

## Ranking, Income Diversification, and Income Size – Are They Related?

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**Abstract:** *This paper aims to assess the degree of the income diversification of the UK higher education providers as a component of their overall financial resilience. In addition, we investigate a correlation between ranking, income diversification, and income size. The main research question is whether the higher ranking of the universities, in particular, is associated with higher income and higher diversification relative to lower-ranked universities. To measure income diversification using descriptive statistics, we use Hirschman-Herfindahl Index (HHI), Corrected HHI, and Revenue Diversification Index (RDI). We covered a period of ten years, from 2010/11 to 2019/20. The findings reveal that a higher ranking of the universities measured by both ranking systems has been significantly positively correlated with the size of income and income diversification and negatively correlated with income concentration.*

**Keywords:** higher education, income diversification, Hirschman-Herfindahl index, income concentration, university ranking

### INTRODUCTION

The paper aims to assess the degree of income diversification of the UK higher education (HE) providers as a component of their overall financial resilience.<sup>1</sup> In addition, we test the bivariate correlation coefficients between the HE providers ranking, the degree of income diversification, and the size of their income. The main research question is whether the higher ranking of the universities is associated with better diversification and superior income relative to lower-ranked HE providers. Previous studies thoroughly analyzed the impact of income

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<sup>1</sup> In this paper, due to the specific terminology used in reporting of the UK higher education providers to the Higher Education Statistics Agency, the term *income* has the same meaning as *revenue* and has been used interchangeably. *Revenue (income) size* represents the total revenue sourced from the sale of the organization's goods and services.

diversification on the financial health of nonprofit organizations and, to a lower degree, its impact on the financial health of HE providers. This research further contributes to understanding HE providers' income diversification. It associates the ranking of the universities, income diversification, and size of the income.

Income diversification is an essential part of the overall financial resilience of any organization. Income diversification is the ability of the organization to increase the number of revenue sources and diminish the importance of a single source on its viability. For example, the disruption of tuition fees as a single revenue source may have harmful effects on some higher education providers. Financial resilience is the ability, or capacity, of an organization to bounce back to at least its original financial performance level after a disruptive event (Chen, 2021). From the quantitative perspective, the ratios that also capture information about stability, capacity (liquidity), gearing, and sustainability enable an assessment of financial resilience (Ryan & Irvine, 2012). Financial shocks and consequently lower demand in some sectors may harm the primary source of income and lower their ability to serve the market. It is particularly true for nonprofit organizations because of their size and growth, affecting a large number of people (Tuckman & Chang, 1991). The significance of revenue diversification is also applicable to the government sector and tax revenues. For example, (Suyderhoud, 1994) concludes that when a better measure of diversification and balance is used, it is clear that greater balance is generally associated with improved fiscal performance. The higher education sector is financially susceptible to any disturbances that affect the size of the tuition fees and contracts as their primary source of revenue. There are two reasons why HE providers must carefully monitor revenue size. Firstly, as the HE providers pursue economics of scale with a relatively high degree of operating leverage, any downfall of the primary revenue source may harm the continuity of the operations. Diminished demand for the HE provider's services does not necessarily result in lower costs and vice versa. In other words, due to the exposure to high fixed costs, a high degree of operating leverage indicates the high sensitivity of the operating profit or surplus to the change in revenues.

Secondly, the last decade has been marked by reconsideration of the viability of state funding for public universities and colleges. According to (Estermann & Pruvot, 2011), direct public funding continues to be the most important income source for universities in Europe, representing, on average, close to three-quarters of an institution's budget, and additional sources represent more than 10% of the budget of a majority of universities. However, some universities and colleges primarily rely on private funding, sometimes exclusively from tuition fees. Regardless of the type of ownership, privately or state-funded universities actively seek to reduce their financial vulnerability and supplement the primary income with other income sources. Many universities across Europe are developing their fundraising capacities, including philanthropic funding and foundations, but the companies and alumni are also getting more involved (Estermann & Pruvot, 2011). For example, many UK HE providers often supplement primary income with income from endowments and donations. The academic endowments linked with the UK universities and colleges are estimated to be worth £15.8 billion in 2020 and play a significant role in the UK higher education system (Šestanović et al., 2022). (Wekullo & Musoba, 2020) found that state and local appropriations and institution endowments are significantly associated with the institutional financial health of the public research universities. Additional income sources strengthen the HE providers' financial security and make a safety cushion when tuition fees fall below the critical level. Thus, UK colleges and universities, like in the US, receive revenue from several sources. The educational mission is funded with revenue from tuition, state and local appropriations, and income from endowments or investment returns while also receiving grants

and contracts for research and training or revenue from "auxiliary" services (Desrochers & Hurlburt, 2016).

