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**Rankings and Financial Statements of Universities: the Financial  
Ratio Analysis**

Bachelor's thesis

International Business Administration, Finance and Accounting

Supervisor: Enn Listra

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I declare I have compiled this thesis independently and all works, important standpoints and data by other authors have been properly referenced and the same paper has not been previously presented for grading. The document length is 8005 words from the introduction to the end of summary.

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## **ABSTRACT**

In today's world, comparison make us better persons and organizations. Global ranking of universities has nurture the pursuit of growth and excellence not just in only academic spheres but also on the impact universities have on a global scale.

This thesis aims examine dearth of empirical evidence in research papers that compared financial productivity of the higher educational institutes with the quality of education it imparts, so therefore it was necessary to embark on the research to add to the body of knowledge and indicators that determine the global ranking of universities.

The results indicate that the financial ratio analysis is a useful tool in understanding the strengths and weakness of universities financial performance and the correlation between the financial ratios examine in this thesis most especially the current ratio and available fund ratio was positive, and further expanded investigation on trends and a larger population sample will consolidate on the correlation of the global university ranking and the two financial ratios.

**Keywords:** University, Ranking, financial ratio analysis, financial statements, higher educational institutes

## INTRODUCTION

Since a few years, scholars believe that if someone wants to achieve success, quality education is essential from a quality university. This perspective is exhibited from a range of studies in which scholars argue that people have inclination towards investing in post-secondary education both on personal and public policy levels (Tchamyou, 2020). Although, recent times exhibits that students' willingness to invest in their educational activities is significantly changed. As per Kvitka et al (2019), such events lead educational institutes to increase their tuition fee, which has been a key reason for the students' protest against aggravating tuition prices and decrease in state assumptions (Kvitka, S., Starushenko, G., Kovalenko, V., Deforzh, H., & Prokopenko, O., 2019). Experts find that in order to evaluate higher education quality education, financial performance metrics have crucial role and helps us determine the quality of the education (Morales-Díaz, J., & Zamora-Ramírez, C., 2018). However, scholars argue that since student crisis is observed, universities or higher educational institutes have reduced making investments in those programs that tend to train graduates with essential skills for their practical life (Tchamyou, 2020). A survey on the student's performance across various countries was carried out and found that they had poor performance in analytical and research skills (Easton, P. D., McAnally, M. L., Sommers, G. A., & Zhang, X. J., 2018). Another journal opinion on this situation is that unless universities articulate the value of their services, they are unable to win stakeholder trust (Kadim, A., Sunardi, N., & Husain, T., 2020). Nonetheless, a quality education benefits both the students and society.

This study addresses the following research questions:

- Which financial ratio best describes the financial performance of higher educational institutes?
- Which ratio or combination of ratios most successfully indicate the ranking position of a university?
- What is the correlation between financial ratios and global university ranking?

Some experts are less convinced with the idea that ranking level is directly and positively linked with the university financial performance (Ehrenberg, R. G., & Rizzo, M. J. , 2004). The doubts that the financial performance of higher educational institutes is linked with the university rankings globally necessitated this research to examine the relationship between financial ratios of the universities and their quality performance i.e. their global ranking.

Financial performance indicators/ratios are created to offer an organisational stakeholders assurance about the organizational financial health and if its assets and resources are managed effectively. In addition, this also exhibits that the management of the organisation is adequately evaluating firm performance. Financial ratio, in particular, shows the relationship between two figures that is collected from the organizational financial statements and other performance data that shows evidence about the firm than only a figure in the statement. Empirical evidence shows that the use of financial ratio analysis in the higher educational institutes is expanded in the recent few years as scholars argue that financial analysis of higher educational institutes offers an additional technique to assess its performance and quality education and compare each institution with other organizational attributes of competitors (Montanaro M. K., 2013).

Wholly, financial productivity of the firm is best explained by following ratios and helps us evaluate different aspects of its education. The efficacy of financial ratio analysis to assess the financial performance of universities and compare their standards ascertain their persistent reporting. Eventually, reporting decrees are created that exhibits the dependency on ratios and use it as a means to evaluate university performance (Sazonov S. P., Kharlamova E. E., Chekhovskaya I. A., & Polyanskaya, E. A., 2015). Financial ratios are not estimated to explain the organisational performance as “good or bad” but they only show if organisation is “better or poor” compared to other organization in the same industry. Educational institutes like universities and colleges use their financial performance indicators (ratios) and evaluate the quality of their academic performance and enact stakeholder interests. Undoubtedly, there is a strong evidence that quality education is essential for the progression of the organisation. In addition, this also helps trustees to stay aware of its various obligations. Hence, this is arguably true that for the quality performance metrics of higher education, its sustainable financial performance is essential. The problem of this thesis is linked with examining the role financial ratios have on the university rankings and to what extent ratios helps us determine the quality of the higher educational institute.

The theoretical chapter explores the various ranking organisations and the importance of ranking Universities. The methodologies used in ranking over the years was examined and the author based the thesis on the Times Higher Education (THE) world university ranking. Topical terminologies like financial statements, financial analysis, and financial ratios forming the building blocks of this thesis were expounded.

The methodological part of this thesis encompasses the purpose of the analysis, the collection of 2019 financial statements of the 40 universities used as sample, the processing of the data to generate financial ratios and size comparison, and the statistical analysis using Spearman's correlation coefficient to measure the strength and direction of association between university ranking and financial ratios.

The next part of the thesis reveals the results of individual and combination of the financial ratios in relation to the financial performance and position of the university in the world university ranking. The results of Spearman's correlation coefficient generated using SPSS validates the association proposed by the title of this thesis. The author's suggestions and conclusions on further analysis of this correlation were also noted.

