

**FAKING PRESTIGE: RIGGING THE UNIVERSITY RANKING
SYSTEM**

The image features a large, faint watermark of the Mahidol University logo in the background. The logo is circular, with a blue outer ring containing Thai text. Inside the ring is a yellow emblem depicting a traditional Thai architectural structure, possibly a stupa or a similar religious monument, set against a light blue background.

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**A THESIS SUBMITTED IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF MANAGEMENT
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Thesis
entitled
**FAKING PRESTIGE: RIGGING THE UNIVERSITY
RANKING SYSTEM**



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FAKING PRESTIGE: RIGGING THE UNIVERSITY RANKING SYSTEM

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ABSTRACT

As Southeast Asia grows in prosperity, increasing amounts of resources are being directed toward the education sector. For middle income countries, higher education is viewed as a critical ingredient for economic upgrading. This paper argues that university education in Southeast Asia is moving toward a zero-sum status competition. The ever-growing focus on university rankings and the emergence of open-access research publications are fueling an expensive contest to game the university ranking system. Using a compilation of rankings and research publication data, along with an in-depth case study, we demonstrate some basic mechanisms of ranking manipulation. We argue that future rigging of the system will inevitably become subtler and more difficult to detect, resulting in an ever more difficult task of measuring quality in higher education.

KEY WORDS: Fake Ranking/ Ranking Manipulation/ Ranking System/ University Ranking/ Quality in Higher Education

33 pages

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CHAPTER 1

INTRODUCTION

1.1 Background and Problem Statement

Cognizant of the critical role of innovation in driving upgrading, policymakers in middle-income economies have not been hesitant to direct resources to their countries' leading research universities. Measuring progress achieved through such investment, however, is tricky. Unlike primary or secondary education, there are no widely accepted standardized exams (like the PISA) to measure the learning outcomes of university graduates. The effectiveness of the educational services rendered must therefore be measured more indirectly through indicators such as surveys of student satisfaction or graduate employment rates. Satisfaction, nevertheless, does not equal competence, and finding a job is determined by numerous factors (e.g., the current macroeconomic environment) beyond what is taught and learned in university classrooms. Assessing the returns on investment in R&D is even more complicated. Resorting to counting the number of patents filed/granted is convenient, but the long-tailed nature of patent values makes such measures less than ideal.

Pressured to justify continued public funding for their institutions or to gain attention from students in an increasingly noisy student admissions market, university administrators scramble to identify recognized, concrete key performance indicators for their institutions. International university rankings have emerged as a popular yardstick for many administrators. While such rankings receive great media attention and boast a quantitative gauge of a university's "quality," they suffer from similar weaknesses as performance measures previously mentioned. Nevertheless, the appeal of having a focal, quantitative measure of university quality can be so strong that policymakers and university administrators end up devoting an inordinate amount of energy and resources to obtaining higher rankings.

In the following sections, we demonstrate, using a case study, how the manipulation of international university rankings is done. The investigation will hint at

the cost a university pays to achieve a significant ranking boost. Finally, the case study will allow us to speculate about the benefits and disadvantages of such gaming of the ranking systems.

1.2 Study Objectives and Research Question

1.2.1 Study Objectives

To understand the roots of the Middle-Income Trap, the tendency for middle-income economies to fail to achieve high-income status, Doner and Schneider (2016) identify institutional weaknesses that inhibit a country's ability to upgrade its competitive capabilities as the major culprit. To highlight such shortcomings, Doner and Schneider (2016) point to middle-income economies' poor track record in strengthening education and R&D – both functions traditionally associated with universities.

1.2.2 Research Question

- What the University Ranking System factors should be improved?
- How to improve each of the University Ranking System factors mentioned?

1.3 Scope of study

The researchers confined the area of study to focus on the University Ranking System. The data for this study will be collected from Scopus, a bibliographic database that indexes academic publications from around the world. The data will include information on the number of publications, the number of citations, the impact factor of journals, and the h-index of researchers.

1.4 Limitations

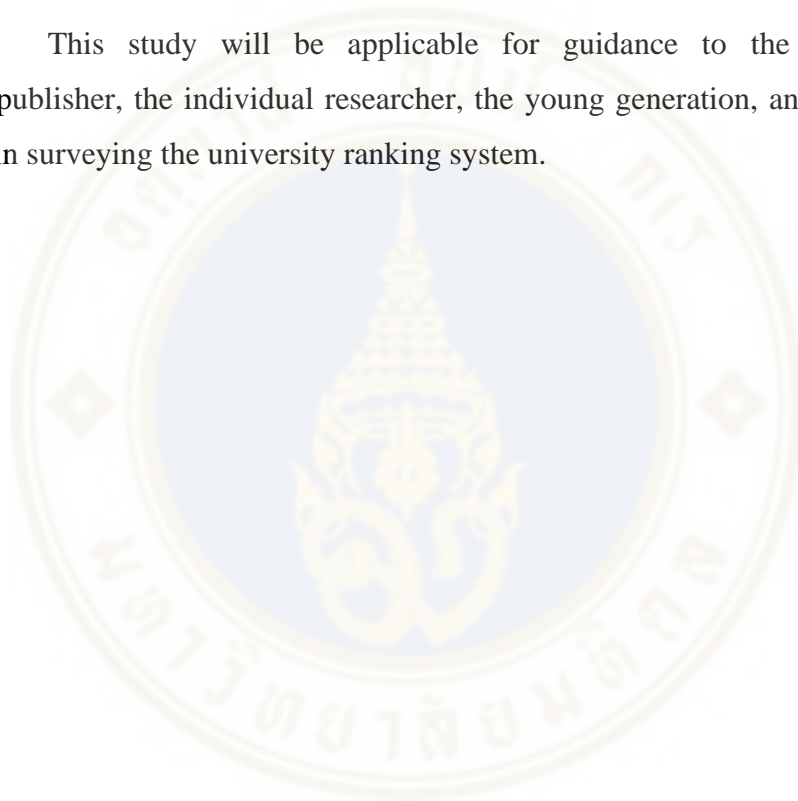
This study is limited by the availability of data from Scopus. The data may not be comprehensive, and it may not be representative of all academic publishing.

1.5 Definition

The University Ranking: Systems or methodologies used to evaluate and compare universities or higher education institutions based on various criteria. These rankings aim to provide insights into the relative quality and performance of universities across the world.

1.6 Benefits

This study will be applicable for guidance to the university, the journal/publisher, the individual researcher, the young generation, and the alternative system in surveying the university ranking system.



CHAPTER 2

LITERATURE REVIEW AND RELATED LITERATURE

Overview of Higher Education in Thailand

According to Nicholls (2016), Thailand is currently reviewing and reforming its tertiary education sector due to the effects of globalization on education. This is reflected in the global ranking of universities, which challenges the status quo in education and highlights the shortcomings of long-standing institutions with a strong reputation. Thailand's history of higher education has been characterized by an iterative process of review and reform, influenced by national imperatives and changing educational ideologies. Although the tertiary education sector in Thailand is modeled on a Western template, it is now out of step with much of the rest of the world. BB

2.1 A Brewing Storm in Thailand's Higher Education

Recently, Tossapol (2023) conducted an investigation into research papers published by over ten esteemed university professors in Thailand. These papers were acquired from foreign sources via a website, with a payment of 30,000 baht. The professors then claimed authorship and are now known as "young researchers with 100 papers."

One professor from the northernmost university in Thailand published over 28 papers on Pubpeer, and it is a website that allows users to discuss and review published research papers, and 114 papers on Scopus, which is a database of scholarly literature in the same year, which equates to a paper every week. Another professor from a central district university published 38 papers on Pubpeer and 142 papers on Scopus, with 16 of them being similarly named. Additionally, the professors' areas of expertise do not align with their published research, leading to concerns that the students' contributions may have been misrepresented.

The underlying issue is that universities are pushing professors to share their knowledge publicly to improve their global ranking. The professors' performance is

evaluated based on their publications, which also brings recognition and credit to the institution. However, it is essential to acknowledge that purchasing papers is a violation of the Royal Gazette of Higher Education (2019), chapter 70 and 77. This violation can result in the loss of title, revision, and even imprisonment for up to three years, with a fine of 60,000 baht.