After the introduction, the paper proceeds as follows. The following section addresses the literature review. The third section outlines the research design and method by which the study was conducted. In the fourth section, we present our findings and outline the implications. Finally, the last section gives the main conclusions and recommendations for further research.

## LITERATURE REVIEW

There is a vast body of literature on the impact of income diversification on the financial health of nonprofit organizations in general and, to a somewhat lesser degree, the impact of the diversification on higher education providers' financial health. (Hung & Hager, 2019) analysis of 40 original studies has shown a small, positive, yet statistically significant association between revenue diversification and nonprofit financial health. Tuckman and Chang (1991) define a financially flexible organization as having access to equity balances, many revenue sources, high administrative costs, and high operating margins. Notably, nonprofit organizations that cultivate equal amounts of revenues from disparate sources are less vulnerable than those that derive all revenues from a single type of source. Testing the (Tuckman & Chang, 1991) study, (Greenlee & Trussel, 2000) showed that financially vulnerable charities have slightly higher revenue concentration than those non-vulnerable charities. Another test of the same study showed that a high revenue concentration was useful in predicting the death of visual arts organizations, theatres, music organizations, and generic performing arts organizations (Hager, 2001). (Keating et al., 2005) tested the revenue concentration index (RCI) used in the (Tuckman & Chang, 1991) study and found the highest correlations with insolvency risk and financial disruption. (Thomas & Trafford, 2013) also confirmed Tuckman and Chang's hypothesis that a financially non-vulnerable nonprofit will have strong revenue diversification, a high proportion of administration cost in relation to the total cost, and high equity reserves and high operating margin. (Trussel, 2002) obtained similar results and found a higher concentration of revenues in the financially vulnerable nonprofit organization. (Mayer et al., 2014) found that, in contrast to modern portfolio theory that advocates a trade-off between diversification and return, the effects of diversification on volatility and expected revenue depend on the compositional change in the portfolio. For example, a more diversified portfolio achieved by replacing earned income with donations reduces both volatility and expected revenue, while replacing investment income with donations to achieve an increase in diversification of the same magnitude reduces volatility and increases expected revenues. In addition, a diversified revenue portfolio is associated with a healthier financial position as measured by such indicators as asset size, operating margin, and growth of net equity (total assets minus total liabilities) (Chang & Tuckman, 1994). Revenues should be diversified by sources so that the nonprofit does not become overly dependent on government appropriations, private gifts, grants, user fees, or any single source (Chabotar, 1989). (Kingma, 1993) argued that modeling financial risk for nonprofits has shown that neither complete dependence on one funding source nor complete diversity of funding will minimize income variability. Instead, to choose the correct level of revenue diversity, each nonprofit organization manager must consider the variance of all streams of revenue, the covariance between these streams, and the expected level of growth of each stream.

(Tuckman & Chang, 1991) argued that an organization that finds it difficult to retain some of its revenues at the end of the year might not be able to develop the equity base needed to provide

