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Distribution of Income Diversification on Financial Sustainability of Indonesian Private Universities; Empirical Studies

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Abstract

Purpose: This study examines the distribution of income diversification in improving the financial sustainability of private universities amidst difficulties in operational funding during the Covid-19 pandemic with IT Capability moderation. **Research design, data and methodology:** Closed survey aimed at 468 financial sector leaders from 189 private universities in ten provinces in Indonesia. **Results:** All income diversification activity variables have a significant positive effect on financial sustainability. In the analysis of liquidity indicators, there are two activities that have a significant positive effect, namely goods and services ($\beta=0.337$) and profitable financial management ($\beta=0.124$). Furthermore, the results of the solvency indicator test obtained significant positive results in Goods and Services Activities ($\beta=0.337$), Commercial Intellectuals ($\beta=0.161$), Commercial Contracts ($\beta=0.103$), and Profitable Financial Management ($\beta=0.147$). The results of the test of higher education growth indicators on three activities have a significant positive effect, namely Goods and Services ($\beta = 0.290$), Endowments ($\beta = 0.158$), and Commercial Contracts ($\beta = 0.134$). The results of the moderation test conclude that IT Capability strengthens the effect of income diversification on financial sustainability. **Conclusion:** The results of the study as a recommendation for private universities in developing income diversification with information system technology-based management.

Keywords: Financial sustainability, Income Diversification, IT Capability, Higher Education, Financial Sustainability Instruments, Distribution

JEL Classification Code: G4, M1, M4, P4, L2, L3

1. Introduction

The economic downturn as a result of the COVID-19 pandemic triggered a global economic crisis (Handayani & Rakhmawati, 2020) which affected the ability of private universities in Indonesia to finance their operations (Haryadi, 2020; Ikhsan, 2020). This condition shows

Indonesian private universities' high dependence on one primary income source, namely tuition fees. Referring to León's theory of organizational flexibility (2001), at least the source of organizational income comes from at least 5 (five) sources of income, so it is necessary to develop universities diversification income. *Income diversification* is described as several activities that seek to reduce dependence on certain types of income or donors (Peter &

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Kamanzi, 2019). Carlo et al. (2019) claimed that using the ratio of income generated by universities through competitive research grants, contracts, and tuition fees, can improve universities' financial capacity. The need for diversification of universities income is concluded to be significant according to Nazli et al. (2019) in a survey of perceptions of universities leaders in Malaysia and Rohayati et al. (2016).

They looked at philanthropy for Malaysian universities as a source of income. Piotrowska and Kozłowski (2020) analyzes the income structure of universities in Poland, sourced from a third fund. Webb (2015) found an interesting relationship that college income with income diversification has increased student income and subsequently improved financial health. The correlation between income diversification and financial sustainability was supported in the Kuffour and Peprah (2020) study in Ghana.

In another study, supporting factors for optimizing university diversification activities have been studied, including organizational culture (Prince, 2007), staff capacity, staff competence, and leadership (Estermann, 2010; 2011). Garland (2019) mentioned the factors that influence the income of universities diversification: physical factors, finances, reputation, policies, structure, entrepreneurship, and abilities. Although many studies have related to the factors that support income diversification, no research examines the role of Information Technology (IT) Capabilities in diversifying university income. The role of IT Capability in supporting Financial Sustainability has been proven in the research of Henning and Jordaan (2016) and Maciá et al. (2021) but is not yet related to income diversification. The technology variable itself has been associated with income diversification activities, namely the sale of goods and services at universities (Akhmadi & Pratolo, 2021), but has not been associated with aspects of increasing financial sustainability.

The novelties in this study are 1) to examine the effect of distribution the types of university income diversification activities on financial sustainability; 2) analyze the role of IT Capability as a moderating factor in the relationship between income diversification and financial sustainability, which has never been done before. The study on the effect of income diversification was found to be significant in the research of Kuffour and Peprah (2020) but used university profile as moderation variable. Another novelty of this research is that the study of distribution income diversification associated with financial sustainability is the first study with a university object in Indonesia. Income diversification is part of the performance assessment indicators of Indonesian universities by the Indonesian National Accreditation Board; that is, the income of students is a maximum of 30 percent of the total income. The problem is that the practice of developing and

distributing new sources of income for private universities in Indonesia has not been fully managed optimally. Therefore, we examine the application of the relationship between distribution income diversification and the financial sustainability of universities in Indonesia.