2.2 Predatory Publishing Around the World

Macháček and Srholec (2022) investigated the presence of predatory journals in Scopus, an extensive citation database. They used the names of journals and publishers listed as "potential, possible, or probable" predatory on Jeffrey Beall's list to identify relevant journals. The study revealed that 324 journals appeared on both Beall's lists and Scopus, with 164,000 published articles between 2015 and 2017.

The authors also discovered significant differences between countries regarding the prevalence of predatory publishing in Scopus. India, Pakistan, China, and Iran were found to have the highest rates, while the United States, the United Kingdom, and Germany had the lowest.

The authors concluded that predatory publishing poses a significant challenge to scholarly communication. They urged for greater awareness of predatory journals and publishers and for measures to be implemented to prevent them from infiltrating major citation databases like Scopus.

2.3 Rigging the University Ranking System

According to a report by Catanzaro (2023), Saudi universities have been paying highly cited researchers to list them as their primary affiliation, even if they do not work there. This has allowed these universities to improve their ranking in global university rankings. The report also found that Saudi universities have offered bribes to other institutions to enhance their rankings.

This practice of paying researchers to list Saudi universities as their primary affiliation is academic fraud. It misleads university rankings and undermines the credibility of Saudi Arabia's higher education system. The report urges greater transparency in university rankings and stricter measures to prevent academic fraud.

Academic fraud is not limited to Saudi Arabia. Other countries have also been reported to have similar issues. This is a serious problem that undermines the integrity of scientific research. It is crucial to raise awareness of this issue and take the necessary steps to prevent it.

2.4 Open Access Publishing

The world of academic publishing is going through a big change due to open access (OA) publishing models. These models challenge the traditional way of doing things, which is focused on the Impact Factor metric and Toll Access publication. While the Impact Factor is used to show how competitive scholars are and gives them status, it also makes it hard to access knowledge because of subscription barriers. Journal editors act as gatekeepers, controlling who can share authoritative information.

OA publishing is different because it disrupts this way of doing things. By using digital technology, altimetric indicators can show the impact of research in real-time, beyond just citations. OA models aim to make knowledge accessible to everyone, instead of just a select few. However, there are challenges to this, like scholars seeing altimetric as a burden and predatory OA publishers who undermine credibility.

Despite these challenges, it's important to recognize that change is necessary. Embracing open access will lead to more people being engaged, more societal impact, and more innovation. This change isn't just happening in academia, but in other sectors too. As more people get involved, traditional practices like the Impact Factor and Toll Access will be questioned. Scholars, societies, funders, and policymakers must work together to redefine impact, make knowledge more accessible, and promote innovation. In this era of digital transformation, open-access publishing is essential to staying relevant in shaping policies and practices around the world.

2.5 Criticisms of University Ranking Methodologies

According to Lukman et al (2009), the popularity of university rankings has risen over the years, providing a means for students, researchers, and policymakers to compare the performance of different institutions. However, there are criticisms of the ranking methodologies. One of the most common criticisms is that ranking tables often hide methodological problems and anomalies. This is because the weighting of different

indicators can significantly impact the overall ranking, and it often needs to be clarified why a specific weighting scheme has been chosen. Furthermore, the data used to compile rankings can be incomplete or inaccurate, and the methodologies used to analyze the data can be complex and opaque.

Another criticism is that university rankings heavily emphasize research at the expense of other crucial aspects of university performance, such as teaching and student outcomes. Research is often seen as more objective and quantifiable than other aspects of university performance. However, this emphasis can lead to paying attention to other important factors that contribute to the overall quality of an institution.

Therefore, concerns have been raised about the reliability and validity of university rankings. A study by researchers at Leiden University found no correlation between rankings based on subjective evaluations and citation counting, an accepted measure of scientific impact. This suggests that subjective evaluations may not be a reliable way to measure the performance of universities.

2.6 Times Higher Education (THES) rankings concerns

Over the years, the reliability of the THES rating system in producing consistent academic management results has been called into question. In fact, evaluators such as van Raan (2005) have criticized the citation-based scores as invalid due to the inconsistencies. However, to address these concerns, Times Higher Education magazine announced on December 16, 2009, that they would be replacing the peer rating component of the THES with a new opinion survey. This new survey would involve at least 25,000 responses from a representative sample that meets the standards expected by university social scientists. While this change may potentially render the 2009 and 2010 scores incomparable, it could bring much-needed stability to the year-on-year variances in the long term. By implementing a more comprehensive and reliable survey, the THES rating system may finally produce trustworthy academic management results that universities can rely on.

2.7 A Critique of Flaws in the Methodology of University Rankings

According to the study of Fauzi et al (2020), Understanding that university ranking exercises can positively and negatively affect universities is essential. On the

one hand, they can contribute to a country's economic development by producing skilled graduates and conducting innovative research. For instance, a study by Jabnoun (2015) found that Taiwan's universities significantly contributed to the country's economy from 1965 to 2000.

On the other hand, university rankings can lead to negative consequences, such as increased competition and pressure on universities to perform well. This can lead to universities prioritizing quantity over quality and paying attention to other essential aspects of their mission, such as teaching and student support. For example, a study by Reddy et al. in 2016 found that university rankings may need to be more relevant to the skills required for employment.

The Times Higher Education (THE) ranking is one of the most well-known university rankings. It uses a variety of indicators to assess university performance, including teaching, research, citations, international outlook, and industry income. However, the use of normalization by THE ranking has been criticized for artificially inflating the rankings of certain universities. It is essential to understand that university rankings can have positive and negative consequences. These consequences should be taken into account when interpreting and using university rankings.

2.8 The Challenges of Rankings and the Need for New Ranking

In the study of Berbegal-Mirabent et al (2015), assessing the quality of higher education institutions has become increasingly popular through university rankings. However, there are several challenges associated with these rankings. Defining and measuring university quality can be difficult as rankings use different indicators. This can make it hard to compare rankings and identify the best universities. Additionally, many ranking organizations need to disclose their methodologies in detail, making it difficult to understand how the rankings are calculated. This can lead to concerns about the accuracy and fairness of the rankings. Moreover, many rankings heavily emphasize research while giving less weight to teaching and other important aspects of university performance. This can lead to a focus on research at the expense of teaching and other essential activities.

New, transparent, comprehensive, and fair ranking systems are needed. These new systems should consider the different missions and goals of universities and

the different dimensions of university quality. They should also be more transparent about their methodologies so that users can understand how the rankings are calculated. One example of a new ranking system is the one developed by the Centre for Higher Education Development (CHE). This system lets users compare universities on specific dimensions, such as research, teaching, and internationalization.

However, studies have shown that university rankings can be biased against certain types of universities, such as those in developing countries, or focusing on teaching rather than research. This highlights the need for new ranking systems that are more transparent, comprehensive, and fair. By addressing the challenges of university rankings, we can ensure that these rankings are used to benefit the higher education community.

Consequently, university rankings are complex and controversial, and no perfect ranking system exists. It is vital to be aware of the limitations of university rankings when interpreting their results. Rankings should be used in conjunction with other sources of information, such as student reviews and faculty evaluations when making decisions about universities. Developing more transparent, comprehensive, and fair ranking systems is an important task, as university rankings can significantly impact the decisions of students, researchers, and policymakers.

2.9 Best Use of Citation Databases

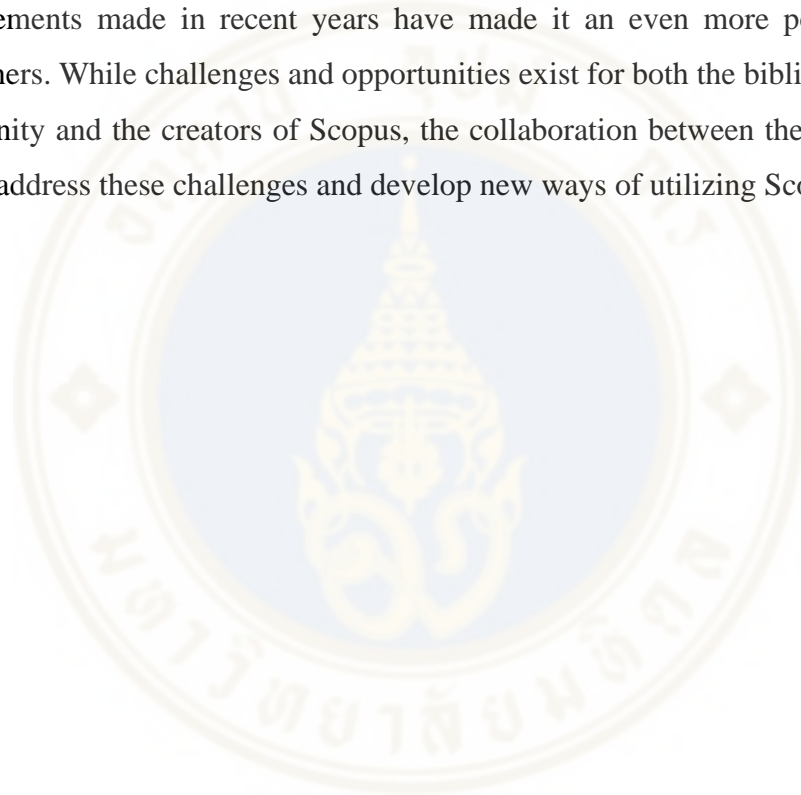
Baas et al (2019) show that Scopus is a database that catalogs academic publications from various sources. In recent times, Scopus has made substantial investments in enhancing its data quality. Scopus has incorporated institution profiles into its database, which enables the automatic organization of information through name variants and institutional hierarchies similar to authors. This feature allows for manual adjustments if necessary.