a cushion against financial shocks. Nonprofits that experience revenue instability is more likely to remain financially vulnerable than those that do not. (Cheslock & Gianneschi, 2008) note that while state appropriations are declining as a share of public higher institutions' budgets, they remain an important source and major determinant of an institution's financial well-being. In addition, the authors conclude that the level of inequality in private giving is dramatically higher than for the state appropriations. (Chikoto & Neely, 2014) empirically tested whether revenue concentration contributes to the growth of nonprofit organizations and found that in contrast to revenue diversification, implementing a revenue concentration strategy generates a positive growth in one's financial capacity—in particular, a growth in one's total revenue, over time. (Foster & Fine, 2007) investigated the size of the nonprofit organizations and found that most organizations have gotten big by concentrating on one type of funding source, not by diversifying across several funding sources. (Carroll & Stater, 2009) found that nonprofits can reduce their revenue volatility through diversification and that a diversified portfolio encourages more stable revenues and, consequently, promotes greater organizational longevity. Model of (Yan et al., 2009) estimates show that nonprofit organizations with higher revenue diversification are more likely to issue debt but do not necessarily have higher debt ratios. (Kim, 2017) indicates that revenue diversification strategies of nonprofit organizations lead to better program outcomes, reflected in increased attendance. In addition, becoming less dependent on a single resource provider allows organizations greater capacity to manage programs without disruption. (Chikoto & Neely, 2014) results suggest that although revenue concentration can be expected to increase nonprofits' financial capacity, increasingly becoming more concentrated over time may be unwise. Their results suggest that revenue concentration is more effective at generating financial growth when deployed as a one-time strategy. As an organization's revenue streams became more concentrated over time, authors observed declines in total revenues, total net assets, and unrestricted net assets over the 5-year period. Opposite to prevailing conclusions on benefits of the revenue diversification, (Frumkin & Keating, 2011) found that revenue concentration for some nonprofits is more beneficial than revenue diversification. Nonprofit organizations with highly concentrated and specialized forms of revenue experience some significant benefits, in the form of lower administrative and fundraising expenses, although this some with costs associated with greater exposure to swings in an organization's financial position.

Concerning the income diversification of the HE providers, (Lucianelli & Citro, 2017) warn that only those higher education institutions with sound financial structures and stable income flows will be able to fulfill their multiple missions and respond to the current challenges in an increasingly complex and global environment. Therefore, the universities are cultivating commercial operations to diversify their funding sources, becoming more business-like and entrepreneurial (Hughes et al., 2013). (Garland, 2020) analyzed the financial health of England's universities founding that established pre-1992 universities are more financially diversified and thus less vulnerable to changes in their external environment. (Taylor, 2013) concludes that from the point of the full diversification, the current reliance of UK universities on income from teaching, the development of alternative income streams to reduce the risk of instability in student recruitment seems unlikely. (Irvine & Ryan, 2019) employed a multi-dimensional study based on seven years of government financial data from 39 publicly funded Australian universities. The differences between the Top 10 and Bottom 10 universities measured by revenue were most evident in revenue diversity, a strong predictor of financial viability, with the larger universities having greater potential for revenue diversification. (Estermann & Nokkala, 2009) argue that the commitment to long-term stable university funding is crucial for institutional autonomy.

Diversifying institutional funding to multiple funding streams creates additional accountability requirements. As most European universities are dependent on state funding, it inevitably limits a university's ability to function independently. (Eurydice, 2008) emphasizes that most countries pursue a policy of supporting the diversification of funding sources. Central authorities encourage higher education providers to seek new financial resources such as investments by private companies, contract research and other commercial activities, donations, loans, and similar.

### RESEARCH DESIGN AND METHODS

The income of the HE providers is obtained from the data submitted to the Higher Education Statistics Agency (HESA) with six income categories: tuition fees and contracts, funding body grants, research grants and contracts, other income, investment income, and income from donations and endowments.

We applied three measures of income diversification - the Hirschman-Herfindahl index (HHI), the Revenue Diversification Index (RDI), and the corrected Hirschman-Herfindahl Index (cHHI).

Developed independently by the economists Hirschman (Hirschman, 1945) and Herfindahl (Herfindahl, 1950) as a measure of trade and industry concentration or inequality, HHI is regarded as a precise measure of concentration that considers the number of revenue streams and the distribution amongst them (Chikoto et al., 2016). It has appeared as a measure of revenue diversification in various contexts for measuring the concentration of household income (or wealth), market output, and horizontal mergers (Rhoades, 1993). The HHI has been applied in the context of fiscal performance and tax policy (Suyderhoud, 1994), and particularly in the nonprofit sector (Carroll & Stater, 2009), (Chang & Tuckman, 1994), (Chikoto et al., 2016), (Tuckman & Chang, 1991), (Yan et al., 2009)). The HHI, as a measure of income concentration, captures two dimensions of concentration, the number of sources and the extent to which dollars of revenue are dispersed across sources (Chang & Tuckman, 1994). A general expression is computed as follows:

$$\sum_{i=1}^N (r_i/R)^2, i = 1, \dots, n,$$

where N = number of income categories, r = income category from  $i_{th}$  source, and R = total income from all sources. If total income comes from one source (N = 1 and  $r_i = R$ ), then HHI has the upside limit of 1. As the number of income categories increases and income distribution becomes more even, HHI declines. When all income sources are represented and distributed equally among the income categories, HHI reaches the downside limit of 1/N.

The RDI measures revenue diversification, as shown in (Suyderhoud, 1994). The higher value of the RDI indicates greater income diversification. Technically, RDI quantifies the achieved diversification ( $1 - HHI$ ) relative to maximum diversification ( $1 - 1/n$ ). The RDI is computed as follows:

$$RDI = \frac{1 - HHI}{1 - \frac{1}{n}}$$

Using the procedure shown in (Chammas, 2017), cHHI extends the lower HHI boundary. cHHI is the opposite value of RDI. Instead of the lower limit of 1/N, the cHHI has a minimum value of 0 (maximum diversification) and a maximum value of 1 (maximum concentration). Therefore, the sum of RDI and cHHI is equal to one. It is computed as follows:

$$cHHI = 1 - \frac{1 - HHI}{1 - \frac{1}{n}}$$

Our population comprises all the UK HE providers within the HESA database with reported income sources. For illustrative purposes, Table 1 shows the distribution of the UK HE providers by the number of income sources for the year 2019/20. Only seven HE providers collect income from only one source. In contrast, more than half of our sample collects income from all six sources, suggesting considerable income diversification. In addition, approximately only one-third of the sample collects income from four or fewer income sources. However, the number of income sources as a sole measure of diversification has serious drawbacks. Thus, compared to HHI, it is not a methodologically sound measure of income diversification.

**Table 1***The higher education providers and number of income sources*

Number of income sources	Number of HE providers	Percent of total	Cumulative percent
1	7	2.6%	2.6%
2	23	8.7%	11.3%
3	32	12.1%	23.4%
4	33	12.5%	35.8%
5	28	10.6%	46.4%
6	142	53.6%	100.0%
Total	265	100.0%	

Table 2 shows that 97.7% of the HE providers generate income from tuition fees and education contracts. On the other side, other income categories are also well represented. Notably, 82.6% of HE providers generate investment income, and 71.7% create income from donations and endowments. For the most reputable UK academic universities and colleges, the role of the endowments in providing a healthy income stream and strong balance sheet has been substantial over the years, although with less importance than US academic institutions (Šestanović et al., 2022). Income from research grants and contracts is represented in the 60% percent of HE providers.

**Table 2***Income sources and number of higher education providers*

Income sources	Number of HE providers with source	Percent of HE providers with source
Tuition fees and education contracts	259	97.7%
Total other income	254	95.8%
Investment income	219	82.6%
Funding body grants	192	72.5%
Total donations and endowments	190	71.7%
Total research grants and contracts	159	60.0%

Table 3 presents the HHI, RDI, and cHHI for all the UK HE providers in the HESA database for the ten years, beginning with 2010/11 and ending with 2019/20. In general, the HHI above 0.25 indicates a high concentration. In our example of six income categories, perfectly diversified income is reached with equal distribution of each of the six income categories in the total income, with an equal share of 16.66% of each category in the total income. Thus, the downside limit of the HHI is 0,1667, and an upside limit is 1. The methodological nature of the HHI honors the equality of the income categories in total income; thus, relying on one primary income source brings relatively high HHI.

