Viewforth Consulting Ltd

ESTIMATING THE TRUE ECONOMIC VALUE OF THE UK HIGHER EDUCATION SECTOR

Methodology and preliminary analysis of the UK HE Sector in 2016/17

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Preface - About Us

The current authors have worked on issues of higher education economic impact and measurement of economic and social value for many years. We produced the first ever analyses of the UK university sector as an industry and the economic impact of its expenditure (McNicoll COSHEP 1995, McNicoll, McCluskey & Kelly CVCP 1997), as well as conducting scores of subsequent studies for sectoral and government agencies as well as individual universities.

We worked with the Dearing Committee on economic aspects of higher education, developed the first UK application of welfare economics to higher education for measurement of economic and social value (Kelly, McNicoll & McLellan, 2005; Kelly, McNicoll & Brooks 2007; Kelly & McNicoll 2011) and were involved in the coordination of a major ESRC/Funding Council initiative on the impact of universities on regional economies (2007-2011). Since 2011, we have worked together as part of Viewforth Consulting Ltd, a Scottish-based micro company specialised in analysis of higher education economic and social impact.

The present paper has been undertaken as unfunded personal research, it is entirely independent of any UK HE institution, agency or government body. The findings derived and the views expressed are those of the authors alone.

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Summary

Millions of pounds have been spent on a myriad of evaluation, accountability and 'benchmarking' exercises for higher education in the UK over the past two decades, including the Research, Teaching and Knowledge Exchange Frameworks. There have been swathes of data collection exercises, and seemingly endless debate on whether or not higher education offers 'value for money.' Despite all of this, no holistic view has ever been taken of what value the sector is generating for the economy and society as a whole. None of the higher education agencies or government departments appear to have even attempted to address the core, pressing question for society: *What is the true economic value of higher education?*

New approach applying fundamental methodology

This report introduces a new approach, based on fundamental economic theory regarding economic valuation, that of true economic efficiency pricing in efficiency terms. We apply this to the UK HE Sector for 2016/17 as the most recent year for which we had access to relevant data. This was in order to make a preliminary test of the robustness of the methodology and the potential importance of the results and insights that it may afford into higher education policy.

Results of preliminary analysis

This new analysis, for the first time, has been able to estimate *the true economic value of UK higher education*. Given the physical volume of inputs and outputs in UK higher education in 2016/17, the analysis shows the following:

The total economic value of the UK higher education sector in 2016/17 would have been £44.96 billion, as opposed to its actual revenue in that year of £35.67 billion – its economic value running some 26% greater than its financial value.

This shortfall between economic and financial value was attributable to

- £4.92 billion (27%) less paid for UK Domestic and EU undergraduate teaching than its estimated true economic value
- £4.37 billion (33%) less paid for public and charity research and related activities than their estimated true economic value

The shortfall was met by the HE sector itself in two ways:

- University staff, especially senior academics, being paid £5.35 billion (22%) less than their economic value
- Universities failing to achieve the necessary economic sustainability margin needed to maintain and develop the sector. The shortfall here came to £3.94 billion – around 49% less than estimated as required.

Inferences

The implications of this analysis for the UK HE sector are grim. They include the inevitability of:

- A brain drain, with the most talented staff leaving the sector for higher paid careers elsewhere, in other industries or in universities abroad
- Continued financial instability, with universities unable to maintain their current portfolios or invest to innovate and increasing numbers of institutions teetering on the brink of insolvency

There are further implications, including the unavoidable conclusions that:

- There will be too many domestic students being taught at too low levels of quality. Where prices paid for a university education are too low, there will inevitably be very high demand and university suppliers will only be able to meet that demand by reducing quality.
- Too much research will be demanded by the public sector for too little resource and quality will inexorably be sacrificed for quantity.

All of this will lead to the decline of the UK higher education sector's international reputation and its ability to meet the real needs and wants of UK society.

Overall, this analysis shows that – very far from the popular notion that UK universities are 'marketised' - the UK University system is operating in a state of extreme market failure, trapped in a vicious circle of mediocrity by a government-imposed straitjacket of administered prices and micromanagement. There has been a complete failure of policy and imagination and a collective (sectoral and government) preoccupation with *accounting* issues rather than economic reality.

In terms of 'value for money', overall, it is clear that, based on the physical volume of inputs and outputs in 2016/17, UK higher education has been subsidising UK society, not the other way round. It also must be said that the people doing the subsidising and taking the brunt of the shortfall between financial and economic value have been higher education staff.

Ultimately what this paper begins to show is that the application of proper economic methodology to the functioning of the higher education sector can reveal considerably more in relation to what is happening within the sector and the value it delivers than the £ millions being spent on evaluating and policing the sector. This is not number crunching but confronting the economic reality of a sector that is now completely out of kilter. We need a new discussion about the content of the social contract between universities and society, what is really, and realistically, expected on both sides. It is perfectly possible for government to let the market evolve in an economically efficient way with agreed, *transparent* and socially approved adjustments for equity and all of society would be better off as a result.

Introduction

We are releasing this paper in Summer 2022, as the higher education sector in the UK appears, once again, to be in crisis mode. For anyone who has worked in higher education over the last 30 years there is a distinct feeling of déjà vu. When is the higher education sector *not* in crisis?

Finance

The sector is emerging post-pandemic in vulnerable financial shape. In March 2022 the National Audit Office (NAO) highlighted, of institutions in England, that 32% of institutions had an in-year deficit, with 20 of those (8%) having had a deficit for at least three years running. Furthermore, 13% of institutions had forecast that:

> *"by the end of the year, they would not have enough money to fund at least 30 days expenditure from their cash or credit facilities."*[1]

Indeed in April 2022, just one month after the publication of that NAO report, the first higher education institution under the regulation of the Office for Students, albeit one of the smaller providers, went bust. [2] The position in other parts of the UK is no better. In Scotland, for instance, also in March 2022, the Scottish Funding Council has reported that:

> *"Ten institutions [3]are expecting to report underlying operating deficits in 2020-21 albeit the levels of deficit, in general, are significantly reduced against previous returns. Eight institutions are forecasting underlying deficits in both 2021-22 and 2022-23"*[4]

Unhappy Staff and Students

There is an ongoing and acrimonious dispute between higher education staff and higher education employers on pay and conditions, particularly regarding pensions, with regular bouts of industrial action having taken place since 2018. There is no resolution in immediate sight. [5] As the academic year nears its close, a new wave of university staff redundancies at several established institutions has been announced, with the closure of a number of Arts and Humanities Departments. A recent union survey of higher education staff indicated that staff morale is so low that nearly two thirds are considering leaving the profession over the next five years.[6] Students do not seem very content either. The latest Annual report from the *Office of the Independent Adjudicator for Higher Education*

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[1] *Regulating the Financial Sustainability of higher education providers in England National Audit Office, March 2022 https://www.nao.org.uk/report/regulating-the-financial-sustainability-of-higher-education-providers-in-england/*

[2] The sudden closure of the Academy of Live and Recording Arts (established 1979) in April 2022 attracted considerable publicity. See : https://www.theguardian.com/education/2022/apr/04/british-drama-school-closes-suddenly-after-heavy-losses See also: https://www.oiahe.org.uk/students/complaints-about-alra/

[3] That is to say, 10 institutions out of 18, 55% of the HE sector in Scotland.

[4] *The Financial Sustainability of Colleges and Scotland in Scotland* Scottish Finding Council (SFC) March 2022 https://www.sfc.ac.uk/publications-statistics/corporate-publications/2022/SFCCP022022.aspx

[5] For the latest news on this, see the Universities and College Union website, e.g.: https://www.ucu.org.uk/article/12256/UCU-members-back-marking-boycott-in-pension-dispute

[6] *https://www.ucu.org.uk/media/12532/HEReport24March22/pdf/HEReport24March22.pdf*

has highlighted that the Office has received the highest ever numbers of complaints from students in England and Wales.[7]

Confused Policy

Government policy towards higher education, particularly in England, appears increasingly inconsistent and erratic - even panicked - with a raft of proposed interventions into the management and finances of higher education institutions. These include not only maintaining an administered fee cap on what universities can charge domestic undergraduates but also proposing a reintroduction of a numbers cap on students, alongside a potential government-imposed minimum entry requirement for higher education.[8] MPs on Government Select Committees accuse university staff of "having not pulled together" during the pandemic[9]; there is a regular slew of media articles criticising universities, highlighting 'fat cat' vice chancellors[10], assertions that there are a proliferation of 'Mickey Mouse' degrees and too many students doing the "wrong" courses"[11].

This has led to suggestions that the government may levy sanctions and fines on universities if not enough of their graduates go into 'graduate jobs'.[12] Above all, there are frequent accusations of universities *not giving value for public money*.[13]

How did we get here?

How did we get here? Many millions of pounds have been poured into piecemeal attempts to 'measure' aspects of the sector in isolation, invent performance indicators and 'benchmarks' (the Research, Teaching and Knowledge Exchange Frameworks, to name a just a few.) In the meantime, funded research into the economic and social importance of higher education remains fragmented and often tangential, with an emphasis on general outcomes rather than on what the Universities can actually do and deliver. (For instance, a focus on the impact of university-business collaboration

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[7]Students can complain to the Office of the Adjudicator (OIAHE) if they are not satisfied with redress through an institution's internal processes. The OIAHE covers England and Wales. In 2021 they received 2,763 complaints, up 6% on 2020. See: https://www.oiahe.org.uk/resources-and-publications/latest-news-and-updates/oia-publishes-annual-report-for-2021/

[8] As many have pointed out, this is somewhat at odds with a simultaneous government demand that universities do better on 'widening participation' and increase entry to students from disadvantaged backgrounds, using contextual admissions and so forth.

[9] A video from the Education Select Committee in October 2021: https://fb.watch/cXXAlFR-sk/

[10] The Daily Mail 11 January 2021 https://www.dailymail.co.uk/news/article-9132573/Almost-50-universities-chiefs-kept-fat-cat-salaries-pandemic-began-despite-students-suffering.html

[11] https://www.standard.co.uk/news/education/universities-degrees-higher-education-grades-funding-student-loans-b984218.html the Evening Standard 23 February 2022 February 2022

[12] See: *https://www.timeshighereducation.com/news/virtually-all-universities-risk-ofs-sanction-under-new-rules* The fact that universities have no control over the labour market is apparently neither here nor there.

[13] https://jnews.uk/ofs-announces-plans-to-punish-english-universities-for-poor-value-for-money-higher-education/ https://www.bbc.com/news/education-52999315 This is *despite* the fact that it is widely acknowledged that the public purse does not cover all the costs of higher education provision in the UK. Most recently this has been stated quite bluntly by the National Audit Office in its 2022 report *Regulating the Financial Sustainability of higher education providers in England : "Publicly funded teaching and research make a loss across the sector once the full economic costs of those activities are taken into account. "* *https://www.nao.org.uk/report/regulating-the-financial-sustainability-of-higher-education-providers-in-england/ National Audit Office, March 2022*

on innovation, on the 'impact' of research, on graduate 'employability', what graduates end up earning and rates of return to the exchequer or on higher education process and comparative system studies.) **No holistic view has ever been taken of what value the sector is generating for the economy and society as a whole** – which is, frankly, essential to know if there can be any sensible insight into whether or not universities are delivering 'value for money' to society.

This report is intended to give a new and, we believe, fundamental, perspective on the issue of UK universities and economic value. The analysis and its findings are preliminary, but we hope we have been able to shed new light on the apparently intractable problem of how to capture the real value generated by UK higher education.

Paper Content and Structure

This paper presents new insights into the economic value generated by the UK higher education sector for UK society. We will demonstrate how, through application of fundamental economic theory, the real economic value of the sector can be measured. Furthermore, by applying fundamental economic principles to the measurement of value, it enables the worth of hitherto 'invisible' aspects of university outputs – such as the real value of publicly funded research being undertaken – to be more clearly observed. Preliminary estimates of economic value are made for the 2016/17 UK University academic and financial year.

The paper comprises three parts. **Part One** summarises our approach undertaken to measuring economic value and the relevant economic theory. **Part Two** presents the results of our preliminary application to the higher education sector using 2016/17 data. **Part Three** highlights the implications and inferences that can be drawn from the results, as well as posing some of the key questions arising for the sector, for government, and for UK society as a whole. There are a series of appendices giving more detail on data sources and usage.