Additionally, Scopus has also implemented internal review processes to monitor pre-identified areas of quality focus, such as processing, profile quality, and data accuracy and completeness. This system enables the content team to detect trends early and observe progress on critical initiatives to improve quality. Scopus has significantly improved the completeness of DOIs, indexed publication records, removal

of duplicate records, citation links accuracy and completeness, and author and institution profile correctness and completeness.

Until 2014, Elsevier's Bibliometric Research Program (EBRP) allowed researchers to request pre-compiled data sets, which were subject to review and approval by a scientific board. Since 2014, researchers have been able to access raw data directly from Scopus through application programming interfaces (APIs). This advancement has facilitated bibliometric research and the development of new Scopus data applications.

Therefore, Scopus is a valuable resource for bibliometric research, and the improvements made in recent years have made it an even more powerful tool for researchers. While challenges and opportunities exist for both the bibliometric research community and the creators of Scopus, the collaboration between the two groups can help to address these challenges and develop new ways of utilizing Scopus data.



CHAPTER 3

RESEARCH METHODOLOGY

3.1 Research Design

As noted earlier, the purpose of this study is to examine academic publishing and detect any unusual behavior. To achieve this goal, we utilized the extensive academic literature coverage provided by the SCOPUS website. Specifically, we focused on universities, authors, and the number of papers published annually, citation counts. To begin our investigation, we defined the scope and parameters of our research, including the timeframe and the universities and authors of interest. We then identified the relevant variables needed for our analysis, such as university names, author names, number of publications, citation counts, and other pertinent information. We gathered the necessary data using appropriate search queries and filters within the SCOPUS website. After obtaining the data, we organized it into a comprehensive dataset that served as the foundation for our subsequent analysis. We searched for abnormal patterns or activities in academic publishing using statistical and data analysis techniques. Overall, our research paper provides a detailed and thorough investigation into the world of academic publishing. We utilized the resources of the SCOPUS website and implemented rigorous data analysis techniques to identify any abnormal activity within this field and provide the implication of our findings and the impact on society.

3.2 Data Collection

The data for this study will be collected from Scopus, a bibliographic database that indexes academic publications from around the world. The data will be collected using a variety of search queries and filters. The search queries will be designed to identify publications that are likely to be associated with unusual behavior, such as publications that have a high number of citations but a low h-index. The filters will be used to narrow down the search results and to focus on specific universities,

authors, and journals. The data collection process will be conducted in two phases. In the first phase, the data will be collected from Scopus and saved in a spreadsheet. In the second phase, the data will be analyzed using descriptive statistics, statistical tests, and visualizations. The data collection process will be collected anonymously, and the privacy of the individuals involved will be protected.

3.3 Research Instrument

The data for this study will be collected from Scopus, a bibliographic database that indexes academic publications from around the world. The data will include information on the number of publications, the number of citations, the impact factor of journals, and the h-index of researchers.

3.4 Data Analysis

The data will be analyzed using descriptive statistics, statistical tests, and visualizations. Descriptive statistics will be used to summarize the data and to identify any unusual patterns. Statistical tests will be used to test the significance of any relationships between the variables. Visualizations will be used to help understand the data and communicate the study's findings.

3.5 Methodology Integrity

This study will use quantitative methodology to analyze numerical data from Scopus on the university ranking system. The goal of this study is to explore the factors that are most correlated with ranking and to identify the impact of university rankings on research funding and student outcomes. The data will be collected from Scopus and analyzed using descriptive statistics, statistical tests, and visualizations. The findings of this study will be generalizable to other universities around the world.

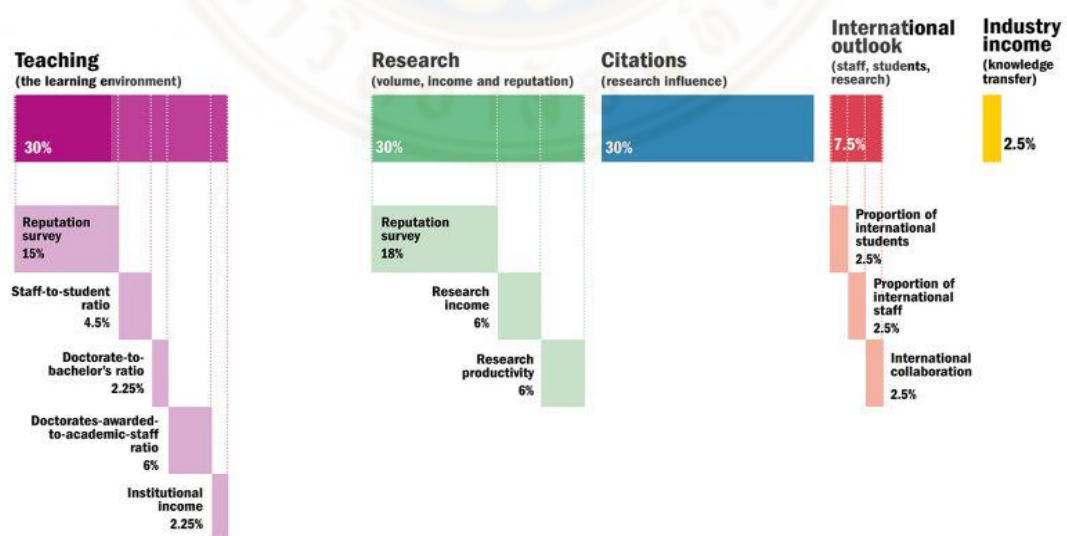
CHAPTER 4

FINDINGS AND DISCUSSION

4.1 University T: A Case Study

Established in 1997, University T is a public, autonomous university enrolling roughly twenty thousand students. Located in a Southeast Asian developing economy, University T is home to a variety of faculties, including business, engineering, biotechnology, and languages. What is noteworthy about University T is, according to major rankings, it is its country's top university, ranked hundreds of places ahead of prestigious domestic national research universities that are both more selective and receive far more research funding. Further, University T is also ranked hundreds of places above a much more established university in a neighboring country (that we will refer to as University M), which enjoys per capita income almost twice as high as University T's home country. How was such a feat accomplished? To answer this question, we must first understand the basic mechanics of university ranking systems.

Figure 1: THE World University Rankings Methodology



Source: <https://www.timeshighereducation.com/world-university-rankings/world-university-rankings-2023-methodology>

Universities are typically ranked based on an index composed of elements thought to be relevant for a university to perform its multidimensional roles. For instance, Times Higher Education (THE) ranks universities based on a combination of five performance dimensions (figure 1): teaching (30%), research (30%), citations (30%), international outlook (7.5%), and industry income (2.5%). The first two major components – teaching and research – are mainly based on surveys of ‘reputation,’ a quality that is slow to change and difficult to manipulate. The third major component – citations – is more susceptible to gaming.

