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Bell, A. R. ORCID: https://orcid.org/0000-0003-4531-0072, Brooks, C. ORCID: https://orcid.org/0000-0002-2668-1153 and Urquhart, A. ORCID: https://orcid.org/0000-0001-8834-4243
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Why have UK universities become more indebted over time?

Adrian R. Bell [a], Chris Brooks [b], Andrew Urquhart [a,*]

[a] ICMA Centre, Henley Business School, University of Reading, UK
[b] University of Bristol, 15-19 Tyndalls Park Road, Bristol, BS8 1PQ, UK

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ABSTRACT

Media reports of a financial apocalypse facing some UK universities were rife around the onset of the covid-19 pandemic, with much of the blame for their apparently perilous monetary situation levelled at excessive borrowing. This study examines the extent to which higher education institutions in the UK have become more indebted over the past decade and determines the factors that explain why some universities have borrowed more than others. We find that universities with vice chancellors who are older, higher paid, and who have been in their roles for a shorter time, on average have greater levels of indebtedness. We do not observe significant relationships with institutional borrowing for the gender of the vice chancellor, or their previous experience as a deputy vice chancellor or having previously held the top role elsewhere. Among university characteristics, only the level of total assets has any explanatory power for indebtedness, and not its overall institutional ratings score, whether it is a member of the Russell Group, or its total number of students.

1. Introduction

The onset of the covid-19 pandemic in 2020 significantly affected UK universities with several key sources of ancillary income such as conferences, food, and student hall accommodation severely dented. More than £500 million was lost across the sector in 2019-20 compared with the year before, comprising almost half of such income in some cases.[1] Unfortunately, costs were barely impacted since most are fixed irrespective of income or student numbers, such as staff salaries, leading to an unprecedented and unexpected shock to universities' financial positions. This led to some universities imposing hiring freezes, pay freezes, and in certain cases, tiered pay cuts – for example, The University of Kent, in order to plug the predicted £20–35 million covid-related shortfall in addition to its £15m structural deficit (reported by KentOnline in June 2020).[2]

Universities were able to make some savings through furlough for on-campus staff such as porters, catering, cleaning and some administration, but this barely scratched the surface of their cost structure since the bulk of salary payments are for academic staff. Consequently, collapsing revenues combined with sticky costs led to concerns being raised regarding institutions' financial viabilities since the vast borrowing that universities had undertaken, necessitating the payment of interest and in particular covenants requiring them not to run significant operating deficits. It was suggested in December 2020 that up to 40 English universities were facing severe

* Corresponding author.
E-mail addresses: chris.brooks@bristol.ac.uk (C. Brooks), a.j.urquhart@icmacentre.ac.uk (A. Urquhart).

[1] 'Lockdowns wiped hundreds of millions from 'extra' income streams' Simon Barker, Times Higher, 1 July 2021.
[2] 'University staff face 20% pay cuts as universities deal with financial fall-out of Covid-19', Lydia Chandler-Hicks, Kent Online, 26 June 2020.

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financial challenges because of the pandemic restrictions and a drop in international student numbers.[3] For instance, the University of Leicester had spent circa half a billion pounds on new student accommodation and other buildings, and was one of only two UK universities that felt the need to borrow money through the government's covid loan facilities according to the Times Higher.[4] Universities, however, survived the 2020-21 academic year in better shape than many had feared, but the move to on-line teaching and the lack of 'face time' led students, including high fee-paying Chinese nationals, to have less than ideal experiences.[5]

Some commentators suggested that universities had merely been unlucky that the pandemic hit, and they could not possibly have predicted that something so extraordinary would happen. However, others have argued that unbalanced expansions comprising predominantly students from one country (mainland China) studying in one discipline (business and management), vast spending on physical assets with no potential resale value, an underfunded pension scheme with an increasing deficit, and excessive borrowing have left institutions in such a perilous state that any adverse factors affecting the sector would have led to the same outcome (see for example, McGettigan, 2013). Concerns about the implications of any discord between the governments in London and Beijing have been voiced repeatedly, arguably indicating that the current situation of a collapse in international student numbers was inevitable, with the question being not if it would occur but when and what would precipitate it. For instance, The Sunday Times suggested that the sector could face losing up to 20% of its income if China banned its students from coming to the UK as a result of the barring of Huawei components from 5G grid equipment.[6]

In the corporate world, an integral aspect of a free market is the possibility that a firm can fail, resulting in bankruptcy, losses to equity holders and creditors, and the company either being wound down or taken on by another firm with a view to generating a path to its future sustainability. Likewise for universities, massive long-term borrowing has increased the risk of universities failing. Even prior to the pandemic, rumours were rife that some institutions were close to insolvency, needing short-term financing to keep going.[7] The IFS calculated that two universities 'had slightly negative net assets (owing to recent pension scheme revaluations), indicating a precarious financial position on the edge of insolvency' prior to the pandemic (Drayton & Waltman, 2020, p. 16).

Given the unique position of UK universities as quasi-autonomous bodies responsible for the education of millions of students each year and their strategic economic importance, it is surprising that there has been so little scholarly investigation of their financial positions. Much of the newspaper commentary on the topic has focused on a small number of extreme cases that may or may not be representative of the situation in the sector as a whole.

This study aims to fill this gap by conducting a comprehensive investigation of the extent to which UK universities have become more indebted over the past two decades. We also determine the factors that could explain why some institutions have increased their borrowing significantly more than others, examining both vice chancellor (VC) and institution characteristics. In doing so, we draw on the corporate finance literature, which has shown that CEO characteristics are a primary factor in explaining risky decision-making by companies, particularly regarding their borrowing. In so doing, in essence we view VCs as *de facto* CEOs of their institutions. Their role includes providing leadership in academic and administrative duties, representing the university externally, securing a financial base to allow the delivery of the university's mission, aims and objectives, as well as carrying out ceremonial and civic duties.

We primarily employ a fixed effects panel regression model applied to a longitudinal dataset of more that 100 UK universities obtained from the Higher Education Statistics Agency (HESA). We find that indeed, university indebtedness rose dramatically, caused predominantly by a rise in long-term borrowing. The growth in institutions' borrowing outpaced the growth in average income by a considerable margin. The panel regression results show that universities with vice chancellors who have been in their post a shorter period time, who are older and receiving higher salaries tend to take on more debts.

The remainder of the paper develops as follows. Section 2 describes the higher education financial landscape in the UK and how it has evolved over the past two decades, and Section 3 presents a summary of university financial positions regarding incomes, expenditures, and levels of indebtedness. Section 4 presents a conceptual framework that we develop to underpin the empirical work we conduct, with Section 5 outlining the investigative methods and data sources. Section 6 shows the main results while Section 7 ends by providing a discussion of the findings, their implications and conclusions.

