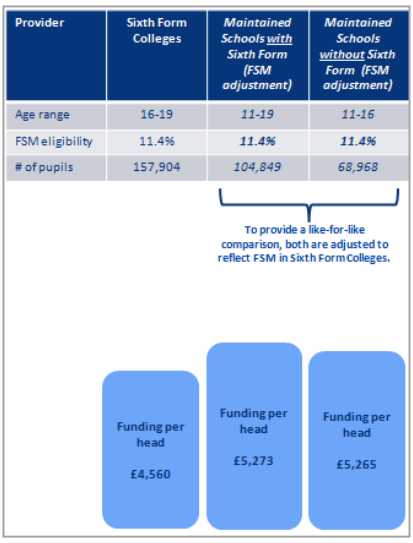
Information from the **Education Funding Agency** suggests that the average **headline** funding per student in a Sixth Form College stands at **£4,560** per student per annum. Excluding Grammar schools, this compares to **£4,747** in an Academy Sixth Form and **£4,742** in a Maintained School Sixth Form.

However, for those Maintained School and Academies with Key Stage 5 provision, the opportunity exists to cross subsidise their 16-19 education provision using the budget that is nominally reserved for 11-16 student provision. Specifically, secondary schools (with or without Sixth Forms) in general receive funding that is not ring-fenced. In other words, with the exception of a relatively small element of funding (predominantly related to the support of young people with Special Educational Needs), resources can be allocated across year groups or activities at the discretion of the schools' Senior Management Team.

Effective funding – maximum potential cross subsidies

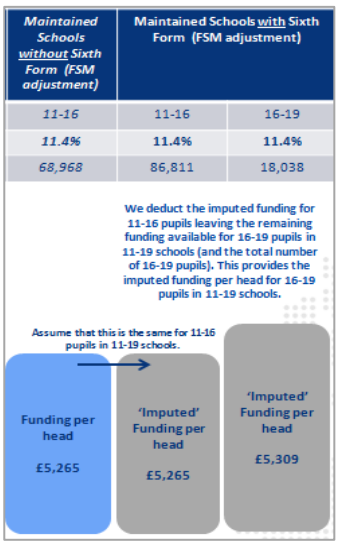


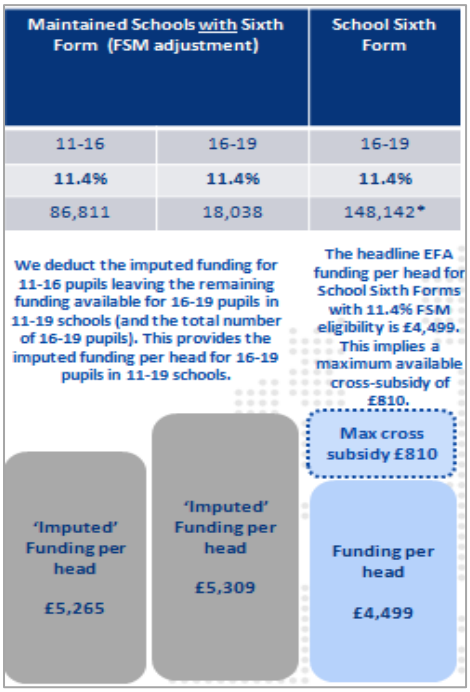
Headline funding information suggests that compared to the average funding per student of **£4,560** in Sixth Form Colleges, the average per capita funding in 11-19 Maintained Schools **with** Sixth Forms stands at **£5,669** and per capita funding in 11-16 Maintained Schools **without** Sixth Form provision stands at **£5,833**. However, average FSM eligibility in Maintained Schools with and without Sixth Forms stands at **17.3%** and **20.1%** respectively. As some of this additional funding (or *potential* cross subsidy) is as a result of higher socio-economic deprivation, it is necessary to strip out this deprivation-related funding by concentrating on just those Maintained Schools whose FSM eligibility is broadly comparable to Sixth Form Colleges (i.e. with Free School Meal eligibility approximating **11.4%**).



When this restriction to the data is adopted, the analysis demonstrates that average per capita funding in Maintained Schools **with** Sixth Forms stands at **£5,273** and per capita funding in 11-16 Maintained Schools **without** Sixth Forms stands at **£5,265**.

We now make the **crucial assumption** that, once FSM eligibility is controlled for, the level of funding per student aged between 11 and 16 in a Maintained School is **equal** irrespective of whether the school has a Sixth Form.





Using information on the total number of students aged between 11 and 16 in Maintained Schools **with** Sixth Forms, we impute the total funding associated with 11-16 provision in Maintained Schools **with** Sixth Forms. Deducting this 11-16 related funding from total funding (i.e. 11-19), we then divide the remaining (Sixth Form) funding by the total number of Sixth Form students.

The analysis suggests that the imputed level of funding per capita in Maintained School Sixth Forms stands at **£5,309** per student per annum once Free School Meal eligibility has been controlled for.

Combining this information of imputed Sixth Form funding in Maintained School Sixth Forms (**£5,309**) with the FSM adjusted headline level of funding of **£4,499**[39] suggests that the **maximum level of cross subsidy** that might be available to students in Maintained School Sixth Forms stands at **£810** per student per annum, which is equivalent to approximately **18%** of FSM adjusted headline funding.

Undertaking the identical analysis in relation to Academy Sixth Forms, the analysis suggests that the imputed Sixth Form funding in Academy Sixth Forms stands at **£6,799**, which combined with the (FSM adjusted) headline level of funding of **£4,597** suggests that the maximum level of cross subsidy that might be available stands at **£2,202** per student per annum, which is equivalent to approximately **48%** of headline funding[40]. Full information on the two cross-subsidy analyses is presented in Annex 2.

Effective funding – adopting a more 'conservative' estimate of potential cross subsidies

The above calculations provide an estimate of the **maximum (theoretical)** potential cross-subsidy available to Maintained School Sixth Forms and Academy Sixth Forms, by restricting the analysis to those Maintained Schools and Academies whose FSM eligibility is **comparable** to that of Sixth Form Colleges (i.e. **11.4%**).

However, the level of potential cross-subsidy ***decreases*** when we focus on the **actual** differences in mean FSM eligibility between Maintained Schools with and without a Sixth Form, leading to a more **conservative estimate of cross subsidy**. The key reason for this outcome is that in calculating the more conservative estimate, total EFA funding per student for Maintained Schools with a Sixth Form (11-19) is based on the average FSM eligibility of 17.3% (i.e. the analysis for is not restricted to those Maintained Schools with an FSM eligibility comparable to that of Sixth Form Colleges (11.4%)). This results in a higher estimate of EFA headline funding for Maintained School Sixth Forms that is deducted from imputed Sixth Form funding, reducing the level of potential cross subsidy.

More explicitly, average FSM eligibility in Maintained Schools with a Sixth Form stands at 17.3%, compared to 20.1% in Maintained Schools without a Sixth Form. To arrive at the more conservative estimate of cross-subsidy, we restrict the analysis to those 11-16 Maintained Schools **without** a Sixth

[39] As before, the headline EFA funding for Maintained School Sixth Forms is restricted to those 11-19 Maintained Schools with a Sixth Form with FSM eligibility comparable to Sixth Form Colleges (i.e. **11.4%**).
[40] Note that the analysis of total 11-16 funding and 11-19 funding available to Academies excludes those Academies which are governed by Multi-Academy Trusts, due to a lack of information on individual institution-level funding in the data.

Form with a FSM eligibility that is broadly comparable to that for 11-19 Maintained Schools **with** a Sixth Form (i.e. we restrict the analysis to 11-16 Maintained Schools with approximately 17.3% FSM eligibility instead of 11.4% in the previous illustration). When this restriction to the data is adopted, the analysis demonstrates that average per capita funding in Maintained Schools **without** a Sixth Form stands at **£5,724**, compared to **£5,669** in Maintained Schools **with** a Sixth Form.

Again, we make the crucial assumption that, after controlling for FSM eligibility, the level of funding per student aged between 11 and 16 in a Maintained School is **equal** irrespective of whether the school has a Sixth Form. Following the same steps as in the calculation of *maximum* cross-subsidy, the analysis suggests that the imputed level of funding per capita in Maintained School Sixth Forms now stands at **£5,421** per student per annum. Combined with the headline level of funding of **£4,742**[41], this suggests an estimate of cross-subsidy of **£680** per student per year (equivalent to approximately **14%** of headline funding). Hence, the conservative estimate of the cross-subsidy amounts to **84%** of the maximum level of cross-subsidy suggested by the data.

Undertaking the same analysis for Academy Sixth Forms suggests that the imputed funding per head in Academy Sixth Forms stands at **£6,054**. Combined with the headline level of funding (**£4,747**), this suggests a cross-subsidy of **£1,307** per student per annum (amounting to **27.5%** of headline funding, and **59%** of the maximum cross-subsidy).

Keeping the analysis consistent with previous charts, we apply these conservative estimates of potential cross-subsidies to the assessment of cost effectiveness of different 16-19 providers.

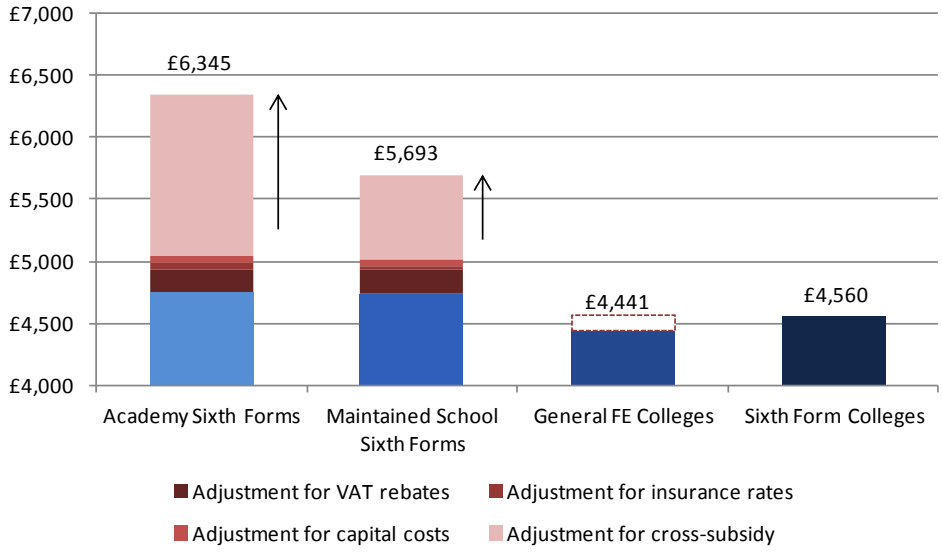
Impact of potential cross subsidies on cost effectiveness

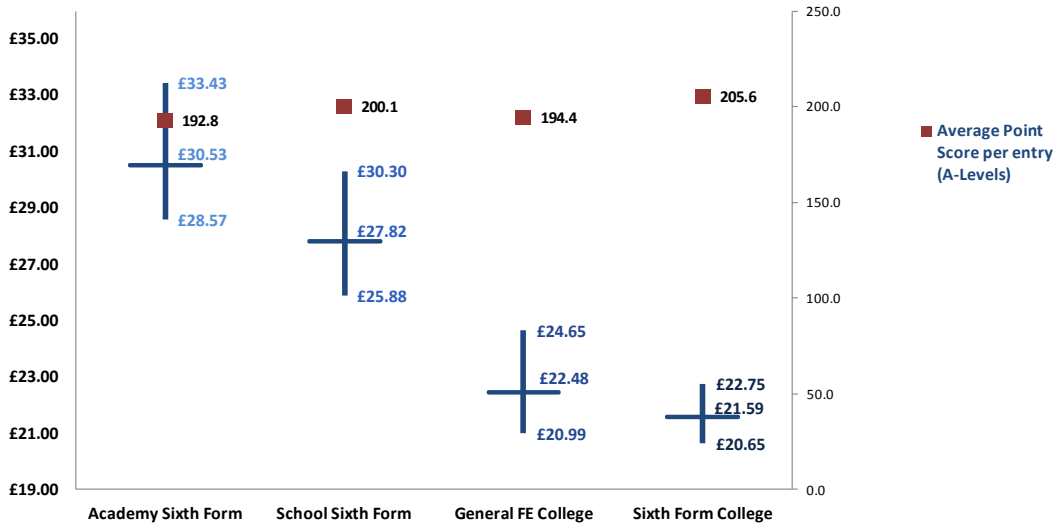
Adding these more conservative estimates of additional potential resources available to Academy Sixth Forms and Maintained School Sixth Forms further reduces the cost effectiveness of these educational providers (see the bottom panel of Figure 14). While there is again no difference to the funding arrangements of Sixth Form Colleges, the increase in the level of effective resource available to Academy and Maintained School Sixth Forms has increased the median cost effectiveness estimate of **£30.53** and **£27.82** for Academy and Maintained School Sixth Forms (respectively) compared to **£21.59** for Sixth Form Colleges. This implies that the median performing Sixth Form College is between **22%** and **29%** more cost effective than the median performing Academy or Maintained School Sixth Form.

The analysis also indicates that the most cost-effective Academy and Maintained School Sixth Forms significantly underperform the least cost effective Sixth Form Colleges.

[41] To ensure consistency throughout the calculation of more 'conservative' estimates of cross subsidy, we use the *unadjusted* headline level of funding per student (**£4,742**) allocated to Maintained School Sixth Forms by the Education Funding Agency, i.e. in contrast to the maximum cross-subsidy analysis, we do *not* restrict the analysis to those institutions with FSM eligibility comparable to Sixth Form Colleges (**11.4%**).

Figure 14: Total effective funding per student, total and per Average Point Score per entry, after adjusting for VAT, insurance rates, capital costs and (conservative) potential cross-subsidies, by provider type





Note: The cost effectiveness charts reflect the mean FSM eligibility by provider (i.e. 11.4% for Sixth Form Colleges; 17.3% and 20.1% for 11-19 ad 11-16 Maintained Schools respectively; and 15.0% and 15.1% for 11-19 ad 11-16 Academies respectively). As such, the level of potential cross subsidy added to these cost effectiveness charts (£680 for Maintained Schools and £1,307 for Academies) reflect the differences in actual Free School Meal eligibility between Maintained Schools with and without a Sixth Form, and Academies with and without a Sixth Form, respectively, and is consistent with the cost effectiveness analysis presented in previous charts. The analysis is based on non-selective 16-19 education providers only.

Source: London Economics' analysis of Education Funding Agency (2014b), HC Deb (2014), Education Funding Agency (2014a), Skills Funding Agency and Education Funding Agency (2014), Department for Education (2014a) and Department for Education (2013b).