Table 1: Comparing *University M* and *University T*

| | <i>University M</i> | <i>University T</i> |
|-------------------------------------|---------------------|---------------------|
| <i>Age</i> | ~ 80 years | ~25 years |
| <i>Students</i> | ~30,000 | ~25,000 |
| <i>GDP/Capita of host country</i> | ~7,000 USD/person | ~3,800 USD/person |
| <i>THE 2023 rank</i> | 801-1,000 | 401-500 |
| <i>Teaching (30%)</i> | 33/100 | 13.5/100 |
| <i>Research (30%)</i> | 22.5/100 | 16/100 |
| <i>Citations (30%)</i> | 36/100 | 99/100 |
| <i>International Outlook (7.5%)</i> | 70/100 | 40/100 |
| <i>Industry Income (2.5%)</i> | 46/100 | 58/100 |

Table 1 contrasts characteristics of Universities M and T, along with their 2023 Times Higher Education university rankings. While University M is more established, possesses a longer tradition of research (as will shortly be demonstrated), and is in a country with substantially higher average income, it is ranked significantly below University T. A quick glance at the ranking components confirms that the citation score is the main factor driving the divergent rankings. How did University T achieve a citations-score of 99/100?

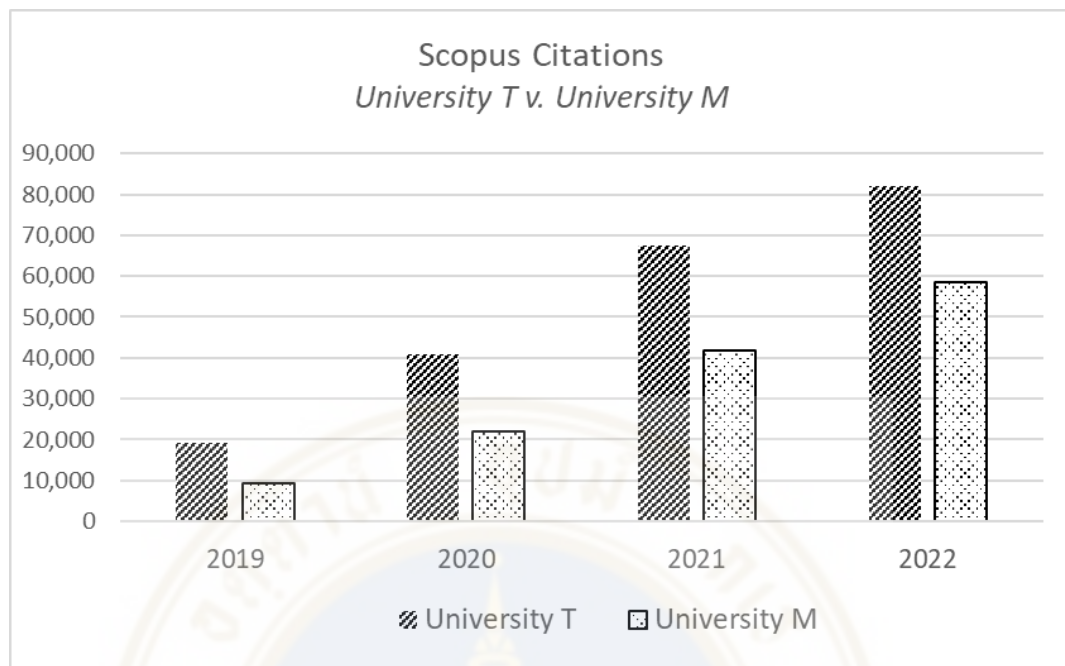
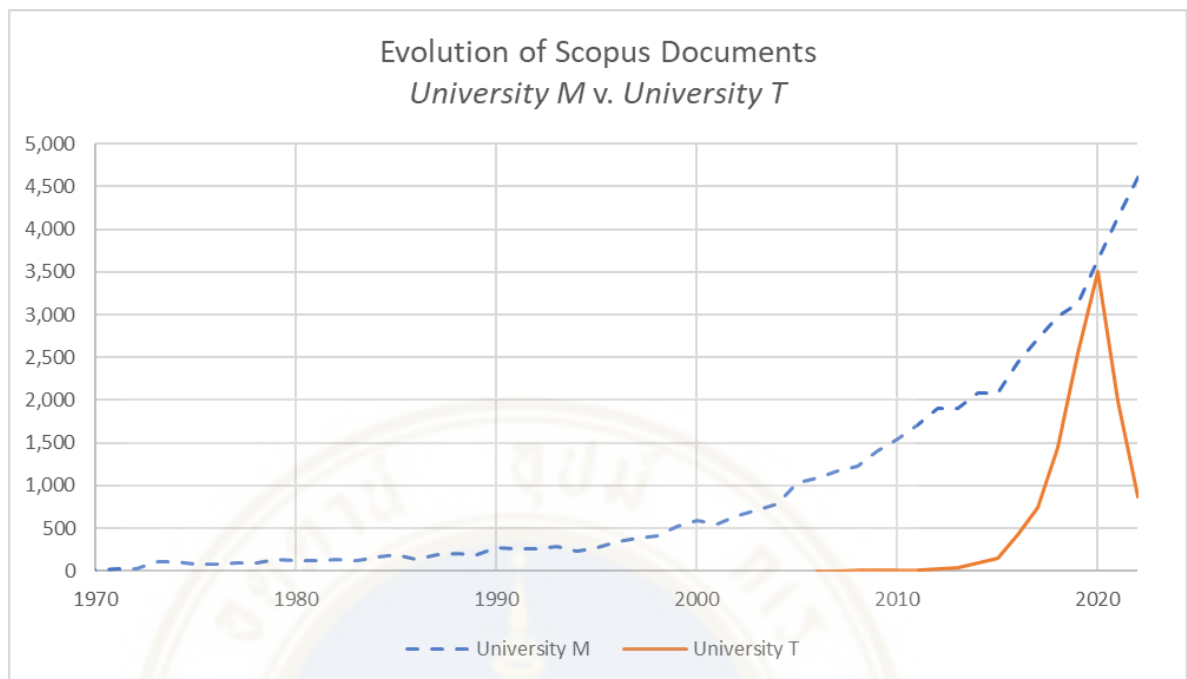
Figure 2: Scopus Citations, 2019-2022

Figure 2 confirms that University T indeed generates significantly more annual citations in Scopus than University M. The citation gap has grown from less than ten thousand per year in 2019 to over twenty thousand per year in 2022. These figures would appear to suggest that University T possesses a longer history of research publications than University M. Data in Figure 3, however, indicates otherwise. While University M possesses a long tradition of gradual growth in publications, going back to the 1970s, University T showed virtually no publications in Scopus prior to 2016. University T's publications showed an incredible rate of growth between 2016 and 2020, after which there was an equally dramatic decline in 2021.

Figure 3: Scopus Documents, 1970-2022

The remainder of this paper investigates how such explosive growth in publications and citations in a major database such as Scopus can be achieved. The investigation will show that such feats are attained using a combination of i) arranging for external researchers to temporarily adopt the university's affiliation and ii) boosting the number of publications and citations of affiliated researchers using a handful of journals that are on their way to be delisted from Scopus.

Because once counted, publications and citations rarely get canceled, even when a journal is removed from the database, a timely and strategic push for more publications and citations can result in a significant boost in the university's ranking. A key aspect supporting this process is the growth of a new breed of academic publication, i.e., open-access journals. This new publication model – which requires the authors to pay for the publisher's services, not the readers – generates incentives for high-frequency publications because the greater the number of papers a journal publishes, the bigger the revenue it generates.

Open-access journals also give their papers an edge in garnering many citations in a short period of time due to the papers' broad accessibility. While the described process is effective in boosting a university's ranking very rapidly, the academic benefits of such gaming are questionable.

4.2 Hyper-Prolific Authors

The data presented in Figure 3 demonstrates a notable rise in publications and citations. It is believed that certain researchers may have played a role in this increase in rank. As a result, it is possible that some individuals resorted to using ghostwriters to include their names on a paper or falsely associating themselves with a specific university to showcase their impact on the institution's ranking.

In order to investigate this, we utilized the Scopus database and searched for the university in question within the "Affiliations" section. We then selected the "Documents, affiliation only" option and narrowed our search by cross-checking the author's name in the "Author name" section. Upon locating the document, we proceeded to click on each author's name and access their "Full Profile." Through this method, we were able to locate the documents published by the author each year, as well as a "Documents by year" graph. We carefully examined each year to determine the most recent document and to extract the author's current affiliation. Our findings were compiled into Table 2 to provide concrete evidence of our investigation.