There is a dearth of empirical evidence in the literature that compared the financial productivity of the higher educational institutes with the quality of education it imparts. Till date, there are no empirical studies conducted on how financial performance through financial ratios comprehend the reputation of the universities and shows its better or poor quality of education. The aim of this study is to examine and explain the relationship between the global ranking of higher educational institute and their financial performance and identify which particular financial ratios best describes the global ranking of the university. The linkage between financial performance and the academic performance through the market ranking of universities is investigated by referring to the methodology proposed using financial ratios: available funds, current ratio, current debts, and contribution ratio to evaluate educational institutes' financial performance. (Kashisaz S., & Mobaraki E. , 2018)

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# **1. OVERVIEW OF GLOBAL UNIVERSITY RANKING**

The online Cambridge dictionary defines ranking as the position or level something or someone has in a list that compares their importance, quality, success, etc (Cambridge University Press, 2021). Comparison is the root of the ranking of universities, and there are many organisations that have designed careful balances and comprehensive methodologies to appraise the universities of the world. Currently, we have about 23 organisations with difference university rankings based on different ranking criteria and indicators, but the top 3 of the university ranking organisations according to Wikipedia are Times Higher Education (THE), Quacquarelli Symonds (QS) and Academic Ranking of World Universities by Shanghai Ranking Consultancy. (Wikimedia Foundation Inc., College and university rankings, 2021)

The ranking used in this thesis is based on The World University Rankings by Times Higher Education (THE). In this thesis, it important to note that financial ratios of universities around the world are compared with this industry averages and then investigated against their position in the world university ranking.

Quacquarelli Symonds (QS) World University ranking as different categories, QS ranking by subjects, QS Graduate Employability rankings, QS best student cities, QS Business masters ranking, QS global MBA rankings, QS USA university rankings, QS university rankings by region, QS university ranking by location, QS Top 50 under 50, QS system strength rankings, QS stars rating system and QS IGAUGE rating system. All these categories are managed through the following indicators, international students' ratio, international faculty ratio, faculty student ratio, citations per faculty, academic reputation, and employer reputation. (QS Quacquarelli Symonds Limited, 2021).

Academic Ranking of World Universities (ARWU) published by Shanghai Ranking Consultancy was first published in 2003. It uses six objective indicators to rank world universities, comprising the number of alumni and staff winning Nobel Prizes and Fields Medals, number of highly cited researchers selected by Clarivate Analytics, number of articles published in journals of Nature and Science, number of articles indexed in Science Citation Index - Expanded and Social Sciences Citation Index, and per capita performance of a university. (ShanghaiRanking Consultancy, 2021). It also has different categories, ARWU-Field (Natural sciences and mathematics, Engineering/Technology and computer sciences, life and agriculture sciences, clinical medicine and pharmacy and social science), subject ranking and special focus institutions ranking.

There are over 25,000 universities in the world, and the Times Higher Education (THE) collected data from over 1,900 global research universities to computing their ranking. At this point, it is noteworthy to applaud every university that made it to the list of the ranking not minding if they are at the top, middle or bottom of the ranking. Times Higher Education (THE) formerly used five super category methodology, which are teaching, research, citations, international outlook and industry income. Many researchers have criticize this methodology and I guess this has prompted a redesign of the ranking indicators. In 2019, as one of the leaders of university ranking organisations, Times Higher Education (THE) launched the only global league table that assesses universities against the United Nations' Sustainable Development Goals (SDGs), which is a 17 impact table methodology that covers various indicators like no poverty, zero hunger, good health and well-being, quality education, gender equality, clean water and sanitation, affordable and clean energy, decent work and economic growth, industry innovations and infrastructure, reduced inequalities, sustainable cities and communities, responsible consumption and production, climate action, life below water, life on land, peace justice and strong institutions and partnerships for the goals. It also has various categories of ranking namely: Asia university rankings, world reputation rankings, young university rankings, emerging economies rankings, Latin America rankings, Impact rankings, and teaching rankings (Times Higher Education, 2021).

Though the Times Higher Education World University rankings were founded in 2004, this history of university ranking goes far back to 1983, when US News and World report started to publish annual America's best colleges review. Independent organisations ranking universities with various performance indicators have gained reputation and their comparison of higher institutions has directly influenced the strategy most universities apply to get a good rating at the ranking in order to attract both national and international students. Ratings and rankings have assumed significant importance in the governance of the education of universities. Ratings connected to the quality of research and education are increasingly used by national governments to allocate public funding where peer reviewers find "quality" and "excellence." (Marques M., & Powell J. J., 2019). Apart from the government, other stakeholders like prospective local and international students, the international labour market, donors and investors have a keen interest in the ranking of universities.

Some critics have previous criticize Times Higher Education World University rankings that close to half of the criteria for ranking were assessment based on standings of university departments through the lens of cross-section researchers, stating that a good ranking should ratify it's opinion survey (Taylor P. & Braddock R., 2007). The researcher further established that there is no perfect

ranking system and that each system have their strength and weakness in criteria. Emphasizing that some universities on a mission to get a higher rankings would channel funds towards the indicators that may serve as catalyst to speed up their ranking to the top of the table.

A recent journal, titled university ranking using research, educational and environmental indicators criticized the various methodologies and indicators different ranking organization applied to produce a ranking table each year. It is true that knowledge is infinite and research is a continuous process that is one of the main reason that these ranking organization keeps updating, changing and reviewing indicators of ranking universities till date. This paper discovered that the main indicators of ranking were research and academic reputation and recommended a methodology of ranking in a hierarchy level with three base indicators, research, educational and environmental performance of universities. (Paul T. & Richard B., 2007).

The article, the financial implications of institutional rankings listed environmental forces influencing university rankings as growing criticisms, growing government interest, competition among institutions, increasing consumer savvy-ness, growing public demand for accountability, increase in student survey and increasing concern for institutional cost. It also indicated various ranking quality indicators as a peer assessment, retention rate, student selectivity, graduation rate, class size, full time faculty, library holdings, technology, freshmen merit, scholars, faculty resources, financial resources and graduate students stipends. The author proposes that there is a positive association between university financial resources and their ranking, using Pearson correlation coefficient the endowment funds of 10 universities were measured against other variables (ranking indicators) and 8 out of 12 variables returned a positive r-coefficient and varying strength (Michael S. O., 2005). Though the research established that universities with more financial funding are top on the university ranking, the stewardship of the funds was not investigated and examining the financial statements of universities and deriving financial ratios which reveal the financial performances will be a good measurement of the financial management of the universities.