2. The UK higher education environment

Universities in the UK underwent a period of remarkable growth over the past two decades, both financially and in terms of student numbers. According to the Office for National Statistics, the number of people aged 18 to 24 in full-time education rose from a million to almost two million between 1992 and 2010,[8] while according to HESA there were over 2.5 million students in the 2019/20 academic year.[9] A key component of this overall rise has comprised of an increase in international student numbers, which grew over 400% from 2000/01 to the 2019/20 academic year. Such students permitted expansion beyond what would have been possible from 'home' (UK & EU) numbers, which are limited by the proportion who are willing and qualified to attend university, and by slow

[3] 'Forty English universities in cash trouble' as pandemic bites' John Morgan, Times Higher 10 December 2020.
[4] 'From Richard III to boycott: where did it go wrong at Leicester?' Anna McKie, Times Higher, 1 July 2021.
[5] See https://thepienews.com/news/uk-61-of-chinese-students-rate-study-experience-as-bad-during-pandemic/.
[6] 'Universities face 'wipeout' if Beijing bans students' Gabriel Pogrund, Tim Shipman and John Collingridge, The Sunday Times, 19 July 2020.
[7] 'Three UK universities on the brink of bankruptcy and more reliant on short-term loans to survive', Richard Vaughan, iNews, 1 November 2018.
[8] See https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/articles/howhasthestudentpopulationchanged/2016-09-20.
[9] See https://www.universitiesuk.ac.uk/facts-and-stats/Pages/higher-education-data.aspx.

domestic population growth.

Postgraduate taught student numbers, in particular, swelled in business schools among programmes in management, accounting and finance. A similar pattern has been observed across other parts of the English-speaking world including the US (Steck, 2003), Australia (Hancock, 2020), Canada (McCartney & Metcalfe, 2018), and New Zealand (Bollard & Mayes, 2005). Such students, with the premium fees that they are charged, enabled universities to significantly enhance their revenues and to expand the scale and scope of their programmes, to hire more staff (both academic and administrative), increase the salaries of their leadership teams, invest in new buildings, and to fund new ventures such as overseas campuses. In essence, UK universities cross-subsidised their other activities by levying 'market-level fees' to international students, which is an unregulated segment with no cap on the amounts that can be charged.

This growth in both home and overseas student numbers has been accompanied by substantial changes in the finances of UK universities over the past three decades, with the funding landscape having changed almost beyond recognition over this time period. While retaining their status as quasi-independent charitable organisations, both the financial size and revenue sources of universities have undergone radical transformations.

Prior to the introduction of student fees in 1998, universities received government funding that arose, ultimately, from general taxation. Fees for undergraduate students were introduced at £1,000, which was subsequently raised to £3000 in 2004, with the possibility for variable fees up to a maximum of £9000 beginning in 2010 following the Browne Review. The government had anticipated that on average universities would charge a £7500 fee, but almost all providers selected the highest permissible figure, fearing that charging less would lead to perceptions of an inferior product and cause reputational damage as well as unnecessarily leaving money on the table. In essence, they believed that students would not be strongly price-sensitive and collectively, this left the sector in its healthiest financial position since the 1980s (McGettigan, 2013, p. 19). More recently, the fee limit was raised to £9250 in 2017 in England, where it still remains at the time of writing (2021). Many commentators and students therefore consider that universities have transformed from being funded directly by the taxpayer to being funded by consumers paying fees.[10]

At the same time as student fees have gradually replaced government block grants as their primary income source, universities have become more commercial in their outlook, increasingly thinking and behaving like businesses (Mills, 2012), as well as having an increasingly 'cozy' relationship with companies (Mitchell, 1999). Much scholarly writing has expressed concern at this trend, which has, for example, resulted in universities selling merchandise that has been made in sweatshops (Silvey, 2002), as well as affecting research agendas (Neumann & Guthrie, 2002) and teaching programmes (Gebreiter, 2021).

The commercialisation of higher education in the UK in several respects follows a trail blazed in the US. First, institutions have sought to make a surplus from teaching and research as well as elite sports (Bok, 2009), although it is much less prevalent elsewhere. Second, US universities have increased faculty numbers at roughly the same rate as students, but the number of senior administrative roles grew at a much higher rate (Ginsberg, 2011). Third, and more importantly as we will document below, the UK has also followed the US in substantially increasing its bond issuance in recent years (McGettigan, 2013).

According to McKenna (2018), there are several telltale signs when universities become corporations, including: the creation of vast numbers of new executive administrative positions; senior academic staff allocated to roles via appointments rather than elections; decisions and policies designed to reflect administrative rather than scholarly priorities; and highly bureaucratic regulatory frameworks with no room for common-sense discretion.

From the UK perspective, this change in approach from state-funded collaborators to customer-financed competitors has been caused by several factors in addition to the introduction and growth of undergraduate fees described above. First, universities have increasingly competed for students, spending significant sums on advertising and recruitment.[11] Given the relatively fixed number of home applicants wanting to attend university, in order to grow their numbers, each university faces a choice between reducing the quality of the intake and increasing their market share. Universities increasingly compete for students not just within the UK but internationally (Chatterton & Goddard, 2000), which implies spending significant sums on travelling to international education fairs run by the British Council and profit-making companies.

Second, the rise of the number and prominence of university league tables has provided an easily identifiable yardstick (whether legitimate or not), against which a university's performance can be benchmarked relative to both its peers and its own previous rating. The growing prominence of the National Student Survey as both a ranking measure in itself and a component of other league tables has encouraged the treatment of students as customers who must be kept satisfied. Universities are keen to keep students happy not only because it encourages the latter to perform better and improves retention rates ('happy students make good students'), but more strategically because higher student satisfaction scores will improve the institution's position in the rankings tables (Letcher & Neves, 2010). This enhancement in the reputation of the university will, in turn, feed into higher demand for its courses and a further increase in student numbers or quality or both.

UK governments of all political colours encouraged the development of this competitive internal market for students and facilitated it by fostering the entry of 'new players' into the market (see Ferlie & Trenholm, 2019 and also the discussion in Locke & Marginson, 2020) with a Green Paper entitled 'Fulfilling our Potential: Teaching Excellence, Social Mobility and Student Choice,' November 2015. The paper outlined a belief that new providers would 'shake up' the sector, forcing it to provide greater value for money, driving down costs and increasing innovation and diversity. Yet establishing an entirely new university, even spanning a narrow range of programmes, is a significant challenge, and consequently these new initiatives have been limited in number and none has made a significant dent in the market share of the existing providers.