Therefore, we could identify the top 20 authors who contributed the highest number of Scopus-indexed papers to University T during the period 2019-2023Q1. Each author's publications index in Scopus is tabulated in Table 2. The average number of total publications for these 20 authors over approximately 4.25 years is 257 papers, roughly 60 papers per year¹. The maximum number of annual Scopus-indexed papers for a University T – affiliated author is 206 papers, achieved by R3 in year 2019. In fact, R3 is such an interesting and extreme case we will later investigate this researcher in greater depth. In our further investigation, we will refer to R3 as *Researcher J*.

¹ This includes papers where the affiliation of the author is not University T.

Table 2: Scopus Documents and University Affiliations of the Top 20 Most Prolific Authors Affiliated with University T.

| Researcher | Papers with Univ. T affiliation (2019-23Q1) | 2019 papers | Latest Paper Affiliation in 2019 | 2020 papers | Latest Paper Affiliation in 2020 | 2021 papers | Latest Paper Affiliation in 2021 | 2022 papers | Latest Paper Affiliation in 2022 | 2023Q 1 papers | Latest Paper Affiliation in 2023Q1 | Total Papers, 2019-23Q1 | Share of Total Papers with Univ T affiliation, 2019-23Q2 |
|------------|---|-------------|----------------------------------|-------------|----------------------------------|-------------|----------------------------------|-------------|----------------------------------|----------------|------------------------------------|-------------------------|--|
| R1 | 260 | 121 | University T | 173 | Other | 117 | Other | 136 | Other | - | N/A | 547 | 48% |
| R2 | 247 | 56 | University T | 79 | Other | 147 | Other | 104 | Other | 48 | Other | 434 | 57% |
| R3 | 225 | 206 | Other | 138 | Other | 55 | Other | 30 | Other | 8 | Other | 437 | 51% |
| R4 | 200 | 105 | University T | 74 | University T | 17 | University T | 6 | University T | 8 | University T | 210 | 95% |
| R5 | 169 | 60 | University T | 139 | Other | 48 | Other | 26 | Other | 13 | Other | 286 | 59% |
| R6 | 141 | 74 | Other | 20 | Other | 231 | Other | 199 | Other | 79 | Other | 603 | 23% |
| R7 | 131 | 48 | University T | 72 | University T | 73 | Other | 96 | Other | 36 | Other | 325 | 40% |
| R8 | 129 | 58 | University T | 39 | University T | 25 | Other | 22 | Other | 11 | Other | 155 | 83% |
| R9 | 127 | 51 | University T | 66 | University T | 41 | Other | 18 | Other | 9 | Other | 185 | 69% |
| R10 | 118 | 24 | University T | 38 | University T | 30 | University T | 27 | Other | 10 | Other | 129 | 91% |
| R11 | 115 | 21 | University T | 49 | University T | 24 | University T | 29 | Other | 7 | Other | 130 | 88% |
| R12 | 114 | 63 | University T | 71 | University T | 28 | Other | 16 | Other | 5 | Other | 183 | 62% |
| R13 | 110 | 26 | Other | 61 | University T | 53 | Other | 8 | Other | 2 | Other | 150 | 73% |
| R14 | 109 | 30 | University T | 48 | University T | 21 | University T | 8 | University T | 3 | University T | 110 | 99% |
| R15 | 109 | 62 | Other | 73 | Other | 24 | Other | 5 | Other | 2 | Other | 166 | 66% |
| R16 | 108 | 18 | University T | 49 | University T | 44 | University T | 15 | Other | 11 | Other | 137 | 79% |
| R17 | 106 | 62 | University T | 82 | Other | 58 | Other | 71 | Other | 10 | Other | 283 | 37% |
| R18 | 104 | 35 | Other | 137 | Other | 114 | Other | 99 | Other | 21 | Other | 406 | 26% |
| R19 | 99 | 37 | Other | 50 | Other | 29 | Other | 22 | Other | 7 | Other | 145 | 68% |
| R20 | 94 | 11 | University T | 43 | Other | 62 | Other | 5 | Other | 4 | Other | 125 | 75% |

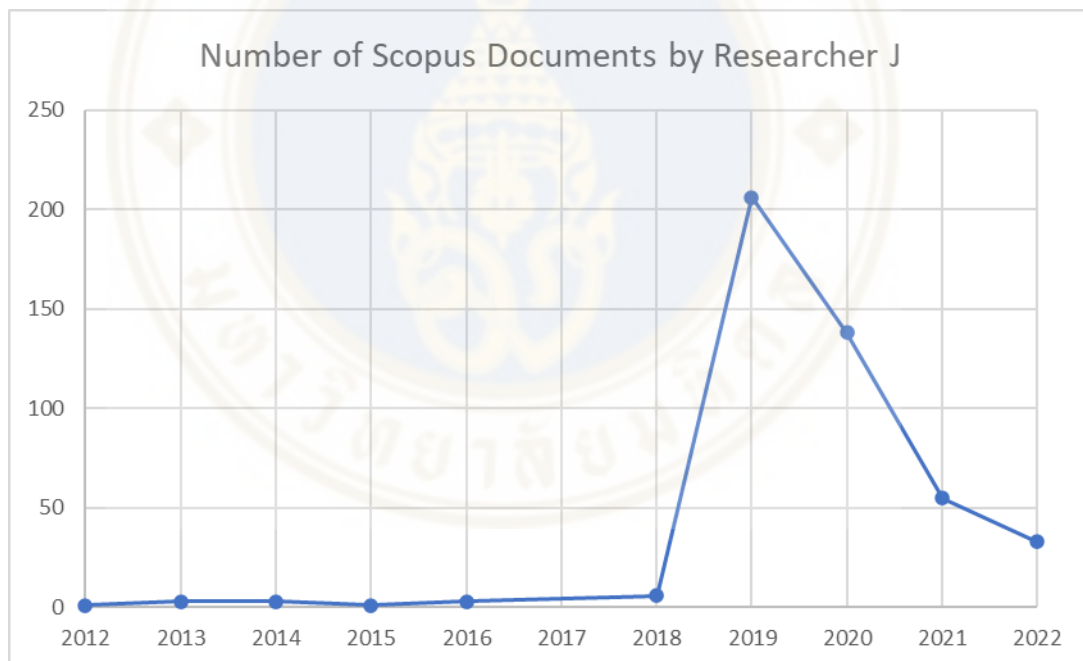
A few noteworthy insights can be derived from some deeper investigation into these hyper-prolific authors listed in Table 2. First, the affiliation to University T of all but two of these twenty researchers was temporary. In other words, by the year 2023, 18 out of the 20 hyper-prolific researchers had changed their affiliation to a different university, usually another institution located in the Asia Pacific Region. Affiliation switching can, in fact, happen at very high frequencies. Researchers 3, 6, 15, 18, and 19 never had University T listed as their affiliation in the last papers they published each year over the 4.25-year period. In other words, multiple affiliations are used during a single year. This finding indicates that universities that want to quickly boost their international rankings can tap into a pool of highly prolific publishers whose affiliations are highly fluid.

Second, hyper-prolific researchers sometimes exhibit suspicious publication records. Figure 4 displays the number of Scopus documents by Researcher J during the years 2012 to 2022. Prior to the awe-inspiring 206 papers published in 2019, the average number of papers published by Researcher J during the years 2012 to 2018 was 2.8 papers per year. The year 2019, therefore, exhibited a growth in annual research output by more than 7,000 percent. How could such a feat be possible? A closer look at Researcher J's publications in 2019 indicates that 158 out of the 206 total publications (76%) appeared in only 5 journals. Tellingly, Scopus had discontinued the indexing of four out of these five journals by the year 2020.

The main takeaway from the data so far is that gaming the ranking system can be done quickly by recruiting hyper-prolific researchers to temporarily adopt your

university affiliation. This result coincides with the recent finding reported in Catanzaro (2023). However, unlike what is reported in Catanzaro (2023), we here do not have evidence that any of the affiliation changes were monetarily compensated. It is also unclear how much authentic research collaboration took place during these brief periods of relationships. While there is anecdotal evidence that some of these hyper-prolific researchers may not embody actual long-term career researchers whose work generates real academic impact, we cannot say with certainty that such shoddy associations are widespread. Therefore, while it is impossible to say how costly or resource-draining such maneuvers are, it seems quite implausible that such tricks would meaningfully improve the actual quality of research, teaching, and learning at the university in question.

Figure 4: Researcher J's Scopus Documents According to the Year it Appeared



In January 2023, controversy broke out in Thailand, an upper-middle-income country with a growing research sector. A couple of university lecturers were alleged to have paid ghostwriters to include their names in many Scopus-indexed papers across a variety of fields (The Nation, 2023). The fee to have one's name listed on an accepted paper was roughly US\$1,000.