This thesis will examine the correlation between the financial ratios of universities and their rankings, and would suggest that financial ratios be added to the list of indicators for the ranking of universities.

## **1.1. Significance of the study**

This thesis tends to extend the body of literature related to the financial ratio analysis and using it as a tool to indicate the financial situation of the higher educational organisations. It is estimated that if stakeholders have an information about the financial health of the higher educational institutes, they are better able to affect higher educational market and the quality of its education. Parents and students can assess the financial strength and identify the quality of its education. The findings of this study is multidimensional. First, the results can help students and affect their choice of selecting an educational institute based solely on its global ranking; instead of its financial performance. Second, the results can also help staff members and faculty members of educational institutes on how their efforts can help their related organisation and add to its productivity in terms of quality education. Third, donors of educational institutes can have better image about the financial health of the organisation and its quality of education based on global ranking. Fourth, if investors' confidence is increased and they invest larger amount in the financially healthy educational institute, it can also result in the growth and development of market. Hence, this study is likely to offer valuable information to all the stakeholders in the higher educational market and help them decide which particular university is most important and have healthy market performance.

## **2. FINANCIAL STATEMENTS ANALYSIS**

### **2.1. Financial Statement**

Globally financial statements are prepared on the basis of either International Financial Reporting Standards (IFRS) or the US Generally Accepted Accounting Principles (GAAP) (Pelekh U., Khocha N & Holovchak H., 2020). Organisations around the world choses their accounting principles according to the national or regional laws that covers their financial reporting. Financial statements are an approximation of economic reality and activities as a result of selective reporting of events due to accounting system and methods ( Gerald I. W., Ashwinpaul C. S., & Dov F., 2002). Financial statements are official documents stating the dated situation of an organization's assets, it is usually prepared in national currency of the organization and in accordance with the legal regulations and accounting principles of the country (Vasile E., & Croitoru I., 2020). There are four major groups interested in the information provided by the financial statements of universities namely resource providers (taxpayers, contributors, lenders, suppliers and others), constituents (persons and groups benefiting from the services offered), governing and oversight bodies (persons and agencies responsible for establishing policy, overseeing and appraising the administration) and administrators (stewards and individuals responsible for carrying out the policies mandated by governing agencies). There are many reasons why universities though they are non-profit organisation also prepare financial statements: to show that the university is financially sound and following accounting principles, to show whether the university remain or improve her financial position, to show that the university is not heading to bankruptcy and has the ability to remain functional, and to show that the management discharges its stewardship and performance responsible. (Woelfel, 1987).

Andrew Lennard explains financial statements as stewardship according to International Accounting Standard Board definition financial statements shows the results of the stewardship of management, or the accountability of management for the resources entrusted to it (Lennard A., 2007).

Financial statements is expected to provide credible information that may guide the decisions of both present and potential investors, as well as creditors and other users in making rational investment, credit or any other financial decisions ( Gerald I. W., Ashwinpaul C. S., & Dov F., 2002). Financial statements must have qualitative characteristics (i.e. attributes that makes the

information useful) like being relevant, reliable, comparable and understandable (Smith, 2010). Financial statements of universities general objectives are to provide information useful in making resources allocation decisions, assessing services and capacity to continue to provide service, assessing management's stewardship and performance and finally the institution's economic resources, obligations and net resources (Woelfel, 1987). The financial year of most universities begins 1 August and ends 31 July. For the purpose of this thesis the annual report containing the financial statements of the universities for the year ended 2019 was analyzed. Organisations prepare financial reports at regular intervals (mostly annually), these reports include financial statements and supplementary reports. Financial statements are audited by independent auditors, who provide opinion on the examined financial statements to fairly present the company's performance and financial position (Robinson T.R., & Hennie V. G., 2008).

Every financial statements consist of the following:

1. Balance Sheet (also known as Statement of Financial Position) – The balance sheet is the financial statement that shows the assets, liabilities, capital, total debt and equity of the organisation at a given time (the date on which it is closed). Current assets and liabilities are presented separately from non-current assets and liabilities. Equity called net assets is determined as the difference between assets and liabilities. The balance sheet gives a broad view of information on the structure of other financial statements that generated that result, namely the statement of income, financing and expenses during the current year (Vasile E., & Croitoru I., 2020). Most balance sheet statement also contain cash and cash equivalent, total number of students and total number of staff.
2. Income Statement (also known as profit and loss account) – this is the financial statement that shows the organisation's income and expenditure within a given period of time. Income as regards universities like every other non-profit organisations are categorise into funds. Unrestricted funds mostly comprise government grants, student tuition fees, and revenues from so-called ancillary services (e. g., student residence services, conference and catering services, campus bookstore sales). These funds can be used for the general purpose in line with the mission of the university, it basically covers the operating costs. Restricted funds can only be used for specific purposes, e.g., Capital (land, buildings, equipment) or Endowments. Most donors specify the purpose their funding should be utilized. (Cameron M. & Janet M., 2016)
3. Cash flow Statement - considers the inputs and outputs in tangible cash within a stated period.

The common outline of a cash flow statement is as follows:

Cash Inflow - Cash Outflow + Opening Balance = Closing Balance (Wikimedia Foundation Inc., Cash flow statement, 2020).

4. Equity Statement – it is the statement that detailed the ownership of the organisation. Equity refers to shareholders, and their stake in the company if the assets were liquidated.
5. Notes to Annual Financial Statements – this is a full disclosure report of the reasons for the management decision as regards the financial statement.
6. Management reports – this is the summary of all the reports in the financial statement, it communicate results, issues and risk of the organisation to shareholders and government agencies.