[10] See https://www.universitiesuk.ac.uk/news/Pages/Around-a-half-of-students-now-see-themselves-as-customers-of-their-university.aspx.
[11] https://www.theguardian.com/education/2019/apr/02/universities-spending-millions-on-marketing-to-attract-students.

3. A picture of UK university finances

Fig. 1 plots the total amount of debt outstanding annually over the 2008 to 2019 period aggregated across all universities in our database. Total debt (dotted line), which grew by 180% over the interval, is separated into short-term (black line) and long-term debt (grey line). At the start of the sample period, total debt was around £100m, roughly equally split between short- and long-term financing. These figures remained relatively stable with modest growth until around 2015 when the total amount of long-term more than doubled in four years to over £150m, now comprising two thirds of the total. These numbers for the UK match those globally, where bond sales by universities and colleges rose to almost $12 billion in 2020, more than doubling in just a year and rising from a mere $500 million a decade earlier.[12]

The perilous financial state that some institutions currently face is at odds with the relatively benign monetary environment they found themselves in by the early 2010s, with fees and income stable, and numbers of home and overseas students both growing at both the undergraduate and postgraduate levels. By 2011, universities were overwhelmingly in a financially strong position, with 70 institutions running operating surpluses, only ten having deficits and sector-wide cash reserves of £6.5bn (McGettigan, 2013).

Fig. 2 shows the percentage changes in university total income and its components over our sample period from 2008 to 2019, averaged across all universities, and also separated into Russell Group and non-Russell group institutions. It is clear that the sector has been spectacularly successful over the period, with overall income rising around 75%, even allowing for a fall of 30% in payments from funding bodies. This compares with a rise in general price levels as measured by the consumer prices index of just 25% over the same horizon. Among all components of income, that from tuition fees has risen the most, by around 220% averaged across all institutions, while second is endowment and investment income, which approximately doubled. Research grants and other income also rose by considerably more than the rate of inflation, albeit less emphatically.

The separation of income by mission group into Russell Group institutions versus non-Russell Group institutions is also highly revealing, and shows that the former grew their income by substantially more. Put simply, the rich became far richer, not only overall but in every revenue sub-category. Russell Group universities more than doubled their research income, while that in their non-Russell group counterparts was barely able to keep up with inflation. Similarly, endowment income rose by over 150% at Russell Group universities on average but at the others overall it actually fell. Finally, it is teaching income where the findings are perhaps the most surprising given common belief that Russell Group universities focus on research while the others specialise more in teaching: Russell Group teaching income rose almost 300% compared with 180% for the others.

Fig. 3 switches the focus to university expenditures and their components, again examining the total percentage change over our sample period for all institutions combined and separately for Russell Group and non-Russell Group universities. The figure provides an initial indication that, perhaps, all is not well with university finances after all. While total income had risen around 70% aggregated across all institutions, expenditure outpaced it, rising by close to 100%. And although Russell Group universities had been more successful in raising their incomes over the period, they were less able to keep a lid on their costs, with total expenditure rising 140% compared with just 60% for non-Russell Group universities.

For non-Russell Group institutions, expenditure on 'other staff' rose at a higher rate (90% for academic staff versus 110% for non-academic staff), although expenditure on academic and other staff rose roughly in tandem at Russell Group universities. In both cases, however, these increases are dwarfed by those from interest and financing costs, which rose by a staggering 200% for Russell Group universities and 120% for the others. These numbers are testament to the amount of debt that universities have taken on and would raise significant concerns were there a requirement to roll over the funding at a time when interest rates had risen.

4. A conceptual framework for university finances and hypotheses development

Given the corporatization of universities, can we draw parallels from work conducted in the corporate finance literature about optimal debt levels and the factors affecting the amount of debt that a firm will choose in its financing mix? In the corporate finance literature, there is a large body of work on the effects of capital structure on firm value. Dating back to Myers (1984), such studies argue that for each company there exists an optimal amount leverage to maximise firm value (the ratio of the value of its debt to the value of its equity), although a firm's actual leverage ratio might be higher or lower than that figure. But when a firm issues debt starting from a position of zero borrowing, its risk of bankruptcy will significantly increase.

The situation for universities is very different: not only can they not issue equity, they are also (with the exception of a handful of private sector providers such as the University of Buckingham) not run for profit. However, some of the arguments in favour of debt issuance for firms also apply to universities. Long-term borrowing is frequently the only way to finance large capital projects such as new buildings or the development of overseas ventures where the costs are predominantly up-front, but any payoffs will accrue gradually over many subsequent years. What universities and companies have in common that debts need to be serviced, with interest paid when due and the capital repaid at maturity (possibly by 'rolling over' the debt via new bond issuance).

A key aspect of corporate structures is that there exists the possibility of bankruptcy for companies getting into financial distress and this is also an unavoidable issue for universities that borrow heavily against future expected income and invest it in fixed and largely unsellable assets. The UK government has appeared comfortable with this risk and has suggested that any institution suffering such a fate would be taken under government control, stripped of its independence and in essence run as a further education college

[12] 'Facing pandemic squeeze, universities hit bond markets for cheap cash' by Yoruk Bahceli, Reuters, 11 August 2020.

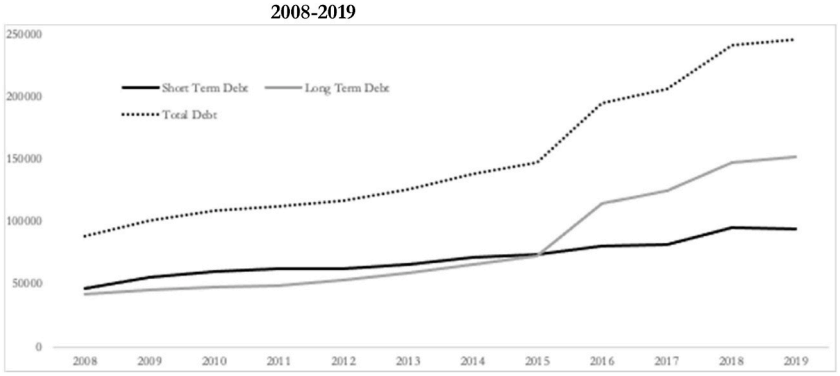

Fig. 1. UK university debts 2008–2019.