**Table 3**

*Aggregate income diversification measures for higher education providers*

<b>Year</b>	<b>Number of HE providers</b>	<b>HHI</b>	<b>CorrHHI</b>	<b>RDI</b>
2010/11	164	0.25	0.11	0.89
2011/12	163	0.25	0.10	0.90
2012/13	161	0.26	0.12	0.88
2013/14	161	0.28	0.14	0.86
2014/15	162	0.30	0.16	0.84
2015/16	162	0.32	0.18	0.82
2016/17	164	0.32	0.19	0.81
2017/18	165	0.32	0.19	0.81
2018/19	199	0.32	0.18	0.82
2019/20	264	0.34	0.20	0.80

The HHI steadily rose from 0.25 in 2010/11 to 0.34 in 2019/20, indicating a high income concentration. The same situation is with cHHI, which uses standardized values of income concentration of minimum 0 and maximum 1, with cHHI reaching 0.20 in 2019/20. Conversely, the opposite indicator, RDI, steadily declines from 0.89 in 2010/11 to 0.80 in 2019/20, suggesting decreasing diversification. However, it should not surprise that HE providers collect most of the income from tuition fees and education contracts.

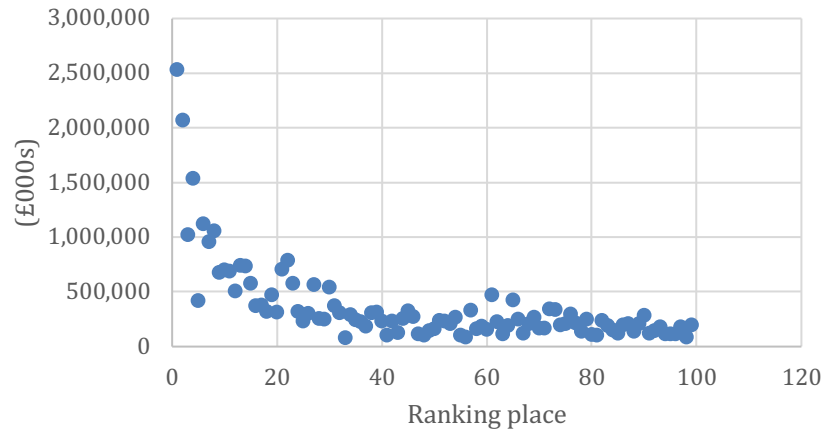
We have tested the correlation of the three variables, controlling for the number of students and total assets. Firstly, there is a well-grounded perception that the higher-ranked universities are more visible and thus better positioned to achieve higher income. As a result, we expect better-ranked universities to generate more income than worse ranked. Thus, firstly we test the correlation between relative ranking position and the logarithm of the total income. We use the logarithm of the income as there is a clear relationship between the ranking and income size of the universities (Figures 1 and 2). The size of the universities' income shows an exponential relationship with the better ranking, i.e., better-ranked universities are achieving higher income. It is valid for both World University Rankings provided by Times Higher Education (WR THE) and QS. World University Rankings (WR QS).

In addition, we would expect that the better-ranked universities more successfully attract the non-core income sources (besides tuition fees and contracts), especially research grants and contracts, and thus have less concentrated income sources. In other words, better-ranked universities enjoy more visibility and a higher reputation, attracting more additional non-core income sources. For example, (Cheslock & Gianneschi, 2008) suggested a slightly positive

relationship between state funding and private donations. They argue that better governmental funding stimulates additional donations for more prosperous HE institutions. Thus, we test the correlation between ranking position and the income concentration index (cHHI). Finally, we investigate the correlation between the income size and revenue diversification index (RDI) and test whether higher-income universities rely more on one primary income source and thus are less diversified.