In this thesis, it important to note that financial position (Balance sheet) and Income statement are the only two statements analyzed with financial ratios against the university position in the world university ranking.

## **2.2. Financial Analysis**

The book International Financial statement analysis explains financial analysis as the process of examining a company's performance in the context of its industry and economic environment in order to arrive at a decision or recommendation (Robinson T.R., & Hennie V. G., 2008). There are 4 major techniques used in analysis financial statements, ratio analysis, comparative financial statements, horizontal analysis and vertical analysis (Woelfel, 1987). In this thesis paper, the two statements investigated are the Statement of financial position (i.e. the balance sheet) and Income statement. The balance sheet reveals the relationship among the assets, liabilities and owners' equity.

The mathematical expression is Assets = Liabilities + Owners' equity.

Income statement presents the revenue and other income of the company, the expenses incurred and Net Income (which can either be profit or loss).

The formula expression is Revenue – Expenses = Net Income.

There are various techniques in analyzing financial statements; Horizontal analysis is the comparison of historical data (i.e. two different accounting period) to detect either growth or decline trends. Vertical analysis is the comparison of a sub-component on the financial statements in relation to the total component (i.e. different item compared in same accounting period) and

lastly ratio analysis is the central part of fundamental equity analysis (i.e. comparing line-item data), these ratios most times have benchmarks which are industry average that reveal the financial status of the organization. Chabotar, K. J. (1989, cited Foster, G., 1986) define financial ratio as the relationship between two items drawn from the organization's balance sheet, operating statement, and related records (Chabotar K., 1989).

### **2.3. Financial Ratios Analysis**

Financial ratios are simply dividing one item of the financial statement with another item on the same statement. The result show the measure of relationship between the two items of the statement. Financial ratios give deep meaning to the figures on the financial statements. Financial ratio analysis as an analytical interpretation of presented information contained in the balance sheet and income statement, other financial reports. As the word 'ratio' means relationship, the purpose of financial ratio is to assess the financial standing of an organisation and as well as the trend of change in the financial statement of the organisation. The authors further stated that financial ratios can be used for evaluation of performance, disclosure of the relation between activities and performance, benchmarking with the industry, implementation of Altman Z-score (test of company bankruptcy tendency) and forecasting of growth in the future (Knežević S., Rakočević S. B., & Đurić D., 2011).

Financial ratios are important indicators for every person (i.e. investors, banks, general public, regulatory agencies) in financial markets. The connection between financial performance of organisations and various financial ratios are discussed in several studies.

The journal titled the influence of financial ratios on firm value, hypothesis was that each or all the financial ratios affect the firm value. The researchers conducted classic assumption test, normality test, autocorrelation test, multicollinearity test, heteroscedasticity test, F-test, and T-test on the sample population consisting of 16 companies in the agricultural sector listed on the Indonesia Stock Exchange in the 2015-2019 periods. The results of the research state that liquidity, profitability, leverage, market and size simultaneously have an effect on the firm value (Ichsan S., Andrian D., & Pirmansyah D. , 2021).

In financial analysis, financial ratios are grouped into 5 major categories (Horrigan J.O., 1965):

Liquidity ratios - these measure an organisation's ability to continue doing business

Table 1. Liquidity ratios

Current ratio	Current assets / Current liabilities
Equity/Fixed ratio	Stockholders' equity / Fixed assets
Equity ratio	Stockholders' equity / Total assets

Source: Author

Solvency ratios - these measure an organisation's reliance on debt to finance operations

Table 2. Solvency ratios

Equity multiplier	Average assets/ Average equity
Equity to assets	Equity / Assets
Debt to equity	(Average short terms debts + long-term liabilities) / Average equity
Net working capital to assets (%)	(Net working capital x 100) / Assets

Source: Author

Capital turnover ratios - these measure management's quality and performance

Table 3. Capital turnover ratios

Inventory turnover	Net sales / Average inventory
Receivables turnover	Net sales / Average Receivables
Capital turnover	Net sales / Average Capital
Working capital turnover	Net sales / Average Working capital turnover
Cash turnover	Net sales / Average Cash
Fixed assets turnover	Net sales / Average (Fixed assets turnover net value + property investments)

Source: Author

Profitability ratios - these measure an organisation's ability to generate profit

Table 4. Profitability ratios

Operating margin	$(\text{Operating profit} \times 100) / \text{Net Sales}$
Profit margin	$(\text{Net profit} \times 100) / \text{Net Sales}$

Source: Author

Investment ratios - these measure the performance of the organisation's shares

Table 5. Investment ratios

Return on assets	$(\text{Net profit} \times 100) / \text{Average Assets}$
Return on equity	$(\text{Net profit} \times 100) / \text{Average Equity}$

Source: Author

Financial ratios have been used for financial analysis of various business industries to maximize its value to shareholders and it can also benefit non-profit organisations like universities to maximize its values to students and it fund providers even though the financial management objectives and categorization of financial resources are not similar. As universities are non-profit organisations not all financial ratios are applicable to their financial statements to determine their sustainability, universities do not make emphasis on net income or return on investment, they do not have ownership shares or equity (Chabotar K., 1989), hence Woelfel in his journal titled financial statement analysis for colleges and universities suggested that the only four ratios that are important to universities as an organisation are Current Ratio, Available Fund, Debt Ratio and Contribution ratio (Woelfel, 1987).

### 2.3.1. Current Ratio

The current ratio divides the organisation's current assets (this include cash, short-term investments, and receivables) by its current liabilities. Current ratio is widely used in assessing an organisation's ability to pay short-term debts. It is defined as the relationship between Current assets (both liquid and illiquid) and current liabilities. Higher institution industry benchmark for current ratio is 2, and any universities with this ratio score would be able to pay their bills in good time, while any university with a ratio that is significantly less than 2.0 may have dwindling cash reserves and troubles with creditors. Meanwhile current ratio much above 2.0 may imply poor cash

management, a high current ratio may also be as a result of receivable and inventories rather than cash and short-term investment (Chabotar K., 1989).