The results of this study make a practical contribution to the financial management of private universities. With minimal assistance from the government, private universities must be agile in managing and distributing their resources to contribute to university revenues. The development of revenue-generating activities is adjusted to the university's short-term and long-term financial needs. In addition, universities must invest in IT capability development because it is proven to moderate the management distribution of income diversification towards financial sustainability. This study develops the four pillars of financial sustainability, namely income diversification, by analyzing the distribution types of income diversification activities at private universities. As a result, different activities support the university's financial sustainability from different dimensions.

2. Literature Review and Hypothesis Development

2.1. Income Diversification and Financial Sustainability

Financial sustainability of higher education is also called financial stability, namely the condition of availability of funds with allocation and use that supports the performance of the main activities and development of higher education based on capital growth while maintaining solvency under acceptable risk (Baitova, 2014). The financial sustainability of higher education can be seen from aspects 1). Liquidity is the ability of universities to finance their operations from their income (financial independence) (Sazonov et al., 2015; Al-Kharusi & Murthy, 2017; Irvine & Ryan, 2019; Alshubiri, 2020); 2). Solvency is seen from the ability of universities to cover their long-term obligations (financial sustainability) (Al-Kharusi & Murthy, 2017; Carlo et al., 2019; Almagtomea et al., 2019; Alshubiri, 2020) and 3). Growth (Achtenhagen et al., 2010; Gupta et al., 2013; Supplee, 2014) can be represented by an increase in the number of new students and college assets.

Universities must secure and diversify their financing sources to function efficiently and remain competitive. (Di Carlo et al., 2019; Garland, 2019). In their efforts to identify funding sources, private and public universities can carry out various income-generating activities for universities.

These activities can vary; besides starting a business, universities can increase income by increasing contributions to trust funds or endowments, philanthropy (Rohayati et al., 2016); fundraising for institutional activities, income from

the sale of goods and services, intellectual property, and income from alliances between entities (Peter&Kamanzi, 2019); sourced from income from education and services (Oana & Bogdan, 2018); Tuition fees, contracts, funding body grants, research grants and contracts, other income, non-market income, third stream income (Garland, 2020); operating activities, changes in economic activity-related income from research activities, sales of scientific products, and research and development services (Piotrowska & Kozlowski, 2020).

Evaluation of *income diversification* has been carried out, among others, in Malaysia by using the Hirschman-Herfindahl Index (HHI) to assess the financial statements of state universities in Malaysia and conducting opinion surveys through questionnaires to several senior Malaysian university officials regarding suggestions for various income diversification activities (Nazli et al., 2019); in England with the conclusion that universities in England that were established before 1992 had *income diversification* that supported the *financial sustainability* of the campus (Garland, 2020); in Poland with an analysis of the income structure of universities institutions at 1995-2017 to identify the types of income in expanding the financial capacity of universities (Piotrowska & Kozlowski, 2020); in Ghana by using a questionnaire to examine the correlation between *income diversification* and *financial sustainability* of private universities with significant results (Kuffour & Peprah, 2020); and in the US with the conclusion that financially diversified universities have a more balanced income portfolio and have a lower dependence on government funds (Stewart, 2008) and have better solvency levels (Besana & Esposito, 2015). Furthermore, Webb (2015) found an interesting relationship: the income of universities with *income diversification* has increased income from students and other improved financial health. The financial health of universities means that financial stability and *financial sustainability* are more substantial because one is *income diversification* (Irvine & Ryan, 2019). Koryakina (2018) examines financial diversification and financial sustainability in terms of university risk. Commercial risk (loss) and management risk (dual role of management is less than optimal) make diversification of higher education funding not optimal. Several funding diversification