The researchers could then use the publication record to apply for higher academic rank, as well as bonuses from their university (Bangkok Post, 2023). There is, thus, at least anecdotal evidence that high-powered incentives aimed at encouraging university lecturers to publish their research can end up creating perverse behavior that creates more harm than good.

4.3 Highly Cited Researchers

We uncovered a significant anomaly as part of our inquiry into the possibility of ranking manipulation related to the University T with a particular researcher. Specifically, we found that a disproportionate number of papers had been published in connection with University T compared to another researchers. This prompted us to delve deeper into the extent to which researcher J's work may have contributed to the University's ranking.

Publishing many papers will not successfully boost a university's rankings if other academics do not cite the papers. To study the methods to generate high citations, we assemble the top 20 papers published by a researcher with a University T affiliation that received the greatest number of citations during the years 2017-2023.

We first looked for the university we suspected in the "Affiliations" section and selected the "Documents, affiliation only" option. We then narrowed down the years to 2013-2017 and sorted the results by "Cited by (Highest)." This helped us obtain the most highly cited research papers, which we saved in a CSV file. We then extracted data from each author of these papers to create the table.

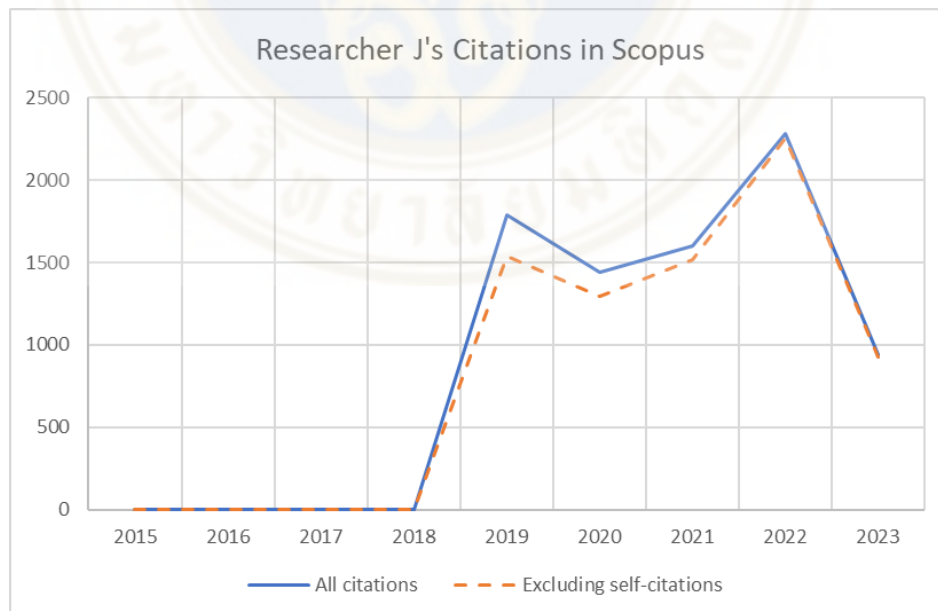
The results are presented in Table 3. Here we see many names appearing multiple times. Interestingly, there is no overlapping between the names of the hyper-prolific authors (Table 2) and the highly cited researchers (Table 3). Like the analysis of the hyper-prolific authors, we note that the affiliation of the top 20 highly cited researchers with University T is almost always temporary. Out of the top twenty most highly cited researchers, only two listed University T as their affiliation in their latest publication in the year 2023. It is also noteworthy that 7 (35%) of the most highly cited papers are published exclusively in open-access journals. The potential weakness of open-access publishing in terms of a lack of 'status' as discussed in Thananusak and Ansari (2019), therefore, does not appear to be a problem here.

Table 3: The Top 20 Papers Most Highly Cited by University T and Their Affiliations Over Time.

| Paper# | Researcher | OA only? | Citations | Affiliation (university) of last paper in year | | | | | | |
|--------|------------|----------|-----------|--|--------------|--------------|--------------|--------------|--------------|--------------|
| | | | | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
| 1 | R1 | Yes | 699 | Other | Other | Other | Other | Other | N/A | N/A |
| 2 | R2 | No | 557 | Other | Other | Other | University T | Other | Other | Other |
| 3 | R3 | No | 478 | Other | Other | University T | University T | Other | N/A | N/A |
| 4 | R2 | Yes | 299 | Other | Other | Other | University T | Other | Other | Other |
| 5 | R4 | No | 295 | Other | Other | Other | Other | Other | Other | Other |
| 6 | R5 | No | 293 | Other | Other | Other | University T | University T | Other | Other |
| 7 | R6 | Yes | 262 | University T | University T | University T | University T | University T | University T | Other |
| 8 | R7 | No | 252 | University T | University T | University T | University T | University T | University T | Other |
| 9 | R7 | No | 251 | Other | University T | University T | University T | University T | Other | Other |
| 10 | R8 | No | 246 | N/A | N/A | University T | University T | University T | N/A | N/A |
| 11 | R9 | Yes | 245 | Other | University T | University T | University T | University T | University T | Other |
| 12 | R4 | Yes | 242 | Other | Other | Other | University T | University T | University T | Other |
| 13 | R10 | No | 221 | University T | University T | University T | University T | University T | University T | University T |
| 14 | R11 | No | 203 | N/A | N/A | Other | University T | University T | Other | Other |
| 15 | R2 | Yes | 202 | Other | Other | Other | University T | Other | Other | Other |
| 16 | R2 | No | 197 | Other | Other | Other | University T | Other | Other | Other |
| 17 | R12 | No | 196 | University T | University T | University T | University T | University T | University T | Other |
| 18 | R13 | Yes | 196 | University T | University T | University T | University T | University T | University T | University T |
| 19 | R14 | No | 195 | Other | Other | University T | University T | Other | Other | N/A |
| 20 | R15 | No | 194 | Other | University T | University T | University T | University T | University T | Other |

Returning to Researcher J, we discovered that this researcher’s citations were essentially zero for all years up to 2018. In the year 2019, the number of citations suddenly shot up to almost 1,800. How was such an incredible jump in annual citations achieved?

Figure 5: Researcher J’s Scopus Citations – All vs. Excluding Self-citations.



According to Figure 5, the jump could not have been achieved by the self-citations of researcher J and co-authors, as most of the citations were not self-citations. It appears the citation boost was accomplished through a more concerted effort.

Significant bulks of citations occurred in a handful of journals whose focus did not clearly match with the topics of researcher J's papers. Tellingly, the indexing of these journals in the Scopus database was subsequently discontinued in the year 2020. It, therefore, appears that engineering large jumps in paper citations during a short period of time is achieved with the cooperation of the editorial office of certain suspect journals as well.

4.4 Open-Access Journals with Exceptionally High Publication Frequency

Because journal publishers play a key role in boosting university rankings, in this section, we investigate the nature of the journals and publishers that facilitated the meteoric rise of University T around the year 2019.

We searched for the university we suspected in the "Affiliations" section and then selected the "Documents by source" option. Next, we carefully reviewed each source provided and located the specific document we required under the "Source" section. This allowed us to access all the relevant information for that document, including the "Publisher," "Year," and "Document" Published each year. We extracted all the necessary information from each source to create Table 4.