4 Long term economic benefits associated with 16-19 education

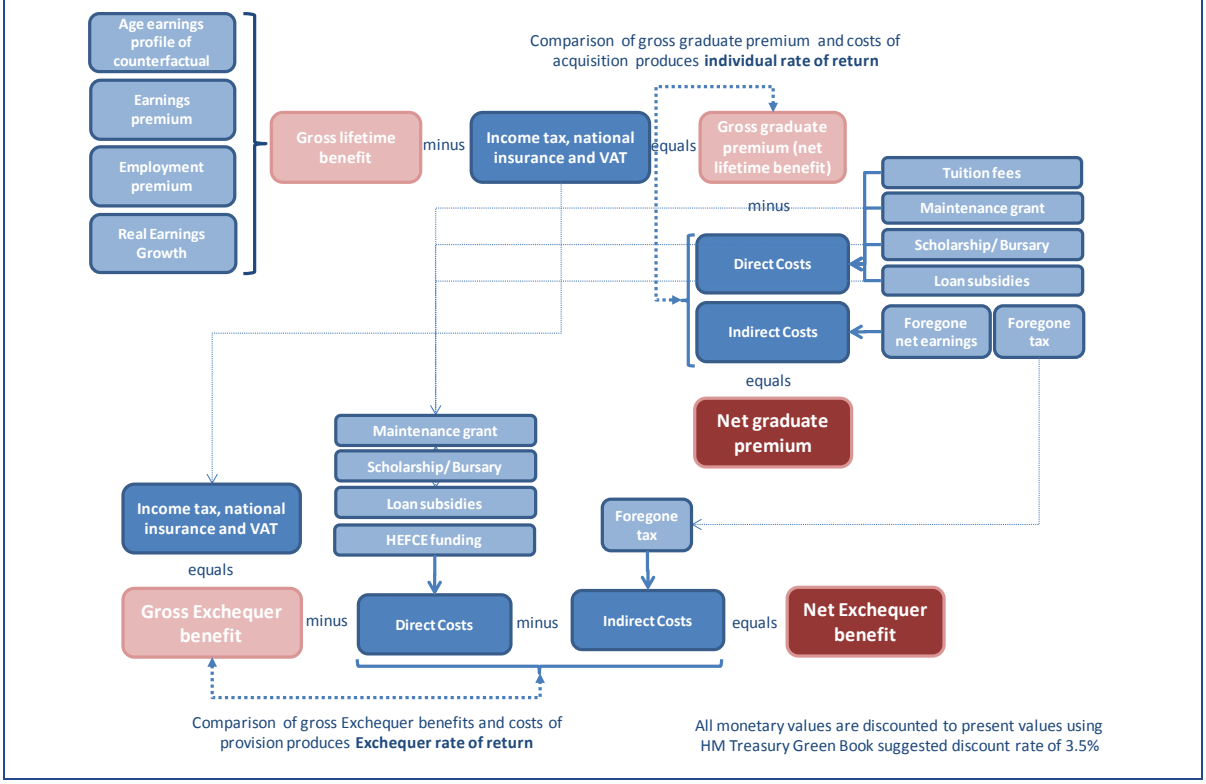
In addition to these differences in cost effectiveness between educational providers, there are further long run dynamic benefits generated by Sixth Form Colleges that are not captured in the analysis to date. Instead of focusing on the more short term outcomes such as Average Point Score per student (section 2.1) or Average Point Score per entry (section 2.2), it is possible to estimate what the differential economic benefits associated with attendance at a Sixth Form College are by combining information on the different rates of entry into higher education (section 2.4) and the associated benefits accrued by the individual and the Exchequer.

4.1.1 Summary of methodological approach

There is a well established methodology in place for estimating the lifetime economic benefits accrued by the individual and the Exchequer associated with degree level qualifications (see Department for Business, Innovation and Skills (2011)).

In order to estimate the value of qualification attainment to the individual or the Exchequer, it is necessary to compare the various costs and benefits of qualification attainment or provision. The ultimate objective is to estimate the **net graduate premium** (i.e. the net earnings and employment benefits (after tax) minus the direct and indirect cost associated with qualification attainment) and the **net Exchequer benefit** (i.e. the additional taxation receipts minus the costs of teaching funding to universities and student support). In Figure 15, we present a simple schematic detailing how the various components feeding into the costs and benefits associated with qualification provision and acquisition tie together.

Figure 15: Combining cost and benefits to the individual and Exchequer



Source: London Economics produced in Department for Business, Innovation and Skills (2011)

A detailed explanation of the methodological approach to assessing net Exchequer benefits and graduate premiums is provided in Annex 4.

4.1.2 Results

The analysis indicates that the mean net graduate premium associated with an undergraduate degree for men stands at approximately **£107,574** (net of costs of acquisition and using post tax earnings), while the mean net graduate premium for women stands at approximately **£87,278**[42] [43].

Having taken into account the costs associated with higher education provision, the average net Exchequer benefit associated with undergraduate degree level provision stands at **£138,074** for men and **£73,501** for women in today's money terms.

From HESA information on undergraduate degree completion rates, we have assumed that the average completion rate upon entering higher education stands at **83.9%**[44]. From section 2.4, approximately **65.1%** of Sixth Form College students progress into higher education compared to approximately **64%** of students in Academy Sixth Forms and **62.7%** of students attending Maintained School Sixth Forms. Using the current numbers of students attending Sixth Form Colleges, this differential progression rate suggests that there are approximately **2,503**[45] more students progressing to higher education than might otherwise be the case (even though the average level of FSM eligibility in Sixth Form Colleges is higher than in Maintained School or Academy Sixth Forms).

Combining the information on completion rates and the benefits accrued by the individual and Exchequer, along with an assumption that **55%** of these students progressing to higher education are female (equivalent to the overall proportion of undergraduate starters that are female), the analysis suggests that the total ***additional net economic benefit*** generated as a result of the superior progression rates from Sixth Form Colleges stands at approximately **£418 million** per annum, of which approximately **£203 million** is accrued by the individual and **£215 million** is accrued by the Exchequer.

[42] The econometric analysis estimated the present value of the gross lifetime benefits associated with gaining an undergraduate degree at age 21 to be **£118,799** for men and **£87,200** for women (based on the 2012-13 academic year). We assumed that the net fee cost for an undergraduate degree stood at **£8,303** per annum, while students received an average non-repayable grant of **£1523**. In addition, we assumed that students received a tuition fee loan of £8303 as well as a maintenance loan of **£4304** per annum over three years. Finally, from analysis undertaken elsewhere (see IPPR (2013)), we assumed a RAB charge (i.e. loan subsidy) of **22%** for men and **54%** for women. Combining this information and discounting using HM Treasury Green Book guidance (**3.5%**), we estimated the cost of undertaking a degree for a representative undergraduate in England to be **£11,225** for men and **-£78** for women. Subtracting these direct costs from the estimates of gross lifetime benefits results in our estimates of net lifetime benefit. In the case of the Exchequer, in addition to the costs associated with student support, we also estimated the average cost associated with HEFCE Teaching funding to be **£891** per annum.

[43] The fundamental reason why women achieve a lower graduate premium in absolute monetary terms compared to men despite posting higher earnings and employment returns than men is due to the fact that the earnings achieved by women in the counterfactual group are relatively low. The large percentage increases in earnings returns and employment probabilities are calculated off a low base and result in lower monetary estimates of net graduate premiums compared to men. In addition, women tend to spend a larger amount of time out of the labour market compared to men that also impacts on lifetime earnings. It is highly likely that if women were actively engaged in the labour market for the same length of time as men, their lifetime earnings would be greater, resulting in higher estimates of the net graduate premium and rates of return.

[44] This is based on a non-continuation rate among first degree young entrants into higher education of 5.7%, as provided by the Higher Education Statistics Agency (no date), applied to a total study duration of 3 years and assuming that students complete their qualification at the end of the third year of study.

[45] This is calculated based on a weighted average of the proportion of Maintained School and Academy Sixth Form students progressing into higher education of 63.5% (weighted based on the total number of Sixth Form students per provider type).

5 Concluding remarks

Sixth Form Colleges have consistently demonstrated the exceptional outcomes they achieve for their students on behalf of the Exchequer. Although more has been achieved with less, the on-going erosion of headline resources available to Sixth Form Colleges, and the asymmetry in the effective funding levels between different 16-19 education providers, is already starting to limit the ability of Sixth Form Colleges to maintain the current depth and breadth of provision. Further funding cuts would inevitably limit the ability of Sixth Form Colleges to deliver the current scale of opportunity to students.

Given the clear evidence relating to the outcomes achieved by Sixth Form Colleges, along with the cost effectiveness, certainty and long term economic benefits associated with those outcomes, this economic analysis strongly suggests that additional resources should be made available to Sixth Form Colleges to continue and support the highly effective education activities currently undertaken across the sector.

BACKGROUND MATERIAL

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Annex 1 List of Sixth Form Colleges

Table 3: List of Sixth Form Colleges, 2013-14 academic year

Alton College	Newham Sixth Form College
Aquinas College	Notre Dame Catholic Sixth Form College
Ashton Sixth Form College	Oldham Sixth Form College
Barrow-in-Furness Sixth Form College	Palmer's College
Barton Peveril Sixth Form College	Paston Sixth Form College
Bexhill College	Peter Symonds College
Bilborough College	Portsmouth College
Birkenhead Sixth Form College	Priestley College
Bolton Sixth Form College	Prior Pursglove Sixth Form College
Brighton Hove and Sussex Sixth Form College	Queen Elizabeth Sixth Form College
BSix Brooke House Sixth Form College	Queen Mary's College
Cadbury Sixth Form College	Regent College
Cardinal Newman College	Reigate College
Carmel College	Richard Huish College
Cheadle and Marple Sixth Form College	Richard Taunton Sixth Form College
Christ the King Sixth Form College	Rochdale Sixth Form College
Cirencester College	Saint Brendan's Sixth Form College
City of Stoke-on-Trent Sixth Form College	Saint Charles Catholic Sixth Form College
Coulsdon Sixth Form College	Saint Dominic's Sixth Form College
East Norfolk Sixth Form College	Saint Francis Xavier Sixth Form College
Esher College	Saint John Rigby College
Franklin College	Saint Mary's College Blackburn
Gateway Sixth Form College	Saint Vincent College
Godalming College	Scarborough Sixth Form College
Greenhead College	Shrewsbury Sixth Form College
Hartlepool Sixth Form College	Sir George Monoux College
Havant College	Sir John Deane's College
Havering Sixth Form College	Stockton Sixth Form College
Hereford Sixth Form College	Strode's College
Hills Road Sixth Form College	The Blackpool Sixth Form College
Holy Cross College	The College of Richard Collyer
Huddersfield New College	The Henley College
Itchen College	The Sixth Form College Colchester
John Leggott College	The Sixth Form College Farnborough
John Ruskin College	The Sixth Form College Solihull
Joseph Chamberlain Sixth Form College	Thomas Rotherham College
King Edward VI College Nuneaton	Totton College
King Edward VI College Stourbridge	Varndean College
King George V College	Wilberforce Sixth Form College
Leyton Sixth Form College	Winstanley College
Long Road Sixth Form College	Woking College
Longley Park Sixth Form College	Woodhouse College
Loreto College	Worcester Sixth Form College
Lowestoft Sixth Form College	Wyggeston and Queen Elizabeth I College
Luton Sixth Form College	Wyke Sixth Form College
NEW College Pontefract	Xaverian College
New College Telford	

Source: Sixth Form Colleges' Association

Annex 2 Calculating potential cross subsidies

Figure 16: Calculating maximum cross subsidies with the Maintained School sector

Provider	Sixth Form Colleges	Maintained Schools with Sixth Form	Maintained Schools without Sixth Form	*Maintained Schools with Sixth Form (FSM adjustment)*	*Maintained Schools without Sixth Form (FSM adjustment)*	Maintained Schools with Sixth Form (FSM adjustment)		Maintained School Sixth Form
Age range	16-19	11-19	11-16	*11-19*	*11-16*	11-16	16-19	16-19
FSM eligibility	11.4%	17.3%	20.1%	***11.4%***	***11.4%***	**11.4%**	**11.4%**	**11.4%**
# of pupils	157,904	797,582	553,927	*104,849*	*68,968*	86,811	18,038	148,142*

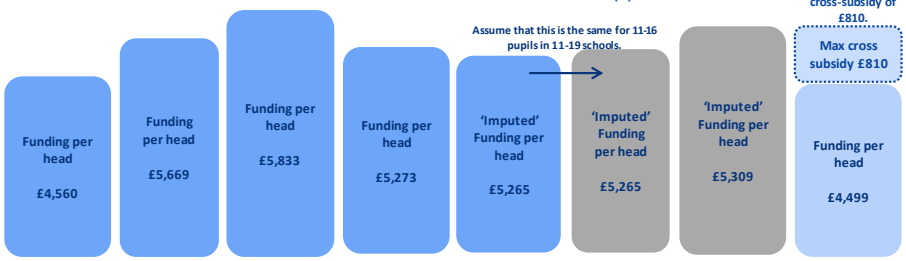
Maintained Schools without a Sixth Form have a higher incidence of FSM than Maintained Schools without a Sixth Form.

To provide a like-for-like comparison, both are adjusted to reflect FSM in Sixth Form Colleges.

We deduct the imputed funding for 11-16 pupils leaving the remaining funding available for 16-19 pupils in 11-19 schools (and the total number of 16-19 pupils). This provides the imputed funding per head for 16-19 pupils in 11-19 schools.

The headline EFA funding per head for School Sixth Forms with 11.4% FSM eligibility is £4,499. This implies a maximum available cross-subsidy of £810.

Assume that this is the same for 11-16 pupils in 11-19 schools.



•The number of pupils in School Sixth Forms refers to the total number of 16-19 pupils in receipt of EFA funding attending Maintained School Sixth Forms.

Source: London Economics' analysis of Education Funding Agency (2014b), Sixth Form Colleges' Association (2013), Education Funding Agency (2014a), Skills Funding Agency and Education Funding Agency (2014), Department for Education (2014a) and Department for Education (2013b).

Figure 17: Calculating maximum cross subsidies with the Academy School sector

Provider	Sixth Form Colleges	Academies with Sixth Form	Academies without Sixth Form	*Academies with Sixth Form (FSM adjustment)*	*Academies without Sixth Form (FSM adjustment)*	Academies with Sixth Form (FSM adjustment)		Academy Sixth Form
Age range	16-19	11-19	11-16	*11-19*	*11-16*	11-16	16-19	16-19
FSM eligibility	11.4%	15.0%	15.1%	***11.4%***	***11.4%***	11.4%	11.4%	11.4%
# of pupils	157,904	613,374	149,873	75,891	18,938	61,516	14,375	246,728*

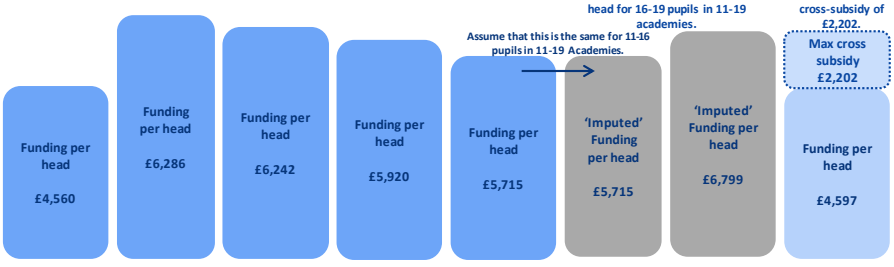
Academies have a different incidence of FSM eligibility than Sixth Form Colleges.

To provide a like-for-like comparison, both are adjusted to reflect FSM in Sixth Form Colleges.

We deduct the imputed funding for 11-16 pupils leaving the remaining funding available for 16-19 pupils in 11-19 academies (and the total number of 16-19 pupils). This provides the imputed funding per head for 16-19 pupils in 11-19 academies.

The headline EFA funding per head for Academies with 11.4% FSM eligibility is £4,597. This implies a maximum available cross-subsidy of £2,202.

Assume that this is the same for 11-16 pupils in 11-19 Academies.



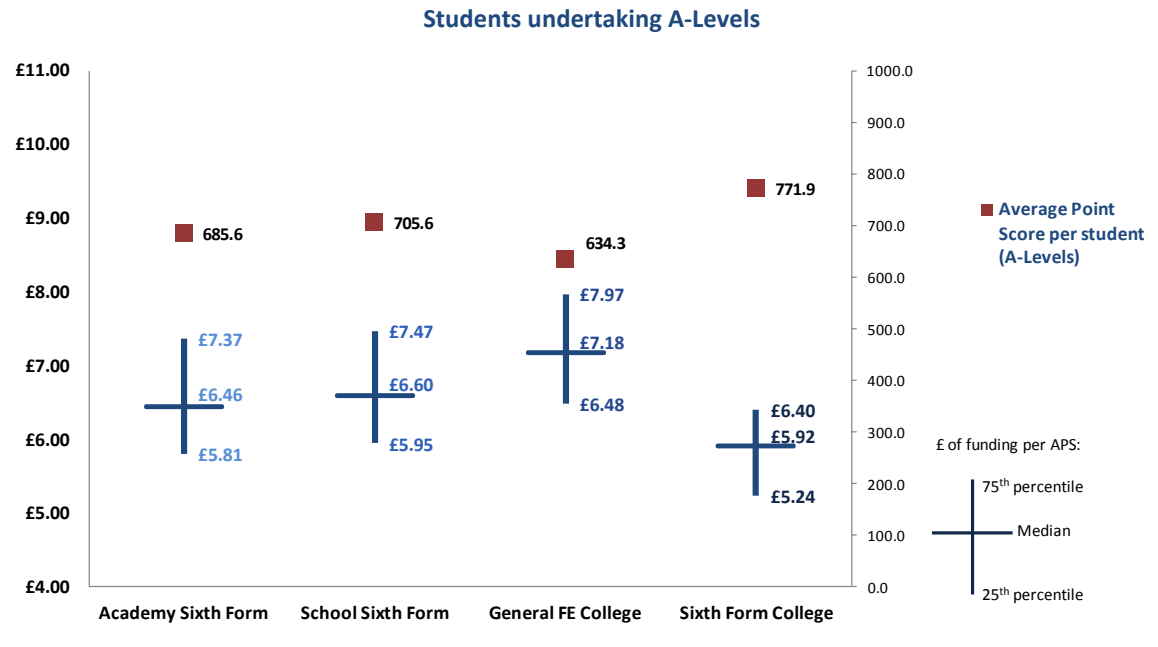
Note: The analysis of cross-subsidy for academies excludes multi-academy trusts, due to a lack of funding information at individual Academy level for these trusts.
* The number of pupils in Academy Sixth Forms refers to the total number of 16-19 pupils in receipt of EFA funding attending Academies.