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

The quick ratio is very similar to current ratio, but it requires excluding inventory from the current asset item before calculating the ratio. As universities are not manufacturing and merchandizing organisations their inventory is insignificant, so therefore this ratio is irrelevant to our investigations. Previous study examined the variations in recording methods between three institutions and discovered twenty non-standardized internally designated recording methods that may invalidate an inter-institutional ratio comparison, also financial activities that are not reported in the statements but reported in the notes to financial statements may pose another problem. Therefore without standardization of reporting framework across institutions there is a high possibility of error in judgments depending on current ratios (DiSalvio P., 1989).

### **2.3.2. Available Fund Ratio**

Available Funds means the total cash at hand, bank cheque and cash in the bank account in relationship with current liabilities. The benchmark for available fund ratio for universities is 0.75,

$$\text{Available Fund ratio} = \frac{\text{Cash and cash equivalent}}{\text{Current liabilities}}$$

### **2.3.3. Debt Ratio**

This ratio measures the proportion of total liabilities to total assets. The benchmark for this ratio is 0.33 for universities. The debt ratio is part of the solvency (also called Leverage) ratio will show how many organisation's assets are owned by shareholders when compared to assets owned by creditors (lenders). Specifically is Debt to Asset ratio is used to compare the amount of assets owned by the company with total debt. (Ichsan, S., Andrian, D., & Pirmansyah, D., 2021). An increasing

$$\text{Debt ratio} = \frac{\text{Total Liabilities}}{\text{Total Assets}}$$

#### **2.3.4. Contribution ratio**

This ratio measures the proportion of total income to total expenditure. The benchmark for this ratio is 0.33 for universities (Chabotar K., 1989).

$$\text{Contribution ratio} = \frac{\text{Total Income}}{\text{Total Expenditure}}$$

#### **2.5. Limitations of financial ratio analysis**

Though ratios are indicators to benchmark an organisation in comparison with its industry, it doesn't put into perspective the stage of growth the organisation is currently, ratios are only one out of many indicators meant to guide management decisions making. Ratios cannot reveal the leadership and reputation of an organisation. It needs to be consistent over a period of fiscal years before conclusion can be drawn (Chabotar K., 1989). The author of ratio analysis in higher education: caveat emptor summarized three limitation of financial ratio analysis, inflation distortions in reporting, judgements made on trends in internal analysis and non-standardized recording methods in inter-institutional comparisons (DiSalvio P., 1989).

### **3. METHODOLOGY**

#### **3.1. The methodology of analysis**

This thesis uses quantitative research methodology and used linear regression to illustrate the impact of financial ratios on the academic ranking of the university. The thesis used financial ratios of the global universities and measured their financial performance using current ratio, available funds, debt ratio and contribution ratio. These financial ratios have been used in the previous studies to evaluate the financial performance of universities and educational institutes. Independent variables of the study included four given ratios and they are selected from the composite financial index; whereas, the dependent variables of the study are ranking score universities used in the study (Kadim, A., Sunardi, N., & Husain, T. , 2020).

There are several indicators that were given by previous scholars to measure and assess the academic qualities of the universities. A research was conducted and it raised several concerns about multicollinearity of the indictors used by the universal global ranking system and their inability to distinct universities that are closely linked with each other. Studies show that rankings of the universities have small; yet, significant impact on the attributes of the entering class. Despite that there are research findings supporting university ranking, some scholars criticise the ranking system followed by the universal ranking system (Al Kharusi, 2017). However, another research article recognized that the ranking followed for universities are valid and have become an influential element to view the academic quality (Kvitka, S., Starushenko, G., Kovalenko, V., Deforzh, H., & Prokopenko, O., 2019). On the other hand, Easton et al (2018) found that reviewing financial health of the universities or higher educational institutes uncover challenges when someone wants to provide comparable results. It is unlikely to use a single metric and use it as a basis to describe the overall financial health of the educational institute (Easton, P. D., McAnally,

M. L., Sommers, G. A., & Zhang, X. J., 2018). On the other hand, previous studies show that a blend of various financial indicators can be used to attain an entire degree of viability, usage of resources and operational productivity. Metrics in the form of indices are regarded effective when assessing educational institute financial health but not essentially regarded ideal when someone wants to compare financial health of different educational institutes. This difference in reporting requirements lead to various challenges when someone wants to calculate the desired metrics. The empirical literature does not exhibit any consensus on the accurate index that should be used to rate the industry. However, various indices show that there is Composite Financial Index that includes current ratio, debt ratio and contribution ratio that have the most comprehensive metrics used to evaluate the financial health of the universities. Previous studies show that the indices used as Composite Financial Index are readily available for calculating university financial health. Considering the study by Al Kharusi, (2017) this study also used the given indices as Composite Financial Index i.e. Current ratio, debt ratio and contribution ratio as independent variables; whereas, these independent variables are connected with university ranking and shows better information for decision making process of stakeholders. Potential students and parents can have the most accurate information on how educational institutes use various activities that lead them to better select and improve the odds of progress. Not only this, investors can have better access to the sustainability of the educational institute and the probability of the return on investment is increased. Management of the universities can have more comprehensive information and they make operational decisions that can appeal students and future investors. The board members of universities can also have better understanding about the organisational strengths and their constraints that may help them in strategic planning process. The given knowledge attained from this study is likely to enhance the transfer of knowledge and reduce the likelihood of agency costs amongst various stakeholders (Al Kharusi, 2017).

### **3.2. Primary data**

To establish empirical proof for this thesis, 40 annual financial statement of universities for the fiscal year 2019 listed on Times Higher Education (THE) World University Rankings were collected, examined and analyzed. While collecting the data, the first stratified groups were just two: Top Universities (universities in range of 1 to 350 in the ranking) and Ranked Universities (universities in range of 350 to 1000 in the ranking). But as the data continued to grow, an unplanned pattern was noticed and hence the stratification was reclassified into 4 groups: Top Universal Universities (10), Top Technical Universities (10), Ranked Universal Universities (12) and Ranked Technical Universities (8).