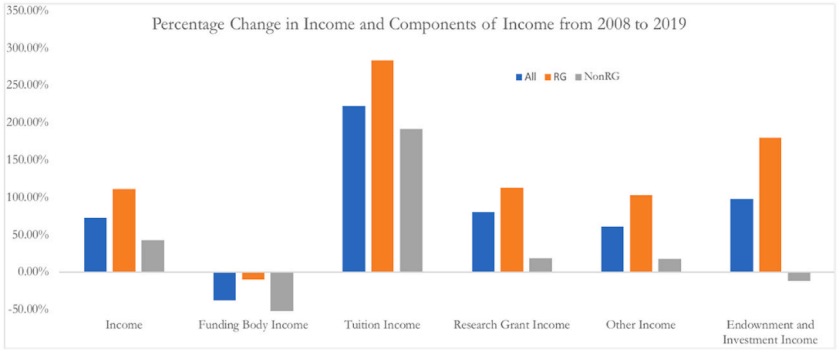

Fig. 2. Percentage change in income and components of income at UK universities 2008–2019.

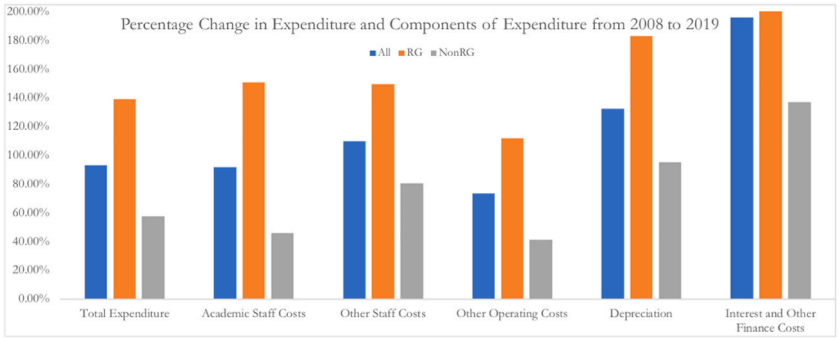

Fig. 3. Percentage change in expenditure and components of expenditure at UK universities 2008–2019.

offering the kinds of vocational courses that parliament seems to believe are lacking in the current system. On July 6, 2020 at the height of speculation around potential failures, Research Professional reported that the government was developing 'a restructuring process and fund for universities, whereby as a last resort it would intervene to take over a failing institution and repurpose its course offer'.[13]

In order to develop testable hypotheses regarding what might motivate universities to build up significant debts, it is necessary to reflect on what they might be aiming to achieve and what their strategic plans might be to achieve those aims. Universities UK, the umbrella organisation representing all UK institutions, boldly states its mission to be 'to create the conditions for UK universities to be the best in the world.'[14] Similarly, many individual institutions specify in their mission statements their desire to be 'world leading' or

[13] https://www.researchprofessionalnews.com/rr-he-agencies-other-2020-7-further-bailout-needed-to-stop-13-universities-going-bankrupt/.
[14] Universities UK Strategic Plan 2018–23, https://www.universitiesuk.ac.uk/about/Documents/uuk-strategic-plan-18-23.pdf.

'renowned as the best'. According to Hazelkorn (2008), 93% of an international sample of surveyed HEI leaders wanted to enhance their institution's national ranking, while 70% aimed to be among the nation's top 10% of universities.

One way to interpret how these ambitions and strategies are operationalised and measured is that universities ultimately compete for prestige as measured in the rankings tables in the contemporary global higher education environment. The focus on rankings, while usually implicit rather than explicit, ensures that the competitive processes and investment in facilities is ultimately a zero-sum game where one institution can only gain in the league tables at the expense of others. This implies that expenditures on infrastructure are similarly a zero-sum game where the average quality of infrastructure increases but a given university's relative position remains the same since its own expenditure is largely cancelled out by the comparable spending of its competitors.

Debts are therefore accumulated in the course of investments that university senior leadership teams believe will raise the rankings of their universities. They often claim that this cutthroat competitive market demands significant investment in buildings and facilities, yet research suggests that students are much less concerned about facilities and physical infrastructure than they are about teaching quality and course organisation (Bell & Brooks, 2018). Universities that are currently ranked lower have greater incentives to take on debts in order to improve their relative position despite the increased riskiness that borrowing entails. This leads to our first hypothesis:

4.1. Ranking and aspiration

H1a. Lower ranked universities will take on more debt

However, it is possible to make the reverse argument to the one above, namely that lower rated universities will appreciate that it is unlikely then will be able to 'borrow their way up the league table', and such institutions might have more binding borrowing constraint. This leads to the alternative to H1a that:

H1b. Lower ranked universities will take on less debt

A second set of explanations for why universities become more indebted relates to differences in the characteristics of their leaders. VCs enjoy a certain presidential privilege that allows them considerable latitude in making decisions without challenge from their wider leadership teams. This behaviour also reflects a shortermism approach, and perhaps one might argue that the tenure of VC's is too short (the average in our database is 5.5 years) for the changes that would make a big difference to the internal functioning of universities to bed in and begin to show their effect. Therefore, leaders look for quick fixes, which are big-ticket items such as buildings and marketing campaigns. Growing a reputation for excellence in research or teaching from the ground up where it did not already exist is an expensive and prolonged endeavour that would be unlikely to reach fruition during the VC's term in charge, leaving that individual's legacy in doubt and allowing their successor to take the credit. Instead, the establishment of grand ventures and investment in infrastructures financed by borrowing have morphed from a means to providing the structure and facilities needed to strengthen research and teaching into being an end in themselves.

Questions have been raised about the efficacy of university governance systems. Although they have become more corporate in outlook as we have documented above, universities are nonetheless not subject to the same checks and balances that would apply in the private sector. There is significant evidence that weak levels of corporate governance are associated with higher risk among companies (Mathew et al., 2018) including boards that are too small (Cheng, 2008), having too few independent directors (Platt & Platt, 2012), and lacking diversity (Harjoto et al., 2018). In the university context, it has been suggested that the lack of strong non-executive positions (held, for instance, by people from regulated industries) has meant that the conflicts of interest that exist among university management committees are not properly understood and audit committees are not sufficiently tough (Gill, 2019).

A recent report by Kakabadse et al. (2020) argues that university councils, which should act as a checking mechanism for the increasingly powerful and presidential role of the Vice-Chancellor, are 'poorly-structured and outdated in approach,' while 'university governors lack diversity, time, incentive, and the tools to be effective' (p.1). In their survey of 37 UK HEIs, Kakabadse et al. (2020) find that the average university governance board size is 20, which they suggest is excessively large and dilutive, diminishing the opportunities for its independent members to have a sufficiently strong questioning voice. Independent members are frequently 'disengaged and "out-of-touch" with the reality of university operations and yet still seem to be in awe of the VC' (p.20). They also find that university council members are disproportionately male, white, and over 55 years old compared to both the staff body and the typical composition of corporate boards.