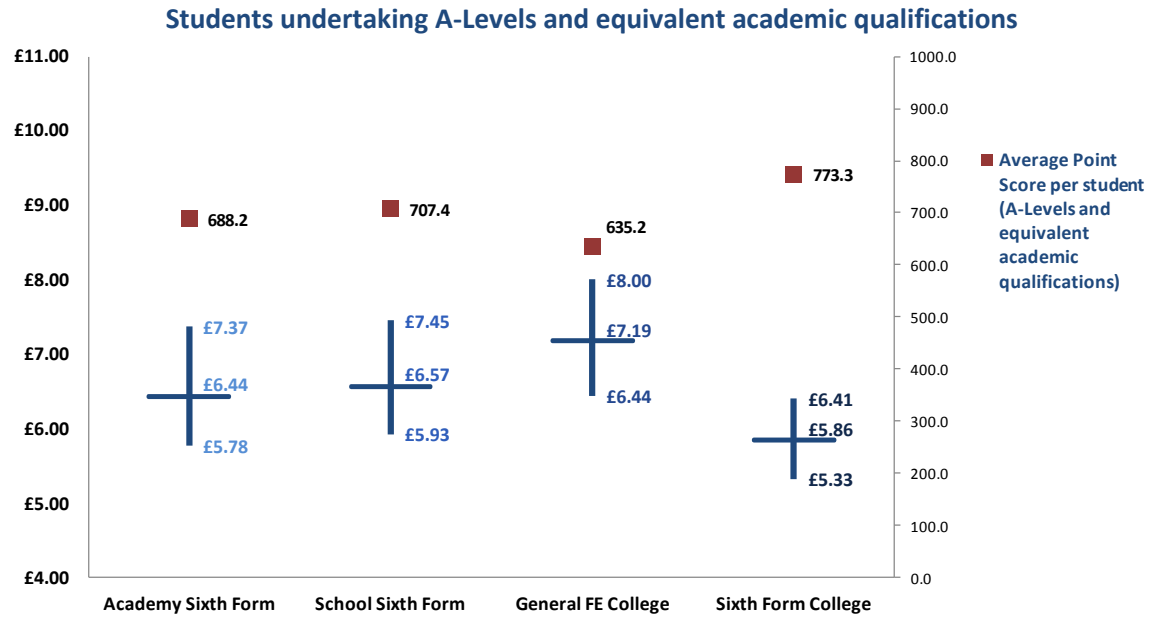
Source: London Economics' analysis of Education Funding Agency (2014b), Sixth Form Colleges' Association (2013), Education Funding Agency (2014a), Skills Funding Agency and Education Funding Agency (2014), Department for Education (2014a) and Department for Education (2013b).

Annex 3 Detailed outcomes and cost effectiveness information

A3.1 Average Point Score per student

Figure 18: Headline funding per Average Point Score per student, by provider type

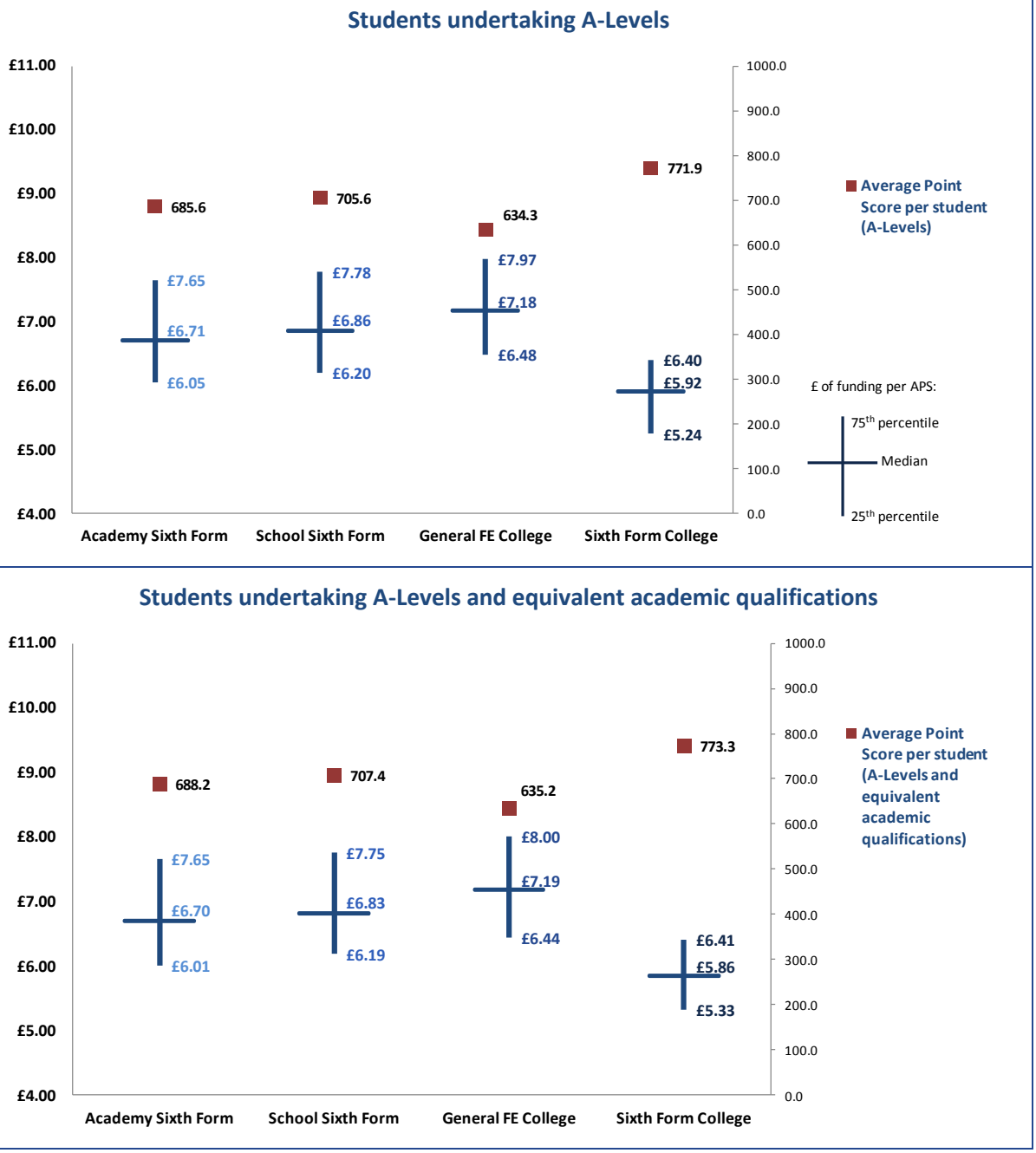




Source: London Economics' analysis of Education Funding Agency (2014b) and Department for Education (2013c).

Adjusting for VAT rebates

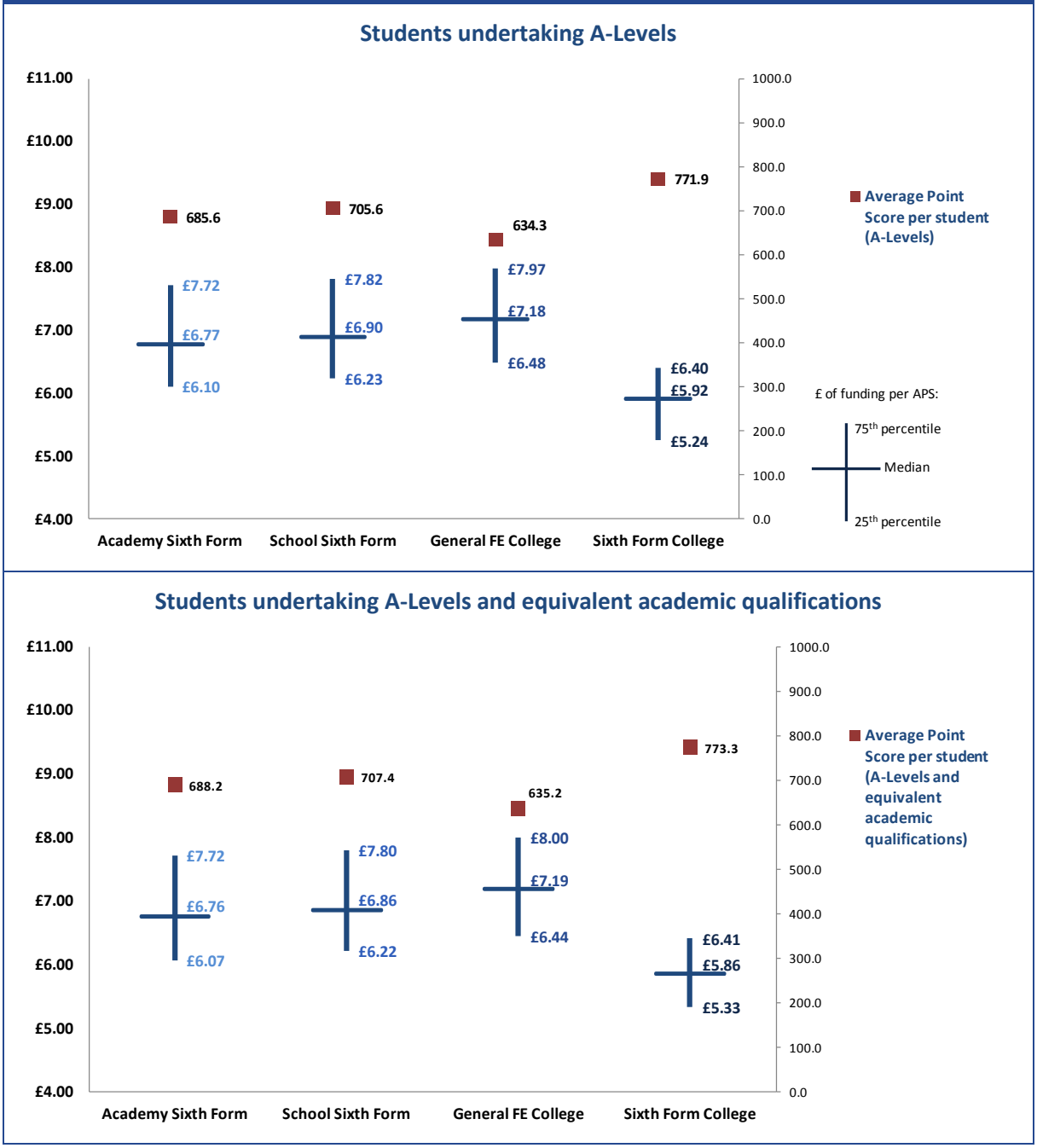
Figure 19: Effective funding per Average Point Score per student after adjusting for VAT rebates, by provider type



Source: London Economics' analysis of Education Funding Agency (2014b) and Department for Education (2013c).

Adjusting for insurance rates

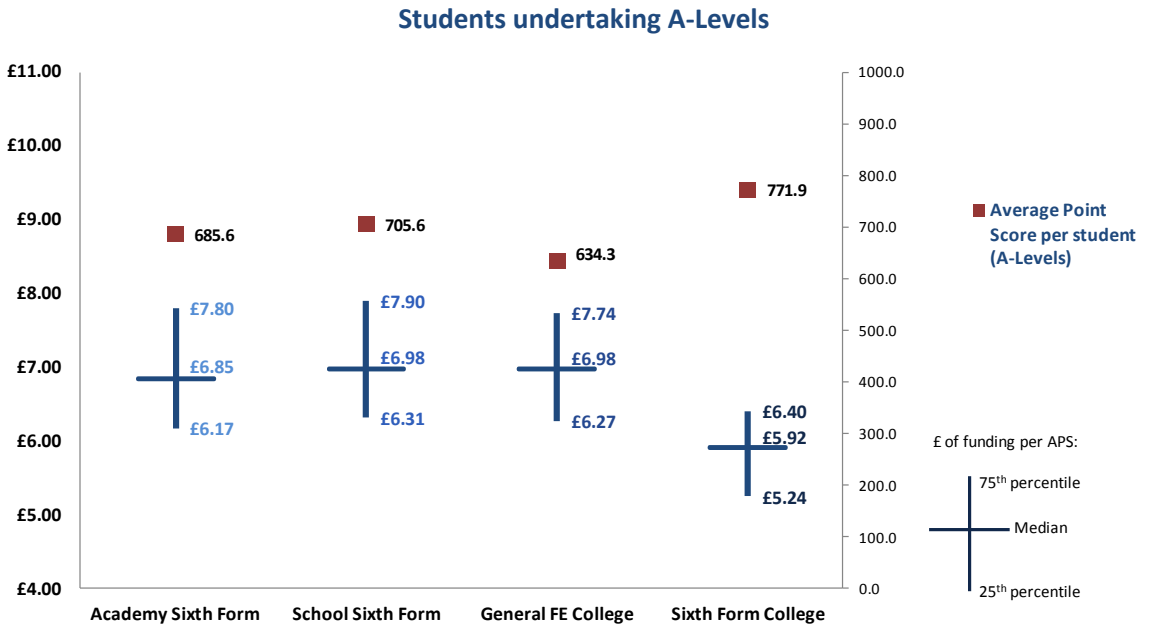
Figure 20: Effective funding per Average Point Score per student after adjusting for VAT rebates and insurance rates, by provider type

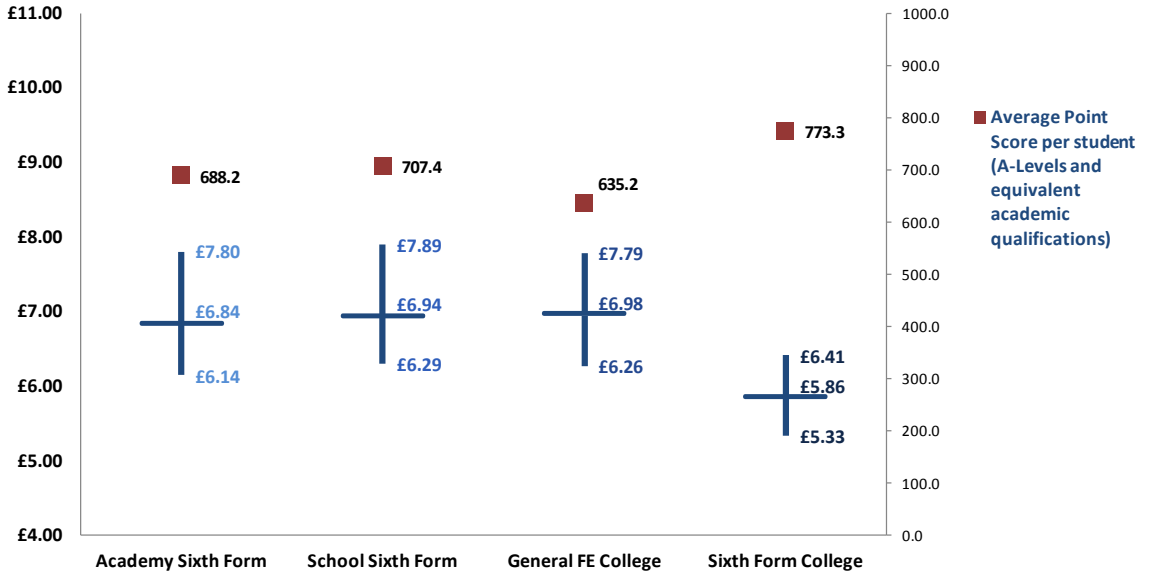


Source: London Economics' analysis of Education Funding Agency (2014b) and Department for Education (2013c).