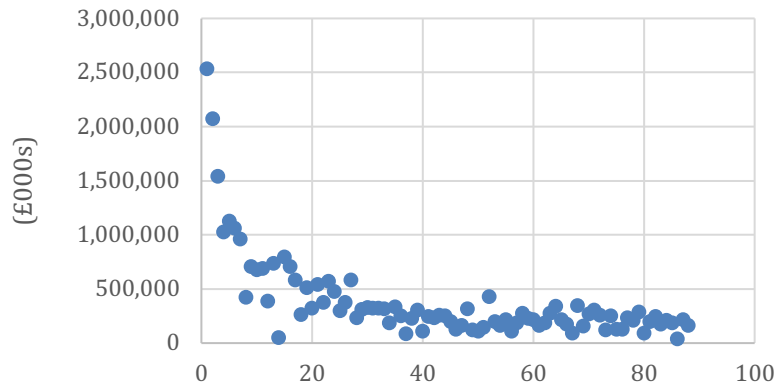
**Figure 1**

*WR THE ranking and income size*



**Figure 2**

*WR QS ranking and income size*



For a relative ranking position, we narrowed our sample to only those UK universities ranked within one of two widely recognized university ranking systems – World University Rankings provided by Times Higher Education (WR THE) and QS. World University Rankings (WR QS). Both income data and rankings are for 2020. We use a population of 99 universities for the first ranking system, with one HE provider excluded as we have not found its income data in the HESA database. The other ranking system has 88 UK universities. Finally, the income size is measured using the logarithm of income ( $\log_{10}(\text{INC})$ ) because of a non-linear relationship between ranking and income size. The income concentration and diversification are measured using cHHI and RDI, respectively.

## RESULTS AND DISCUSSION



For the more intuitive explanation of the bivariate correlation coefficients, the better ranking is associated with a higher relative number, i.e., the lowest-ranked university is assigned with the number 1, and the best-ranked university is assigned with the highest number in the set of ranked universities. The strength of the relationship can be interpreted from the value of the correlation coefficient. A perfect relationship would have a value of +1.0 or -1.0 (a perfect positive or a perfect negative relationship). When two variables are unrelated, the correlation co-efficient is zero. In this context, for absolute values of coefficient  $r$  lower than 0.30 relationship is regarded as weak, 0.30 - 0.59 as moderate, 0.60 - 0.79 as strong and 0.80 – 1,0 as very strong. Table 3 presents the zero-order ( $r$ ) and partial correlations ( $r_p$ ), controlling for the number of students and total assets between relative ranking according to the WR THE ranking system in 2020, logINC, and cHHI. As expected, WR THE (2020) showed an independent positive relationship with the logINC ( $r_p = 0.66, p < 0.001$ ), suggesting that higher-ranked universities achieve significantly larger income. On the other hand, there is an independent negative relationship with the revenue concentration index HHI (corrected) ( $r_p = -0.64^{***}, p < 0.001$ ). These results strongly suggest that higher-ranked universities also have less concentrated income sources. Similarly, the logarithm of the income showed an independent moderate positive relationship with the Revenue diversification index ( $r_p = 0.39^{***}, p < 0.001$ ), which implies that better-ranked universities achieve greater income diversification. Our results show that these relationships were not due to the variance shared with control variables (number of students and total assets). Thus, we can conclude that a higher ranking of the universities according to WR THE system has been significantly positively associated with the size of income, positively correlated with income diversification (RDI), and negatively correlated with income concentration (cHHI). Finally, the size of the income (measured as a logarithm of the income) is positively correlated with diversification (RDI). Thus, results indicate that the higher ranking of the universities has been linked with several benefits, such as higher income and better diversification.

**Table 3**  
*Bivariate correlations between relative WR THE (2020), logINC, cHHI, and RDI*

	Zero-order correlations ( $r$ )		Partial correlations ( $r_p$ )	
	WR THE rank	LogINC	WR THE	LogINC
LogINC	0.72 <sup>***</sup>	1	0.66 <sup>***</sup>	1
cHHI	-0.72 <sup>***</sup>	-0.48 <sup>***</sup>	-0.64 <sup>***</sup>	-0.39 <sup>***</sup>
RDI	0.72 <sup>***</sup>	0.48 <sup>***</sup>	0.64 <sup>***</sup>	0.39 <sup>***</sup>
Number of students	0.14	0.50 <sup>***</sup>		
Total assets	0.56 <sup>***</sup>	0.79 <sup>***</sup>		

*Note:* Pearson's correlation was shown. Partial correlations are between relative WR THE, LogINC, cHHI, and RDI, controlled by the number of students and total assets.