The rationale behind the powerful positions of VCs is that they are in essence the Chief Executive Officers (CEOs) of UK universities and have control and oversight of the institution. Their role includes providing leadership in academic and administrative duties, representing the university externally, securing a financial base to allow the delivery of the university's mission, aims and objectives, as well as carrying out ceremonial and civic duties. There is a growing literature documenting the impact of VCs on institutions, with such studies documenting that a VC's salary is significantly related to the performance of the institution (Bachan & Reilly, 2015; Dolton & Ma, 2003; Gounopoulos et al., 2019; Johnes & Virmani, 2020; Walker et al., 2019). To capture this effect, we collect VC compensation data from Times Higher Education, which provides information on the remuneration of each VC, including base salary, benefits, pension contributions and total financial package of each University VC in the UK on a yearly basis. However, some institutions do not provide any enhanced monetary benefits to their VCs or fail to disclose any such benefits while some do not provide pension contributions beyond the base salary. Therefore, for consistency, we measure the salary of the VC as the total remuneration received by the VC for that academic year.

We also include a number of other VC characteristics that may have an influence on their behaviour and consequently on the strategies and policies of their institution with the first being the gender of the VC. There is a vast literature documenting the different

characteristics of female and male corporate managers, with one of the most documented findings being that female managers are more risk averse than their male counterparts. (Faccio et al., 2016; Huang & Kisgen, 2013; Schopohl et al., 2021). Financial markets expect female CEOs to take less risk and relatively risky firms are more inclined to hire female CEOs when the role next becomes vacant in anticipation that the firm's level of risk might reduce (Martin et al., 2009).

The literature has also found that the CEO's age can be a determining factor of corporate policies, with a number of papers documenting that older CEOs are more risk-averse than younger CEOs (Andreou et al. 2017; Serfling, 2014). Therefore, we include the age of a VC as we conjecture that older leaders are likely to be more experienced, more powerful, with less to prove and having more control over the corporate strategy of the institution. We also include two dummy variables to capture the experience of the VC, namely whether they have been a deputy VC or have been a VC previously.

There is also considerable discussion in empirical corporate finance regarding the effect of CEO remuneration on the firm's degree of risk-taking and indebtedness. While the findings are somewhat mixed, the weight of evidence suggests on balance that higher remuneration levels lead to less risk-taking since in such circumstances, CEOs would not wish to put their own generous personal income in jeopardy (see Berger et al., 1997; Jensen & Meckling, 1976).

The lines of reasoning above lead to the following hypotheses regarding vice chancellor characteristics and their implications for university indebtedness:

4.2. Governance

H2a. Universities with female VCs will take on less debt

H2b. Universities with older VCs will take on less debt

H2c. Universities with better paid VCs will take on less debt.

It is important to note that the above hypotheses are established based on the presumption that taking on additional debts is risky. However, if a particular university's current level of debt is very low, taking on a modest amount of additional debt will not lead to significant risks of default, which would be the case if the institution's level of debt was already very high.

We would also expect firms with weaker cash positions and greater expected damage from financial distress would choose lower debt levels (Mikkelson & Partch, 2003, p. 277). Although given the nature of our dataset we are unable to test this directly, by the same token, we anticipate that universities with greater asset bases will be willing and able to borrow more heavily as these can be used as collateral and in some cases could be sold to service debts in the event that the institution became financially distressed. Possible examples of assets that could be sold off include land, halls of residence, conference accommodation and hotels, and catering sites. This leads to our third hypothesis:

4.3. Financial position

H3. Universities with larger asset bases will take on more debt

5. Methods and data

In this section, we explain the data collection procedure as well providing summary statistics for the variables employed in this study.

Our investigation is based on the population of UK Higher Education Institutions (HEIs) where we limit the analysis to exclude specialised colleges or institutions such as music, art, theatre entities in order to ensure homogeneity across our sample (consistent with Degl'Innocenti et al., 2019). This leaves us with 117 institutions which are listed alphabetically in the table in Appendix 1. We employ the Higher Education Information Database for Institutions (HEIDI) provided by the Higher Education Statistics Agency (HESA) that comprises detailed data on each UK HEI. Specifically, we collect data over the academic years 2007/2008 (the earliest year available) to 2018/2019, thereby providing 12 years of data that is not affected by the Covid-19 period.[15]

Our main variable of interest is the institution's level of debt, which is split on the balance sheet between short-term and long-term debt. Specifically, short-term debt includes all debt to creditors falling due within one year while long-term debt is debt to creditors falling due after more than one year. However, the level of debt of a HEI will be dependent on the size of the institution since larger institutions may have more debt than smaller institutions. Therefore, we also use scaled debt, which is the total debt of an institution divided by the total assets.

We also incorporate a number of institutional control variables in our analysis. Firstly, we consider the size of the institution and proxy this by the total number of students, as well as the total number of staff. The amount of surplus (in £000s) is also included as a control variable as the amount of surplus an institution makes may have a strong influence on the amount of debt that it accrues. We also include the Complete University Guide Overall Score to control for the performance of the institution. We include a number of

[15] Although data are available before the 2007/2008 academic year, some variables are missing prior to that time, and therefore limits our start date in order to have full variable coverage.

dummy variables to distinguish between different types of institutions and specifically for Russell Group members, institutions with medical schools and those that have a tripled accredited Business School. The Russell Group is a collection of 24 institutions, initially formed in 1994, with the aim to "help ensure that our universities have the optimum conditions in which to flourish and continue to make social, economic and cultural impacts through their world-leading research and teaching."[16] We include a dummy variable for institutions with medical schools since having a medical school is a "badge of honour" although often a large drain on the resources of institutions because of their higher salary and research infrastructure costs (Agasisti and Salerno, 2007). We also include a dummy variable for triple accredited business schools, with the rationale being that they are often the 'cash cows' of institutions and having a strong business school with the "gold seal" of triple accreditation can help to build its brand and attract large numbers of high fee-paying postgraduate students.

All variables and their definitions can be found in Table 1 with summary statistics presented in Table 2, with means averaging both over the sample period and across institutions. Focusing first on our primary variable of interest, typical total debt levels are of the order of £150 million, comprising roughly half short-term and half long-term. 20% of universities had a female VC, while their median age was 58 with a range (42, 71). They typically remain in post for around five years, although the range of tenures is vast, varying from just a single year up to 26 years. The vice chancellor was appointed externally in over 80% of cases, with almost three quarters of them having formerly been a deputy vice chancellor and 14% having already held a vice chancellor post at another institution. Table 3 reports the correlation matrix of our variables.