Adjusting for capital costs

Figure 21: Effective funding per Average Point Score per student after adjusting for VAT rebates, insurance rates and capital costs, by provider type

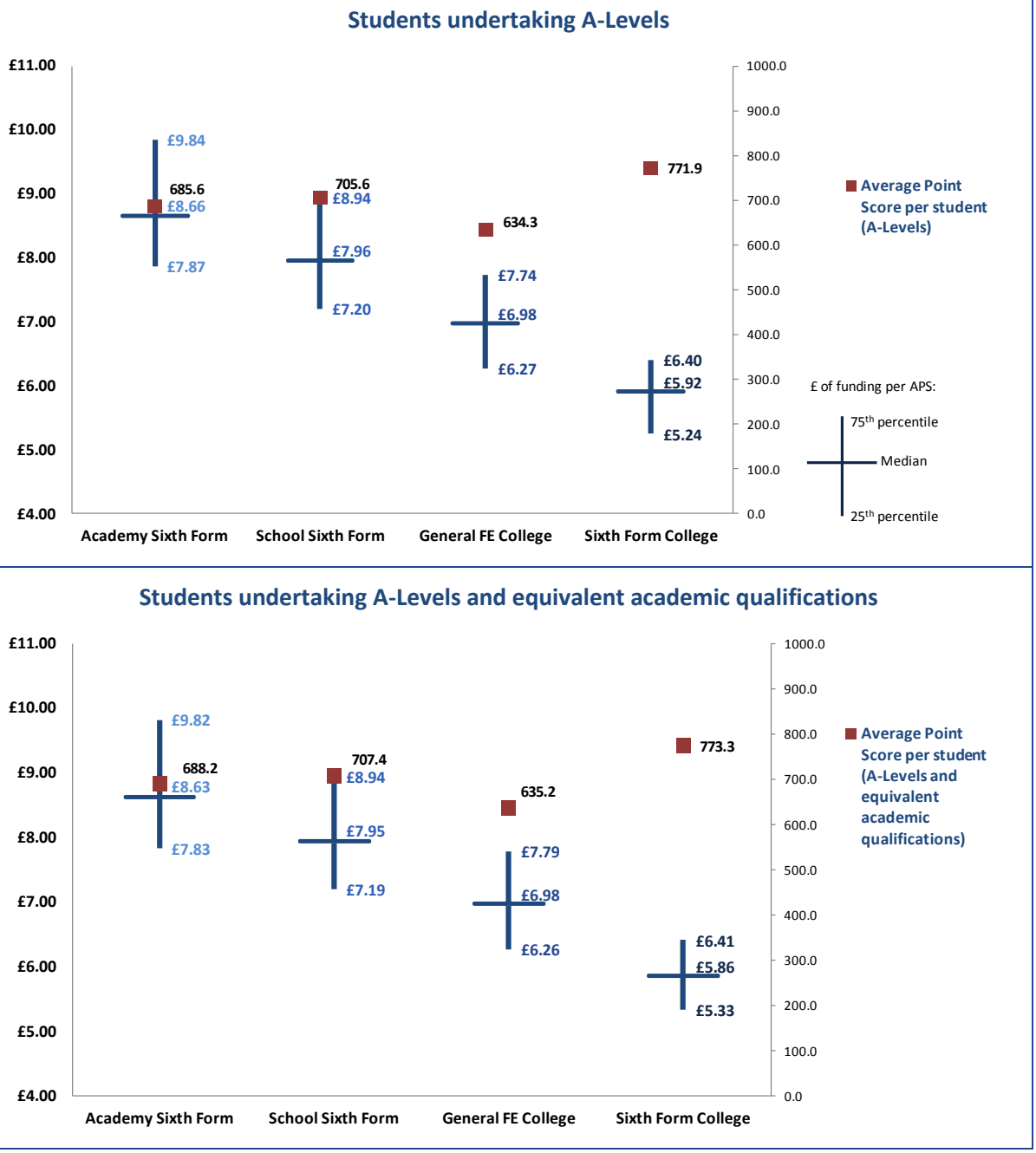




Source: London Economics' analysis of Education Funding Agency (2014b) and Department for Education (2013c).

Adjusting for potential cross-subsidies

Figure 22: Effective funding per Average Point Score per student after adjusting for VAT rebates, insurance rates, capital costs and potential cross-subsidies, by provider type

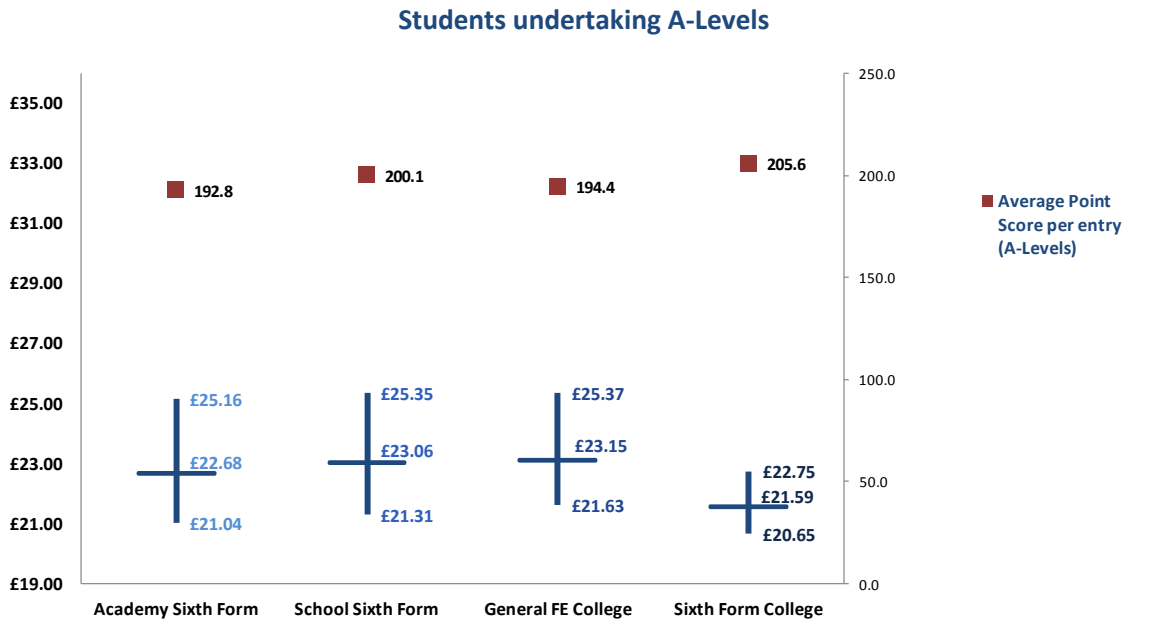


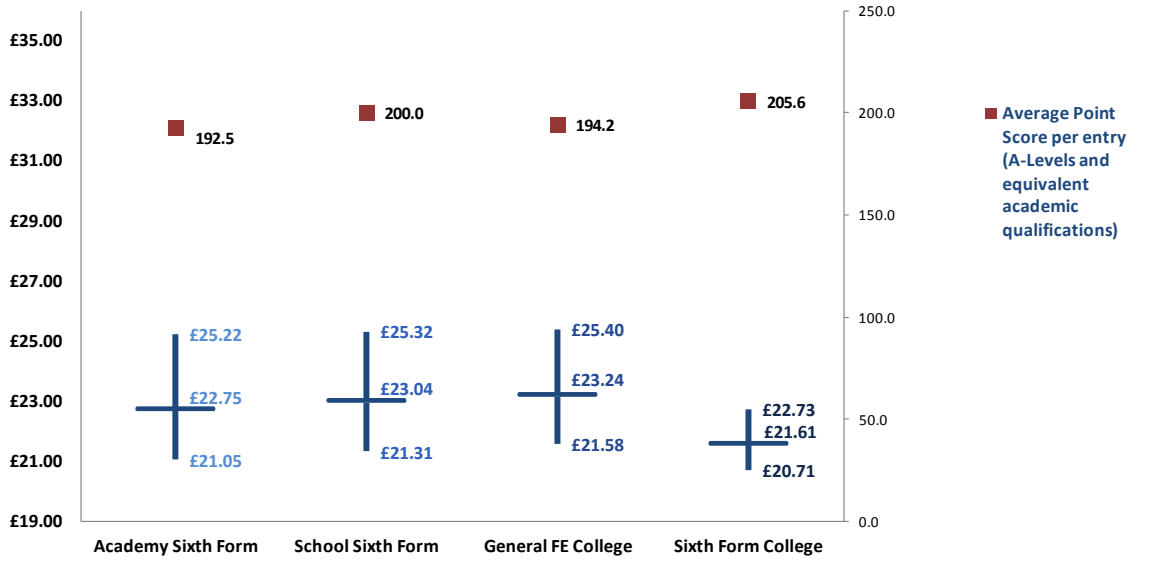
Source: London Economics' analysis of Education Funding Agency (2014b) and Department for Education (2013c).

A3.2 Average Point Score per entry

Headline funding

Figure 23: Headline funding per Average Point Score per entry, by provider type

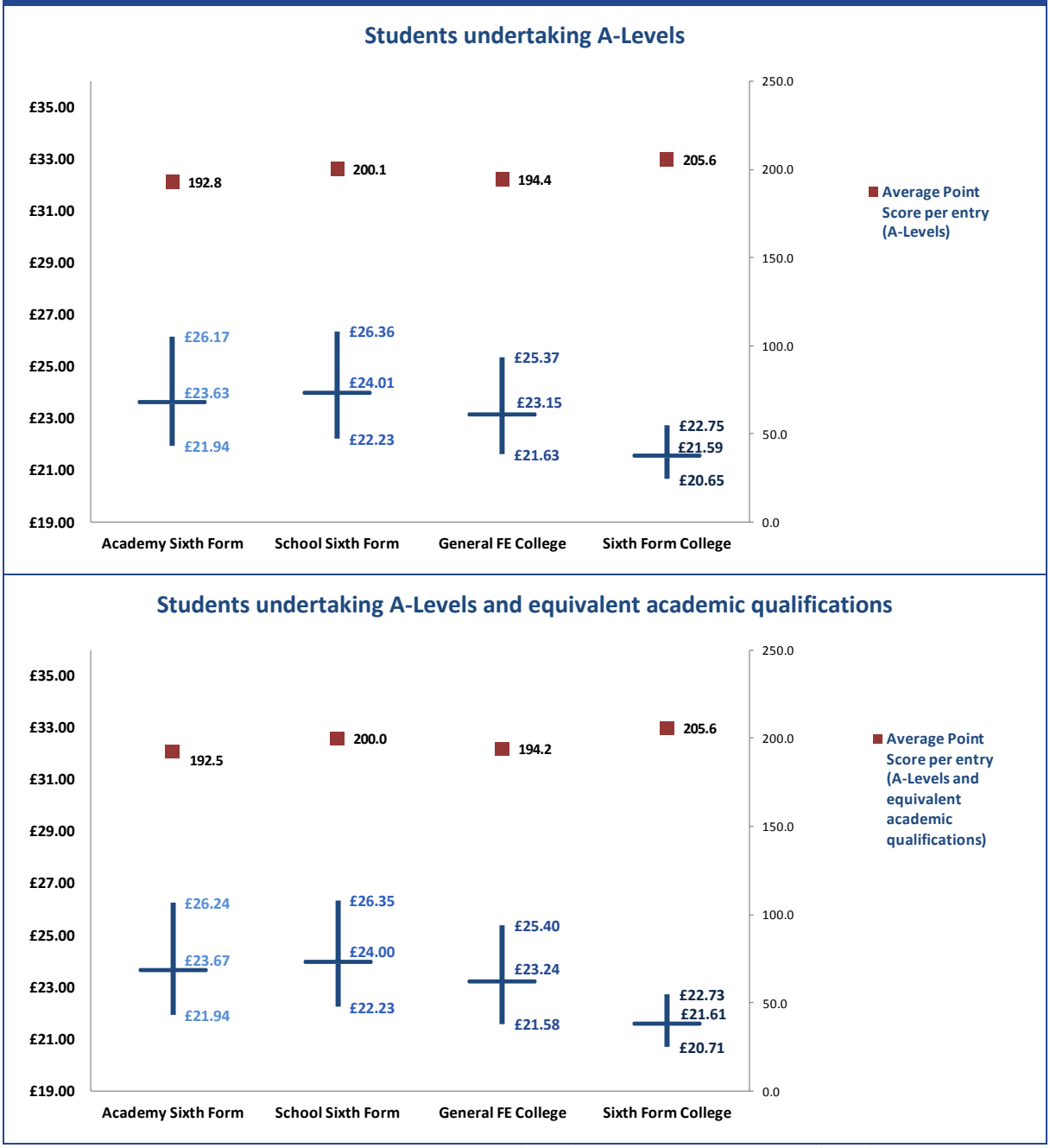




Source: London Economics' analysis of Education Funding Agency (2014b) and Department for Education (2013c).

Adjusting for VAT rebates

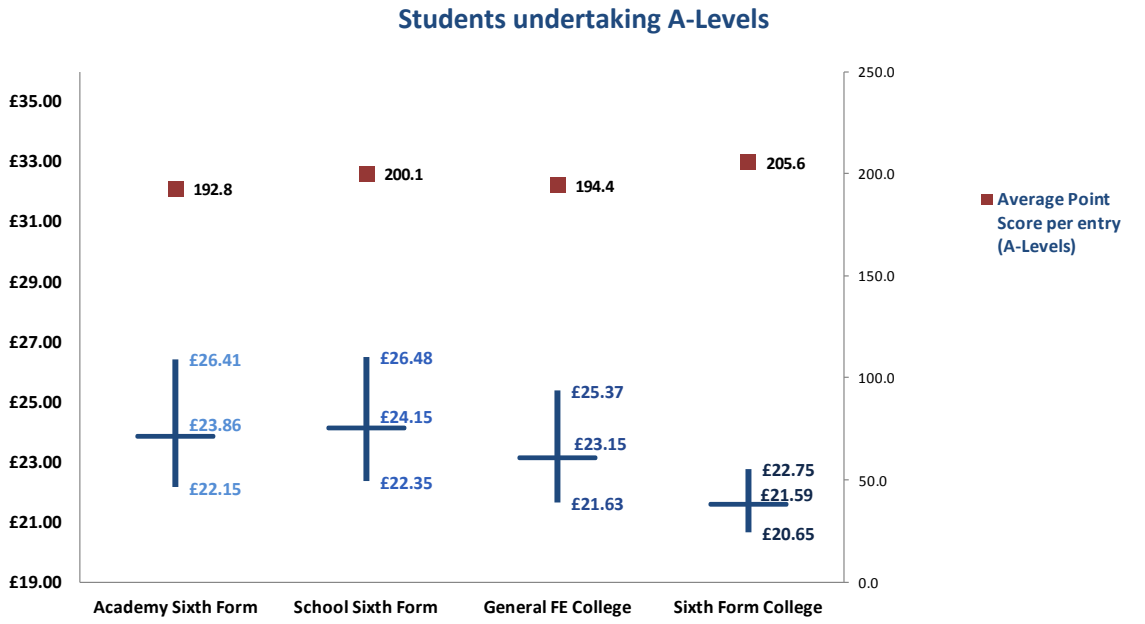
Figure 24: Effective funding per Average Point Score per entry, after adjusting for VAT rebates, by provider type

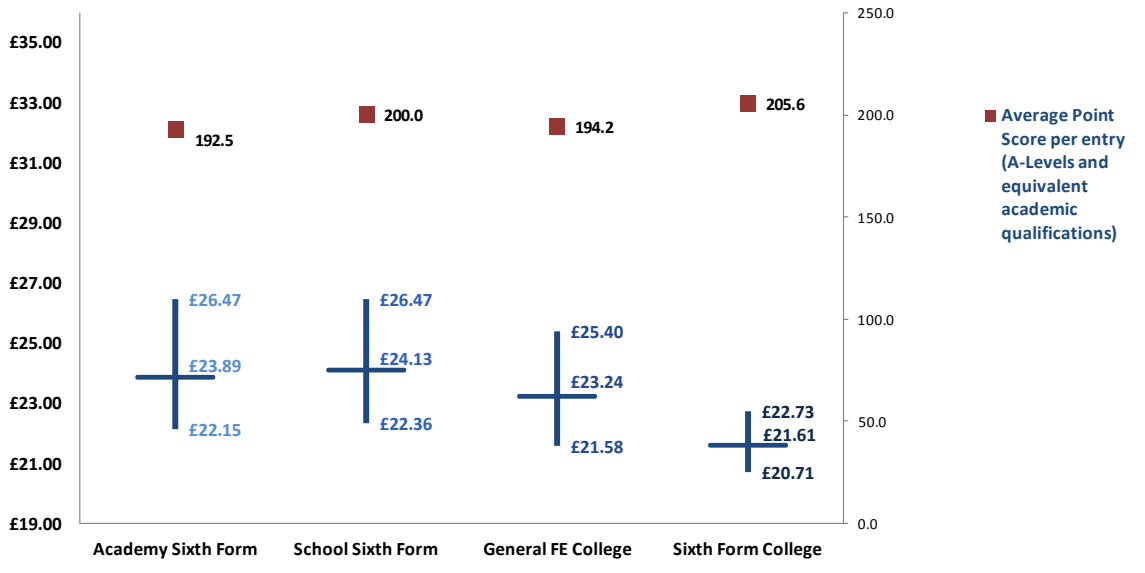


Source: London Economics' analysis of Education Funding Agency (2014b) and Department for Education (2013c).