For the purposes of this paper the UK Higher Education Sector is defined as those institutions – predominantly private, non-profit-making entities – that are included in the Higher Education Statistics Agency financial data for **2016/17**. [14] These include both universities and other higher education institutions. In referring to all of these institutions in this paper the term 'university' and 'higher education institution' will be used interchangeably, as will 'university sector' and 'higher education sector'. The paper focusses on the UK higher education sector as a whole. Adjustments have been made in the data analysis to take account of the different financial arrangements, particularly in regard to domestic undergraduate fees, across England, Wales, Northern Ireland and Scotland.

Part One: Defining and measuring the economic value generated by the university sector in the UK: issues and challenges

Addressing an economic, not a financial, question.

We would argue that one of the major barriers to clarity of thought in many current discussions about higher education is that when people talk about the 'economics' of higher education and whether or not universities are delivering 'value for money', they are in fact talking about *finance* and not about economics. The distinction between the two is vitally important. We would suggest that part of the reason for the ongoing policy malaise in higher education is due to policymakers, regulatory agencies (such as the Office for Students) and even those committees charged with undertaking reviews of higher education (e.g. Augar[15]) – predominantly looking at higher education

[14] In 2016/17, this included 164 institutions. Since the year of analysis, considerable more higher education providers have been included in HESA statistics – 266 institutions in 2019/20. This largely reflects policy changes in England where more organisations, including a number of profit-making organisations, could apply for registration as a recognised higher education course provider (and hence qualify for publicly funded student loan purposes.) These include a number of extremely small institutions (for instance one institution recorded an income of only £384k in 2019/20.) The principles of the approach adopted in this paper would continue to apply however, regardless of how many organisations are considered 'higher education providers' in any given year.

[15] The 'Augar Review' was produced in 2018 https://www.gov.uk/government/publications/post-18-review-of-education-and-funding-independent-panel-report

through an *Accounting* prism. This has led to an overwhelming preoccupation with *costs* and the *financing* of higher education rather than the *value generated* by higher education.

How to pay for higher education is of course a serious policy matter, but it is a second order question. It should not obscure the more fundamental issue of *whether or not higher education is worth paying for at all.*

To address the latter you need to look at *the economic value generated* by universities and address the question: *What is the value of what the higher education sector does?* We need to be able to capture the overall value to society generated by the higher education sector, including the value of elements that are not measured in traditional accounting and actual financial flows. It is only then that it will be possible to make fully informed decisions about higher education and whether or not it offers 'value' for society money.

Measuring University Outputs

We began to explore an holistic approach to capturing the value of what higher education *does* several years ago, initially in work supported by the Nuffield Foundation and the Scottish Funding Council, where we pioneered the application of fundamental welfare economic theory to the operations of UK higher education. [16] This was an output-based approach and focussed on ways to value what the higher education institutions *produced* as a result of what they did.

Outputs versus Outcomes

It is important to note here that *outputs* always need to be differentiated from *outcomes*. When it comes to higher education the two are often confused. The point is that only *outputs* are in the control of the university. *Outcomes* are reliant on additional external factors beyond the university's control. For example:

- University staff can deliver teaching *(an output)* but they cannot compel students to learn enough to successfully become a graduate (*an outcome*.)
- Universities can provide extensive support for students to develop 'employability' skills (*an output*), but they cannot guarantee graduates will obtain jobs *(an outcome*) in an external labour market over which they have no influence.
- A member of staff may produce an international level quality research paper *(an output)* but whether or not it makes an obvious impact *(an outcome)* is dependent on many factors, including the 'absorptive capacity'[17] of the economy or the prevailing cultural, legal or social milieu into which the research is released.

There is extensive discussion of this in our earlier work and many government good practice guides on evaluation – including the Green book, the Magenta Book,[18] etc., acknowledge a clear distinction between outputs and outcomes. This makes it all the more ironic that government policy towards higher education has become sufficiently confused that they appear to be trying to use 'outcomes'

[16] *Towards the estimation of the value of the outputs of Scottish Higher Education Institutions* Kelly, McNicoll & McLellan (2005); *Towards estimating the value of the outputs of Scottish Higher education Institutions Next Steps* Kelly, McNicoll & Brooks (2008) and a user-friendly summary is contained within *Through a Glass darkly: Measuring the social value of universities* Kelly & McNicoll (NCCPE 2011)

[17] 'Absorptive capacity' simply means there is sufficient external wherewithal (know-how, economic and business infrastructure etc.) to make use of the research

[18] *The Green Book: appraisal and evaluation in central government (Updated 2022)* https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-governent *The Magenta Book: HM Treasury guidance on what to consider when designing and evaluation* (Updated 2020) https://www.gov.uk/government/publications/the-magenta-book

e.g. 'Graduate outcomes' as a performance indicator for universities, against all their own good practice guidelines.

Universities are not 'special' organisations

Among some of the other challenges involved in assessing the value of what universities do and deliver is confronting the popular belief - still current across many parts of the sector – that universities are 'special' types of organisation, whose different complex activities, including the 'intangible' and 'non-monetary', are 'invaluable' or beyond valuation.[19] If one is thinking in purely financial or 'Accounting' terms, there may be some truth to that. However, *in economic terms,* universities are like any other organisation operating in the modern economy. *They use resources in order to undertake their chosen activities, in order to deliver certain things.* This means that it should be possible to make some estimate of the value of what they deliver using recognised economic techniques, in the same way that this could be done for any other industry or set of organisations.

Our initial approach to output valuation

Our approach to valuing higher education outputs involved three core steps:

- Identifying the range of higher education outputs *(What do universities produce?)*
- Quantifying these in natural or physical units *(How much of it do they produce?)*
- Finding an economic efficiency price[20] for each unit of output, using shadow-pricing where necessary. (*What is the value of the things they produce?*)

Identifying and quantifying higher education outputs in this way was very much in tune with (and it was undertaken around the same time as) the work of the Office for National Statistics (ONS) Atkinson Review in measuring the outputs of public services so that public sector service value could be included within productivity figures in the National Accounts.[21] Atkinson was also examining outputs that may be difficult to measure (e.g. Value delivered by the education system or the criminal justice system.) We were, in fact, going further than Atkinson by applying shadow-pricing - Atkinson stopped short of this to apply 'quality-weighting' instead, which was sufficient for the specific ONS purposes.

[19] Unfortunately this notion, often held in an idealistic way, contributes to the problems faced by higher education institutions. If something is considered 'beyond valuation', too often it may be treated as having no value. The idea that universities are 'special' has simply led to them not being paid the full value of what they do - while at the same time frequently being lambasted by government for *not doing enough of the things they are not paid to do.* A 'special' kind of business, indeed.

[20] What does 'economic efficiency price' mean? Essentially we are seeking to identify the price that would be generated under completely free and fair market conditions – a situation of general equilibrium, where supply and demand exactly meet. This is a situation where there is perfect allocative efficiency. The right amount of money is spent on the right amount and right type of goods and services to meet the demand for those goods and services.

[21] See: *The Atkinson review: Measurement of Government Output and Productivity for the National Accounts* Many of Atkinson's recommendations on output measurement have now been incorporated into the National Accounts.
https://www.researchgate.net/publication/50859339_The_Atkinson_review_final_report_Measurement_of_government_output_and_productivity_for_the_national_accounts

Over the last few years we have undertaken a range of further analyses using an output-based economic efficiency value approach, often in case studies for different universities and in considering sector-wide questions – such as the value of the significant amount of unpaid public service and knowledge exchange activity in which UK university staff are known to engage.[22]

The work we have undertaken in defining, identifying, quantifying and pricing outputs is consistent with the approaches adopted by the international System of National Accounts, Eurostat, World Bank, HM Treasury et al, and remains theoretically valid. The primary difficulty in implementation of this methodology in UK higher education system-wide, however, has been the perceived 'data-intensive' requirements.

Challenges to undertaking output valuation for universities

When we first explored this approach, we had identified nearly 300 separate output types associated with a single university. Our subsequent research has led us to believe that many categories of outputs could, in fact, be intelligently aggregated for valuation purposes. However, taking forward the robust application of output-based valuation (including the derivation of a single set of agreed shadow-prices) across the whole of UK higher education would still be a fairly extensive task and could only realistically be undertaken by the UK higher education sectoral agencies or by government bodies. Given the extensive amount of resources that those agencies devote to the operation of the array of other regular higher education 'evaluation' exercises (the Research, Teaching and Knowledge Exchange 'Excellence Frameworks', to name three obvious examples, not to mention the annual HESA data collection exercises) this would not be beyond the bounds of possibility. However, it is certainly beyond the scope of individual independent researchers to implement.

There is another key challenge in adopting an output valuation approach. This is because, while a significant proportion of university outputs can be relatively easily identified, quantified and economically priced, it can be more difficult to find an economic efficiency price for university research outputs, in particular those that are less market oriented, including much research in the Arts and Humanities or 'blue skies' research in the Sciences.

Currently most work on ways to capture *'the value of research'* has tended to focus, not on the output value - the value of what the university produces, but on final *outcomes* and externalities, seeking evidence for spillovers, stimulae to innovation through collaboration, third party (especially business) benefit, etc. There is quite a significant body of research in this vein (see, for example, the work from the UK-IRC , such as Enhancing Impact The Value of Public Sector R & D Hughes et al (2012.) A recent useful overview of a typical range of approaches to 'value' capture in research can also be found in Smit & Hessels (2021).[23]

This perception of value achieved through practical research *usage* also underpins the philosophy behind the 'impact' element of the Research Excellence Framework , the promotion of 'Knowledge Exchange' and developments such as the *Catapult Network*[24] which supports collaborations between academic researchers and industry. While, clearly, evidence of use shows that the specific research outputs have value to the users, this still leaves a large proportion of research in the Arts and

[22] See *An elephant in the room: the hidden economic value of public engagement and knowledge exchange of UK universities* Kelly & McNicoll (2018)

[23] Jorrit P Smit, Laurens K Hessels, *The production of scientific and societal value in research evaluation: a review of societal impact assessment methods*, Research Evaluation, Volume 30, Issue 3, July 2021, Pages 323–335

[24] https://catapult.org.uk/.

Humanities as well as more theoretical research in other disciplines somewhat 'orphaned' in terms of how to capture or infer its value, as it is not at all near market. So, with an entirely output-based approach, the problem of identifying the real economic value of the entirety of the university sector remains.

Measuring University Inputs

Therefore, we began to turn our minds to the other side of the equation – *the input side.* When we first began our work, we had disregarded an input approach, because, in line with statistical good practice from the Eurostat handbook, input measures should not be used **as proxies** for output measures. In other words, the 'number of lecturers' cannot be used to reflect university output, just as 'number of doctors' cannot be used to reflect output of the health service. However, in taking an altogether fresh look at the problem and referring back to fundamental economic theory, including the Theory of the Firm, the Theory of Markets and Welfare Economics, we began to realise that, while input measures should not be used *as proxies* for output measures, that does not mean that input ***valuation*** should be disregarded.

Key economic points

The non-economist reader needs to bear with us here. This paper is not a textbook and we will refrain from elaboration of the underlying mathematics; however, it is important to reference some of the relevant core points arising from fundamental economic theory.

These are:

1. In a perfectly competitive market, every firm is a price-taker and will earn from its sales sufficient to cover operating costs (including labour) and derive a "normal profit."
2. In an economy of perfectly competitive markets, the outcome production of goods and services will exactly meet valid demand.

(In other words, in a perfectly competitive market, supply and demand will naturally reach an equilibrium and prices will settle at exactly the right level to meet both consumer willingness to pay and supplier capacity to provide. This is the process that Adam Smith described as the workings of the "Invisible Hand".)

3. The outcome of this competitive equilibrium economy is that the total use of inputs, production of outputs and demand for outputs will be in an equilibrium called ***Pareto Optimum.*** That is to say, the economy is using its resources in the most efficient way possible to meet the maximum demanded goods and services.

(In other words, the equilibrium achieved is the best possible balance of the use of resources to meet the relevant mix of demand. It is the best possible outcome for all engaged parties and cannot be improved upon. If you try to change or adjust it, it implies some resources will be wasted and somebody will be worse off as a result.