The choice of the 40 universities selected was based on the availability of the financial statements online. During in the collection of the data, it was noticed that most universities in the US and UK make their financial statements available online. The university ranking was used as the dependent variable while current ratio, available fund ratio, debt ratio, contribution ratio and size was used as the independent variable. Examining the Income statements it was observed that most universities income are categorized into tuition fees, Government operational funding, research grants, donations, endowments, investment and other incomes. The expenditure consist of staff cost, pension/compensation benefits, depreciation/amortization, other operating expenses, interest expenses, and other grants. Most universities used in this analysis closed the 2019 fiscal year with a surplus account. The universities financial position declaration of assets include cash, cash equivalents, account receivables, inventories, investments, student loans receivable, etc. All these items were grouped into current and non-current assets for ease of calculation during this thesis. It was also noticed that funding in all the universities accounts are either restricted (i.e. funds for a particular project) or unrestricted funds (i.e. funds that can be used for any project at the discretion of the management). The liability session of the balance sheet consist of account payable, accrued expenses, notes and mortgages payable, deposits payable, deferred revenue, bonds payable, post-retirement benefits, etc. All the items of account were grouped into current and non-current liabilities.

### **3.3. Processing the data**

Since all the 40 financial statements examined during the progress of this thesis were not using the same accounting principle, the database of the financial position (Balance sheet) and Income

statement was a blend of both the U.S. generally accepted accounting principles and United Kingdom Accounting standards. The figures from each financial statements were manually plug into the excel spreadsheet and the calculations of the ratios was done according to the formulae explain in the theory session of this thesis. The author converted all currencies to US Dollars using the exchange rate history average for the month of July 2019 available on both [www.exchnagerates.or.uk](http://www.exchnagerates.or.uk) and [www.poundsterlinglive.com](http://www.poundsterlinglive.com). The financial ratio table is in appendix session of this thesis.

The data is not normally distributed, there were outliers and the variable are ordinal, therefore it was necessary to input it into SPSS in other to test the hypothesis using Spearman's Rank-Order Correlation coefficient.

According to [www.statisticshowto.com](http://www.statisticshowto.com), Correlation coefficients are used to measure the strength of the relationship between two variables. There are several types of correlation coefficient, but the most appropriate for non-parametric data (i.e. data that depends on ranking or order of sorts) is Spearman's Rank-Order Correlation (Rho ( $r_s$ )). It measure the strength of association between two variables, where the value  $r = 1$  means a perfect positive correlation and the value  $r = -1$  means a perfect negative correlation (Stangroom J., 2021). The correlation matrix table is in appendix session of this thesis.

### **3.4. Spearman rank correlation coefficient**

It is an excellent statistical tool used to identify monotonic trends in chemical concentrations with time or space. The spearman rank correlation coefficient uses a nonparametric technique in evaluating the degree of linear association or correlation between two independent variables. There many advantages to using this statistical tool, it is non-parametric and unaffected by the distribution of the data, it operates on ranks of data and it is insensitive to outliers, it doesn't require a regularly spaced interval data, and it is easier to calculate with investigating very large data sets. The disadvantages of using spearman rank correlation are that it is less powerful than Pearson correlation coefficient and some information may be loss as data are converted to ranks (Thomas D. G., 2001).

Spearman's Rank-Order Correlation efficient is calculated with the following formula:

$$r_{s=1} = \frac{6 \sum D^2}{N^3 - N}$$

Where N = number of data points of the two variables

D = difference in ranks of the element

Source: (Thomas D. G., 2001)

The online tool available on [www.statisticshowto.com](http://www.statisticshowto.com) and SPSS were the tools used to statistically analyze and interpret the available financial ratio data.

## **4. FINDS AND SUGGESTIONS**

The financial ratio analysis for the 40 universities financial statements has reveal the financial performance of each universities compared to the benchmark and their rankings on the global university rankings. This comparison with the industry benchmark also reveals whether the universities financial performance is strong (i.e. above) or weak (i.e. below) and lastly the Spearman's Rank-Order Correlation using SPSS Statistics returned the value of R reveals the correlation of each financial ratio to the ranking of the universities.

### **4.1. Findings Based on Current Ratio**

Our finding is compared to industry benchmark recommended from previous research which states that current ratio of non-profits should be 2, this implies that any university with a lesser ratio is performing below industry benchmark and is regarded as weak and any university with a ratio equal or a little higher than 2 is performing at par or above the industry benchmark and is regarded as strong in their financial performance. This is proven because the current ratio reveals that the organization has ability to meet its current obligations with a margin of safety (Chabotar K., 1989).

Table 6. Current Ratio industry benchmark results

Current Ratio	Weak (<2)	Strong (>=2)
Top Universal Universities	7	3
Top Technical Universities	7	3
Rank Universal Universities	6	6
Rank Technical Universities	3	5

Source: Author

From above Table, 70 percent of the 20 universities in the top ranking are rated weak in their financial performance as their current ratios are lesser than the industry average (i.e. <2) while only 30 percent are rated as strong in financial performance. Meanwhile 55 percent of the ranked universities are rated as strong in their financial performance against 45 percent rated as weak. This shows that universities in the ranked stratified groups are strong in financial performance

based on the current ratio compared to the universities in the top stratified groups. If current ratio should be added as an indicator in the university rankings, 11 universities in the ranked stratified groups are supposed to be in Top stratified groups. The ranked universities have ability to pay short-term debts better than the top universities, this exposure has answered a part of the research question of this thesis.

Spearman's Rank-Order Correlation efficient returned the value of Rs is 0.263. Although technically a positive correlation, the relationship between current ratio and university ranking is weak (please note: the nearer the value is to zero, the weaker the relationship).