Adjusting for insurance rates

Figure 25: Effective funding per Average Point Score per entry, after adjusting for VAT rebates and insurance rates, by provider type

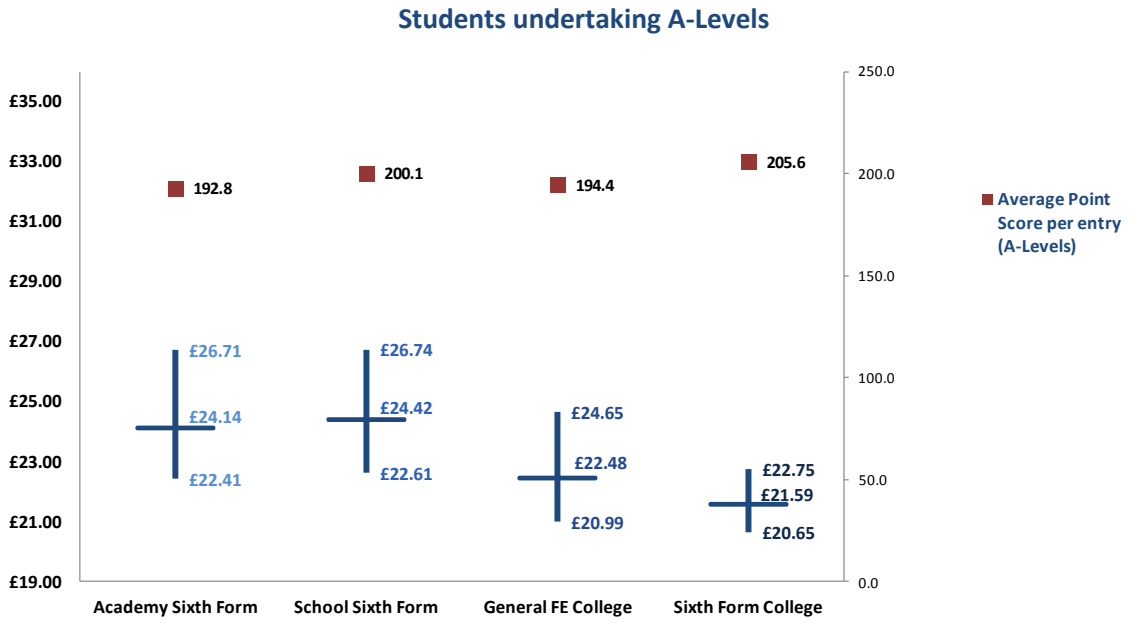


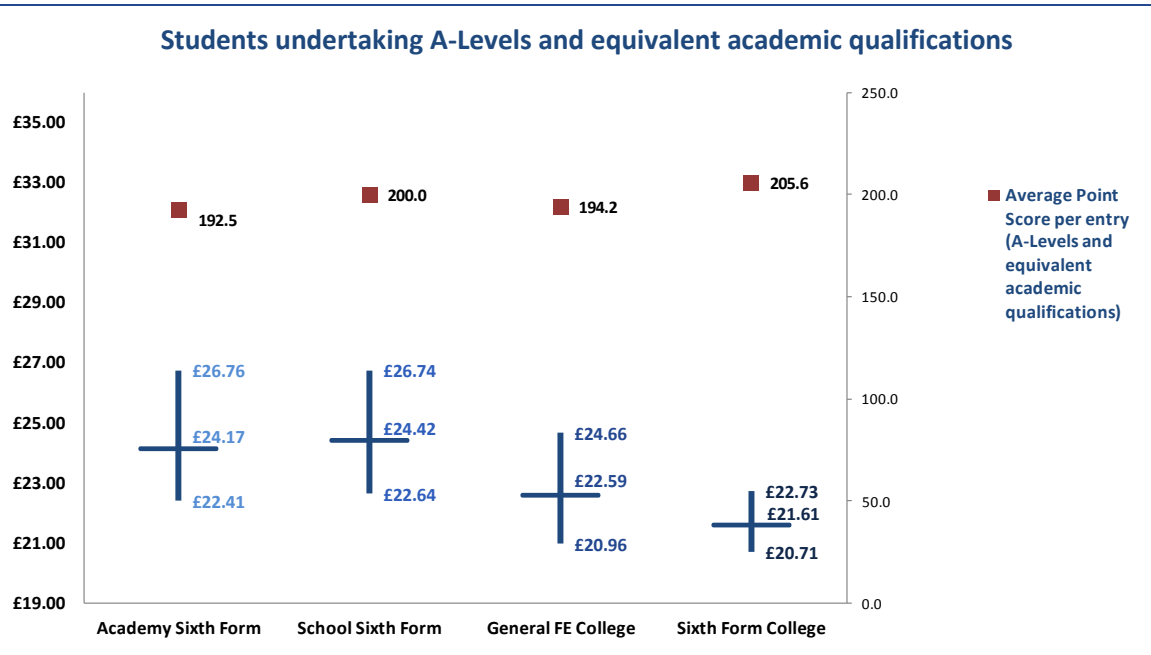


Source: London Economics' analysis of Education Funding Agency (2014b) and Department for Education (2013c).

Adjusting for capital costs

Figure 26: Effective funding per Average Point Score per entry, after adjusting for VAT rebates, insurance rates and capital costs, by provider type

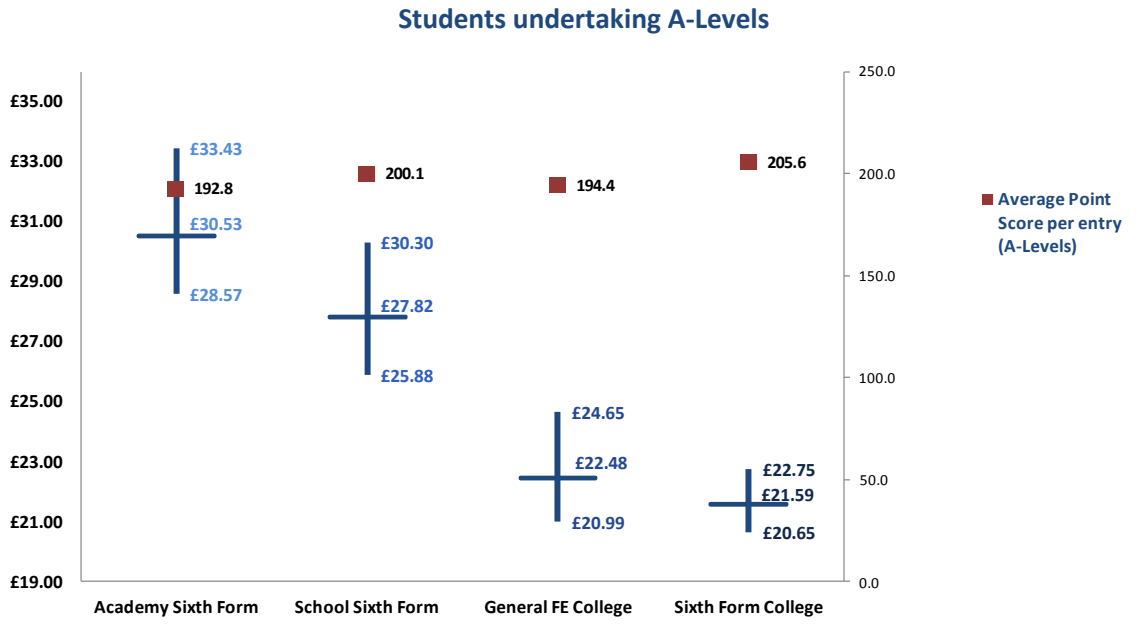


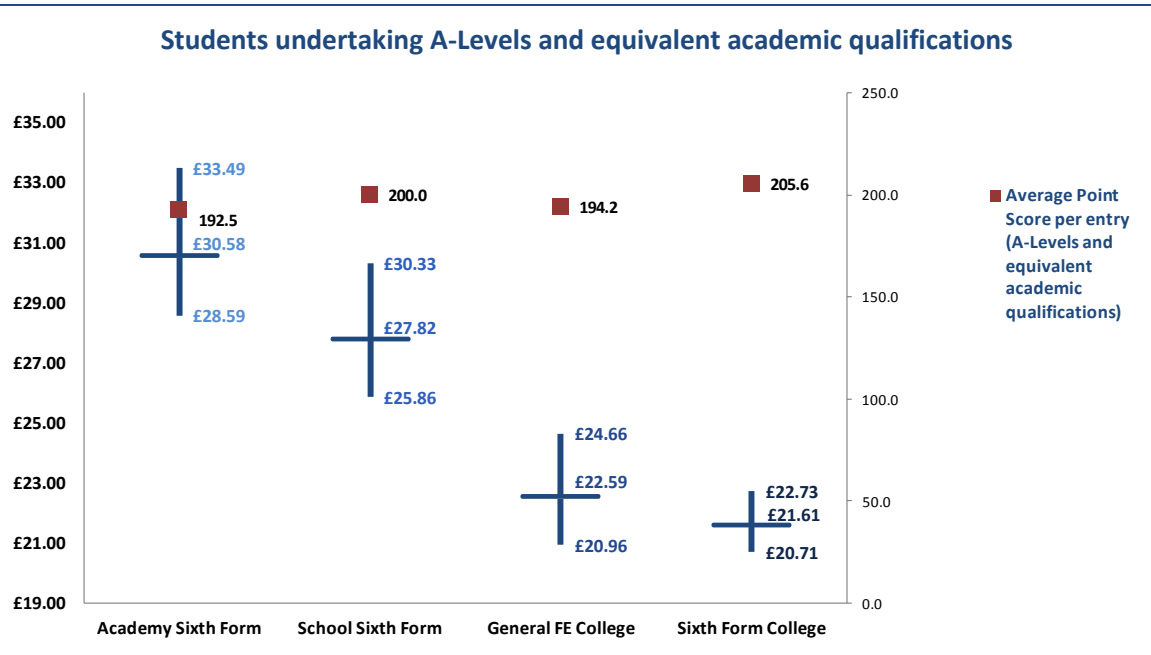


Source: London Economics' analysis of Education Funding Agency (2014b) and Department for Education (2013c).

Adjusting for potential cross-subsidies

Figure 27: Effective funding per Average Point Score per entry, after adjusting for VAT rebates, insurance rates, capital costs and potential cross-subsidies, by provider type



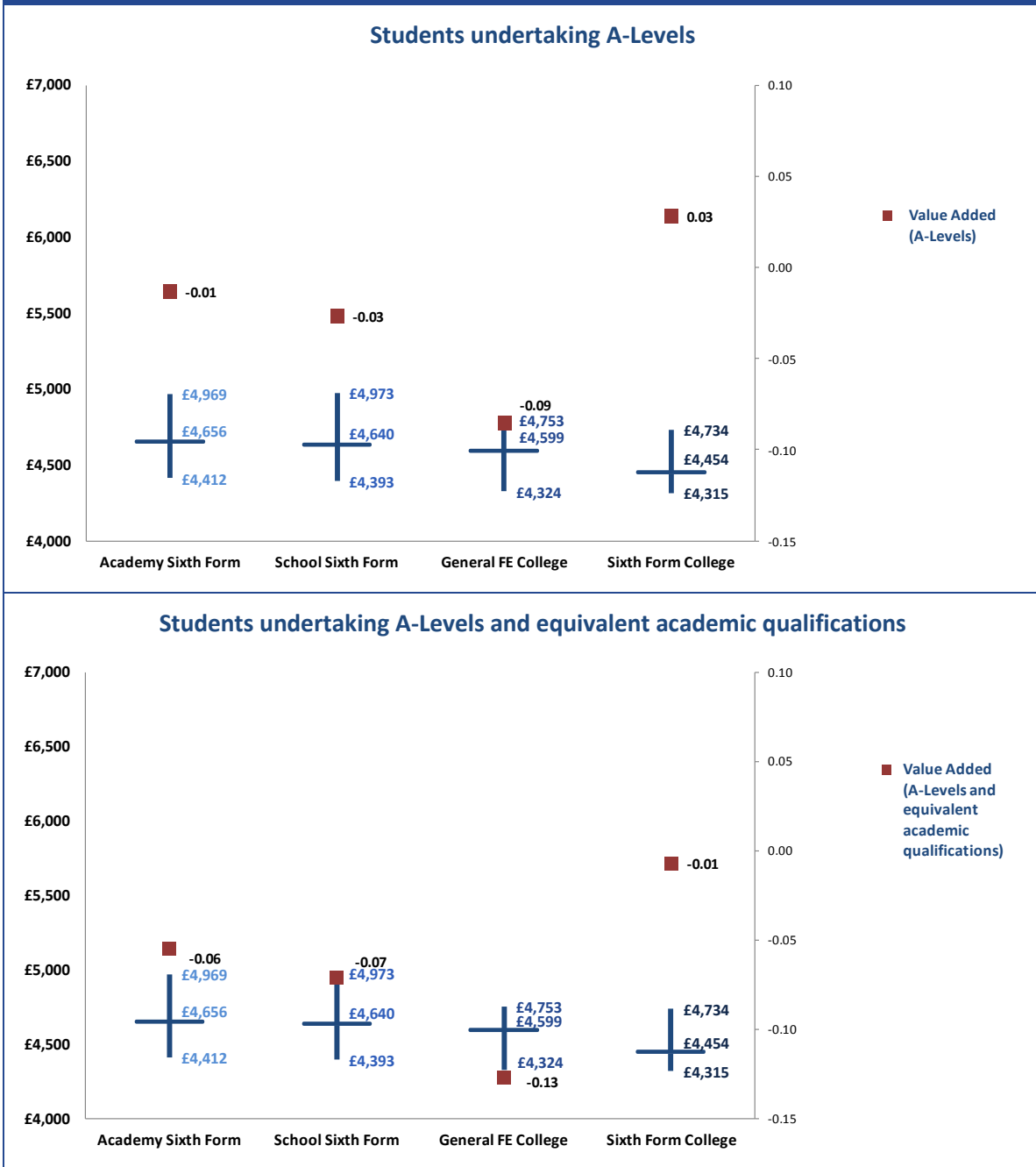


Source: London Economics' analysis of Education Funding Agency (2014b) and Department for Education (2013c).