In terms of the characteristics of the institution-year observations in the sample, around a quarter are part of the Russell Group, 18% have triple-accredited business schools (that is, they received accreditation from all three of the major world bodies: AMBA, EQUIS and AACSB), while a third have medical schools. We take the natural logarithm of all our debt measures, student numbers, capital expenditure, and total assets since they exhibit strong non-normality.

Table 4 presents a matrix of Pearson correlations, which allows us some assurance that our main regressions do not suffer from multicollinearity, although it should be noted that the multivariate nature of the relationships cannot be observed through pairwise correlation estimates. Regarding the latter issue, we find no relationships between the explanatory variables that are of sufficient size to be a cause for concern. We do observe, however, that correlations are very high between total assets and short-term debt (0.88) and between total assets and long-term debt (0.74). Over the longer term, such a high correlation might be expected if institutions borrow money to invest in new infrastructure which then increases their asset bases, but contemporaneously, this perhaps arises from universities with larger asset holdings being able to borrow more by using the assets as collateral. Correlations are also high between both short- and long-term debts and the institution being a member of the Russell Group (0.63 and 0.47, respectively) and between debts and having a medical school (0.48 and 0.36), although not with having a triple-accredited business school. Finally, the correlation is also high between the VC's salary and debts (around 0.5), although the latter is not affected by the VC's age or tenure.

The core method we use to examine the factors that affect HEIs debt levels over the previous 14 years is via estimation of a panel regression model including both year and institution fixed effects, where each data point is an institution-year and the dependent variable is either short-term debt, long-term debt or total debt. There are a total of 1033 observations available. We take a one-year lag of all explanatory variables in order to address potential endogeneity concerns, where debt levels might feedback to affect the explanatory variables (e.g., if the tenure of VCs is shortened by excessive indebtedness). This lag will also allow time for changes in institutional or VC characteristics to feed through into debt levels.

6. Empirical results

Our primary results for the regressions seeking to explain the variation in university debt levels are presented in Table 4. The columns headed (1) and (2) show the regression parameters with standard errors in parentheses for short-term debt as the dependent variable, while columns (3) and (4) are for long-term debt and (5) and (6) for total debt. The explanatory variables separate naturally into two groups: those relating to VC characteristics (gender, salary, age, whether they have previously been a VC at another institution, age, their tenure, whether they have prior experience as a deputy VC, whether they were appointed from outside the institution) and at the institution-level (total student numbers, total capital expenditure, the Complete University Score, total assets and dummy variables for whether the institution is a member of the Russell Group, whether it has a triple-accredited business school, and whether it has a medical school).

Comparing the models across the three dependent variables (the different debt measures), we observe a high degree of similarity in the signs, sizes and statistical significances of the parameter estimates, despite the stark differences in the trends over time displayed in Fig. 1.

Examining first the models containing only VC characteristics (specifications (1), (3) and (5)), the VC's salary and age are positively and strongly significant in influencing debt levels. These parameter estimates suggest that hypotheses H2a and H2b are not supported by the data while H2c is. The parameter estimate on the length of service of the VC (tenure) is strongly and negatively related to debt levels, although there is no explanatory role for the VC's gender in any of the specifications, and neither does the present VC formerly having held such a post elsewhere or having been a deputy VC or being hired from outside make any statistically significant difference to the university's debt level.

When the university characteristics are added (columns (2), (4), and (6)), both the VC's salary and age parameter estimates are

[16] https://russellgroup.ac.uk/about/.

Table 1
Variable descriptions and sources.

Variable	Description	Source
Panel A: HEI variables		
Short-term debt	The total amount of debt to creditors falling due with one year, in £000s.	Higher Education Statistics Agency
Long-term debt	The total amount of debt to creditors falling due after more than one year, in £000s.	Higher Education Statistics Agency
Total debt	The total amount of short-term and long-term debt, in £000s.	Higher Education Statistics Agency
Number of staff	Total number of staff at the institution.	Higher Education Statistics Agency
Number of students	Total number of students at the institution.	Higher Education Statistics Agency
Total CAPEX	The total capital expenditure of the institution, in £000s.	Higher Education Statistics Agency
Total Assets	The total assets of the institution, in £000s.	Higher Education Statistics Agency
CUG Total Score	The Complete Guide total score	Complete University Guide
Russell Group	A dummy variable equal to 1 if the institution is in the Russell Group, 0 otherwise.	www.russellgroup.ac.uk
Medical School	A dummy variable equal to 1 if the institution has a medical school, 0 otherwise.	www.medschools.ac.uk
Triple Accredited Business School	A dummy variable equal to 1 if the institution has a triple accredited business school, 0 otherwise.	https://www.mba.today/guide/triple-accreditation-business-schools
Panel B: VC Characteristics		
VC total salary	The total salary of the vice-chancellor, in £s.	Times Higher Education
VC gender	A dummy variable equal to 1 if the VC is female, 0 otherwise.	Whos who, University profiles and Linkedin
VC age	The age of the VC, in years.	Whos who, University profiles and Linkedin
Deputy VC	A dummy variable equal to 1 if the VC has previously been a deputy VC, 0 otherwise.	Whos who, University profiles and Linkedin
Previous VC	A dummy variable equal to 1 if the VC has previously been a VC, 0 otherwise.	Whos who, University profiles and Linkedin
VC Tenure	The number of years the VC has been in place for, in years.	Whos who, University profiles and Linkedin
VC External	A dummy variable equal to 1 if the VC is externally appointed from the institution, 0 otherwise.	Whos who, University profiles and Linkedin

Table 2
Summary statistics for key variables.

	Mean	Std Dev.	Median	Min	Max	Skewness	Kurtosis
ShortTermDebt	£71,991	£105,172	£40,664	£2328	£1,096,844	4.58	28.25
LongTermDebt	£82,696	£102,603	£52,768	£0	£1,007,596	3.75	22.98
TotalDebt	£154,687	£191,775	£100,458	£4489	£2,046,482	4.47	30.46
TotalStudent	18274	8398	17465	1750	123490	1.93	19.73
TotalCAPEX	£35,330	£102,655	£19,711	£0	£329,2659	27.07	850.72
TotalAssets	£320,972	£318,707	£221,234	-£582,474	£2,507,379	2.72	10.08
RG	0.23	0.42	0.00	0.00	1.00	1.31	−0.28
TripleAccredited	0.18	0.39	0.00	0.00	1.00	1.66	0.74
Medical	0.35	0.48	0.00	0.00	1.00	0.64	−1.59
CUG Total Score	58.60	35.39	57.00	1.00	129.00	0.10	−1.18
VCGender	0.20	0.40	0.00	0.00	1.00	1.52	0.30
VCSalary	£276,215	£58,829	£269,192	£106,000	£489,000	0.70	0.72
VCAge	58.19	4.75	58.00	42.00	71.00	−0.29	−0.11
PVC	0.14	0.35	0.00	0.00	1.00	2.03	2.11
VCTenure	5.31	3.94	4.00	1.00	26.00	1.29	2.22
DVC	0.74	0.44	1.00	0.00	1.00	−1.12	−0.74
VCExternal	0.82	0.39	1.00	0.00	1.00	−1.63	0.64