4. The theory of Welfare Economics states that there are an infinite number of Pareto Optimum outcomes (as defined in (3), depending on the initial distribution of resources. However, the application of appropriate social weights can narrow this down to a single pareto efficient equilibrium which is ***Pareto Optimum Optimorum***. That is to say, the production and

price of ALL goods and services meet the maximum possibilities of that economy according to the demands of that society, as appropriately socially weighted.[25]

*(In other words, there are many - an infinite number- of different outcomes that would meet the definition of **Pareto Optimum,** depending on where you started from and who had which resources to begin with. Hence, a **Pareto Optimum** outcome may not always be seen as a socially equitable outcome. However the incorporation of social weights can 'tip the scales' towards the single best possible outcome use of resources (**Pareto Optimum Optimorum)** bearing in mind wider society wishes and preferences.*)

Those are the key points relating to an efficient, competitive, equilibrium economy. If we imagine the situation that universities are (or could be) operating within such an economy then, as per point (1) above, they would be expected to:

> *"earn from their sales sufficient to cover operating costs (including labour) and derive a 'normal profit'."*

So too would all the other organisations with whom a university deals. The overall prices and the levels of supply and demand would settle into an equilibrium.

Therefore, based on fundamental theoretical economics, we can **absolutely correctly** achieve the economic valuation of university outputs based on the following principle*:*

The economic value of university outputs is identically equal to the economic value of its inputs including "normal profit".

Hence, a legitimate methodology to find the **true economic value of university outputs** is to find what the true economic value (economic efficiency value) **of their inputs** would be, including "normal profit", in a perfectly competitive market.

Shadow-pricing in an imperfect world

In the real world of course, no markets are perfectly competitive and the actual input prices can be different, sometimes very different, from what would be expected in an economically efficient and competitive environment. In this case, we may need to 'shadow-price' inputs to find their economic efficiency value. While shadow-pricing entails additional steps within an analysis, the fundamental principle is the same:

The shadow-priced value of inputs (including 'normal profit') =

the economic efficiency value of inputs =

the shadow-priced value of outputs =

the economic efficiency value of outputs = the true economic value of outputs.

[25] What are social weights? These are ways to reflect the importance a society places on a certain type of outcome. These could be distributional weights, based on income (for instance the HM Treasury Green Book shows ways to use distributional income weights in evaluating policies intended to benefit low income recipients) or ones that reflect other social or cultural preferences such as support for 'widening participation' in higher education or assisting disadvantaged groups to access healthcare, and so on.

In other words, if we focus on estimating the shadow-priced value of the inputs and include the sustainability margin that economists call "normal profit", we will **by definition** have arrived at the shadow-priced value of the outputs – *the economic efficiency value of the university sector*. [26]

Working on this side of the equation was considerably more feasible for our individual unfunded research because:

- Universities typically know a great deal about their inputs
- Most inputs are things that can be priced e.g. staff salaries, equipment, professional services, catering supplies, etc.
- The sectoral agencies collect considerable data on university income and expenditure
- Enough of this information and data is in the public domain for us to make preliminary estimates of value using this new methodological approach

As far as we were aware, no one had ever actually applied this approach to valuation of UK higher education. To test the concept against reality therefore, we decided to apply this theoretical approach to the real UK higher education sector, using the data available to us within our limited resources. The results are presented in Part Two. We would emphasise that the results are preliminary and we were entirely reliant on using data that were freely available in the public domain. We make no apologies for that, given that many UK higher education and government agencies have considerably more means at their disposal for research into higher education than we do and, in due course, it will be perfectly possible for them to replicate and extend this analysis in more detail, with better data and more research resource.

[26] It is really important for people working in the HE sector to grasp that the concept of 'economic efficiency' is not about 'bean counting' and has nothing to do with financial concepts such as 'cost-efficiency'. We are talking about economics and not about finance. An economic efficiency approach is the only holistic way to enable the value of cultural and social aspects of higher education, including the value of Arts and Humanities education, to be acknowledged. Things that are invisible to an accountant can be *very* visible to an economist.

Part Two Headline Results

In this analysis we have focussed on 2016/17 data. Higher education sectoral data is typically published one year in 'arrears' and when we began this work (in 2019) it was the most recent data available. [27] In 2016/17, the university sector had a total revenue (equivalent to sectoral gross output) of £35.67 billion. Costs and expenditure incurred by the sector came to £34.49 billion. This gave an operating surplus (or 'Accounting Profit') for the year of £1.18 billion.

The financial summary is presented in Table 1 below.

Table 1: UK Higher education Sector 2016/17 Financial Summary[28]

UK Higher Education Sector 2016/17 Financial Summary	
	Financial Value £ billion
Total Income	**£35.67 billion**
Non-Labour Operating Costs	£12.54 billion
Staff Costs	£18.95 billion
Depreciation	£2.30 billion
Interest	£0.71 billion
Operating surplus	£1.18 billion

Source: HESA Finance Plus 2016/17

Economic Efficiency Value of Inputs

We analysed the income and expenditure of the sector in 2016/17:

- To identify the elements of University 'input' where the financial value could generally be regarded as representing the economic value.
- To identify those elements where the financial value may not represent the economic value.

In Table 2, items labelled **(A)** are those where their financial value was assumed equal to their economic value. For the items marked **(B)** however, their financial value was not considered as equivalent to their economic value and a shadow-pricing exercise was conducted to estimate their economic efficiency value i.e. what their price would be in a free, competitive, equilibrium market.

[27] It must also, sadly, be noted that after 2018 the usefulness for economic analysis of the publicly available data on UK higher education has significantly deteriorated, largely because of decisions made by the Office for Students in England, whereby HESA no longer collect comprehensive data on higher education institutional resources (specifically staff) in England. Inter alia, this is a contributory factor to the inability of the OfS to make any , even preliminary, judgements on 'value for money' delivered by the sector – a weakness noted by the National Audit Office in its March 2022 report https://www.nao.org.uk/wp-content/uploads/2022/03/Regulating-the-financial-sustainability-of-higher-education-providers-in-England.pdf

[28] For consistency, all HE financial data used in this report (both input and output data) is sourced from the 'static' published *HE Finance Plus 2016/17* volume. The current online open data published by HESA is not entirely consistent year to year as HESA typically updates *part* of the dataset (income and expenditure summary) if an institution 'restates' one year's set of annual accounts in a subsequent year . However it does *not* then update the corresponding and underlying disaggregated income and expenditure figures (e.g. income from research/tuition fees etc.), which means the totals cannot be reconciled. Using a single year's published and archived 'static' figures is therefore the only way to ensure reconciliation of the totals with the disaggregated income and expenditure figures.

The summary results are presented in Table 2. The 'Financial Value' column contains the reported financial data for the sector for the academic and financial year 2016/17 (HESA 2016/17). This is the *financial* value of the sectoral inputs. The 'Economic Value' column is our calculated economic efficiency value for the sectoral inputs, i.e. what these might be in a competitive equilibrium market.

Table 2: Analysis of Economic Efficiency Value: Input side

UK Higher Education Institution Financial and Economic Values 2016/17: The Input Side			
Type (A) or (B)	**Item**	**Financial Value £billion**	**Economic Value £billion**
(A)	Non Labour Operating Costs	12.54	12.54
(B)	Staff Costs	18.95	24.3
(B)	Other OVA (="normal profit")	4.18*	8.12
	Total	**35.67**	**44.96**
(A) Financial Value assumed equal to Economic Value			
(B) Economic Value Calculated by Shadow Pricing			
**Includes Operating Surplus, Depreciation and Interest payments*			

Source: HESA Finance Plus 2016/17 and Viewforth Analysis 2021

Explanation of item categorisations

(A) Items – Inputs where financial value is assumed equal to economic value

- **Non-Labour Operating Costs**

Non-Labour Operating Costs include all the normal day-to-day costs of the things that Universities 'buy in' from other suppliers. These would include, for example, equipment, materials and services such as office and laboratory supplies, legal and financial services, IT services, etc. We consider the financial value of these is likely to be approximately equal to their economic value as universities generally have fairly efficient procurement processes and it is assumed that:

a) Universities are able to purchase what they need freely in the market place – they are not generally constrained as to suppliers they must use.[29]

b) What universities pay for external goods and services to support their operations are likely to be at competitive market prices, particularly since they can buy in world or international markets.

(B) Items – Inputs where financial value is not assumed equal to economic value and which can be shadow-priced

- **Staff Costs**

For many years, it has been suggested that university staff pay, in particular - but not only - some categories of academic pay has not kept pace with external equivalents. The last full scale

[29] There is possibly an exception to this when it comes to Library and Journal subscriptions, given the evidence of market-failure in the academic journal-publishing world. (We have discussed this at length in an earlier report for JISC – *The Value and Benefits of Text Mining* (McDonald & Kelly 2012) However these are likely to have made up only around 2% of an institution's non-labour operating expenses. In addition, fine-tuning would adjust for taxes/subsidies, but would only have a net second order effect.

comparative analysis of pay and conditions in UK Universities was conducted over 2 decades ago. [30] Currently, while universities apply extensive 'job evaluation' type procedures these are generally focussed on intra-sectoral issues – i.e. the 'rate' *within* the sector and to ensure intra-institutional compliance with equal pay legislation rather than being intended to ensure broader salary parity with external equivalents.

It must also be noted that negotiations over most of the wages and salaries in the sector are undertaken through a negotiating committee (the Joint Negotiating Committee for Higher Education Staff or JNCHES) that comprises members of quasi-monopolistic bodies, i.e. the higher education trades unions (with the Universities and Colleges Union (UCU) as the largest single Union) and the University and Colleges Employers' Association (UCEA).[31] It can be easily demonstrated from economic theory that the outcomes of such quasi-monopolistic negotiations rarely result in efficient market equilibrium staff prices.

All of this means that there is a very real possibility that the financial value of University staff salaries do not match their economic efficiency value (i.e. what those levels of skills and qualifications would earn in a perfectly competitive market.) We therefore undertook an extensive shadow-pricing exercise, seeking to compare university salaries with those for equivalently qualified jobs elsewhere in the economy.

Shadow-priced value of Staff inputs

The outcome shadow-pricing exercise led to the economic efficiency value of university salaries in 2016/17 estimated as being in the region of £24.3 billion – over 28% higher than the reported financial value.

More details of our approach to shadow-pricing and the data used is contained in Appendix One.

- **Other OVA: "Normal profit"**

We now need to talk about 'profit', a word which can, unfortunately - and, we would say, mistakenly - raise the hackles of many in the university sector who feel such a concept should have no place in a non-profit-making industry. However, "profit" is not a dirty word and it cannot be got away from. We stress again that we are talking about *economics* and economic sustainability in a competitive equilibrium economy. This is not about accounting and not about turning an *accounting* profit, which has a conventional definition and application (not least for taxation purposes.)

OVA stands for 'other value added' which is broadly equivalent to the *economic* definition of **"normal profit".** Our definition of OVA for the present purposes is:

OVA = Total Revenue minus both non-labour operating costs and labour operating costs

Where the University Financial statements present the basic operating surplus (*Accounting Profit*), **"normal profit"** can be considered the essential long run sustainability margin[32] needed to ensure

[30] *The Independent Review of Higher Education Pay and Conditions* (The Stationery Office, 1999)

[31] For more details on how higher education pay and conditions are negotiated see: https://www.ucu.org.uk/article/1934/History-of-the-current-HE-negotiating-arrangements

[32] The need for a 'sustainability margin' in higher education has been known and discussed many times – for instance, the *Transparent Approach to Costing* (TRAC) system attempts to build in a margin. See: https://www.trac.ac.uk/tracguidance/ However, as we discuss subsequently, this is based on 'Cost-Plus Pricing' in higher education, which is *not* the same as economic efficiency pricing and Cost-Plus pricing only serves to help trap institutions within a vicious circle of mediocrity.

the ongoing future of any business. As well as direct financial costs and expenses, it includes all other economic costs including, for example, opportunity costs. It represents the margin needed to enable ongoing investment in operations, enable innovation and risk-taking to remain competitive as well as some protection against a temporary downturn or adverse occurrence affecting trading conditions.

It is far from 'fat cat' territory (that may be the province of *excess* or *supernormal* profit), but simply means that organisations are *breaking even* in long run economic terms. The future prospect for enterprises that continually fail to earn a "normal profit" are bleak as they are not sustainable in their current form in the long term. In a competitive equilibrium market all businesses would tend towards normal profit levels – it is only in conditions of market distortions, such as instances of monopoly power, that a business will earn excess or 'supernormal' profits.

The universities we are studying may be non-profit-making organisations – but that does not mean they are magically exempt from the necessity to earn "normal profit" to survive. Being "non-profit-making" just means that all and any financial surplus they earn is reinvested in their operations rather than being paid to shareholders.