A3.3 Value Added

Headline funding

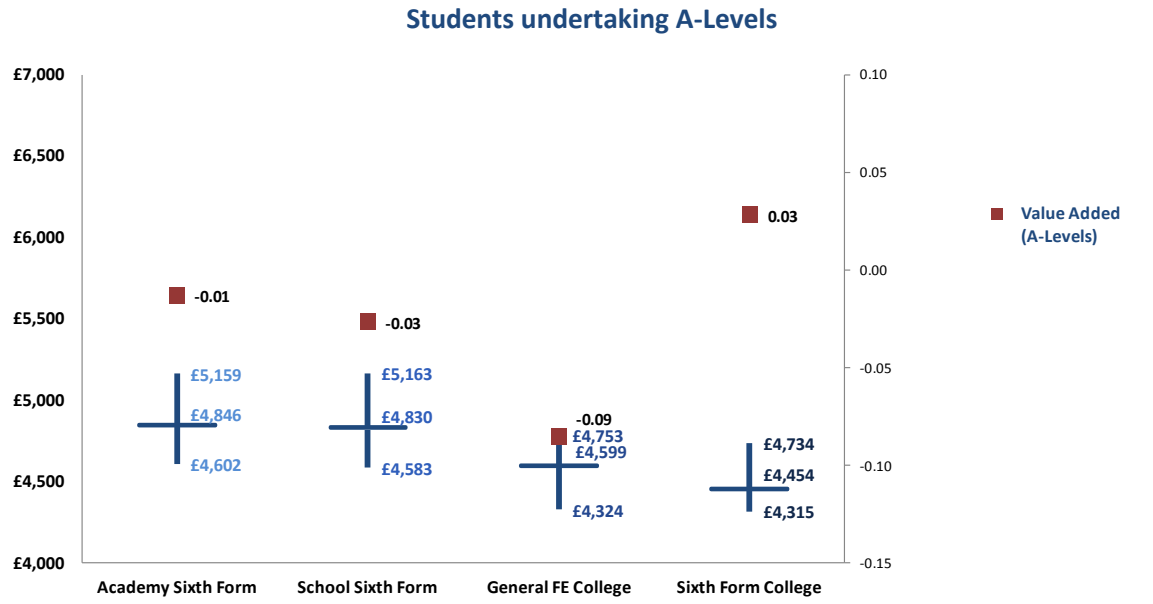
Figure 28: Headline funding per Value Added score, by provider type

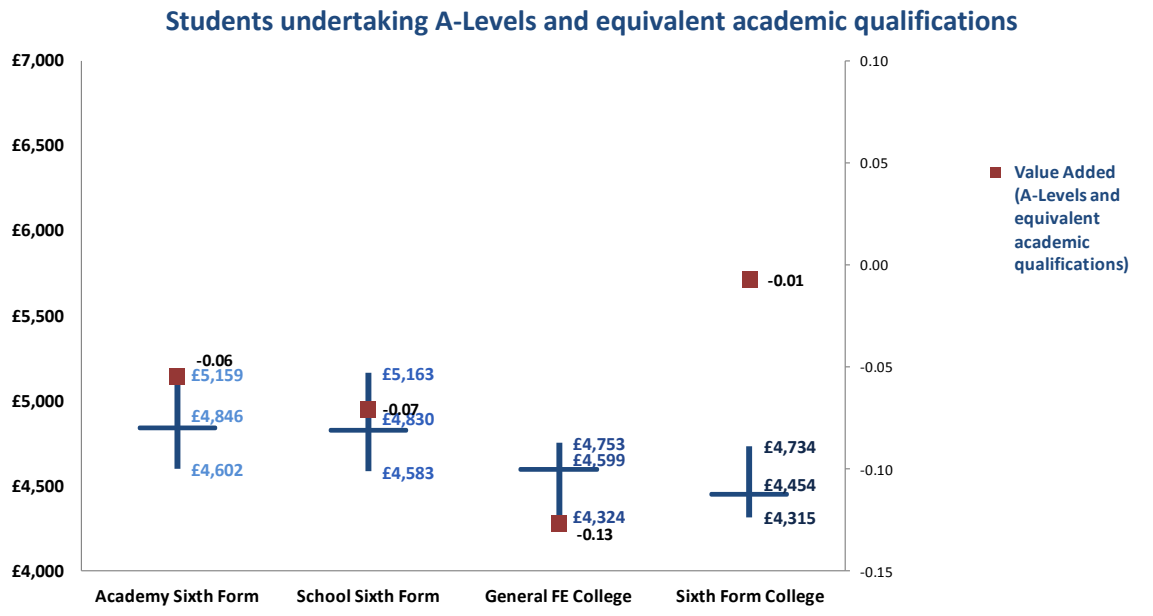


Source: London Economics' analysis of Education Funding Agency (2014b) and Department for Education (2013c).

Adjusting for VAT rebates

Figure 29: Effective funding per Value Added score, after adjusting for VAT rebates, by provider type

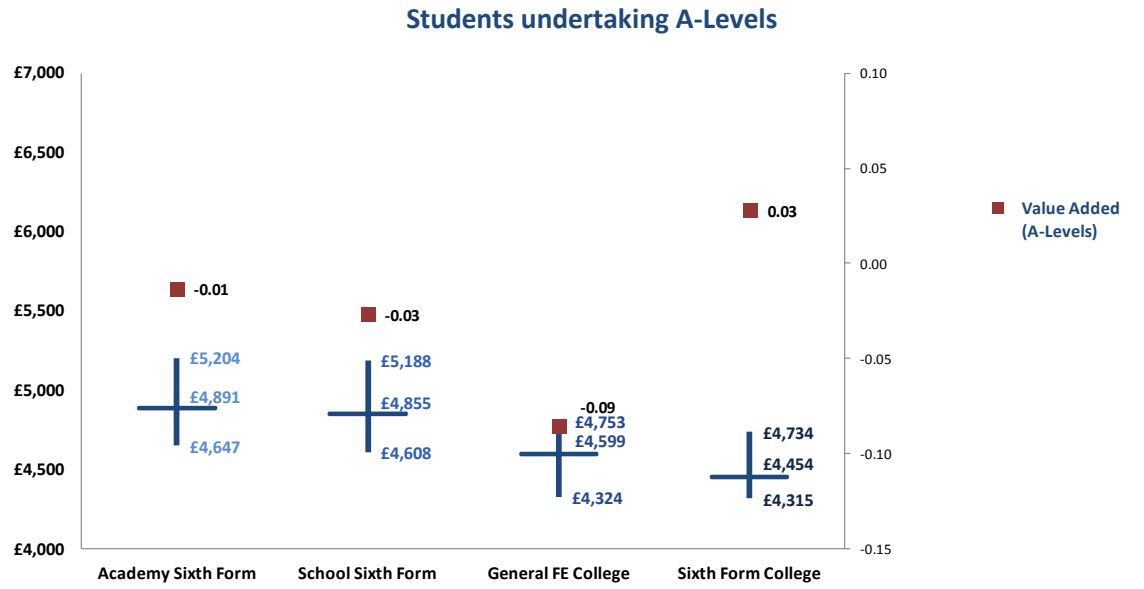


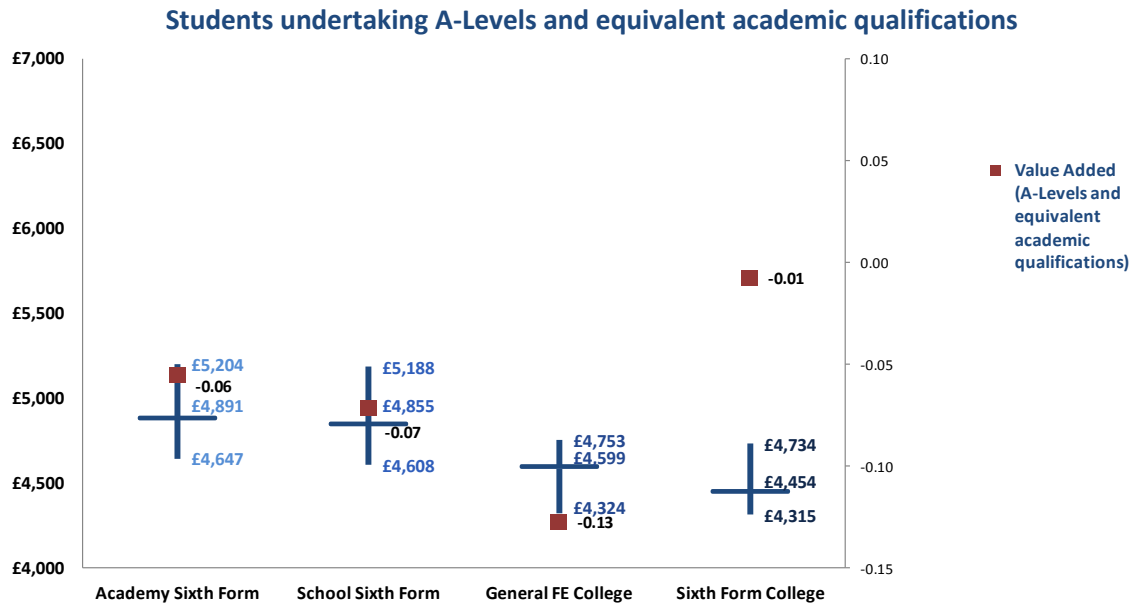


Source: London Economics' analysis of Education Funding Agency (2014b) and Department for Education (2013c).

Adjusting for insurance rates

Figure 30: Effective funding per Value Added score, after adjusting for VAT rebates and insurance rates, by provider type

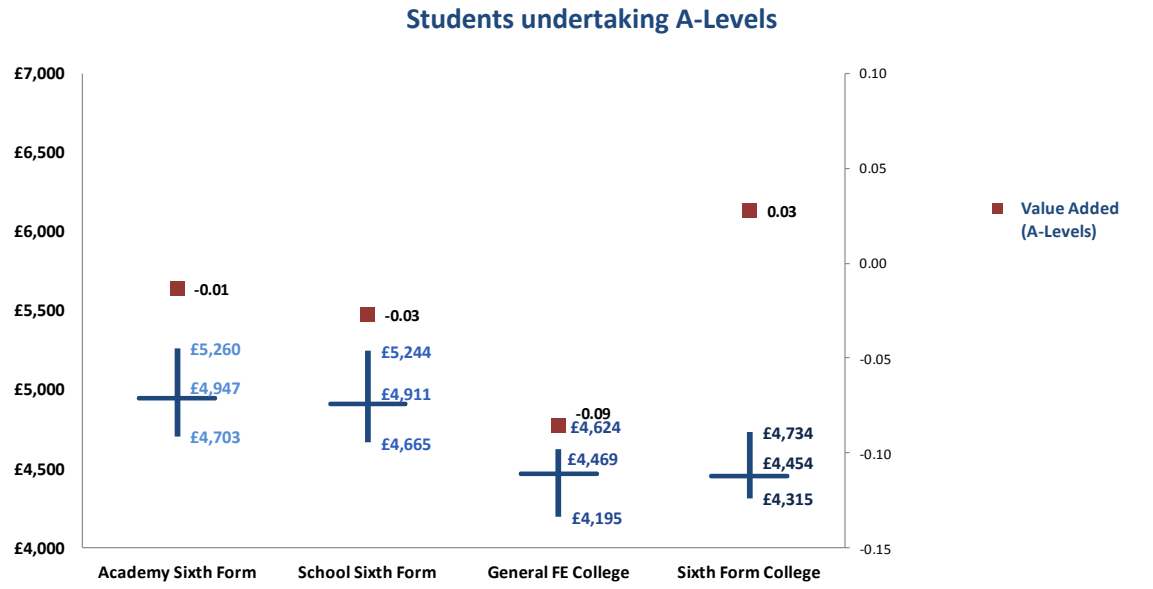


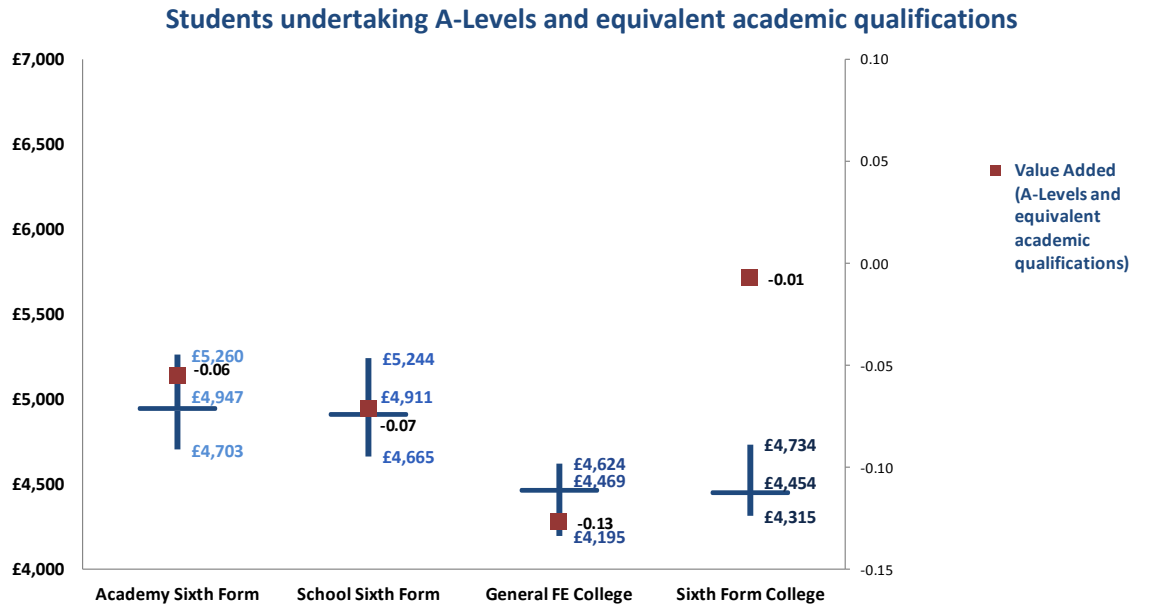


Source: London Economics' analysis of Education Funding Agency (2014b) and Department for Education (2013c).

Adjusting for capital costs

Figure 31: Effective funding per Value Added score, after adjusting for VAT rebates, insurance rates and capital costs, by provider type

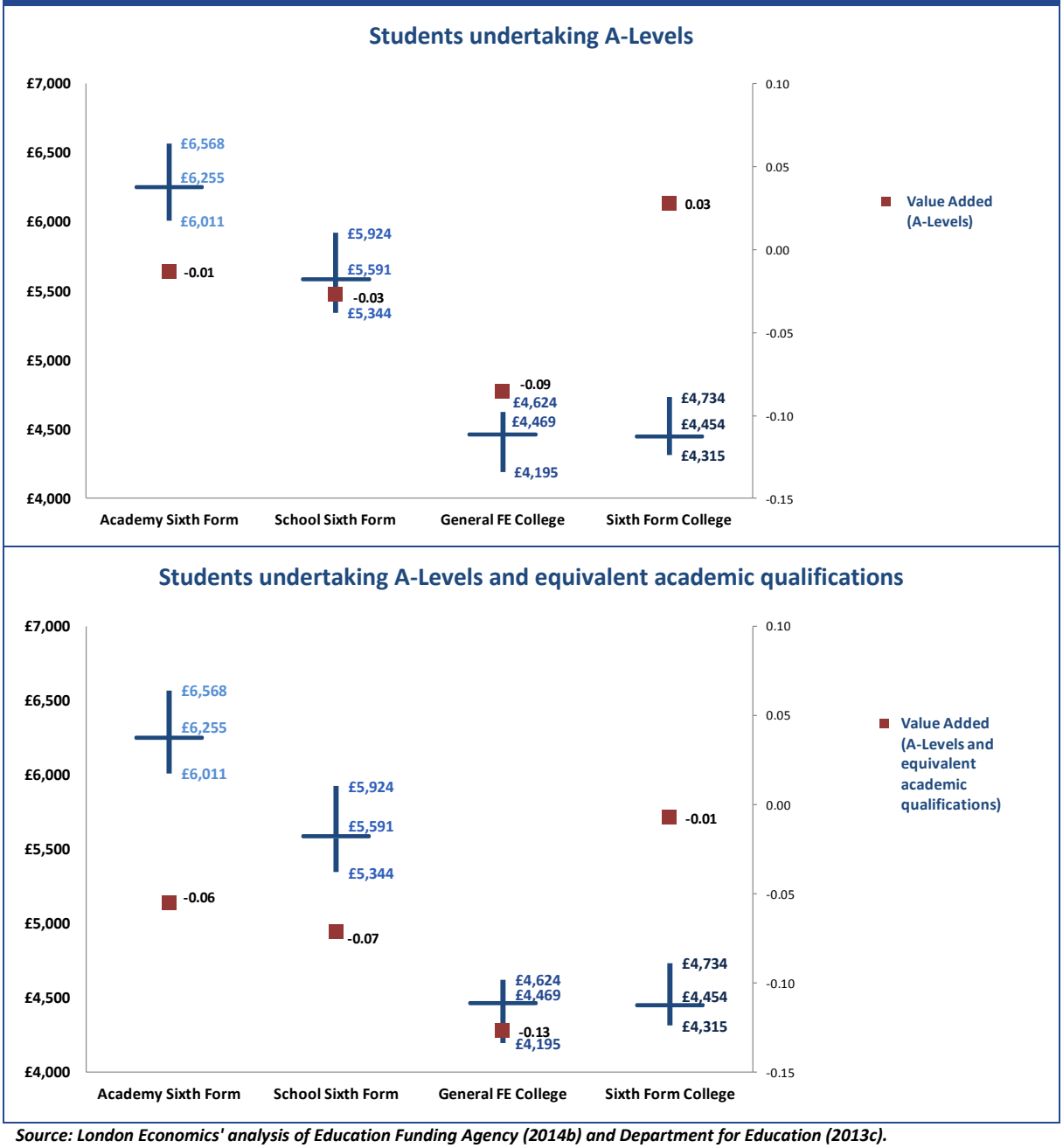




Source: London Economics' analysis of Education Funding Agency (2014b) and Department for Education (2013c).