reduced in size and lose their statistical significance, although VC tenure retains its role. In addition, the parameter on total assets is positive and significant at the 1% level in all three regressions, in support of hypothesis H3. However, neither the rank of the institution nor its membership of the Russell Group or otherwise influence its level of indebtedness, providing no support for either hypothesis H1a or H1b. Finally, having a triple-accredited business school has a negative and significant effect on long-term and total debts but not short-term debts.

7. Discussion and conclusions

This study has examined the change in UK university borrowing since 2008. We find that university indebtedness rose dramatically, caused predominantly by a rise in long-term borrowing, which is consistent with the notion that this has been undertaken to finance asset purchases such as substantial new buildings, rather than to 'stay afloat'. Using a comprehensive panel dataset, we observe that the variation in debt levels across universities is related to institutional and vice chancellor characteristics.

While this paper represents one of very few such studies of higher education funding and indebtedness globally, it is subject to

Table 3
Variable correlation matrix.

	Short Term Debt	Long Term Debt	Total Debt	VC Gender	VC Salary	VC Age	PVC	VC Tenure	DVC	VC External	Rank	Total Student	Total CAPEX	Total Assets	RG	Triple Accredited
LongTerm Debt	0.70															
TotalDebt	0.93	0.92														
VCGender	−0.03	0.04	0.01													
VCSalary	0.49	0.48	0.53	−0.12												
VCAge	0.21	0.18	0.21	−0.03	0.24											
PVC	0.27	0.19	0.25	−0.08	0.23	0.13										
VCTenure	−0.05	−0.01	−0.04	−0.10	0.17	0.40	−0.12									
DVC	−0.10	−0.09	−0.10	0.13	−0.16	−0.02	−0.06	−0.10								
VCExternal	0.03	0.00	0.01	0.09	0.04	−0.07	0.12	−0.10	0.01							
CUG Total Score	−0.51	−0.44	−0.51	0.05	−0.49	−0.13	−0.13	0.03	0.19	−0.05						
TotalStudent	0.35	0.29	0.34	−0.20	0.36	0.07	0.21	0.02	−0.05	−0.13	−0.23					
TotalCAPEX	0.29	0.26	0.30	−0.03	0.18	0.03	0.07	−0.03	−0.02	0.01	−0.21	0.13				
TotalAssets	0.88	0.74	0.88	−0.04	0.57	0.25	0.26	0.03	−0.07	0.04	−0.56	0.44	0.31			
RG	0.63	0.47	0.60	−0.12	0.46	0.20	0.28	0.00	−0.15	0.05	−0.62	0.39	0.27	0.69		
Triple Accredited	0.24	0.15	0.21	−0.08	0.27	0.06	0.22	−0.03	−0.13	0.07	−0.42	0.24	0.10	0.31	0.38	
Medical	0.48	0.36	0.46	−0.02	0.41	0.16	0.20	0.07	−0.18	−0.04	−0.63	0.24	0.20	0.52	0.65	0.28

Table 4
Panel regression results on the determinants of UK university debt levels where we regress various levels of debt on vice-chancellor and university characteristics. Standard errors are reported in parentheses, which are clustered at university level. ***, ** and * indicate significance at the 1%, 5% and 10% levels respectively.

	ShortTermDebt		LongTermDebt		TotalDebt	
Constant	−288,325.900**	6346.16	−208,510.700***	36,864.62	−513,412.700***	43,210.79
	(-118,689.00)	(-35,676.76)	(-62,126.60)	(-37,553.19)	(-166,517.80)	(-48,591.86)
lag(VCGender)	2954.39	−2712.01	18,858.83	13,490.83	19,337.06	10,778.82
	(-14,568.35)	(-10,079.12)	(-17,710.94)	(-13,903.84)	(-30,365.36)	(-22,387.07)
lag(VCSalary)	0.6821***	−0.091	0.6362***	0.034	1.3431***	−0.0570
	(-0.148)	(-0.099)	(-0.094)	(-0.073)	(-0.229)	(-0.131)
lag(VCAge)	3401.424**	767.97	2460.650***	454.591	5718.341**	1222.56
	(-1650.44)	(-624.681)	(-929.594)	(-596.391)	(-2369.34)	(-794.043)
lag(PVC)	23,455.89	13.444	13,394.07	1537.46	38,101.43	1550.90
	(-17,135.83)	(-11,734.24)	(-16,927.09)	(-13,256.19)	(-31,308.90)	(-20,125.51)
lag(VCTenure)	−4493.557***	−2089.950**	−3092.408***	−1076.65	−7326.508***	−3166.598***
	(-1724.01)	(-818.666)	(-1124.93)	(-735.176)	(-2612.23)	(-1159.19)
lag(DVC)	−9221.39	−7535.88	−14,041.32	−14,959.76		−22,495.63
	(-13,767.16)	(-8594.58)	(-14,253.63)	(-11,164.20)		(-16,510.26)
lag(VCExternal)	711.304	−114.74	−7933.93	−9135.99	−7413.05	−9250.72
	(-13,692.60)	(-6023.42)	(-15,386.86)	(-10,210.34)	(-26,558.22)	(-12,528.82)
lag(CUG Total Score)		−143.098*		−327.306**		−470.404***
		(-83.141)		(-131.186)		(-168.254)
lag(TotalStudent)		−0.425		−0.291		−0.717
		(-0.623)		(-0.532)		(-1.075)
lag(TotalCAPEX)		0.021		0.047		0.068
		(-0.035)		(-0.038)		(-0.072)
lag(TotalAssets)		0.226***		0.191***		0.416***
		(-0.071)		(-0.036)		(-0.102)
lag(RG)		29,418.400*		3675.87		33,094.27
		(-15,633.96)		(-16,563.14)		(-25,445.09)
lag(TripleAccredited)		−14,558.20		−24,865.690*		−39,423.89
		(-18,642.78)		(-13,330.69)		(-25,171.09)
lag(Medical)		7278.65		−9547.71		−2269.06
		(-6566.93)		(-8714.40)		(-11,662.61)
Year Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
University Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1187	1187	1187	1187	1187	1187
R^2	0.214	0.606	0.174	0.427	0.222	0.596
Adjusted R^2	0.209	0.601	0.169	0.42	0.218	0.591
F Statistic	45.885***	128.670***	35.377***	62.318***	56.183***	123.611***