activities that can be carried out to improve the financial sustainability of universities in Indonesia are as follows: 1). Business activities selling goods and services. Colleges can offer products or services to generate income (Peter & Kamanzi, 2019). The simple types are campus souvenirs and specific professional consulting services that require technical expertise (Rohayati, 2016). Sales and services are synonymous with university entrepreneurship (Garland, 2019) which can be in the form of university housing, food service, rental of buildings, and college facilities (Peter & Kamanzi, 2019); 2). Establishment and utilization of endowment funds. Universities establish and utilize endowments. This activity can take the form of managing waqf, donations, or internal financial management to establish a university endowment fund. This endowment can be in the form of money or property that generates income for specific purposes such as research or scholarships without reducing the value of the assets themselves (Peter & Kamanzi, 2019). The establishment of the endowment, in this case, benefits the university's income; 3). Intellectual property commercialization activities. Universities have intellectual property commercialization activities that support university finances. In its broadest sense, intellectual property is the physical representation of ideas, creativity, and inventions. This activity can be in the form of knowledge exchange involving universities and the business community, such as research collaboration, consulting, and internships. This activity generates income and increases the academic activities of universities institutions; 4). Commercial contracting activities with industry. Universities cooperate with companies or commercial ventures with mutually beneficial contracts. Entity alliances can form commercial collaboration activities between universities and entities to market images, products, and services for mutual benefit (Peter & Kamanzi, 2019). This collaboration can be in the form of sponsorship of activities, marketing assistance, or supply of entities from universities, consulting, and the like; 5). Financial Management is profitable. Colleges manage financial management and college-owned assets to generate income that benefits the college (Peter & Kamanzi, 2019).

The following are previous studies related to the relationship between income diversification and financial sustainability as shown in table 1:

Table 1: Previous research

No	Author (year)	Income Diversifikasi relation with Financial Sustainability	Results
1.	Rohayati et al. (2016)	examine the factors that influence the success of higher education philanthropy fundraising	Discovering philanthropy contributes to college health
2.	Peter and Kamanzi (2019)	Propose own generation activities as part of university financial sustainability	Suggested activities to diversify higher education income
3.	Garland (2019)	Measurement diversification of campus income as measured with Hirschman-Herfindahl Index (HHI)	The research concludes that UK universities that were established before 1992 have income diversification that supports campus financial sustainability

4.	Irvine et al. (2019)	Analysis of 39 private Australian universities of their financial health	Finding that there are differences between the top 10 private universities and the bottom 10 in terms of income diversification
5.	Carlo et al. (2019)	assess whether the new financial reporting system (accrual basis) can provide a better picture of the conditions of financial sustainability	Using income diversification in measuring financial sustainability
6.	Kuffour and Peprah (2020)	Analyzing the correlation between Income Diversification and Financial Sustainability of Private Tertiary Institutions as Moderated by Institutional Profile	The study revealed a positive and moderate relationship between income diversification and financial sustainability.
7.	Godday et al. (2020)	Empirically investigated the concept of risk management strategies with product/service diversification as strong indicators of a financial sustainable banking	Financial sustainability has a strong direct linear relationship with product and service diversification
8.	Piotrowska and Kozlowski (2020)	Discusses the theme of new sources of income that improve the financial health of higher education institutions (HEIs) in Poland	Generating revenue activities reflected in the changing structure and dynamics of revenues
9.	Lo (2021)	Examining century-old Japanese corporate business sustainability business antecedents	Diversification strategy affects the company's sustainability

This study analyzes each implementation of income diversification activities in universities in Indonesia to see its effect on financial sustainability from the aspect of liquidity, solvency and growth, with the following hypothesis:

H1: *Income diversification* has a significant positive effect on the *financial sustainability* of private universities in Indonesia.

Testing the H1 hypothesis is broken down into (4) study models as follows:

Model 1: Analyzing the effect of each Income diversification activity on the financial sustainability of private universities in Indonesia with a significant positive hypothesis.

Model 2: Analyzing the effect of each Income diversification activity on the financial sustainability indicators of private universities in Indonesia, namely liquidity, with a significant positive hypothesis.

Model 3: Analyzing the effect of each Income diversification activity on the financial sustainability indicators of private universities in Indonesia, namely solvency, with a significant positive hypothesis.

Model 4: Analyzing the effect of each Income diversification activity on the financial sustainability indicators of private universities in Indonesia, namely growth, with a significant positive hypothesis.