\*\*\*  $p < 0.001$ , \*\*  $p < 0.01$

We have also presented zero-order and partial correlations (controlling for the number of students and total assets) between relative ranking according to the WR QS ranking system in 2020, LogINC, and cHHI in Table 4. According to our prediction, relative WR QS (2020) showed an independent moderate positive relationship with the LogINC ( $r_p = 0.46, p < 0.001$ ), and an independent negative relationship with the cHHI ( $r_p = -0.63^{***}, p < 0.001$ ). Also, as expected, LogINC showed an independent positive relationship with RDI ( $r_p = 0.40^{***}, p < 0.001$ ). Following

expectations, WR QS (2020) showed a moderate correlation with the number of students and total assets ( $r = 0.34$  and  $0.57$ ,  $p < 0.001$ ). Also, LogINC showed a strong positive correlation with the number of students and total assets ( $r = 0.64$  and  $0.77$ ,  $p < 0.001$ ). However, the relationship between relative WR QS (2020) and LogINC, as well as the relationship between relative WR QS (2020) and cHHI (as shown by partial  $r_p$ ), was significant after controlling the number of students and total assets, thus showing that these the relationships were not due to the variance shared with control variables. Thus, we can also conclude that a higher ranking in the WR QS system is significantly positively correlated with the size of income. In addition, a higher ranking is negatively correlated with income concentration (cHHI) and positively correlated with income diversification (RDI).

**Table 4**

*Bivariate correlations between relative WR QS (2020), LogINC, cHHI, and RDI*

	Zero-order correlations ( $r$ )		Partial correlations ( $r_p$ )	
	WR QS rank	Log (Income)	UK QS rank HE	Log (Income)
Log(Income)	.68***	1	.46***	1
cHHI	-.67***	-.44***	-.63***	-.40***
RDI	.67***	.44***	.63***	.40***
Number of students	.34**	.64***		
Total assets	.57***	.77***		

*Note:* Pearson's correlation was shown. Partial correlations are between relative WR QS (2020), LogINC, cHHI, and RDI, controlled by the number of students and total assets.

\*\*\* $p < 0.001$ , \*\* $p < 0.01$

## CONCLUSION

Income diversification is an essential part of the overall financial resilience of any organization. The studies of nonprofit organizations have generally proved the beneficial impact of income diversification on financial health. This paper aims to assess the degree of the income diversification of the UK higher education providers as a component of their overall financial resilience. In addition, it investigates whether the higher ranking of the universities is associated with higher income and higher diversification relative to lower-ranked HE providers. The intuition behind this is that the better-ranked universities have better reputations and are positioned to attract more other, non-core income streams in addition to tuition fees. This research reveals the connections between the university's ranking, degree of income diversification, and size of the income.

More than half of the UK HE education providers collect income from all six sources, suggesting considerable income diversification. Approximately only one-third of the HE providers collect income from four or fewer income sources. However, the aggregate Hirschman-Herfindahl index for all HE providers in the observation period of the ten years shows rising values from 0.25 in the first year to 0.34 in the last observed year, suggesting moderate income concentration. In addition, the research reveals that a higher ranking of the universities measured by both ranking systems has been significantly positively associated with income diversification and size and negatively correlated with income concentration. Such a relationship suggests that the better-ranked universities having a better reputation may count on more income sources. However, although there is a strong relationship between ranking, income diversification, and size, there is

no clear direction of causality between these variables. In other words, it is unclear whether the better ranking provides better diversification opportunities or *vice versa*. For example, the additional income sources may bring more opportunities for additional highly-valued activities, e.g., research projects, and thus bring opportunities for better ranking.

This research has certain limitations. First, it considers the HE providers only in the UK. The higher education systems may differ considerably in other countries and may have distinctiveness in government support and financing. For example, some educational systems traditionally rely on endowments as a primary supplemental income in addition to tuition fees. Thus, further research can be extended to other countries. Secondly, the measuring of income diversification relies on six income sources. Further disaggregation of the income sources may bring somewhat different results. Thirdly, the various ranking systems do not have unique criteria. Therefore, using other ranking systems may also impact the results. In addition, correlations do not imply causation. Observed variables can be correlated because of unobserved factors such as reputation, long tradition, quality leadership, greater capacity for investment management, etc. Thus, further research should investigate other common factors that lead to a better reputation and financial soundness of the HE providers.

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