## **4.2. Findings Based on Available Fund Ratio**

The industry benchmark for available fund ratio for higher instructions is 0.75, and this explains that any university with a lower ratio is weak in financial performance and any university with a ratio equal or a little higher 0.75 has a strong financial performance.

Table 7. Available Fund Ratio industry benchmark results

Available Fund Ratio	Weak (<0.75)	Strong (>=0.75)
Top Universal Universities	8	2
Top Technical Universities	8	2
Rank Universal Universities	4	8
Rank Technical Universities	3	5

Source: Author

From above Table, 80 percent of the 20 universities in the top ranking are weak in financial performance while only 20 percent are strong based on their available fund ratio analysis. Meanwhile 65 percent of the ranked universities are strong in financial performance against 35 percent in the based on their available fund ratio analysis.

This shows that universities in the ranked stratified groups are strong in financial performance in the available fund ratio compared to the universities in the top stratified groups. If available fund ratio should be added as an indicator in the university rankings, 13 universities in the ranked

stratified groups will emerge to be in Top stratified groups. This result has answered a part of the research question of this thesis.

Spearman's Rank-Order Correlation efficient returned the value of R is: 0.365. Although technically a positive correlation, the relationship between your available fund ratio and university ranking is weak (please note: the nearer the value is to zero, the weaker the relationship).

### **4.3. Findings Based on Debt Ratio**

The industry benchmark for debt ratio for higher instructions is 0.33, and this implies that any university with a lower ratio is weak in financial performance and any university with ratio equal or a little above 0.33 is strong in their financial performance.

Table 8. Debt Ratio results

Debt Ratio	Strong (<0.33)	Weak (>0.33)
Top Universal Universities	5	5
Top Technical Universities	1	9
Rank Universal Universities	6	6
Rank Technical Universities	3	5

Source: Author

From above Table 4, 70 percent of the 20 universities in the top ranking have ratios below industry benchmark in their debt ratio analysis while only 30 percent are at par with the benchmark. Meanwhile 55 percent of the ranked universities are below industry benchmark against 45 percent at par with the benchmark.

This shows that universities in the ranked stratified groups are performing stronger in the debt ratio compared to the universities in the top stratified groups. If debt ratio should determine the university rankings, 9 universities in the ranked stratified groups are supposed to be in Top stratified groups. This revelation has answered the part of the question of this thesis, it is clear that the debt ratio analysis does not have a correlation with global ranking positions of the universities.

Spearman's Rank-Order Correlation efficient returned the value of R is: -0.158. Although technically a negative correlation, the relationship between your debt ratio and university ranking is only weak (please note: the nearer the value is to zero, the weaker the relationship).

#### **4.4. Findings Based on Contribution Ratio**

The industry benchmark for Contribution ratio for higher instructions is 0.33, and this explains that any university with a lesser ratio have strong financial performance and any university above 0.33 have a weak financial performance based on the contribution ratio.

Table 9. Contribution Ratio results

Contribution Ratio	Strong (<0.33)	Weak (>0.33)
Top Universal Universities	10	0
Top Technical Universities	9	1
Rank Universal Universities	10	2
Rank Technical Universities	7	1

Source: Author

From above Table, 95 percent of the 20 universities in the top ranking are strong in financial performance based on their Contribution ratio analysis while only 1 university returned a ratio reflecting a weak financial performance. On the other hand 85 percent of the ranked universities returned a ratio reflecting a strong financial performance while only 3 universities reflected a ratio of weak financial performance.

This results has answered the part of the question of this thesis, it is clear that the Contribution ratio analysis does not have a correlation with global ranking positions of the universities.

Spearman's Rank-Order Correlation efficient returned the value of R is: -0.072. Although technically a negative correlation, the relationship between these Contribution ratio and university ranking is weak (please note: the nearer the value is to zero, the weaker the relationship).

#### **4.5. Findings Based size (i.e. Total Assets)**

The author went a little beyond financial ratios, and calculated Spearman's Rank-Order Correlation efficient of the size of the universities against the rankings and the Rs is -0.579. There is significant negative correlation, the relationship between the two variables (please note: the nearer the value is to zero, the weaker the relationship).

## CONCLUSIONS

Stakeholders of higher education institutions are searching for better information on the academic quality of colleges and universities. Excellence in both the teaching, research and management of the universities should be a major driving force for universities than focusing on attaining the criteria of ranking organizations to get high ranking amongst other institutions. The university is an important part of our society, and they require a lot of funding to keep them running smoothly. The purpose of this study was to investigate the tendencies to use financial ratios as one of the indicators of university ranking.

To answer the first research question, which financial ratio best describes the financial performance of higher education institutes, this thesis with the foundation of previous research and the analysis carried out has confirmed the most important financial ratios to universities are current ratio, available fund ratio, debt ratio and contribution ratio.

To answer the second research question, which ratio or combination of ratios most successfully indicate the ranking position of a university, this thesis through the use of statistically analytical tool of Spearman's Rank-Order Correlation efficient has established that both current ratio and available fund ratio slightly indicates the ranking position of universities.

Answering the last research question, what is the correlation between financial ratios and global university ranking, this thesis reveal that two financial ratios (current ratio and available fund ratio) returned a positive correlation and the other two ratios (debt ratio and contribution ratio) returned a negative correlation. The size (i.e. total assets) of the universities also have a negative weak correlation relationship with the university ranking. This is quite surprising has it can be accounted as a general assumption that the size of the universities should have a positive correlation with the ranking.

Financial ratios are used to check the financial stewardship of the managers of these institutions and this thesis provides evidence that financial ratios, most importantly current ratio and available fund ratio may be added as one of the indicators in the methodology of ranking universities globally. The rankings criteria used by the Times Higher Education actually prove the quality of the institutions and the financial ratio investigated in this thesis adds new knowledge to the ranking quality in the aspect of the management and stewardship of the funds of the universities. A

university with a strong financial performance gives confidence to both faculty and student for continuous quality education in the present and the near future.