Table 4: Journals with which University T Affiliated Faculty Have Published the Greatest Number of Papers.

| Journal | Open Access Only? | Total papers with University T authors, 2019-21 | Total Articles Published by Year | | | | | | Publisher | 2017-22 growth in articles | 2017-20 growth in articles |
|---------|-------------------|---|----------------------------------|--------|--------|--------|---------|---------|-----------|----------------------------|----------------------------|
| | | | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | | | |
| J1 | No | 178 | 866 | 894 | 1,080 | 975 | 989 | 1,152 | P1 | 33% | 13% |
| J2 | Yes | 158 | 2,838 | 6,124 | 15,346 | 18,056 | 12,819 | 9,656 | P2 | 240% | 536% |
| J3 | Yes | 150 | 1,613 | 1,660 | 2,022 | 2,359 | 2,962 | 2,838 | P3 | 76% | 46% |
| J4 | Yes | 120 | 25,859 | 18,679 | 20,423 | 22,461 | 24,535 | 22,657 | P1 | -12% | -13% |
| J5 | Yes | 112 | 322 | 774 | 1,525 | 2,121 | 2,437 | 2,682 | P4 | 733% | 559% |
| J6 | Yes | 97 | 6,675 | 4,767 | 4,799 | 4,744 | 4,047 | 3,513 | P5 | -47% | -29% |
| J7 | No | 96 | 70 | 60 | 103 | 122 | 253 | 647 | P1 | 824% | 74% |
| J8 | Yes | 95 | 2,176 | 3,541 | 4,992 | 6,572 | 8,557 | 9,648 | P4 | 343% | 202% |
| J9 | Yes | 91 | 1,352 | 2,791 | 5,447 | 9,154 | 11,990 | 13,033 | P4 | 864% | 577% |
| J10 | No | 89 | 1,019 | 1,590 | 1,695 | 1,212 | 856 | 1,008 | P3 | -1% | 19% |
| J11 | No | 85 | 1,339 | 1,680 | 2,160 | 2,411 | 2,622 | 3,559 | P3 | 166% | 80% |
| J12 | No | 83 | 3,005 | 2,208 | 2,934 | 2,976 | 3,210 | 3,377 | P3 | 12% | -1% |
| J13 | Yes | 74 | 2,372 | 4,865 | 7,280 | 10,684 | 14,053 | 16,996 | P4 | 617% | 350% |
| J14 | No | 70 | 572 | 650 | 503 | 790 | 1,067 | 836 | P6 | 46% | 38% |
| J15 | Yes | 69 | 86 | 366 | 1,214 | 2,257 | 3,304 | 4,828 | P4 | 5514% | 2524% |
| J16 | Yes | 67 | 275 | 385 | 381 | 392 | 228 | 153 | P7 | -44% | 43% |
| J17 | Yes | 65 | 77 | 408 | 136 | 444 | 493 | 955 | P8 | 1140% | 477% |
| J18 | Yes | 65 | 19 | 124 | 290 | 554 | 944 | 1,352 | P9 | 7016% | 2816% |
| J19 | Yes | 64 | 28 | 36 | 1,584 | 1,373 | defunct | defunct | P10 | | 4804% |
| J20 | Yes | 94 | 1,923 | 3,378 | 459 | 7,216 | 6,109 | 10,735 | P1 | 458% | 275% |
| Total | | 1,922 | 52,486 | 54,980 | 74,373 | 96,873 | 101,475 | 109,625 | | 109% | 85% |

Table 4 reports the journals that published the highest numbers of papers by University T -affiliated authors. The top ten journals on the list published around 100 papers authored by University T affiliates each over the six-year period (2017-2022). Out of the twenty journals, fourteen (70%) published exclusively open-access, and one (5%) had its indexing in Scopus discontinued. What is noteworthy about this list of journals is the large volume of papers each journal publishes annually. Looking through the list, almost all publish upwards of a thousand papers annually. In cases in which the publication volume is very extreme – ten to twenty thousand papers a year – all are open-access journals. This observation is not surprising, given open access journals generate revenue through article processing charges (APC). A journal's revenue can grow only by a) increasing the already lofty APC per paper or b) publishing a greater number of papers. The need for revenue growth thus tends to drive open-access journals to accept and publish ever greater volumes of research, sometimes in very short periods of time. One of the open-access journals on our list, for example, published a total of 86 papers in 2017. By the year 2022, the same journal published 4,828 papers, a 55-fold increase. Clearly, the increasing demand for publications by universities has been met by an ever-growing supply of publication slots in open-access journals.

Consider a single publisher, P4. A typical APC for the publisher's journal is CHF 2,000. Between 2019 to 2021, University T published roughly 500 papers with this publisher, generating a revenue of about one million USD for the publisher. Considering the 5 journals published by P4 listed in Table 4, about 50,000 papers were published by these journals alone from 2017 to 2022. The data imply an annual revenue of USD100 million, a highly lucrative business indeed.

In a controversial study, Macháček and Srholec (2022) study the discipline and geographic distribution of predatory publishing. Defined as paid, open-access publishers that turn a blind eye to poor research paper quality or fake peer review processes, the authors find that predatory publishing is most prevalent in the social sciences. Interestingly, authors who publish in such journals are more likely to come from middle-income countries with large research sectors, especially in Asia and North Africa. They also find significant participation in predatory publishing among academics from oil-rich countries, similar to findings reported in Catanzaro (2023).

CHAPTER 5

CONCLUSION, GENERAL DISCUSSION, AND IMPLICATIONS FOR FUTURE

5.1 Conclusion

While explicit performance measures can serve as the basis for creating strong incentives, they rarely reflect all desired performance dimensions and are thus susceptible to gaming. University rankings represent a class of performance measures. The outcomes of such rankings carry significant implications for university stakeholders – students, faculty, alumni, and administrators – especially for institutions that do not have a long history of prestige.

Students often rely on rankings in their university application process, giving highly ranked institutions a financial advantage. A top-ranked university can admit more students and, at the same time, be more selective in its admissions process, creating a virtuous cycle that can boost next year's rankings. Faculty and alumni derive a sense of pride in seeing their institution ranked highly. A highly ranked university will attract quality faculty. Satisfied alumni are more likely to give, lifting both the university's finances and its future ranking. University administrators, whose jobs depend on the satisfaction of students, faculty, and alumni, therefore, have strong motives to engineer rapid improvements in their institution's international rankings.

Achieving higher rankings by gaming the ranking process may, however, result in changes that do not improve or even impair the quality of a university's educational services. Through an in-depth case study, our research has revealed mechanisms that have been used to game the university ranking system. The findings illustrate how such gaming is likely to be expensive and wasteful, leading to little or no improvement in the dimensions of educational services that the university stakeholders care about.

Implications of the findings are that metrics for measuring educational quality are likely to decline in relevance as the ability to game such measures increases in frequency and sophistication. Well-informed students and parents will know that

university rankings are both noisy and unreliable tools for choosing a college to attend. Researchers will know that traditional metrics for measuring journal quality and research impact cannot be relied upon when searching for genuine knowledge. The equilibrium to which we are heading may be one in which subjective judgments of insider experts must rely upon more for gauging quality, a situation in which the advantage of powerful incumbents (e.g., the “Ivy Leagues”) will become more entrenched. Successful newcomers will carve a niche for themselves by building strong reputations for quality in specific and narrow fields – a move toward more differentiation in educational service offerings.

The use of deceitful tactics to manipulate the rankings of educational institutions has sparked concerns regarding the honesty and impartiality of the system. The rankings were originally designed to serve as a measure of the caliber of education provided by these institutions. However, their credibility and standing.

5.2 Discussion

The discussion about rigging university ranking systems raises several important ethical and practical concerns. While university rankings were initially intended to provide valuable information about the quality of education and research provided by institutions, the gaming of these rankings can distort their credibility and undermine their purpose as the following:

5.2.1 Misalignment of Incentives: The current university ranking system creates incentives for institutions to focus on gaming the metrics instead of genuinely improving the quality of education and research. This can lead to a misalignment between what the rankings measure and what stakeholders truly value in a university.

5.2.2 Financial Advantage and Selectivity: Highly ranked universities can attract more students, which can lead to increased revenue and resources. This advantage reinforces their ability to maintain or improve their rankings, creating a cycle that can be difficult for less prestigious institutions to break into.

5.2.3 Distortion of Educational Services: When universities prioritize boosting their rankings over actual educational quality, they may make decisions that improve their ranking standing but do not necessarily enhance the learning experience or overall educational services for students.

5.2.4 Erosion of Relevance: As institutions become more adept at gaming the ranking system, the metrics used may lose their relevance and reliability. This can lead to a situation where rankings no longer accurately reflect the quality of educational services or research impact.

5.2.5 Impact on Decision Making: Students and parents who heavily rely on rankings in their college selection process may end up making suboptimal decisions if the rankings are skewed by gaming tactics. This can have long-term consequences for both the students and the institutions they attend.

5.2.6 Research Quality and Integrity: Gaming of university rankings can also extend to research metrics and publication practices, leading to potential distortions in the evaluation of research quality and impact. This can undermine the integrity of the academic community and hinder genuine knowledge advancement.

5.2.7 Concerns About Fairness and Impartiality: The use of deceitful tactics to manipulate rankings raises concerns about the fairness and impartiality of the ranking system. It can undermine the trust that stakeholders place in the rankings as an objective measure of educational quality.