2.2. IT Capability, Income Diversification, and Financial Sustainability

IT Capability emphasizes talents and abilities and is characterized as a set of human resource-based skills, orientations, attitudes, motivations, and behaviors in the field of information technology that contribute to business performance (Willcocks et al., 2006). IT Capability has three dimensions (Ross, 1996; Bharadwaj & Grover, 2016;

Turulja & Bajgorić, 2016), namely: 1). IT knowledge is the level of awareness of the benefits and opportunities of IT within the organization, as well as IT knowledge and abilities (Bharadwaj & Grover, 2016) as a human resource asset; 2). IT operations are associated with the extent of IT usage in an entity's business activities or the transformation of activities to boost IT use, which might take the form of intangible assets (Ross, 1996; Bharadwaj & Grover, 2016) ; and 3). IT infrastructure consists of hardware, software, support personnel, and tools and resources that contribute to the acquisition, processing, storage, dissemination, and utilization of information (Pérez et al., 2012).

IT Capability has been proven to support business processes of entity performance in general in many studies (Bharadwaj et al., 1999; Búrca et al., 2006; Bharadwaj & Grover, 2016; Turulja & Bajgorić, 2016; Chae et al., 2018; Queiroz et al., 2018; Buranuth & Tamprateep, 2019; Erkmén et al., 2020). Universities business processes as income diversification activities require IT Capability alignment tools to facilitate management. This study examines whether the IT Capability of private universities in Indonesia has optimally strengthened diversified income. This focuses on universities' knowledge capacity, operations, and technology infrastructure. IT Capability has been proven to support financial management to improve financial performance (Ashrafi & Mueller, 2015; Herwiyanti, 2015) so this function is related to achieving university financial sustainability. We see the importance of the role of IT Capability in supporting the optimization of income diversification management and further supporting the achievement of financial sustainability with hypothesis:

H2: *IT Capability* strengthens the effect of income diversification on the *financial sustainability* of private universities in Indonesia.

Model 5: IT Infrastructures strengthen the effect of Income Diversification on the *financial sustainability* of

private universities in Indonesia.

Model 6: IT knowledge strengthens the effect of Income Diversification on the *financial sustainability* of private universities in Indonesia.

Model 7: IT Operations strengthen the effect of Income Diversification on the *financial sustainability* of private universities in Indonesia.

3. Research Methodology

3.1. Methods, Populations, and Research Instruments

This research quantitatively examines the relationship between *financial sustainability and income diversification* of private universities in Indonesia with the survey method. The survey was conducted to overcome the difficulty of accessing the financial statements of private universities in Indonesia because it is still closed. To avoid bias, the

procedure for compiling instruments follows the required conditions (Podsakoff et al., 2003; 2012a; 2012b; Rodríguez, 2020). The research instrument was developed from the previous research indicators; financial sustainability refers to Kharusi and Murthy (2017) and Alshubiri (2020), Income Diversification refers to Peter and Kamanzi (2019), and IT Capability refers to Turulja and Bajgorić (2016). The next indicator translated into a questionnaire instrument who were consulted in an expert forum consisting of 6 professors of finance and four university practitioners. After passing the expert validator test with several improvements, the instrument was tested in the field to determine its validity and reliability of the instrument. Several improvements were made in the validity test, and the instruments are ready to be circulated to leaders in the financial sector of private universities in Indonesia. Table 2 The following are the details of the indicators translated into the questionnaire instrument resulting from theory development, selection of expert validation, and pilot test instrument.