The author would recommend that further analysis with a trend of a minimum of 5 years and a larger population sample of about 100 universities should be research to empirical validated the suggestions of this findings and consolidate on the research that is adding to the knowledge of the correlation of financial ratios of higher institutions and their global ranking.

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## APPENDIX

### Appendix 1. Database of ratios and size

S/N	RANKING	Universities	Current Ratio	Available Fund	Debt Ratio	Self-sufficiency Ratio	Size (in USD)	
1	1	University Of Oxford	1.58	0.59	0.37	0.95	8,298,189,740	Top Universal Universities
2	11	Imperial College	1.09	0.55	0.45	0.95	2,837,000	
3	12	John Hopkins University	2.75	0.76	0.28	1.02	12,850,414,000	
4	13	University Of Pennyslvania	1.08	0.42	0.31	1.05	28,079,450,000	
5	15	University Of California	1.62	0.03	0.10	1.06	3,780,199,000	
6	16	Ucl Uk	0.95	0.23	0.57	0.89	3,719,324,123	
7	17	Columbia University	9.99	0.59	0.20	1.04	19,975,879,000	
8	18	University Of Toronto	1.99	1.86	0.38	1.14	10,404,000,000	
9	19	Cornell University	5.89	0.18	0.24	0.98	11,968,334,000	
10	20	Duke University	2.35	0.08	0.38	1.05	23,174,857,000	
11	4	California Institute Of Technology	7.42	0.01	0.43	1.00	5,596,206,000	
12	14	Eth Zurich	8.36	0.88	0.75	0.99	2,874,648,000	
13	38	Georgia Institute Of Technology	2.83	1.87	0.66	1.08	2,678,405,583	
14	56	The Hong Kong University Of Science And Technology	1.29	0.30	0.45	1.06	15,839,000,000	
15	79	Delft University Of Technology	0.96	0.57	1.00	1.06	1,007,780	
16	160	University Of Technology Sydney	0.55	0.32	0.41	1.03	3,388,785,000	
17	186	Queensland University Of Technology	0.90	0.54	0.20	1.08	2,166,467,000	
18	187	Technical University Of Denmark	0.77	0.25	0.88	1.01	1,712,512,575	
19	225	Kth Royal Institute Of Technology	1.14	0.68	1.00	0.99	339,727	
20	350	Michigan Technological University	1.57	0.00	0.45	0.55	490,190,445	
21	350	Wayne State University	1.87	0.48	0.48	0.99	1,692,000,000	
22	450	University Of Tulsa	1.37	0.53	0.12	0.84	1,569,919,000	
23	450	University Of Strathclyde	1.63	1.10	0.50	0.83	613,893,000	
24	450	University Of Plymouth	2.56	1.59	0.75	0.95	506,119,463	
25	550	University Of The West Of Scotland	15.00	10.72	0.68	0.93	328,389,727	
26	900	Marquette University	6.63	0.25	0.26	1.07	1,517,454,000	
27	900	Central Queensland University	1.24	0.98	0.39	1.01	1,072,136,000	
28	900	Tallinn University	1.63	0.90	0.28	1.04	171,663,578	
29	900	Bowling Green State University	6.83	4.83	0.01	1.41	204,156,000	
30	900	Florida Atlantic University	18.90	0.11	0.41	0.48	1,111,780,000	
31	900	Sheffield Hallam University	3.42	2.92	0.32	0.94	564,558,837	
32	900	University Of Texas At El Paso	1.27	0.48	0.14	0.59	1,080,651,635	
33	550	Stevens Institute Of Technology	3.86	1.01	0.33	1.08	610,673,000	
34	550	New Jersey Institute Of Technology	2.58	0.00	0.67	0.69	853,985	
35	900	Delhi Technological University	7.60	6.64	0.10	0.95	74,011,862	
36	900	Istanbul Technical University	2.08	1.38	0.59	0.86	972,044,531	
37	900	Louisiana Tech University	1.94	0.00	1.19	1.02	2,576,941,672	
38	900	University Of Technnology Troyes	0.55	0.32	0.41	1.03	3,388,785,000	
39	900	University of Wolverhampton	1.48	0.98	0.50	1.02	459,566,611	
40	900	Tallinn University Of Technology	1.63	0.90	0.28	1.04	171,663,578	

## Appendix 2. Spearman Rank-Order Correlation efficient

Spearman's rho Correlations						
	Rank	Current_ratio	Available_Fund	Debt_Ratio	Contribution_Ratio	Size
Rank	Correlation Coefficient	1.000	0.263	.365*	-0.158	-0.072
	Sig. (2-tailed)		0.101	0.020	0.329	0.657
	N	40	40	40	40	40
Current_ratio	Correlation Coefficient	0.263	1.000	.430**	-0.163	0.022
	Sig. (2-tailed)	0.101		0.006	0.316	0.892
	N	40	40	40	40	40
Available_Fund	Correlation Coefficient	.365*	.430**	1.000	-0.197	0.244
	Sig. (2-tailed)	0.020	0.006		0.223	0.129
	N	40	40	40	40	40
Debt_Ratio	Correlation Coefficient	-0.158	-0.163	-0.197	1.000	-0.308
	Sig. (2-tailed)	0.329	0.316	0.223		0.053
	N	40	40	40	40	40
Contribution_Ratio	Correlation Coefficient	-0.072	0.022	0.244	-0.308	1.000
	Sig. (2-tailed)	0.657	0.892	0.129	0.053	
	N	40	40	40	40	40
Size	Correlation Coefficient	-.579**	-0.179	-.416**	-0.148	0.221
	Sig. (2-tailed)	0.000	0.270	0.008	0.363	0.171
	N	40	40	40	40	40

\*. Correlation is significant at the 0.05 level (2-tailed).

\*\*. Correlation is significant at the 0.01 level (2-tailed).

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