5.2.8 Reputation and Status: The focus on rankings can perpetuate the advantage of well-established institutions, making it harder for newer or less prestigious universities to gain recognition and attract top talent.

5.2.9 Differentiation and Niche Specialization: The pursuit of higher rankings may lead to a lack of diversity and a move towards more narrow and specialized educational offerings, potentially limiting the scope of education provided.

5.2.10 The Need for Improvements to the University Ranking System: Research from the past has shed light on the issues with the ranking system. The methodology used in the system needs to be clarified, leading to confusion about why certain aspects hold more value than others. This has resulted in people exploiting loopholes in the system to manipulate rankings. Therefore, there is a growing need for improvements to the ranking system.

In conclusion, the current university ranking system, while intended to provide valuable information to stakeholders, has inherent flaws that can be exploited through gaming tactics. This can lead to a distortion of educational services, loss of credibility, and concerns about fairness and integrity. Addressing these issues requires

a reevaluation of the ranking metrics, a stronger focus on genuine educational quality, and a move away from overreliance on rankings in decision-making processes.

5.3 Recommendations

In this section, we consider the recommendations of the above findings for three related stakeholders – the university, the journal/publisher, the individual researcher, the young generation, and the alternative system.

5.3.1 Universities

As it becomes widely known that international university rankings can be manipulated, universities and their stakeholders will be forced to respond. Elite universities are already moving away from quantitative measures of quality by refusing to participate in popular rankings. Less prestigious institutions lacking a long and accomplished history will struggle to distinguish themselves. Perhaps ranking agencies will update their scoring methodologies to make the criteria more difficult to game. The conundrum here is that most quantitative measures are susceptible to gaming. The alternative of moving toward more subjective measures of quality – reputation being a good example – risks reinforcing the entrenched advantage of institutions steeped in history.

Parents and students will be forced to look beyond rankings when making a choice of college. Outside of the elite schools, which can sell their degrees as a signal of their graduates' quality, universities may need to work harder on differentiating their services. If an institution cannot distinguish itself based on its general educational services, it may need to try to distinguish itself as the best school for specific fields, graphic design or petroleum engineering, for example. Such differentiation would help soften competition between universities by allowing different universities to maintain market power in their market segment of choice.

5.3.2 Journals/Publishers

Universities' focus on gaming the ranking system appears to have been a big boon for open-access journals. With a growing demand for publication spaces and citations, open-access journals happily stepped in to fulfill this need. Under shrewd management, open-access journals can maintain good standings in journal indexing databases and thus promise to help universities boost their rankings if the institutions

are willing to finance the hefty publication charges. Neither the tendency that voluminous publications often suffer a drop in scientific merit nor the fact that the ratio between readers to producers of academic output is approaching zero appears to threaten the business model of open-access journals.

The interesting question is, what is the future of traditional, subscription-based journals? While we are already observing many subscription-based journals partially or fully switch to the open-access model, it is not clear that the trend will persist. One important reason is that there is and (hopefully) will always be demand for research that is meant to be read and debated among a circle of specialists. Such research is done for the sake of advancing knowledge and is thus less influenced by monetary concerns. Thus, while open-access publication is likely to continue to grow, traditional, subscription-based journals will maintain an important niche as non-profit gatekeepers of genuine knowledge.

5.3.3 Individual Researchers

The adage “publish or perish” will likely remain relevant for academics. Nevertheless, the additional questions “publish where” and “publish under what affiliation” will grow more prominent. With enough financial resources, researchers can now boost their research output beyond levels achievable in the past. High-frequency publications and open-access journals have removed the limitations faced by researchers in the past, allowing prolific authors to publish hundreds of peer-reviewed research each year. With such new opportunities, however, also come significant risks. The proliferation of open-access journals leads to the risk of lax standards. Because the built-in incentives in the open-access publication reward publishers that publish more, peer-review standards tend to become more lenient. Eventually, it may be accepted that highly cited, peer-reviewed research may not always represent reliable scientific knowledge.

Therefore, the tradeoff between quantity and quality will be at the forefront of future researchers’ consideration. The added complication is that ‘quality’ will no longer be easily discernable by third parties outside the field. Because the standard metrics of publication quality – indexing of journals in significant databases and citation statistics for individual papers – can mostly be manipulated, it might one day be that only insiders to an academic field can tell what journals are genuine and of high quality.

Gone will be the days when an outsider can browse publication statistics and judge who is the most prominent academic in a field. Like international university rankings, scholar and researcher standings based on data analytics will also become irrelevant.

5.3.4 Young Generation

There has been a significant disclosure regarding the questionable nature of university rankings, and this has caused a significant quantity of concern and uncertainty among newer universities. These rankings are a crucial guide for students when it comes to choosing a university, but their perceived unfairness has made it difficult for the younger generation to place their trust in them. This is particularly problematic for developing countries that aspire to compete with developed nations by offering high-quality education. These countries may attempt to manipulate the ranking methodology to achieve their goals, which can lead to a lack of transparency and fairness.

Unfortunately, this issue could result in declining enrollment for lesser-known universities, even if they do not manipulate the rankings, leaving their future uncertain.

5.3.5 Alternative System

As we move forward, it's possible that the traditional approach of selecting universities based on rankings may no longer hold as much weight. Instead, individuals may prefer to pursue higher education at established institutions with a renowned history and reputation that they are already familiar with. Those who are responsible for making decisions on behalf of students, such as parents and advisors, may believe that prestigious universities are the best choice for specific fields of study when it comes to selecting where to enroll.

5.4 Implications for the Future

For this research, we collected data from Scopus - a bibliographic database that indexes academic publications worldwide. The insights gained from this study will have significant implications for the future, which are summarized below:

5.4.1 Choosing the Research Topic.

When selecting research topics, it is important for researchers to conduct a comprehensive literature review to ensure that all possible avenues have been

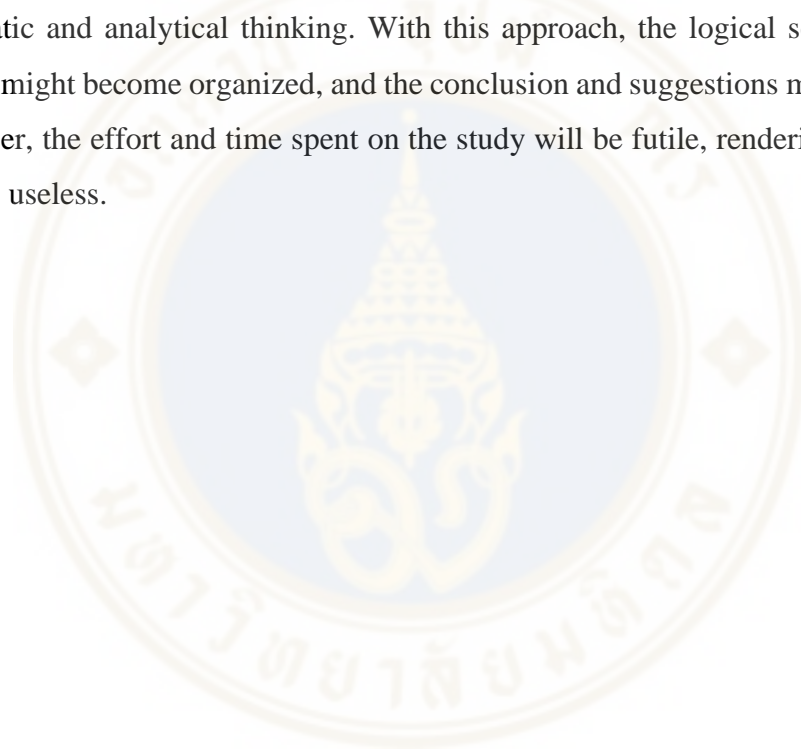
considered. The choice of secondary data approaches will be based on the researchers' interests and skills.

5.4.2 Advisor Counseling

When selecting research topics, researchers need to conduct a comprehensive literature review to ensure that all possible avenues have been considered. The choice of secondary data approaches will be based on the researchers' interests and skills.

5.4.3 Systematic and Analytical Thinking

To ensure the success of the research study, it is essential to employ systematic and analytical thinking. With this approach, the logical sequence of each chapter might become organized, and the conclusion and suggestions may be arrived at. Moreover, the effort and time spent on the study will be futile, rendering any potential benefits useless.



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