In analysing the financial accounting information for the sector in 2016/17, the operating surplus (or '*Accounting* profit') was recorded as £1.18 billion, equivalent to 3.3% of their revenues.[33] However, as we have just highlighted, this is **not the same** as "normal profit". As an approximation of what universities are currently earning that is closest to what could be described as their current "normal profit" margin, we have identified their OVA as £4.18 billion or 11.7% of revenue (i.*e. Total Revenue minus non-labour operating costs and labour operating costs.*)

What would "normal profit" for the university sector look like in a competitive equilibrium economy?

However, we needed to estimate what "normal profit" would look like for the University sector *in an economically competitive and efficient market*. Clearly, there is a considerable degree of uncertainty over this, given that the current HE 'market' is streets away from that description. As an approximation, we made the assumption that, in an economically competitive market, universities would generate similar levels of OVA or "normal profit" as other businesses. Therefore we drew on the 2017 UK Input Output tables to identify a UK-wide average rate of OVA (from across all sectors of the economy) and applied this to the University sector.

Shadow-priced value of Other Value Added (OVA) or "Normal Profit"

The UK average OVA for 2016/17 [34]across all enterprises was equivalent to ***22.76%*** of revenues. Applying the UK average OVA to university sectoral revenue for 2016/17 gave a shadow-priced OVA of **£8.12 billion**. We would emphasis once more that this level of "normal profit" is simply an *economic sustainability* margin, representing a long-run break-even position. It would **not** mean that Universities were "awash with cash."

[33] By way of general comparison, the closest equivalent reported net 'accounting profit' for Service Sector industries in the UK in 2017 was 14%.
https://www.ons.gov.uk/economy/nationalaccounts/uksectoraccounts/bulletins/profitabilityofukcompanies/julytoseptember2017

[34] UK I/O Tables 2017. Average UK OVA derived from (Gross Operating Surplus plus Mixed income)/ Domestic Output at basic prices.

The overall estimated economic efficiency value of the UK HE Sector

We have earlier explained:

> ***The shadow-priced value of inputs plus "normal profit" =***
>
> ***the shadow priced value of outputs =***
>
> ***the true economic value of outputs***

As Table 2 shows, the outcome shadow-priced economic efficiency input value of Universities calculated in this way came to £44.96 billion in 2016/17.

This means that ***by definition***, the economic value of what the UK Higher Education Sector delivered in 2016/17 was £44.96 billion, some £9.29 billion or around 26% higher than the £35.67 billion financial income it received.

Therefore, as we have elaborated in the previous section, for the very first time we now **know** the estimated economic value of the HE sector. In itself, being able to estimate the overall economic value of the entirety of the HE sector operations is a considerable advance on the many previous, partial and piecemeal, approaches to estimating economic value.

However we wanted to go further and consider if it is possible to allocate that value across the range of diverse university outputs to make some observations as to which activities have a higher economic efficiency price (i.e. higher economic value) than their actual financial price.

Economic Efficiency Value of Outputs

Firstly, to reiterate, we now **know** the total estimated economic value of the Sector in 2016/17. (£44.96 billion). This provides the 'control total' when attributing value to different types of university output in that year.

Table 3 presents our outcome allocation of the respective shares of economic value generated across the range of identified output categories. The 'financial value' column shows the actual price in 2016/17 (i.e. what the universities were paid for those outputs). The 'economic value' column shows our estimate of the economic value (economic efficiency price) of those items in that same year. We would emphasise that any fine-tuning of the allocations below (e.g. increasing or decreasing the estimate of the economic efficiency value of tuition or moving elements of other items from one category to another) does not affect the overall calculated value of higher education, which will remain as £44.96 billion. It would simply mean more refinement in terms of in which types of activity the output value is thought to be generated.

In this paper (and presented in Table 3), we have made a broad allocation of value to the different types of output as follows:

(A) Items – those outputs for which financial value assumed equal to economic value.

(B) Items – those outputs for which financial value is not assumed equal to economic value and which can be shadow-priced.

However, there is an additional category (C).

> ***(*C) Items – Outputs for which economic efficiency value can be *deduced.***

The importance of what is revealed by Category (C) can be observed within the results in Table 3. We have earlier explained that it can be difficult to shadow price some elements of university outputs. However, with this approach, if they cannot be treated as part of Category (A) or Category (B), by default they **must** fall into the residual Category (C). The economic efficiency value of the Category (C) items can then be **deduced**, as it logically comprises the residual value once the economic efficiency prices of (A) and (B) are taken into account.

Explanation of Item Categorisations

(A) Items – Outputs where financial value is assumed equal to economic value

- **Teaching of non EU students - Non EU student fees**

Universities typically compete in a global market to attract non-EU students and the outcome fee prices can reasonably be assumed as global market prices.

- **Teaching of UK Domestic and EU[35] Postgraduates – Postgraduate Fees**

There are few, if any, regulations governing the level of fees UK universities can levy at postgraduate level. Indeed, there is evidence that Universities are very price-sensitive in the postgraduate market and the fees charged are, more or less, what universities consider these different market segments will bear.

- **Delivery of non-credit-bearing and related courses - Non-credit-bearing and other fees**

While a relatively small part of overall income, there are no general restrictions on what universities can choose to charge for a wide range of non-credit-bearing courses. Neither is there any compulsion on people to register on non-credit-bearing courses other than through interest or free personal choice. We have assumed therefore that the actual fees charged are likely to be at economically efficient prices.

- **Fulfilment of Research Contracts for private sector and international bodies – Contract income**

We have assumed all research contracts with the UK private sector and all international research contracts are likely to be close to economic efficiency (market) prices, given that the prices involved in these contracts will, for the most part, have been mutually agreed in an internationally competitive market.

- **Provision of Residence and Catering and other assorted services – income received**

The same holds true for a range of other general income (for residence and catering[36], services rendered, investment returns etc.) We have assumed these are broadly operating in the general market place and their actual price reflects their economic efficiency value.

Overall, the economic efficiency value of Category (A) items came to £13.54 billion, which was the same as their financial value.

[35] In 2016/17 all EU fees were treated in the same way as Domestic Fees

[36] It may be that *some* of the residence and catering charges made to students are subsidised by the University and under 'market' rates. However other activities e.g. Conference provision are often explicitly commercially priced in a competitive market. At present we have assumed that all residence and catering outputs are delivered at market price levels.

We have also separately identified those outputs where the actual price is unlikely to be the economic efficiency price and for which we could reasonably derive (within our resources) shadow prices. These items are marked (B) in Table 3.

(B) Items – Outputs where financial value is not assumed equal to economic value and which can be shadow-priced

Item (B) consists entirely of payments for **UK & EU Undergraduate Teaching**. This includes fees and any payments made by UK funding bodies relating to teaching support. The simple reason that these outputs are unlikely to be economically efficient are that - despite all the popular talk of universities being 'marketised' - the UK domestic undergraduate system is highly regulated (with an increasing tendency towards micromanagement by government and its agencies) and exists in an entirely "administered price" system.

The administered prices are different in each part of the UK,[37] but they are all set by the relevant devolved government authority and universities cannot vary these prices, even across different subject areas. There are restrictions covering both full-time and part-time students so both are included as item B. The part-time fee element is relatively modest, but a significant amount, if not all, is still within the administered price system.[38]

In order to estimate what proportion of the economic value of university output (B) represents we undertook a detailed shadow pricing exercise for UK Domestic and EU undergraduate teaching. More details on the shadow-pricing exercise are provided in Appendix Two.

The results of the shadow-pricing exercise gave us an estimated economic efficiency value of Category (B) items (UK Domestic/EU undergraduate teaching) of £18.23 billion.

We then come to Category (C), which contains all the remaining university outputs that are not included in Categories (A) and (B) .

(C) Items: - Outputs for which economic efficiency value can be *deduced*

Value of Category (C)

The total economic value of Output categories (A) and (B) together amounted to £31.77 billion. However, as we have seen, the total economic value of the entirety of the HE sector is £44.96 billion.

The economic efficiency value of the remaining items (Marked (C) in Table 3) can then be **deduced**, as it comprises the residual value, once the economic efficiency prices of (A) and (B) are taken into

[37] Broadly speaking, in England there is a specific, government 'fee cap' whereby all undergraduate course fees (to be charged to individual students, who may be eligible for a government-backed loan to cover these) are the same , with some additional funds distributed by the government agencies to support 'high cost' courses. A very similar system, though with slightly different set prices, operates in Northern Ireland and Wales. In Scotland, Scottish resident undergraduate students typically do not pay any fees directly, the Scottish Government decides how much *it* is willing to pay universities for a fixed number of student places delivered. Students from other parts of the UK studying in Scotland are usually charged fees at the same fixed rate as the English system.

[38] See a recent parliamentary research briefing for more information regarding part-time students: https://researchbriefings.files.parliament.uk/documents/CBP-7966/CBP-7966.pdf

account. This means that the economic efficiency value of the (C) category logically **has to** amount to **£13.19 billion** (£44.96 billion minus £31.77 billion.)

Which Outputs are part of Category (C)?

The most striking aspect of the Outputs contained within Category (C) is that they all share very similar characteristics. Category (C) is not a miscellaneous 'mixed bag'. **All** of the Category (C) outputs relate to research and associated activity undertaken for the UK public Sector and for charities.

- Research Council Awards
- Research-related payments made by the UK Funding Bodies (much of this comprises funds distributed on the back of the REF results.)
- Research for UK Charities
- Other research for UK /EU public bodies
- Other Services rendered for UK/EU Public bodies

Therefore, by a process of logic and based upon the application of fundamental economic principles, this analysis shows the true economic value of the research and related other services delivered by UK universities for the UK public sector and charities amounts to £13.19 billion. As can be seen in Table 3, this is some £4.37 billion (around 50%) *more* than the £8.82 billion Universities were actually paid to deliver these outputs.

The most notable common feature of all of these category (C) outputs is that their financial value (i.e. the actual money paid for them) will have been fixed, not according to the value they deliver, but in accordance with the *TRAC* Cost-Plus pricing system. As we can see from this (and discuss subsequently) the *TRAC* Cost-Plus pricing system significantly 'under-prices' and thereby undervalues research and other services rendered.

Table 3: Analysis of economic efficiency value: The output side

UK HEI Financial and Economic Values 2016/17: The Output side			
(A) Financial Value assumed equal to Economic Value			
(B) Economic Value Calculated by Shadow Pricing			
(C) Deduced Economic Value (estimated as residual.) Value of (C) = Economic Value of Input Minus (A) and (B)			
	(A) Items		
	Teaching	**Financial Value £billion**	**Economic Value £billion**
(A) 1	All Non EU Student Fees	4.68	4.68
(A) 2	UK Domestic and EU Postgraduate Fees	1.51	1.51
(A) 3	All Non Credit-bearing and other fees	0.57	0.57
	Research		
(A) 4	Contracts with UK Private Business/Industry	0.40	0.40
(A) 5	Other EU Contracts	0.15	0.15
(A) 6	Non EU Contracts	0.47	0.47
(A)	**Other Income/Services**		
(A) 7	Residence and Catering Income	2.19	2.19
(A) 8	Other (General) Sources for Services	1.34	1.34
(A) 9	IPR income	0.09	0.09
(A) 10	Other operating Income	1.30	1.30
(A) 11	Investment Income	0.25	0.25
(A) 12	Endowments and Donations	0.59	0.59
	TOTAL (A) Items	**13.54**	**13.54**
	(B) Items		
	Teaching		
(B) 1	Payments for UK & EU Undergraduate Teaching (Includes Undergraduate Fees and all Funding Body Teaching-related payments)	13.31	18.23
	Total (B) Items	**13.31**	**18.23**
	(C) Items		
	Research[39]		
(C) 1	UK Public Sector Research Council and Funding Body Research-related payments	4.72	
(C) 2	Other UK/EU Public Sector research	1.76	
(C) 3	UK Charities Research	1.19	
	Other		
(C) 4	Other services delivered to UK/EU Public Sector	1.14	
	Total (C) Items	**8.82**	**13.19** *Deduced **
	Value Totals	**35.67**	**44.96**

* C) Deduced Economic Value (estimated as residual.) Value of (C) = Economic Value of Input Minus (A) and (B)

Source: Viewforth Analysis

[39] See Appendix Four for fuller detail on allocation within the Research Source headings

Summary of results

- Table 2 shows the outcome economic efficiency price of University inputs as £44.96 billion, which, as we have explained, is exactly equivalent ***by definition*** to the economic efficiency price of outputs. **In other words, £44.96 billion represents the total economic value of UK higher education in 2016/17.**
- Table 3 presents the published information about the actual price (financial value) of the broad range of university outputs together with the estimated share of the £44.96 billion economic value according to the type of output.
    - For a range of outputs (Non EU fees, all other postgraduate and 'non-regulated' fees, contract research for private and international clients and a range of other services), the actual price and money received by the universities was considered to be close to the economic efficiency price. These outputs totalled a value of £13.54 billion.
    - A shadow-pricing process was conducted for those outputs (largely UK Domestic/EU undergraduate fees) where the actual price was considered highly unlikely to be the economic efficiency price and where it was possible within our resources to undertake shadow-pricing. The economic efficiency price (i.e. real economic value) of those outputs came to £18.23 billion (compared to £13.31 billion financial price.)
    - The remaining items comprise research and services rendered to the UK public sector and charities. We can now see there is a residual value of £13.19 billion, which, **by definition**, has to be the overall value of the output of that activity.