Adjusting for potential cross-subsidies

Figure 32: Effective funding per Value Added score, after adjusting for VAT rebates, insurance rates, capital costs and potential cross-subsidies, by provider type

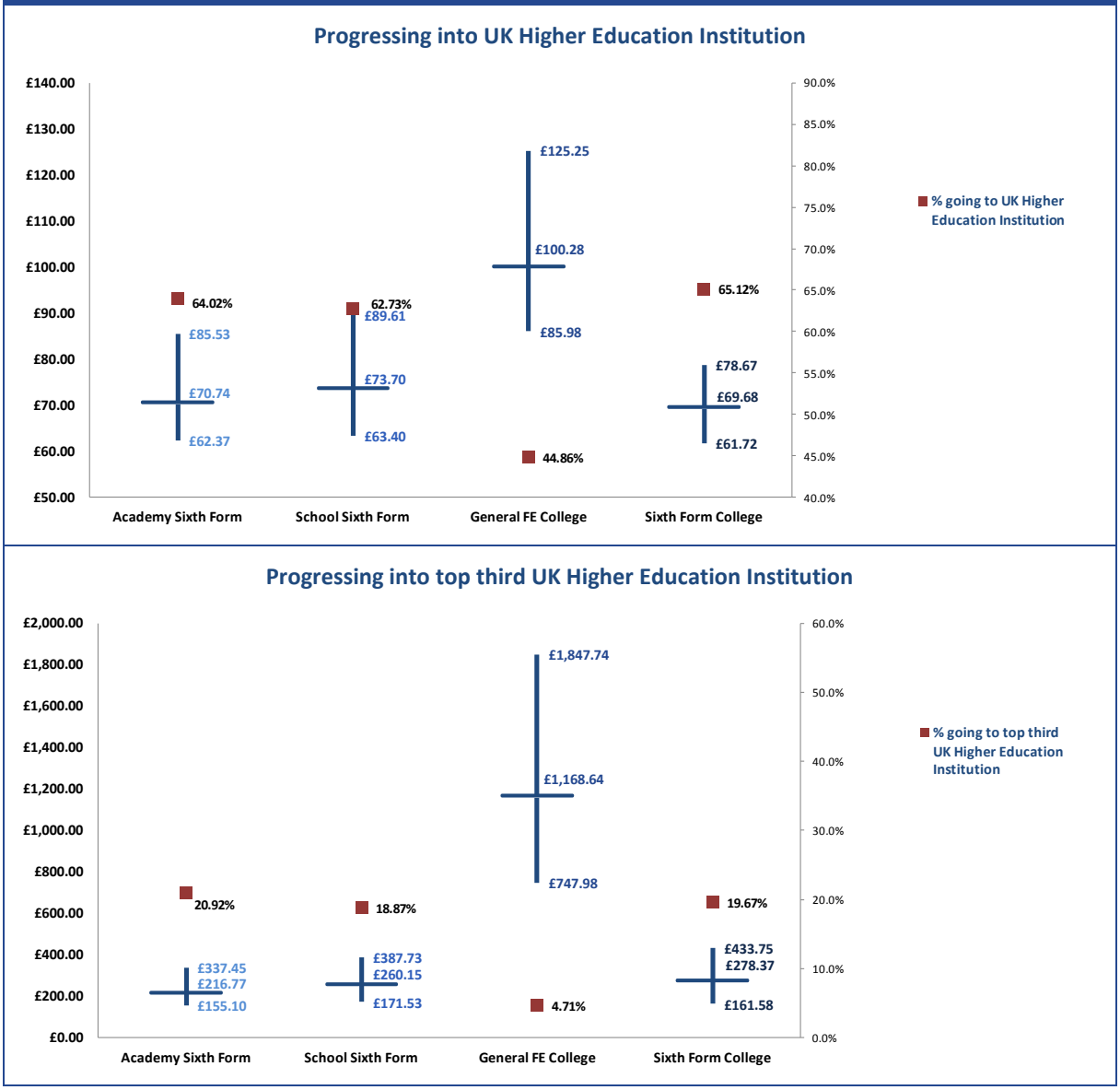


Source: London Economics' analysis of Education Funding Agency (2014b) and Department for Education (2013c).

A3.4 Progression into higher education

Headline funding

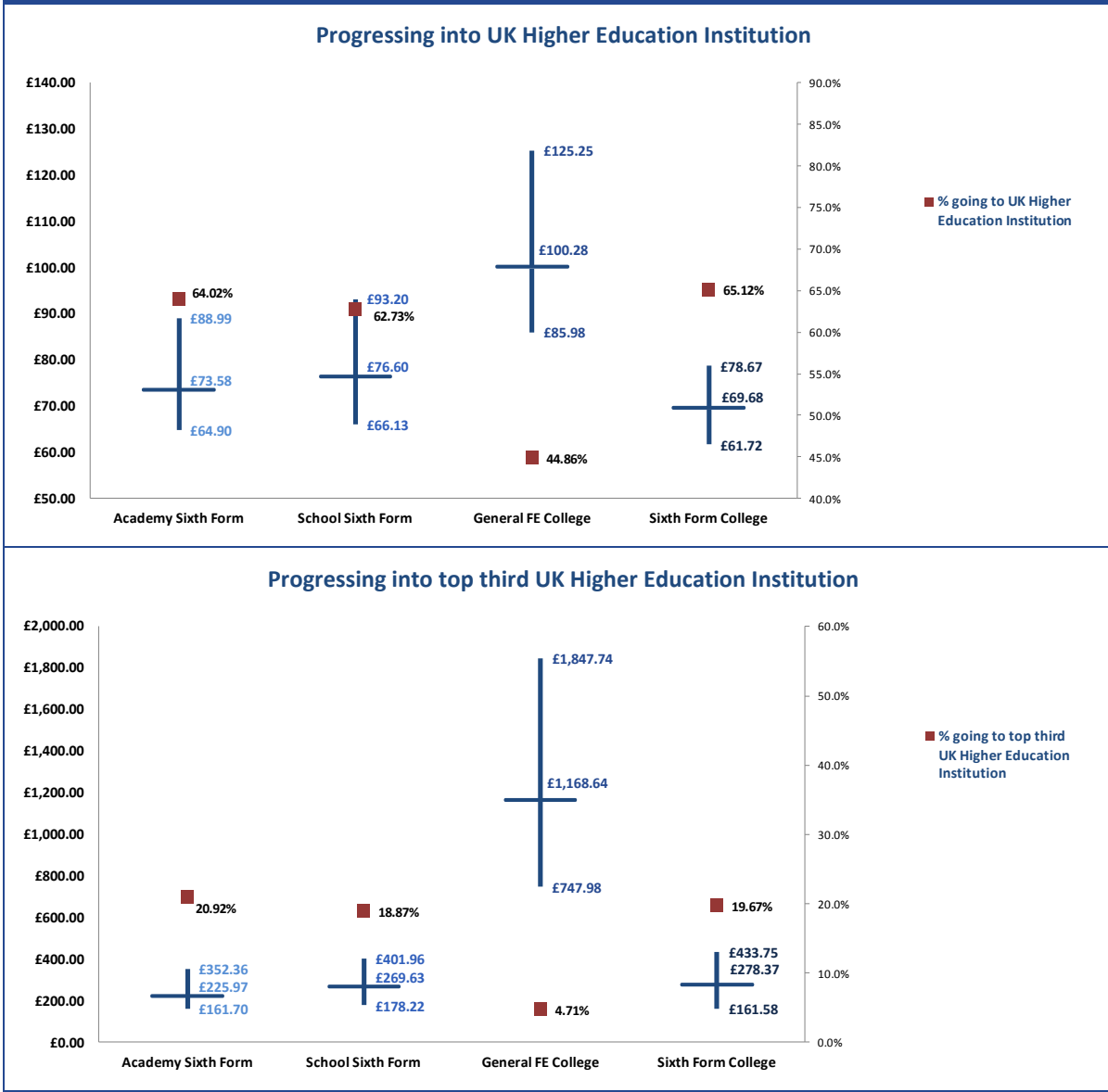
Figure 33: Headline funding per percentage point progression into UK Higher Education, by provider type



Source: London Economics' analysis of Education Funding Agency (2014b) and Department for Education (2013d).

Adjusting for VAT rebates

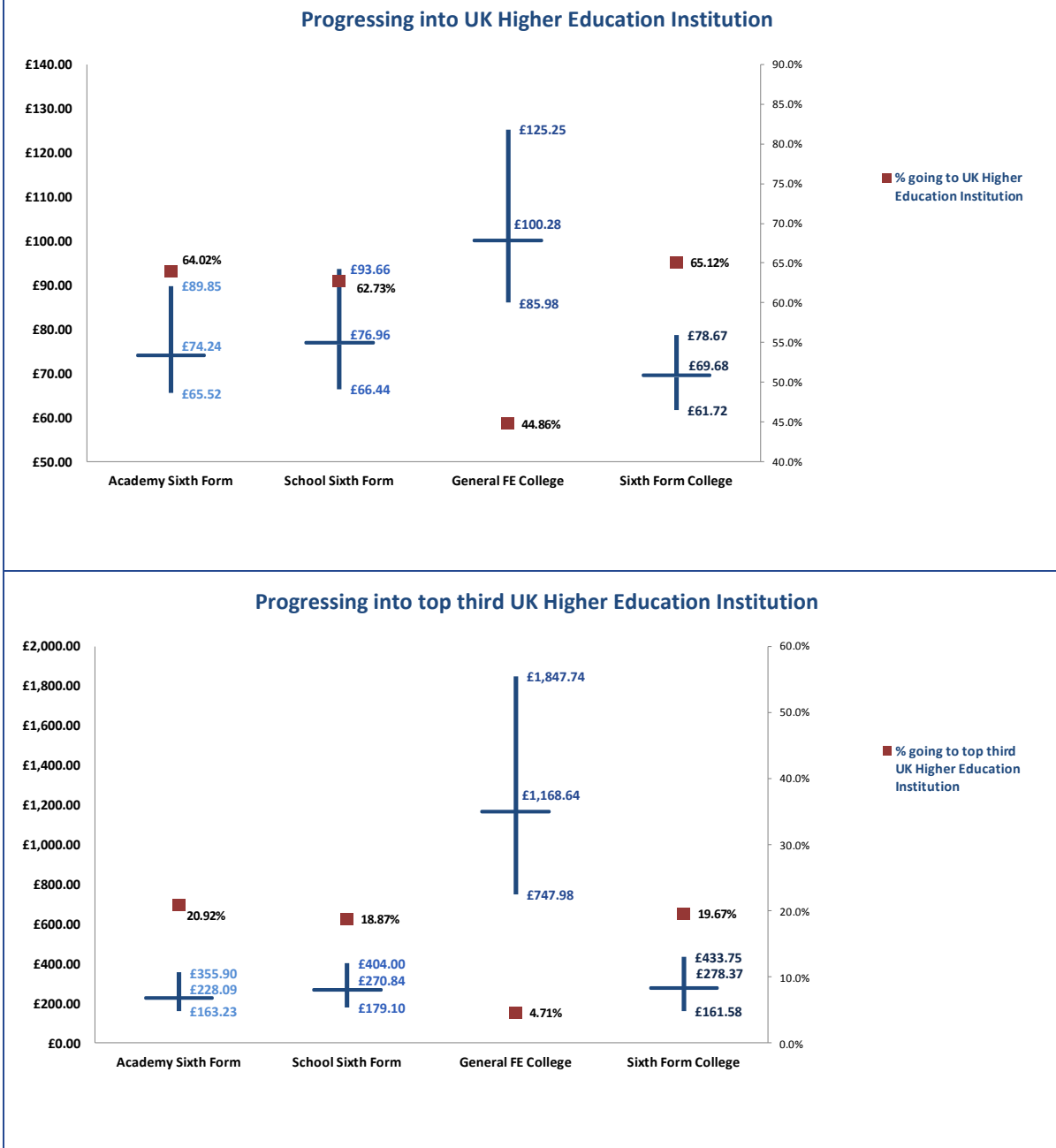
Figure 34: Effective funding per percentage point progressing into UK higher education, after adjusting for VAT rebates, by provider type



Source: London Economics' analysis of Education Funding Agency (2014b) and Department for Education (2013d).

Adjusting for insurance rates

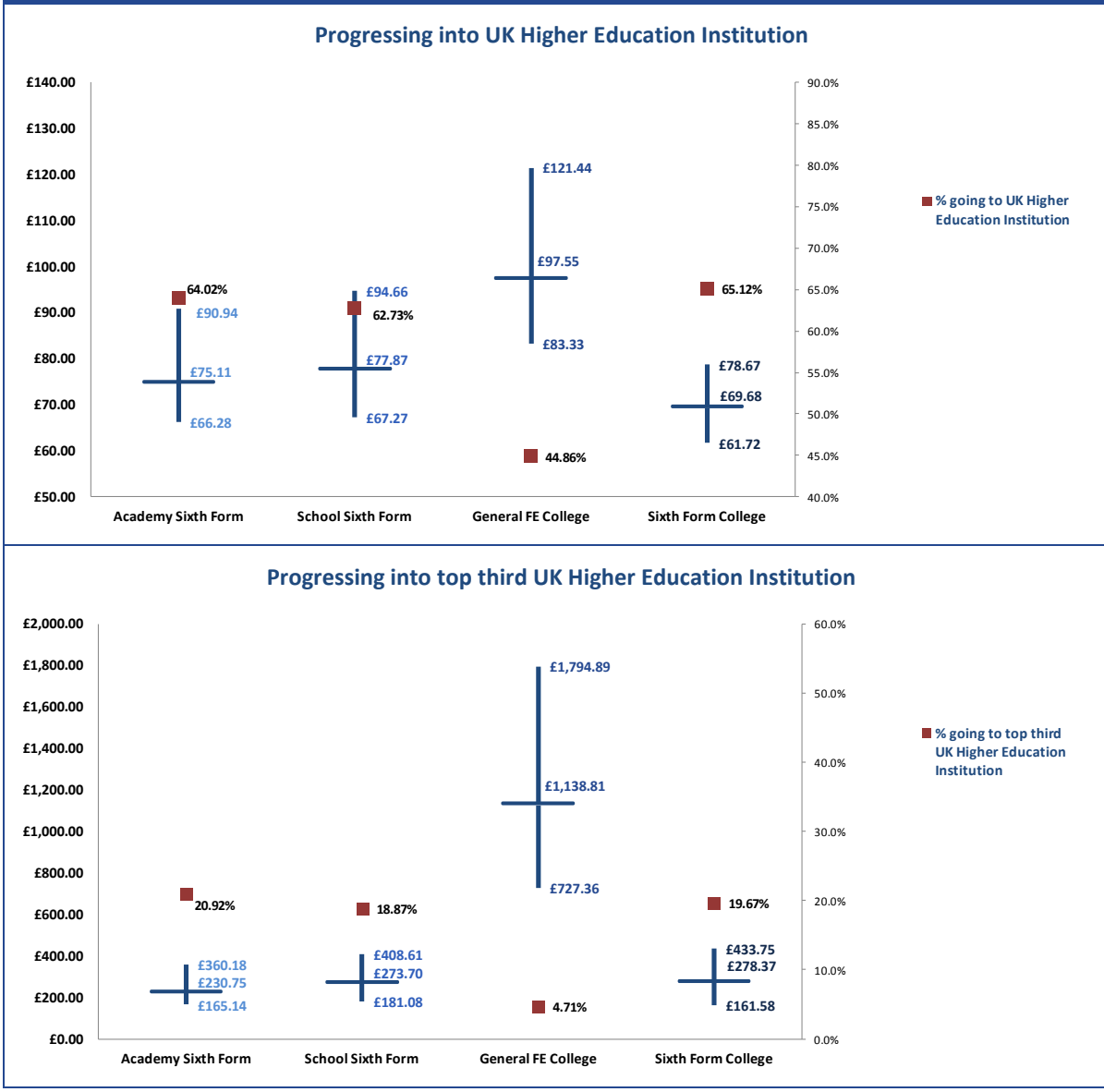
Figure 35: Effective funding per percentage point progressing into UK higher education, after adjusting for VAT rebates and insurance rates, by provider type



Source: London Economics' analysis of Education Funding Agency (2014b) and Department for Education (2013d).