several limitations, most notably with regards to the data and model specification. First, although we include lagged values of the explanatory variables in the panel model to mitigate potential endogeneities, it is not a complete solution in the issue. Second, it would be interesting for future studies to employ a dynamic panel regression including lagged debt as an explanatory variable. Third, the data available from HESA are limited in that the categorisation of expenditures is at a rather aggregate level, making it difficult to identify 'where all the money went'. It would therefore be valuable to investigate alternative sources of data, possibly via Freedom of Information requests, to obtain more granularity on expenditure categories. Finally, an international comparison would be worthwhile to determine whether the phenomena described here also took place to lesser or greater extents in other English-speaking countries with large international student bodies such as the US, Canada and Australia.

Our findings shed light on several issues that the sector needs to overcome if it is to ensure its financial sustainability in the long-term against a likely backdrop of less certain incomes and rising interest costs. Our data reveal although that revenues at UK universities have grown considerably over the past two decades, costs have also risen more than commensurately, and we observe that interest on debt payments is a significant part of this. Whilst times were good, what did universities spend this windfall on? It appears they invested primarily in improving their estates. From 2014 to 2019 they spent 'nearly as much as the entire cost of staging the 2012 Olympic games'.[17] However, almost all the investment was in physical capacity and not the technical infrastructure that is now essential for digital delivery both on- and off-campus, as many providers are now finding. Universities have invested in their wider staff body to some extent, although this involved disproportionately growing professional support services rather than academics.[18] They have also spent heavily on marketing, focusing on the 'sale proposition', the open days and the branding, rather than the student

[17] https://www.architectsjournal.co.uk/news/has-the-university-building-gold-rush-run-its-course.
[18] https://www.timeshighereducation.com/news/academics-minority-more-two-thirds-uk-universities.

experience itself.[19]

We find vice chancellor tenure to be negatively related to indebtedness, which suggests that VCs newer to the job take on higher debt that VCs who have a longer tenure. Our view is that the external appointment of VCs for, typically, five or six years, provides incentives to focus on the short-term. They see their legacy as a shiny building and their role is merely to persuade the university to borrow the money to pay for it. A counter to this short-term agenda would be for universities to appoint from the inside where candidates would have a real connection to the institution, aligning the risk profile and values of the individual and institution. This would encourage the university leader to aim to develop a real lasting legacy rather than primarily pursuing projects to suit their own career ambitions driven by a short-term view. Internal appointments would, however, be a move against many of those made over the last few decades that have seen VC's increasingly appointed from outside the academy entirely.

Even though overseas postgraduate income has returned to its pre-pandemic levels, it appears unlikely to grow further at anything like the rate that it did previously. Universities will need to think about how they continue to fund research and other activities in the absence of this previously unacknowledged subsidy. In this environment, even meeting existing debt servicing costs will become challenging in an increasing interest rate environment, providing little headroom for further substantial borrowing. A compounding factor is high and growing inflation, putting pressure on central banks to raise interest rates, and meaning stagnant fee levels will create income deficit in real terms. This issue is not one that merely affects a handful of providers, but rather it is endemic across the whole sector.

Author statement

Adrian Bell - Conceptualization, Visualization, Writing Original Draft, Writing – Review and Editing.
Chris Brooks - Conceptualization, Visualization, Writing Original Draft, Writing – Review and Editing.
Andrew Urquhart – Conceptualization, Visualization, Methodology, Writing Original Draft, Writing – Review and Editing.

Appendix 1. List of universities included in the study

Aberystwyth University	Queen's University Belfast	The University of Manchester
Anglia Ruskin University	Roehampton University	The University of Northampton
Aston University	Royal Holloway and Bedford New College	The University of Oxford
Bangor University	Sheffield Hallam University	The University of Portsmouth
Bath Spa University	Solent University	The University of Reading
Birkbeck College	St George's, University of London	The University of Salford
Birmingham City University	St Mary's University, Twickenham	The University of Sheffield
Bournemouth University	Staffordshire University	The University of Southampton
Brunel University London	Swansea University	The University of St Andrews
Buckinghamshire New University	Teesside University	The University of Stirling
Canterbury Christ Church University	The Manchester Metropolitan University	The University of Strathclyde
Cardiff Metropolitan University	The Nottingham Trent University	The University of Sunderland
Cardiff University	The Open University	The University of Surrey
City, University of London	The Robert Gordon University	The University of Sussex
Coventry University	The University of Aberdeen	The University of the West of Scotland
Cranfield University	The University of Bath	The University of Warwick
De Montfort University	The University of Birmingham	The University of West London
Edge Hill University	The University of Bolton	The University of Westminster
Edinburgh Napier University	The University of Bradford	The University of Winchester
Glasgow Caledonian University	The University of Brighton	The University of Wolverhampton
Glyndwr University	The University of Bristol	The University of York
Heriot-Watt University	The University of Cambridge	Ulster University
Imperial College London	The University of Chichester	University College Birmingham
Keele University	The University of Dundee	University College London
King's College London	The University of East Anglia	University of Abertay Dundee
Kingston University	The University of East London	University of Bedfordshire
Leeds Beckett University	The University of Edinburgh	University of Chester
Leeds Trinity University	The University of Essex	University of Cumbria
Liverpool Hope University	The University of Exeter	University of Derby
Liverpool John Moores University	The University of Glasgow	University of Durham
London Metropolitan University	The University of Greenwich	University of Gloucestershire
London School of Economics and Political Science	The University of Huddersfield	University of Hertfordshire
London South Bank University	The University of Hull	University of Northumbria at Newcastle
Loughborough University	The University of Kent	University of Nottingham

(*continued on next page*)

[19] Examples of the cost of rebranding are the University of Warwick (https://www.timeshighereducation.com/news/warwick-rebranding-sparks-petition/2019888.article) and the University of Portsmouth (https://www.portsmouth.co.uk/education/university-portsmouth-under-fire-over-aps800000-rebrand-costs-departments-face-cuts-1046146).

(*continued*)

Middlesex University	The University of Lancaster	University of Plymouth
Newcastle University	The University of Leeds	University of the Highlands and Islands
Oxford Brookes University	The University of Leicester	University of the West of England, Bristol
Queen Margaret University, Edinburgh	The University of Lincoln	University of Worcester
Queen Mary University of London	The University of Liverpool	York St John University

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