Additional inclusion of pro bono output

There is a further element of university output which does not appear anywhere in university accounts but which should be acknowledged. That is the value of the extensive additional pro bono knowledge exchange and public engagement work undertaken by University staff. It is a feature characteristic of UK universities that many staff undertake additional public service activity which is not part of their formal university contractual employment and for which they are not paid, but which, nonetheless, should be counted as an additional element of university output.

We have previously written about this characteristic of unpaid work routinely undertaken by university staff and placed an estimated value for 2015/16 on this work of £3.2 billion. This had been shadow-priced by applying a typical 'charge-out' or consultancy rate for university staff time (and in this case the shadow priced outputs can also be assumed to be the same value as if we had shadow-priced the inputs plus normal profit) .

We have not directly included this in the analysis above because (a) it is for a different year and (b) it might confuse the issue under discussion precisely because it is 'invisible' in university accounts. While the work is delivered by university staff, the input value cannot be subsumed under the value of formal staff output because it is unpaid and done voluntarily, outside of work duties. If included, it could be added on both the 'input' and the 'output' side.

Assuming the same value for 2016/17 as for 2015/16, this therefore would add a row to Table 2 (as shown in Table 4.) (It would then also be counted as a 'B' item in Table 3)

Table 4: Additional inclusion of pro bono public service and knowledge exchange

		Financial Value (£billion)	Economic value (£billion)
	Input Values as previously calculated	£35.67	£44.96
Type	Item	Financial Value (£billion)	Economic value (£billion)
(B)	Staff pro bono public service and knowledge exchange (chargeout rates including an element of 'normal profit')	0	3.2
	Total	**35.67**	**48.16**

Source: *An elephant in the room: the hidden economic value of public engagement and knowledge exchange in UK universities* (Kelly & McNicoll, Viewforth Consulting 2018)

In this case, it can be seen that if the value of ALL of the output delivered by UK Higher Education is to be taken into account, the true economic value of the sector in 2016/17 would be £48.16 billion, some 35% higher than its financial value.

Part Three: Interpretation, Implications and Inferences: What does this mean for the future of the UK Higher Education Sector?

So what does all this mean? Firstly this analysis clearly demonstrates that it *is* possible to estimate the true economic value of UK higher education (the very first time, to the best of our knowledge, this has ever been done), using fundamentally correct economic principles. The preliminary analysis also indicates that the true economic value of the sector to society is greater, indeed considerably greater, than its actual current financial cost. The implications of this analysis , which are – to put it bluntly - the inexorable decline of elements of UK higher education, are unlikely to surprise anyone, since they have been the basis of *observational* comment, in a wide range of fora, about higher education over the past few years. [40] There have been *many* canaries in the coalmine. We would suggest that the blind policy (and sectoral) prioritising of a finance and accounting perspective over any understanding of economic efficiency has been a major driver for this decline. It is not only *market* failure we are talking about, but a fairly catastrophic failure of *policy* and *imagination*, to the future detriment of the sector and what it contributes to UK society.

Implications of current input prices

There are two clear inferences from looking at the 'input' side:

- That the amount UK universities pay for labour (especially academic labour) is less than the efficiency value of that labour.
- That UK universities do not earn anything close to the economic efficiency value of "normal profit"

[40] See, for example, *Review of HE Finance and Pay Data (JNCHES, 2008)* *The Great University Con* David Craig & Hugh Openshaw (2018) , *The economics of the UK University system in the time of COVID 19* Peter Dolton NIESR Policy Paper 0.19 (2020)

These points have extensive and far-reaching implications for the longer-term future of the sector.

Brain Drain

- If Universities are not remunerating staff in international competitive economic efficiency prices, inevitably over time there will be a brain drain from the universities. The best staff will leave to enter other industries, or be attracted abroad.
- The best graduates will not seek careers in academe but turn to other sectors with higher pay.
- Top ranking individuals from other countries will have less incentive to come to the UK compared to other destinations.
- The associated decline in quality of staff in UK universities will lead to decline in the UK HE sector compared to international competitors and universities will move down the international rankings.

This will not happen overnight but is *inevitable* and will happen year on year. It is already happening. We have previously highlighted the recent survey indicating that nearly two thirds of current HE staff are contemplating leaving the sector over the next five years. UK Universities have also been steadily slipping down the international rankings. [41]

Inability to invest or innovate

If universities are neither allowed nor encouraged to earn *Normal Profit* [42], which is an economic sustainability margin essential to enable them to fulfil their missions, then a number of things will happen. Institutions:

- Will be unable to innovate and unable to invest in the equipment, infrastructure and staff that will enable them to compete internationally.
- Be compelled to be completely risk averse (surely the antithesis of the philosophy of an enquiring and dynamic HE sector?)
- Be at the mercy of the economic cycle – even relatively minor adverse circumstances will throw more institutions into insolvency.

Essentially the sector will cannibalise itself.

Implications of current output prices

Turning to the 'Output' side, it can be seen that there are two clear areas where universities are not achieving economic efficiency prices:

- Domestic undergraduate teaching
- Research undertaken for the public sector and for charities.

Domestic undergraduate teaching

The UK domestic undergraduate system is trying to function within a rigid administered and fixed price system which allows no flexibility in fee charges between subjects or between institutions and where the fee price is fixed by government. The absence of economic efficiency pricing in domestic undergraduate tuition has entirely skewed and distorted the demand for higher education. A

[41] https://www.theguardian.com/education/2017/jun/07/uk-universities-fall-down-global-league-tables-after-budget-cuts#:~:text=Britain's%20universities%20are%20being%20dragged,prestigious%20world%20university%20league%20table.

[42] It may be noted that a serious problem with *Accounting* definitions of profit is that no cognisance is taken of the dynamics of economic reality. Accounting essentially examines finance ex-post, and dynamic ex-post arithmetic does not exist.

student will pay the same, for example, if they study Engineering or English Literature, if they study at a well-known and internationally prestigious university or a less well-known institution. When prices for a university higher education are too low, there will inevitably be very high demand (almost certainly *over* demand) and university suppliers will only be able to meet that demand by reducing quality.[43]

Basically, the government has set up a system that *guarantees* that too many students[44] will be attracted to universities, that their choices of course will not necessarily be optimal (no *allocative* efficiency anywhere[45]) and the quality of provision will fall as universities struggle to meet that excess demand within prices that are too low.

Research undertaken for the public sector and charities

It is clear from Table 3 that there is a significant deficit in the price paid for public and charity research. This is also essentially a problem arising from what is effectively an administered price system (determined in major part via the 'TRAC' costing system) where the twin problems of reliance on low labour prices and absence of normal profit combine to create a 'perfect storm' of unsustainability.

The TRAC 'double whammy'

The administered pricing system for research has been operating for around two decades through ''Transparent Approach to Costing' (TRAC) process.[46] TRAC is described as an 'Activity-Based Costing System', intended to identify the 'full cost' of key activities in institutions.[47] Originally devised as a way to show 'accountability for public funds' its major use has been for informing the 'price' that public agencies and many charities pay for university research. By the early 2000s, there was widespread acknowledgement that universities could not sustain a public research portfolio on the amount of government support then provided. Following an Office of Science and Technology review of university research funding[48], TRAC was used to devise a formula that represented the so-called "Full Economic Cost" of research, including incorporating an overhead on direct research costs (staff salaries and equipment, etc.) for wider institutional support costs. TRAC has also been used to estimate the 'cost' of providing different types of tuition programmes; in Scotland it is used to

[43] In a normal situation of supply and demand the supply prices would be determined by the combination of both quantity *and* quality.

[44] So how many is too many? This is not an argument about equity or access to higher education, it is an economic truth that low prices result in higher demand, moving to excess demand over supply and a system that is out of kilter.

[45] This is also not a subjective argument about 'right' and 'wrong' subjects, 'STEM' over 'Arts'. It is simply that allowing no price differentiation is inhibiting free or rational choice on the part of students, contributes to an information vacuum and market failure. It also distorts university behaviour, encouraging universities to react to a 'fake' market in the choices of courses they provide and how they attract students to those courses.

[46] We can note that publicly funded university research in the UK has what is known as a 'dual support system.' A certain amount of funding (a fixed amount depending on public budgets each year) is distributed to Universities based, theoretically, on 'quality indicators' and the distribution is fixed for c 5-8 years based on their last results in the 'research excellence framework.' This paper is not focussed on the merits or otherwise of the REF. Just suffice to say that this part of the research funding mechanism is also essentially an administered price system. The remainder comes through projects funded by the Research Councils, government departments etc. and the 'price' of those projects is totally determined by the 'TRAC' costing system. Many large charities also rely on the TRAC costing system to decide what they will pay universities.

[47] See: https://www.trac.ac.uk/tracguidance/

[48] Office of Science and Technology *Cross-Cutting Review of Science and Research: Final Report*, March 2002

inform the 'price setting' for course funding. [49] TRAC uses expenditure data from institutional financial statements, as well as estimated allocations of academic staff time and estates usage for different disciplines and different activities. The TRAC system acknowledges the need for, and incorporates a broad 'Margin for Sustainability and Investment'[50] , and this is worked out on an individual institution level based on each institution's current financial position and its plans over a six-year period.[51] Recent analysis has indicated that the average MSI applied across UK HE is currently approximately 8% of existing institutional expenditure. [52]

However, TRAC is fundamentally flawed and effectively 'bakes in' long-run economic unsustainability. This is because its calculations are based on entirely the wrong premises. Its core workings are driven by academic staff costs that are too low and the incorporated 'sustainability margin' is based on an institution's overall 'under-priced' portfolio. It effectively subjects institutions to a 'double whammy' - too low a cost margin, applied to too low a cost base.

The implications of the pricing of research being too low are similar to those relating to tuition. Essentially there is excess demand for research from clients, too much research is demanded and - the complex machinations of the 'Research Excellence Framework' not withstanding - the quality of that research will fall.

UK universities will end up trapped in a vicious circle of mediocrity across the core areas of university work – teaching and research. It is worth noting that this does not mean that Universities will not be able to hire staff. It will always be possible to find a bum for a seat or a person for a podium. But the 'brightest and best' will certainly not be working in UK higher education.

Just who is subsidising who?

The preliminary analysis shows that UK society is not subsidising UK higher education. The converse is true: by accepting well below the economic efficiency price for a swathe of its activities (the real value of those activities) UK higher education is currently subsidising UK society (and, it must be said, the main subsidisers are the university staff themselves.)

We must then ask: On what basis did UK HEIs agree to do this? What is the "social contract" involved? UK universities are all private organisations. Is it conceivable that other large private organisations (such as KPMG, Astra Zeneca, Diageo, BT or Sky) would be asked to subsidise UK society? The fact that University staff are increasingly unhappy with their lot (as evidenced through ongoing industrial disputes) show that the staff are beginning to wake up to the Faustian pact the universities appear to have signed.

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[49] See, for example, how the Augar Review used TRAC information to estimate the cost of course provision.
[50] See *Margin for Sustainability and Investment: analysis of 2016/17 data* Financial Sustainability Strategy Group (2018)
[51] "*Each institution is required to calculate the average level of cash generation it requires for sustainability based on its own plans over six years, derived from the agreed definition of earnings before interest, tax, depreciation and amortisation (EBITDA) for MSI. When divided by current year's adjusted turnover, this becomes a percentage figure which is the MSI.* " https://www.trac.ac.uk/tracguidance/ Compare this outcome '8%' with the 22.76% OVA or sustainability margin in the rest of the economy.
[52]See useful commentary on TRAC by David Kernohan as part of the WONKHE Analysis series https://wonkhe.com/blogs/tracing-the-pandemic/

It is quite startling to see how far the UK university system has departed from any notion of economic efficiency. If a socially and economically efficient higher education sector is your desired destination, well, you certainly wouldn't start from here. For the past two decades (at least) there has been year after year 'tinkering' with the system, with confusion piled upon confusion until we have reached the current *Alice-in-Wonderland* scenario where absolutely no one is satisfied and universities are being lambasted:

- by some (including many people within the sector itself) for being too "marketised", when - as we have shown - the *opposite* is the case
- By others for supposedly charging "high fees" and not delivering "value for money" when (a) the prices have been fixed by government and (b) the prices they are paid are significantly *less* than the economic efficiency value of what is being delivered.