Adjusting for capital costs

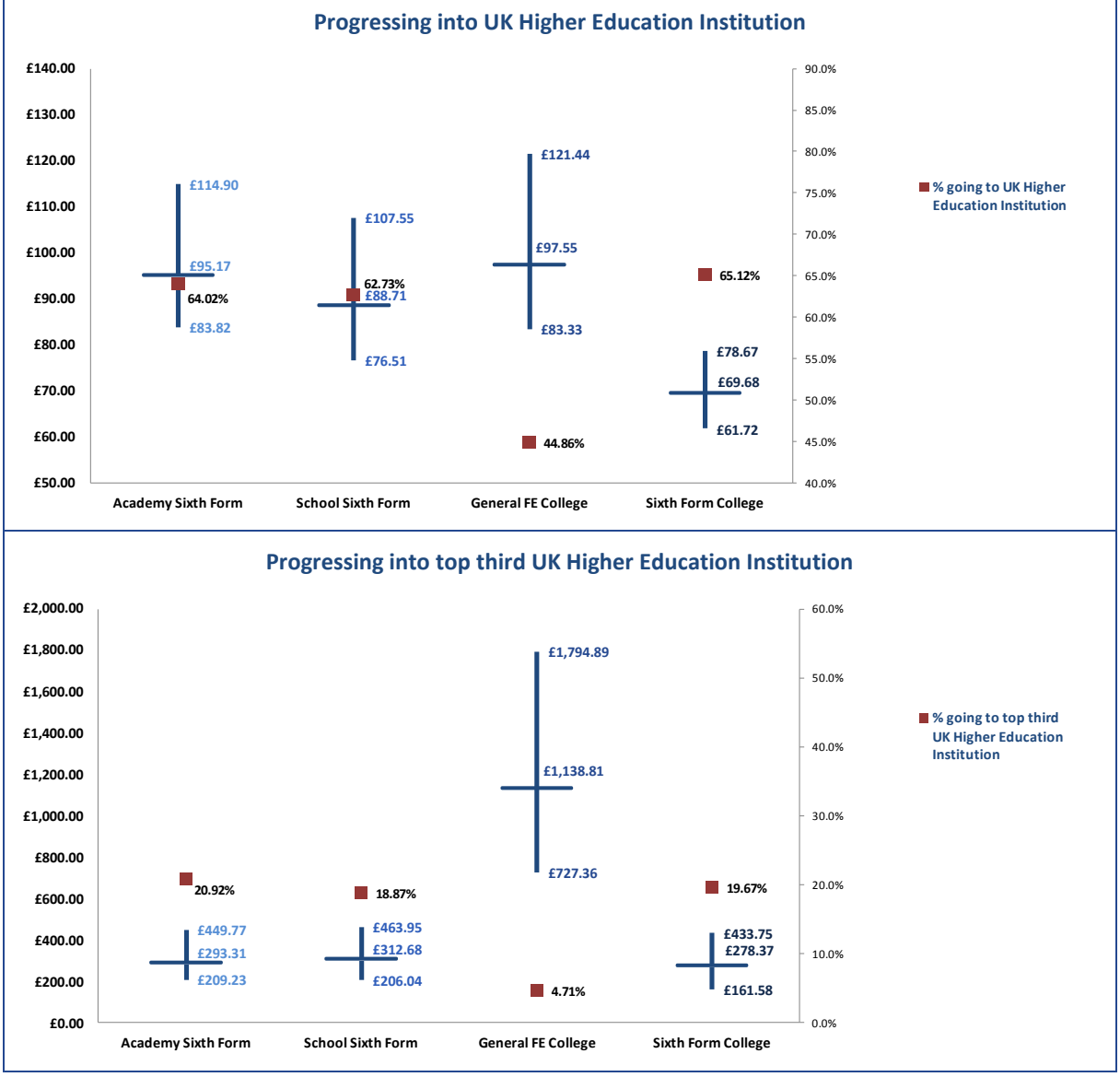
Figure 36: Effective funding per percentage point progressing into UK higher education, after adjusting for VAT rebates, insurance rates and capital costs, by provider type



Source: London Economics' analysis of Education Funding Agency (2014b) and Department for Education (2013d).

Adjusting for potential cross-subsidies

Figure 37: Effective funding per percentage point progressing into UK higher education, after adjusting for VAT rebates, insurance rates, capital costs and potential cross-subsidies, by provider type



Source: London Economics' analysis of Education Funding Agency (2014b) and Department for Education (2013d).

Annex 4 Assessing the economic benefits to undergraduate degrees

This element of the analysis is exceptionally detailed and we provide a summary of the analysis here. The methodological approach is essentially identical to that adopted by the Department for Business, Innovation and Skills (2011) when presenting economic evidence alongside the Higher Education White Paper in 2011. The analysis here is methodologically equivalent; however updates the previous analysis by using more recent data from the Labour Force Survey, but also incorporates the fundamentally different higher education fees and funding regime that came into place in 2011.

A4.1 Estimating earnings returns to higher education qualifications

To undertake this element of the analysis, we estimated a standard Ordinary Least Squares linear regression model, where the dependent variable is the natural logarithm of hourly earnings and the independent variables include the full range of qualifications held alongside a range of personal, regional and job related characteristics that might be expected to influence earnings. We included individuals who were employed on either a full time or a part time basis. This approach has been used widely in the academic literature. The basic specification of model was as follows (in aggregate and for men and women separately):

$$\ln(\omega_i) = \alpha + \beta' X_i + \varepsilon_i \quad \text{for } i = 1 \text{ to n}$$

where $ln(\omega_i)$ represents the natural logarithm of hourly earnings, X_i provides the independent variables included in the analysis as follows:

- Gender
- Age
- Age squared
- Ethnic origin
- Region of usual residence
- Qualifications
- Marital Status
- Number of dependent children under the age of 16
- Full time/ Part time employment
- Temporary or permanent contract
- Public or private sector employment
- Workplace size
- Interaction terms, and
- Yearly Dummies.

A4.2 Estimating the employment outcomes associated with qualification attainment

We adopted a probit model to estimate the likelihood of different qualification holders being in employment or otherwise. The basic specification defines an individual's labour market outcome to

be either in employment (working for payment or profit for more than 1 hour in the reference week (using the standard ILO definition) or not in employment (being either unemployed or economically inactive)).

The specification of the probit model was as follows (for men and women separately):

$$probit(EMPNOT_i) = \alpha + \gamma' Z_i + \varepsilon_i$$

The dependent variable adopted has the binary variable *EMPNOT* that is coded 1 if the individual is in employment and 0 otherwise.

We specified the model to contain a constant term as well as a number of standard independent variables including the qualifications held by an individual (represented by Z_i in the above equation) as follows:

- Gender
- Age
- Age squared
- Ethnic origin
- Region of usual residence
- Qualifications
- Marital Status
- Number of dependent children under the age of 16, and
- Yearly Dummies.

A4.3 Further modelling information

5.1.1 Marginal versus average returns

Throughout the analysis, we present detailed findings of the **marginal** earnings returns associated with different types of higher education qualifications, where marginal earnings estimates provide an indication of the returns associated with different qualifications when these qualifications are the highest qualification the individual holds.

5.1.2 Data

To estimate the impact of higher education qualifications on labour market outcomes, we used information from the Labour Force Surveys between 1996 and 2013. The selection of information over this period is the longest time for which information on education and earnings is available on a relatively consistent basis and thus provides the most robust analysis possible using the Labour Force Survey, as well as allowing significant analysis to be undertaken at a disaggregated level.

The analysis covers higher education qualification attainment across the United Kingdom and all information over the period has been adjusted to reflect inflation and is presented in constant prices.

A4.3.1 Counterfactual

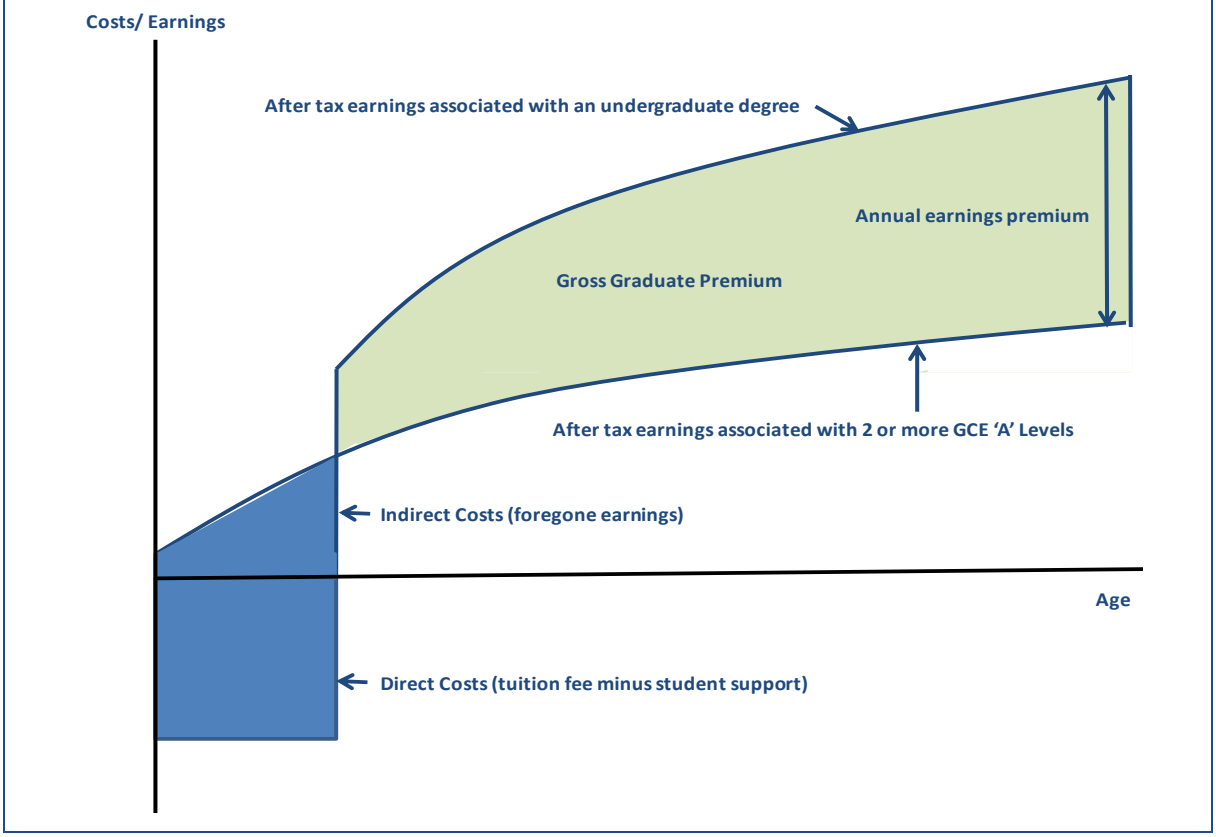
We compared the earnings of those in possession of an undergraduate degree to a counterfactual group to ensure that we assess the economic benefit associated with the qualification itself rather than the economic returns generated by the person in possession of the qualification. In this analysis, the counterfactual group consisted of those in possession of 2 or more 'A' Levels. This is a standard

approach in the literature and allows us to 'strip away' the other personal, regional or socioeconomic characteristics that influence both the determinants of qualification attainment as well as earnings.

A4.4 Assessing individual rates of return and the net graduate premium

To consider the net graduate premium associated with a particular level or type of qualification, it is necessary to estimate the direct and indirect costs associated with acquiring the qualification (tuition fees minus student support and foregone earnings), as well as the benefits of the qualification (the gross graduate premium or equivalent). These costs and benefits will occur at different points in the individual's lifetime (as shown in Figure 38) and so it is necessary to use the concept of net present value to compare them. The net graduate premium is calculated by subtracting the present value of the costs of qualification attainment from the gross graduate premium.

Figure 38: Representation of costs and benefits associated with qualification attainment



Source: London Economics

A4.4.1 Estimating the net lifetime earnings benefits/gross graduate premium associated with qualification attainment

The net lifetime benefits associated with qualification attainment are taken to be the present value of the enhanced post-tax (Income tax, National Insurance and VAT) earnings relative to an individual in possession of 2 or more GCE 'A' Levels. This is also known as the gross graduate premium in the case of undergraduate degrees.

To estimate the value of net lifetime benefits or gross graduate premium, we extended the econometric analysis presented in section A4.1 and A4.2. Using pooled Quarterly Labour Force Surveys (between 1996 to 2013), we undertook the following elements of analysis:

1. We estimated the earnings premium associated with different higher education qualifications in 5 year age bands across the working age population (see section A4.1).
2. We estimated the probability of employment associated with higher education qualifications in 5 year age bands across the working age population (see section A4.2).
3. We estimated the employment adjusted annual earnings achieved by individuals in the counterfactual group (either 2 or more GCE 'A' Levels or an undergraduate degree).
4. We inflated these baseline or counterfactual earnings using the earnings premiums from (1) and the employment probabilities from (2) to produce age-earnings profiles associated with the possession of the particular qualification.
5. We adjusted earnings to account for the fact that earnings would be expected to increase in real terms over time (assumed to be 2% per annum generally).
6. Based on the earnings profiles generated by qualification holders, and current income tax and National Insurance rates and allowances, we computed the future stream of net (i.e. post tax) earnings.
7. We calculated the discounted stream of additional (employment-adjusted) future earnings compared to the relevant counterfactual group (using a standard discount rate of 3.5% as presented in HM Treasury Green Book to generate a present value figure i.e. the gross graduate premium (or equivalent for other qualifications)).

This was undertaken for men and women separately.

Note that the estimates presented on the lifetime earnings premium are based on the assumption that students commence their full time undergraduate degree at the age of 18. The analysis provides an estimate of the post tax enhanced earnings achieved by graduates over their lifetime in present value terms (**net lifetime benefit** or **gross graduate premium),** as well as the enhanced taxation revenue/National Insurance/VAT generated by these graduates over their lifetime assuming the current income tax regime remains in place. If all of the steps except for step 6 above are followed, an estimate of the gross enhanced earnings achieved by graduates over their lifetime is generated instead **(the gross lifetime benefit).**

A4.4.2 Estimating the individual costs associated with higher education qualification attainment

The direct costs associated with qualification attainment include any tuition fees minus any student support the individual may be eligible for (i.e. grants and subsidies on fee and maintenance loans[46]). The assessed indirect costs to the individual include the foregone earnings during the period of qualification attainment. We did not consider any other indirect costs associated with qualification attainment. Subtracting the present value of these costs of attainment from the **gross graduate premium** provides an estimate of the **net graduate premium**.

[46] By considering the actual earnings of graduates post graduation and the characteristics of the current student support regime, we have modelled the interest rate subsidy associated with these loans (in present value terms) as a benefit to the individual thereby reducing the direct tuition fee cost associated with attending university.

A4.5 Assessing Exchequer net benefits and rates of return

A similar comparison between the costs and benefits of qualification provision to the Exchequer can be carried out to obtain the Exchequer rate of return and Exchequer net benefit. Again these costs and benefits will occur at different points in time and will need to be compared using the concepts of the net present value and rate of return.

A4.5.1 Estimating Exchequer benefits associated with higher education qualifications

The economic benefits accrued by the Exchequer include the enhanced income taxation and National Insurance contributions made by graduates, as well as the additional VAT receipts generated through increased consumption (in absolute terms) associated with higher earnings. Based on the expected earnings profiles generated by those in possession of higher education qualifications, the estimates of enhanced taxation receipts are calculated in the same way as the graduate premium described in previous sections.

A4.5.2 Estimating Exchequer costs associated with higher education qualification provision

The assessed costs to the Exchequer include the HEFCE teaching funding (depending on subject banding), student maintenance grants, the subsidy associated with maintenance and fee loans (accruing from the interest rate subsidies on the loans and write off criteria), and foregone income-tax, National Insurance and VAT receipts during the period of qualification attainment.

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