It is also surprising that University leaders – the sectoral bodies and the Vice Chancellors - have effectively *let* this happen when they could well have challenged this narrative, and stopped the slide down the rabbit hole, a long time ago.

Seeking a new equilibrium

So what's to be done? We have been able to use fundamental economic theory and available higher education data to demonstrate that the current economic value of higher education is greater than the financial cost. However, we also need to point out that the 'answer' is **not** simply to 'demand' more money for higher education. That would be falling straight back into a finance and accounting trap. To demonstrate the value of what higher education is delivering, we had to imagine a situation of a dynamic competitive and economically efficient market and examine the sector as *if* that was its current environment. However, it is also true that if the pricing in the HE environment changed in the way we have indicated, *the sector itself would also change*, with its size and shape possibly morphing into something that looked very different.

We certainly cannot confidently predict what that sector would look like, indeed at present we suggest that nobody can, because *no one knows the real price elasticity of supply and demand* in higher education. If prices are higher, less may be demanded, but higher level of quality may be demanded for that higher price. The sector would need to then adapt to guarantee that level of quality. It is possible that the sector would be smaller, maybe much smaller and it may also develop a distinctively different portfolio of subject and activity provision. The point however is, that the system's evolution would eventually reach a new equilibrium that is much more finely attuned to what society reveals it actually wants from higher education.[53] This would also be one which would be much more likely to be allocatively efficient, combining the relevant blend of type, quantity and quality of higher education provision to meet what society wants, as revealed in the prices people are willing to pay and for what *kind* of higher education they are willing to pay.

A word about equity, social and cultural concerns

We need now to pause for breath and address the issue that worries many people when they first hear about the concept of an 'economically efficient' higher education system. We would again repeat we are talking about *economics* and not *accounting*. The economic value of higher education includes the value of things that may not be formally associated with the exchange of money and hard cash. There is absolutely no reason to suppose, for instance, that Arts and Humanities would decline in an economically efficient system. Indeed, the converse could be true, since their real

[53] As an aside, we would also point out that 'society' includes the sector itself, members of the HE sector are also members of society and they too have a legitimate voice in discussions about society wants from higher education

underlying value and importance to society more generally could become clearer and not be hidden behind the smoke and mirrors of *financial* outcome measures such as 'graduate premia.' The other crucial point is if society 'does not like' all of the implications of an efficiently operating higher education market, it can easily apply social weights in its policy development to help achieve more of those things it regards as desirable. We have explained earlier that the application of appropriate social weights can 'tip the scales' towards a balanced outcome that is *pareto optimum optimorum* and in line with society's expressed preferences.

For instance, to ensure access to higher education for people from low income or disadvantaged backgrounds – society can 'weight' applications from people from those backgrounds to give them a higher support priority – and then choose to provide higher fee or bursary support to those students. Similarly, if society wants more doctors or nurses to be educated, it can give a higher weighting to those subject areas and provide more support to those students. The application of social weights in a system will be a trade-off, as the more social adjustments made, the further away the system would move from strict economic efficiency. But the point is that these trade-offs would be *transparent*, and subject to societal scrutiny and approval. That could compare favourably with the current utterly opaque, chaotic situation where higher education appears subject to the latest wheeze or whim of successive government ministers, who are panicked by media headlines about grade inflation or so-called 'Mickey Mouse' degrees.

In other words, we need to go back to fundamentals, have widespread debate and discussion about what society really wants from higher education and develop a new social contract for higher education in the UK. We would suggest that the many and multifarious higher education agencies (Office for Students, UK Research and Innovation and all the Research Councils etc. , as well as sectoral agencies such as Universities UK) devote some more thought to the real *economics* of higher education and advise government accordingly. Next steps could include asking some of the best economics minds in the universities to look at:

- Serious research into estimation of supply and demand elasticities for higher education inputs and outputs in an economically efficient system
- Fine tuning and refinement of economic efficiency prices at a more detailed level
- The complementing of economic efficiency prices with the full consideration of Social Welfare Functions and the trade-offs there would be in addressing issues of equity and achieving socially desired goals.

Concluding Remarks

We began work on this specific paper in 2019, but it has grown out of and evolved from our many years of research on higher education impact and value analysis, going back to the 1990s.We have worked in, and with, universities for decades. We had become increasingly concerned that – despite the apparent policy preoccupation with whether or not universities were delivering 'value for money', none of the higher education agencies or government departments appeared willing to devote resources to addressing the core and pressing question for society: *What is the true economic value of higher education?*

Many millions of pounds have been spent on so many 'evaluation' exercises, such as the REF, TEF and KEF, ostensibly in order to demonstrate some level of 'accountability for public funds' and to 'quality assure' higher education provision. But serious research *on* higher education has remained piecemeal and disjointed, with different elements of higher education activity (be that research,

teaching, collaboration with business, innovation spillovers etc.,) receiving some attention in isolation but without any overarching or coherent approach to considering the HE sector as a whole. Policy approaches to higher education appear to have become almost completely compartmentalised, exemplified by different bodies being responsible for funding and regulation of different parts of higher education activity. The respective narrow focus of the different agencies such as Office for Students and the Research Councils has not been conducive to encouraging a holistic view of universities, what they do and can deliver.

At the same time an increasing number of 'higher education economic impact studies' of questionable quality get churned out every year by individual universities. We were among the UK researchers who first explored and, we would even say, *popularised* the concept of a university economic impact study in the UK.[54] Some types of study, such as those examining university expenditure impact, remain relevant and have policy utility, very particularly at the regional and local level, provided they are well done. But it has been startling to observe the willingness of many universities (not, by any means, all, but a notable number) to accept and promulgate poor quality analyses of university impacts (some of the most egregious examples have added inputs and outputs together to come up with a single 'large number' for the university's impact.) The problem is that too many poor quality studies have the effect of deadening the discourse around university economic value – they may generate an ephemeral PR headline but are easily dismissed by policy makers, meaning the baby is thrown out with the bathwater and the real importance of universities in their regions is taken less seriously than it should.

Another, troubling, issue is where universities appear to so misunderstand the entire process through which their work can generate value for society that they become overly focussed on financial *outcome* data such as graduate premia (which, as we have highlighted , simply cannot function as a sensible performance measure for universities.) Some have even proceeded to present this narrow financial outcome measure as reflecting one of the most important elements of the economic value that they deliver. It is very possible that the misplaced attention that a number of universities have given to this matter in recent years has contributed to their own woes, in *encouraging* the government to start confusing 'graduate outcomes' with 'university outputs.' We intend to write more about the current parlous state of university impact studies in a forthcoming series of blogs.

But to return to the core and pressing question for society: *What is the true economic value of higher education?* In this paper, we have sought to address this, by:

- devising a methodological approach that draws on some of the most powerful economic theory
- using real world available and publicly accessible data to draw preliminary, empirical, conclusions.

Our conclusions may not make for very cheerful reading, but they chime closely with actual and ongoing observations about what appears to be happening in the UK HE sector. Our analysis uses fundamental economic theory to 'predict' the long run impact on UK higher education of the current policy malaise and administered price system. Then, lo and behold, if you look at what *is* happening

[54] Through, for instance, *The impact of Strathclyde University on the economy of Scotland* (McNicoll 1992), leading on to *The Impact of the Scottish Higher Education Sector on the Economy of Scotland* (McNicoll for the Committee of Scottish Higher Education Principals 1995); The *impact of universities and colleges on the UK economy*, (McNicoll, McCluskey and Kelly for the Committee of Vice Chancellors and Principals 1997) and many subsequent studies.

in higher education - extensive industrial unrest, universities in precarious financial positions making widespread redundancies, universities slipping down the international league tables – reality appears to be following the logically predicted path.

We know this will be a controversial paper, both on account of the intellectual approach adopted and the conclusions and inferences we have drawn. Nonetheless, we hope that we will have achieved our aim of sparking new thinking about ways to measure real higher education economic value and reinvigorating serious policy discussion about universities and society.

Appendix One: Notes on Shadow Pricing Labour Costs

The purpose of the shadow-pricing exercise for UK HE Labour input was to consider whether or not the salaries paid (price of Labour inputs) could be considered as a true 'market rate' for jobs and broadly comparable to those in other sectors with comparable levels of required skill and expertise. Broadly speaking, it is the 'market rate', which most closely approximates the 'economic efficiency value' of the job being undertaken.

Overall the shadow-pricing exercise undertaken for university staff was challenging, given our resource constraints and limited access to published information about salary equivalents together with the myriad of highly complex and specialist roles that exist in higher education. However we were able to draw on international pricing comparators for a range of academic staff and used other external references (including the UK Civil Service) for professional and support staff.

Data Sources used

Annual Survey of Hours and Earnings (ASHE)

The main source of publicly available information on salaries within the UK is the Annual Survey of Hours and Earnings (ASHE)[55] from the Office for National Statistics (ONS.) This is the most comprehensive freely available source[56]. We consulted ASHE extensively for our shadow-pricing analysis but the usefulness of ASHE for shadow-pricing higher education roles was extremely limited. The main limitations of ASHE for shadow-pricing are that:

- Data only relates to basic salary of salaried employees. It excludes the self-employed, which means that a large proportion of higher-paid professionals (such as partners in firms, freelancers and those running their own specialist companies) are omitted and their higher rates of earnings and income cannot be compared. This means that neither the mean nor median salaries presented are reflective of the earning power (i.e. the market value) of a wide number of highly qualified professionals to whom higher education staff roles (in particular those of the more senior and experienced staff) could realistically be compared.
- While ASHE is detailed to occupations at 4 digit SOC level, it still cannot reflect the very varied and highly specialist nature of many roles within Higher Education, especially, but not only, academic roles.

We were able to use ASHE as a reference point however for some posts, particularly for non-academic manual staff.

Universities and Colleges Employers' Association

Among other relevant information sources consulted was a range of publications available from the Universities and Colleges Employers' Association (UCEA). This included various Joint National

[55] ASHE is based on a sample (1%) of employee earnings across the country based on HMRC records. For a description, see : https://www.nomisweb.co.uk/sources/ashe#:~:text=Conducted%20in%20April%20each%20year,HM%20Revenue%20%26%20Customs%20PAYE%20records.

[56] Ideally this would have been supplemented by information from the wide number of commercial database tools for comparing salaries across occupations and industrial sectors; however these require subscription which was beyond the resources of this unfunded project.

Negotiating Committee (JNCHES) reports such as a 2008 *Review of HE Finance and Pay Data* as well as 'benchmarking reports' (2011 and 2014)[57] which explored the use of ASHE data to draw general conclusions about median pay for the range of occupations across the economy that are recorded in ASHE. Perhaps unsurprisingly, there was a general conclusion that the median salary of 'Higher Education Professionals' was higher than that of FE or Secondary School Professionals. It was also higher than many other 'Professional' occupations. However, although the reports made some headway with matching a range of non-academic roles to occupations within the broader economy, it could not overcome the limitations of ASHE (as described above) for referencing senior academic posts in particular, and was consequently of limited usefulness for economic efficiency pricing.

UCEA also undertakes a biennial series of reports on the HE labour market which, while not containing data that could be used for shadow-pricing, help to provide some general context regarding the relative competiveness of HE salaries and rival sources of competition for HE staff. In the most recently published report (2019) at the time of analysis, UCEA highlighted key areas of concern in recruitment to particular types of HEI roles – areas emphasised included:

- **Professional Services** – IT, Marketing and related functions, health and safety, Technicians and Estates, with: *"…finance, strategy and HR are also challenging…"* The reasons for recruitment difficulties included requirement for niche knowledge and strong intra-sectoral competition from other HEIs as well as: "*Salary expectations in comparison to the private sector…"*
- **Staff on Academic Contracts** There were fewer general recruitment issues mentioned by UCEA but a range of additional challenges. These included: lack of suitable candidates, especially in relation to research outputs: "*a dearth of applicants with the requisite level of research outputs"*; *"subject specialisms where there is only a small pool of individuals in the world with the required knowledge",* with salary expectations a particular problem in specific subject areas. These areas included IT and cyber security, medicine, engineering, economics. With Economics, the largest challenge appeared to be international competition for high level candidates (from Universities in the USA.) Regional and locational issues also featured.

Other sources

We also drew on UK Civil Service Pay data for some HE Professional and Support Staff and international research from the American Association of University Professors for pricing comparisons for academic staff.

Our practical approach to shadow-pricing labour

The year under analysis was the academic and financial year 2016-17. We analysed HESA staff numbers and aggregate salary data from 2016/17. In that year,[58] there were 419,705 Higher

[57] *Pay Framework and Data research Overview Report'* (2011). This report was originally commissioned by the JNCHES, although the main university Union (UCU) did not endorse its findings. The updated report *Pay in Higher Education 2014* extended the exploration of ASHE data.

[58] Unfortunately HESA no longer(since 2019) routinely collects and publishes data for all staff in UK HE (See: https://www.timeshighereducation.com/news/plans-end-compulsory-records-uks-non-academic-staff-shocking)

education staff[59]. HESA categorised staff into four broad occupational groups (Academic; Non-academic managerial, professional and technical; Non-academic clerical; Non-academic manual.)

- **Academic Staff:** Defined as staff on Academic Contracts. Covers all staff on academic contracts, whether Teaching and Research, Teaching only, Research only or other (e.g. some staff in senior management roles are still included as academic.) These university posts are typically classified as part of Standard Occupational Classification (SOC) 2 - 'Professional'. There were 206,870 people holding academic contracts in 2016/17.
- **Non-academic contract managerial, professional and technical Staff.** This includes staff across a range of occupations, usually encompassing SOCS 1, 2 and 3 (Managerial, Professional and Associate Professional.) There were 101,365 people in this group in 2016/17.
- **Non-academic contract Clerical Staff**. This includes administrative and clerical staff typically classified as SOC 4 (Administrative and Secretarial.) There were 69,310 people in this group in 2016/17.
- **Non-academic contract Manual staff**. This is a very broad grouping and generally includes staff in occupational groupings SOC 5, 6, 7, 8 and 9 (not all of whom may actually be 'manual' workers.) These include Skilled Trades, Caring & Leisure, Sales & Customer Service, Process /Plant and Elementary occupations.) There were 42,160 people in this group in 2016/17.

HESA also disaggregated the total numbers of staff within those groups into six salary band groups along the single HE pay spine.[60] We were able to match the salary band groups to approximate 'levels' or 'grade' of post using a typical published grade structure for Pre-1992 Universities, which also enabled some insight – using the broad grade job content descriptors - into relative seniority of different posts as well as qualification and experience required. These were categorised as Grades 1-3, 4/5, 6, 7/8, 9 and Grade 10+ (the most senior grouping which includes Readers and Professors as well as senior HE Managers.) We were also able to make appropriate adjustment to reflect the numbers in each category of full time and part time staff. [61]

Shadow Pricing was then considered for each occupational group, and level/ grade within that group, separately.

Shadow Pricing of Academic Roles

The shadow-pricing of academic roles was particularly complex, given the highly specialist nature of the occupations. In the higher education sector there are many different roles and levels of academic contract posts, across an extensive range of subject specialisms. As a *broad* summary (this is simply a general indication of different salary groupings) these include:

[59] Excluding 'atypical' staff, who are not regular HE staff and do not hold an employment contract but cover a range of people hired, often for one-off or very short term tasks.
[60]There is an agreed 'HE pay spine' covering the majority of HE institutions in the UK. See here: https://www.ucu.org.uk/he_singlepayspine
[61] It should be noted that these 'grades' are not the same in every university, however by notionally matching the HESA salary groupings on the single HE pay spine to a number of typical pre-1992 university grading structures we were able to take a broad view of the relative seniority and job content of posts, essential for appropriate shadow-pricing .

Academic Staff (**Generic** Grading Structure matching salary groups)	Type of job
Grades 1-3	Various Assistants
Grades 4-5	Demonstrators, Tutors etc.
Grade 6	Research Assistants, Teaching Assistants, Tutors
Grades 7-8	Lecturers, Research Fellows, Teaching Fellows
Grade 9	Senior Lecturers, Readers
Grades 10+	Professors, Deans , Heads of Departments/Schools etc.

We have already highlighted that the published ASHE data does not give sufficient information to enable matching of academic roles to other occupations in the UK economy, not least because ASHE does not include many of those who might be most closely compared in terms of expertise and qualification levels (such as partners in firms, freelancers and company owner/directors.) Academic roles – particularly at the more senior levels – have a further characteristic, that of operating within a global market, with UK higher education competing for subject specialists with other universities internationally. Given the international competitive nature of academic posts therefore, we sought an alternative international comparator that could reasonably reflect a 'market' or 'economic efficiency' price for UK academics.

The American Association of University Professors publishes an "*Annual Report on the Economic Status of the Profession*" which includes comprehensive survey data on salaries for academic staff at different types of University across the USA. We drew on the 2016/17 report for shadow-pricing of more senior academic staff (Lecturer, Senior Lecturer /Reader and Professorial equivalent).

Shadow Pricing Lecturer, Senior Lecturer and Professorial roles.

The 2016/17 report *Visualizing Change*[62] presents data from nearly 1000 different institutions across the USA, including Public, Private and Religiously-Affiliated Universities and Colleges. It includes data for basic salary[63] as well as for the overall 'compensation' package, i.e. representing the cost to the institution including e.g. pension contributions or other benefits. [64] The report analyses the data for different categories of universities as well as on a regional basis. Salary and Compensation package data are presented according to different categories of institution. These are defined as:

- "Doctoral" (Category I), representing Institutions "characterised by a significant level and breadth of activity in doctoral-level education". This included institutions granting a minimum of 30 doctoral level degrees each year across at least 3 different programmes.
- "Master's" (Category IIA), representing institutions "characterised by diverse postbaccalaurate programs but not engaged in significant doctoral-level education…." (This included institutions with minimum of 50 postgraduate degrees granted annually from across at least 3 programmes.)

[62] *Visualizing Change , The Annual Report on the Economic Status of the Profession 2016/17* https://www.aaup.org/file/FCS_2016-17.pdf

[63] Defined as the *"contracted salary excluding summer teaching, stipends, extra load or other forms of remuneration. "* (*Visualizing Change 2016/17*)

[64] Defined as representing *"salary plus institutional contribution to benefits. It is best viewed as an approximate 'cost' figure for the institution, rather than an amount received by the faculty member." (Visualizing Change 2016/17.)*

- " Baccalaureate" (Category IIB) representing institutions "characterised by their primary emphasis on undergraduate baccalaureate education" (with a minimum of 50 bachelor degrees awarded across at least 3 programmes.)

There were 2 further categories covering institutions that focus on associate degrees (below Bachelor level, which may match FE, rather than HE, institutions in the UK.)

To match salary levels as close as possible to 'like with like' institutions, we analysed HESA data for graduate numbers from the 164 UK institutions being studied. This showed 96 institutions with more than 30 students graduating at doctoral level in 2017, which were than categorised as equivalent to the American Category I. A further 58 institutions with fewer than 30 doctoral level awards but awarding more than 50 other postgraduate level degrees in 2017 were categorised as category IIA and the remaining 10 institutions were treated as Category IIB.

We then took the 'average' compensation package across public, private and religiously affiliated universities for each level of staff within each of the Institutional categories (I,IIA and IIB) and applied these to the staff numbers (pro rata for part-time staff) within the matched category of UK Institution:

Staff Numbers in Lecturer/Senior Lecturer/Professor equivalent roles UK HE 2016/17

Staff Level	Numbers in Category I	Numbers in Category IIA	Numbers in Category IIB	Total
Professor/equivalent	33,741	1,905	89	35,735
Senior Lecturer/Equivalent	55,659	8,119	237	64,015
Lecturer/Equivalent	67,562	7,927	406	75,895

Source: HESA 2016/17

The market or economic efficiency price for staff is essentially what an institution would need to pay to hire those staff and hence includes the entire 'package' i.e. including contributions towards pensions, benefits etc. Therefore we took the total 'compensation' package data from *Visualizing Change* as the appropriate shadow price (rather than basic salary which does not include all employer costs) and converted these prices to £ Sterling using the prevailing exchange rate on 31 January 2017[65] (i.e. at the midway point of the academic year.)
These were

Staff Role	**Category I Institution Compensation**	**Category IIA Institution Compensation**	**Category IIB Institution Compensation**
Professor	USD $170,201 (GBP £135,310)	USD $123,563 (GBP £98,233)	USD $120,339 (GBP £95,670)
Associate Professor (treated as equivalent to Senior Lecturer)	USD $124,762 (GBP £99,186)	USD $101,575 (GBP £80,752)	USD $96,450 (GBP £76,678)
Assistant Professor (treated as equivalent to Lecturer)	USD $108,746 (GBP £86,453)	USD $88,505 (GBP £70,362)	USD $81,808 (65,037)

Source: 'Visualizing Change 2016/17' American Association of University Professors. $ to £ Exchange rate as at 31/01/17

[65] On 31 January 2017 the exchange rate was £0.795GBP to $1USD

Shadow-Pricing junior academic roles

As well as the above numbers of Lecturer/Senior Lecturer and Professorial roles there are a further 31,230 staff in UK HE on more junior academic contracts, including Research and Teaching Assistants, Demonstrators and Tutors of various kinds. (Covering Grade Levels 1-6.) There was no clear equivalent within the American pricing system; furthermore the 'market' for junior roles is more national within the UK. A potential equivalent or similar role in other UK organisations for at least some of these posts could be SOC 2426 Business and Research Professionals (Basic Median wage in 2016/17 was £33,114). However, this would only match some of these. Others may tend to be more administrative in nature and have a wider set of occupations to which they could be compared. After consideration, it was judged that the most straightforward way (within our resources) to treat these more junior academic roles would be to assume that the current actual price is already more or less at market or economic efficiency rates i.e. the basic salary plus all employer costs. This ended with a range of between £21,133 - £37,442, depending on the level of the post, including employer NI and pension contributions.[66]

The overall outcome of the shadow pricing of Academic Staff was a total estimated Economic Efficiency Price for Academic Labour of £15.7 billion, which was over 51% higher than the actual price of £10.38 billion in 2016/17.

Shadow Pricing of Professional and support roles

We treated the shadow-pricing of Professional and support roles differently as these roles are most likely to have closer equivalents across the UK Labour market. Nonetheless, the variety, range and levels of posts involved (covering 212,835 staff) was extensive. There were three broad groups under consideration:

- Managerial, professional and technical
- Clerical
- Manual

For the first two groups (Managerial, professional and Technical; Clerical) we took the approach of assuming the market or economic efficiency price would be likely to be very similar to what was paid for broadly equivalent levels of staff (taking around the mid-point of a grade level as an average) within the UK Civil Service. For Manual staff we used data from ASHE on similar types of occupational roles to derive a likely market or economic efficiency price.

Civil Service departments can have varied pay arrangements and different concentrations of staff across pay grades, depending on the nature of the particular Department. We drew on detailed information published by the Northern Ireland Civil Service for 2016/17[67] – which helpfully included a wide range of job titles, enabling a broad matching to the types of roles within universities. The general grade equivalents used were as follows:

[66] The 'average' for Grade 1-3 was £21,135, Grade 4/5 was £28,461 and Grade 6 equivalent was £37,442 (all including employer pension/NI contributions, etc.)

[67] Using data from the NI Civil Service also meant that there was no accidental inclusion of a London Weighting but rather we were using prices that could be applicable across the UK. See: https://www.finance-ni.gov.uk/sites/default/files/publications/dfp/2016-2017%20pay%20scales.pdf and https://www.finance-ni.gov.uk/sites/default/files/publications/dfp/SCS%20Pay%20Scales%201%20August%202016.pdf

University Level (Managerial Professional and technical; Clerical)	Broad Civil Service Equivalent Grade Level
Grades 1-3	AA/AO (Admin Assistant/Admin Officer)
Grade 4/5	EO (Executive Officer)
Grade 6	HEO (Higher Executive Officer)
Grade 7/8	SEO/Grade 7 Senior Executive Officer or Junior Civil Service Grade 7
Grade 9	Junior Civil Service Grade 6
Grade 10+	Senior Civil Service (1 /2)

For the group of Manual Staff, for Grades 1-8 we matched to a number of potentially similar occupational roles within ASHE data. This was a matter of judgement, focussed on roles that are likely to exist within a University, bearing in mind that classification within HESA as 'Manual' staff does not strictly mean a 'manual job' . The very small number (285) of the most senior staff (Grades 9/10+) in this group were treated the same as for the other two groups of Professional and Support staff i.e. matched to Civil Service roles. This small number of staff are likely to be occupying similar roles as their colleagues e.g. Directors and Deputy Directors of major areas.

Occupational Comparisons used for Staff on Manual Contracts (ASHE 2017)

Grades 1-3	**SOC 9**	**SOC Number**
	Security Guards & related	9241
	Elementary Cleaning Occupations	9239
	Hospital Porters	9271
	Elementary Process Plant	9139
	Kitchen & catering Assistants	9272
	Postal workers/mail sorters	9211
Grades 4-5	**SOC 5, 7, 8 and 9**	
	gardeners/landscape gardeners	5113
	Process Plant Machine op	8
	Van Drivers	8212
	Customer service occupations	7219
	Chefs	5434
	Customer service managers and supervisors	7220
Grade 6	**SOC 3, 5,6,9**	
	Plumbers	5314
	Electrical and Electronic trades	524
	Precision instrument makers/repairers	5224
	Print workers	5422
	Postal workers/mail sorters	9211
	Buyers and Procurement Officers	3541
Grade 7/8	**SOC 3 & 1**	
	Fire Service Officers	3313
	Property/housing/estate managers	1251
	Health and Safety officers	3567
	Building Civil Engineer Technicians	3114
	Protective service nec	3319
	Engineering Technicians	3113
	Sales & Business Development Managers	3545

The outcome of the shadow pricing of Non-Academic Staff was a total estimated economic efficiency Price for Professional and Support Staff labour of £8.59 billion. This was very close to the actual pricing of professional and support labour (just over 1% higher than the actual price of £8.49 billion.)

A caveat to the pricing of professional and support staff in this analysis is that it is inevitably broad brush and indicative rather than absolute. We were obliged to use broad judgement and knowledge of a range of HE professional roles to match very roughly to potential external comparators. Another point is that in using the Civil Service pay scales for a range of posts we are assuming that these are themselves competitive salaries and in economic efficiency prices. However, we make no apology for these limitations, given the lack of resources within an unfunded project.

Despite what appears in recent years to have been an extensive emphasis in UK HE on the development of job level descriptors and 'job families' within HE[68] , this seems to have been primarily intended for intrasectoral purposes including issues of gender and equal pay . There does not appear to have been much follow on from the extensive comparative analyses of jobs with private and public sector equivalents using Hay 'job size' indicators that were carried out as part of the Bett Report[69] (nearly a quarter of a century ago). That is the type of analysis that is more likely to give robust indicators of the real market value or economic efficiency price of different roles.

Summary of results

Overall, this shadow-pricing exercise finally resulted in an estimated economic efficiency price of the labour input of UK HE in 2016/17 of £24.3 billion, over 28% higher than the actual labour input price. The biggest difference between the economic efficiency price and the actual price in 2016/17 was for academic staff; international comparators indicated the 'market' price for academic labour as being over 51% higher than actual. The estimated economic efficiency price of non-academic professional and support staff labour was very close to the actual financial price.

[68] E.g. Many institutions use the Higher Education Role Analysis (HERA) system developed by The Educational Competencies Consortium (https://www.ecc.ac.uk/)

[69] *Independent Review of Higher Education Pay and Conditions* (The Stationery Office, 1999)

Appendix Two: Notes on Shadow Pricing Domestic and EU Undergraduate Tuition

There were 1,370,770 full time domestic (UK and EU) fulltime undergraduates in 2016/17, with a further 285,845 part-time undergraduate students. As explained in the main text of this paper, the provision of domestic (and in 2016/17 EU students were treated the same as domestic students) undergraduate education was undertaken within an extremely rigid administered price system which bore little, if any relationship to a free market.

Clearly therefore the administered 'price' of domestic undergraduate tuition could not be regarded as being that of a free market 'economic efficiency price'. In many subjects, however, domestic students are studying side by side with international students who ARE paying a full 'market' price for their tuition. Universities have competed internationally to attract students to study in the UK at that price. The Times Higher Education (THE) has published the fee rates prevailing for undergraduate international students in 2016/17 at institutions across the UK[70]; the **average** rate for the whole UK could be derived, in 3 fee 'bands':

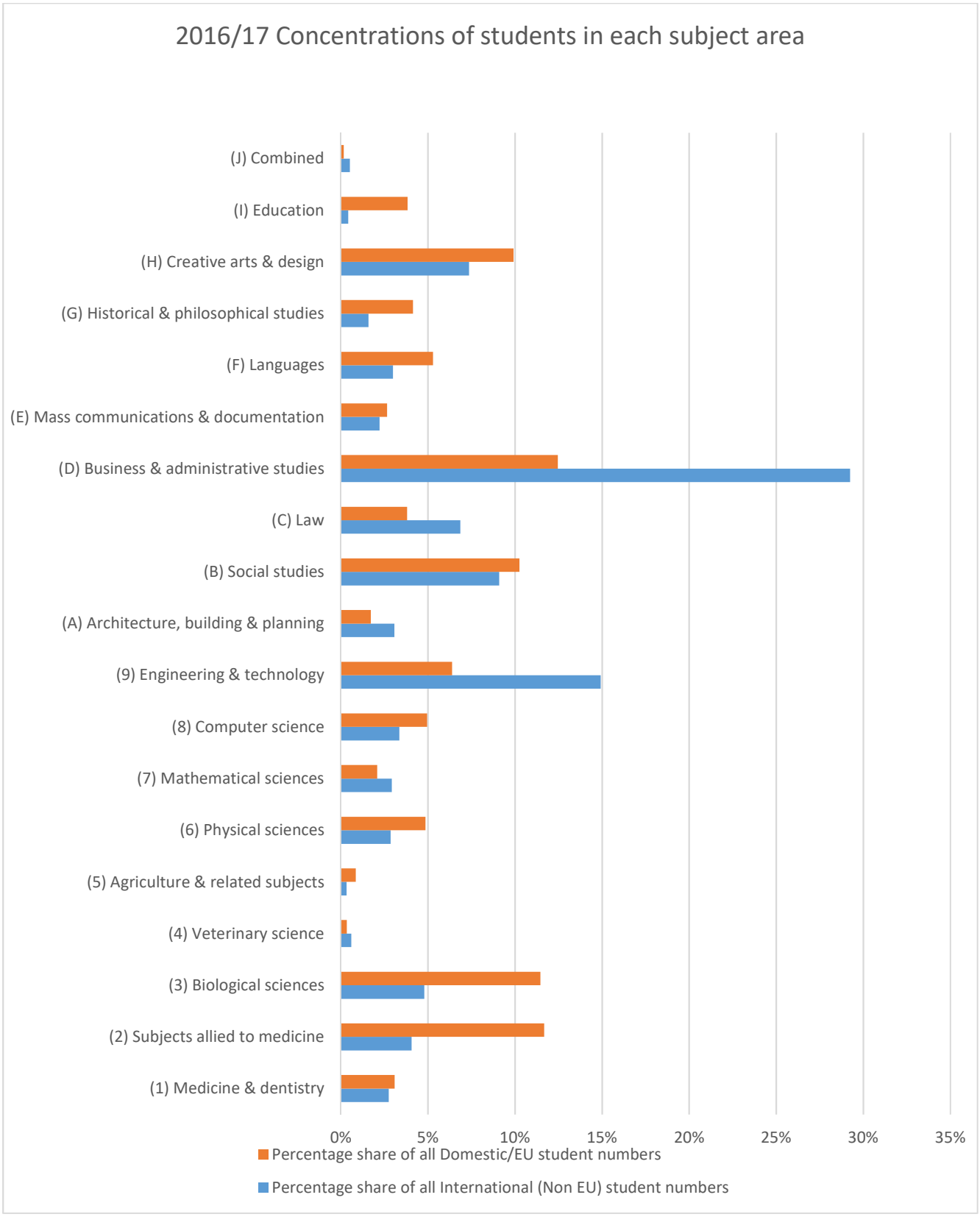
- Classroom: £13,394
- Lab-based: £15,034
- Clinical: £24, 169

It could be possible to simply use the flat average international rate for students studying within the relevant subject areas (classroom/lab/clinical etc.). However, this is perhaps too 'rough and ready'; in fully competitive circumstances the domestic student market could potentially behave in a different way from the international market. No one actually *knows* what the price elasticity would be in a 'free' domestic market, since this has never existed; however, a potential clue may be gleaned from comparing the difference between the domestic student *postgraduate* fees compared to international *postgraduate* fees, since universities are free to set their own postgraduate fees. The published information[71] shows a strong degree of differentiation in postgraduate fees, with a range of different prices for different courses within an institution and almost all institutions set lower prices for domestic postgraduates compared to international postgraduates, typically between 50 -80% of the international rate. A small number of institutions did not differentiate and charged the same. No institution charged *more* to domestic students than to international, suggesting the international rate is the 'ceiling' competitive rate.

We also looked at the apparent differences in international and domestic student 'demand' for different types of course as expressed through the subject areas in which international students were concentrated and where domestic students were concentrated.

[70] https://www.timeshighereducation.com/sites/default/files/breaking_news_files/annual-tuition-fee-data-for-full-time-courses-at-uk-institutions-2016-2017.pdf

[71] Times Higher Education (Ibid)



Source: HESA 2016/17

Therefore, to make an estimate of an economic efficiency price we assumed that:

- Some subject areas are likely to be able to command a fee similar to the prevailing international fee rate. We assumed these subjects were most likely to be those where there is relatively strong international demand (showing the international fee rate as a competitive rate) as evidenced by similar or greater proportions of the international student population taking that subject compared to relative proportions of domestic students taking that subject. Those subjects were Medicine and Dentistry, Veterinary Science, Mathematical Sciences, Engineering and Technology, Architecture, Building & Planning, Law, Business & Administrative Studies, Combined Studies.
- With all remaining subjects there is likely to be some variation from the prevailing international rate as can be observed happens at postgraduate level, with variation of domestic postgraduate fees from international postgraduate fees. It is of course impossible to say exactly what that variation would be and it could differ considerably from institution to institution and subject to subject. We decided to take an indicative 75% of the average international rate fee as an estimated economic efficiency price for these subjects, to take cognisance of the possibility of at least some prices in a competitive domestic undergraduate market being lower than the international rates. This affected some Lab-based and Classroom courses (75% of the Lab-based fee is £11,276; 75% of the Classroom based fee is £10,045.)
- Overall, therefore, the prices applied for domestic undergraduate fees in each subject band are presented in the table below. Once these were applied to the relevant numbers of students in each subject area the total economic efficiency value of UK Domestic & EU teaching in 2016/17 came to £18.23 billion.

Of course, with more information and resources these estimates could be further refined. However further refinement would not change the overall value of the higher education sector in 2016/17 (which remains as £44.96 billion); it would simply be a refinement and reallocation of where output value is identified as being generated within the sector.

Subject	Assumed fee band and fee applied
(1) Medicine & dentistry	Clinical £24,169
(2) Subjects allied to medicine	Lab-based £11,276
(3) Biological sciences	Lab-based £11,276
(4) Veterinary science	Clinical £24,169
(5) Agriculture & related subjects	Lab-based £11,276
(6) Physical sciences	Lab-based £11,276
(7) Mathematical sciences	Classroom £13,394
(8) Computer science	Lab-based £11,276
(9) Engineering & technology	Lab-based £15,034
(A) Architecture, building & planning	Lab-based £15,034
(B) Social studies	Classroom £10,045
(C) Law	Classroom £13,394

(D) Business & administrative studies	Classroom £13,394
(E) Mass communications & documentation	Classroom £13,394
(F) Languages	Classroom £10,045
(G) Historical & philosophical studies	Classroom £10,045
(H) Creative arts & design	Classroom £10,045
(I) Education	Classroom £10,045
(J) Combined	Classroom £13,394

Source: Viewforth Analysis

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Appendix Four: Additional Notes on Table 3

Notes to Table 3 and inclusion within Research Source headings

UK Public Research Council & FB REF related includes	
Funding Body (REF-related)Payments	2.41
Research Council Awards	1.95
Research Training Support Grants	0.34
TOTAL	*4.70*
UK Charities includes	
Research Grants	1.19
Charity supported Research Studentships	0.03
TOTAL	*1.22*
Other UK/EU Public Sector services includes	
Grants from Las, Health, hospitals	0.35
Other grants	0.23
AND	
OSR income from BEIS, UK Central Government	0.56
TOTAL	*1.14*

Source: HESA Finance Plus 2016/17