Table 2: Research Indicators and Instruments

Variable/Indicator/ Sub-Indicator	Instrument
FSliquidity1	My college is very independent financially and does not depend on income from students.
FSliquidity2	My college can meet routine operational costs in 1 fiscal year (salary, electricity, and academic operations) by sourcing from college income in 1 fiscal year.
FSliquidity3	My college is capable of meeting routine operational costs in 1 budget year WITHOUT relying on financial assistance from other parties.
FSliquidity4	My college can meet routine operational costs in 1 budget year WITHOUT third-party debt (banks, suppliers, etc.).
FSliquidity5	My college can meet routine operational needs in 1 year WITHOUT depending on the number of new students admitted each year.
FSSolvability1	My college always reserves cash funds for recurring operational costs in the following year.
FSSolvability2	My college has ample assets to spare in times of crisis.
FSSolvability3	My college always allocates more than 10% of investment funds every year.
FSSolvability4	My college has a business unit that can contribute to more than 10% of the budget each year.
FSSolvability5	My college has maximized the COMMERCIALIZATION of laboratories and infrastructure to generate significant additional income for the college.
FSSolvability6	My college already has intellectual property rights or patents or other research technologies that contribute significantly to the college's income.
FSGrowth1	The number of new students at my college always meets the target/quota from year to year.
FSGrowth2	Realized income at my college increases significantly from year to year.
FSGrowth3	The realization of income at my college that is NOT from students continues to increase significantly from year to year.
IDGoods and Services1	My college manages sales of goods/services activities that generate revenue according to the target.
IDGoods and Services2	My college has a business unit that generates significant revenue.
IDGoods and Services3	The business venture at my college generates profits that significantly support the university's income.
IDGoods and Services4	My college business venture has been very well managed.
IDGoods and Services5	My college business venture is a legal entity.
IDEndowment1	My college receives a lot of waqf or donations, which are used to generate significant income for the college.
IDEndowment2	My college has an endowment that is a CASH fund saved and developed to generate long-term college income.
IDIntellectualComm1	Patents at my college have contributed significantly to the college's revenue.

Variable/Indicator/ Sub-Indicator	Instrument
IDIntellectualComm2	The commercialization of Intellectual Property Rights at my college has contributed significantly to the college's income.
IDIntellectualComm3	Research at my college has been commercially valuable and generates significant revenue.
IDIntellectualComm4	The laboratories and educational facilities at my college have been used for commercial activities that significantly increase the college's income.
IDIntellectualComm5	My college has consultants who contribute significantly to higher education.
IDCommContracts1	My college often receives sponsorship from external parties for university activities.
IDCommContracts2	My college has contracts with external parties that generate significant revenue for the college.
IDProfitableFM1	The income from interest services and/or bank profit sharing at my university is significant.
IDProfitableFM2	My college receives significant income from renting out auditorium space, classrooms or the like.
IDProfitableFM3	My college has investments (Bonds, Sukuk, and the like) that generate significant income for the college
ITInfrastructures1	My college already has excellent facilities and infrastructure to support the implementation of financial governance.
ITInfrastructures2	Internet access at my college is very smooth.
ITInfrastructures3	The LAN (Local Area Network) network at my college is available and very well managed.
ITInfrastructures4	The availability of servers at my college is very sufficient.
ITInfrastructures5	The database system management at my college has been very well managed.
ITInfrastructures6	My college allocates very sufficient funds for the development of information technology.
ITKnowledges1	My university already has sufficient IT human resources to support the implementation of information systems.
ITKnowledges2	All employees are very supportive of the use of information technology at my university, including in financial management.
ITKnowledges3	Information technology is very useful in carrying out work, including financial management at my university.
ITKnowledges4	The financial manager at my college is very good at using technology.
ITOperations1	My college already has a very adequate budgeting information system technology.
ITOperations2	My college already has a very adequate Accounting Information System technology.
ITOperations3	My college already has a very adequate student Payment Information System technology.
ITOperations4	My college already has a very adequate asset information system technology
ITOperations5	My college already has a very adequate tax information system technology.
ITOperations6	My college has used information technology for financial governance very consistently.

Data source: processed by researchers

The minimum population of the study was determined by referring to Krejcie and Morgan (1970), namely 346 respondents from universities representing 3,336 private universities in Indonesia. Using a media workshop in collaboration with the Government Universities Service Institution, we collected 612 questionnaires filled out by the vice chancellor for finance and high-level finance leaders from 189 private universities in Indonesia. The distribution of respondents came from 10 provinces: Central Java, West Java, East Java, West Sumatra, Bengkulu, Palembang, Lampung, Bangka Belitung, Maluku and West Papua.

The research instrument resulted in 468 data ready to be analyzed from the selection process. The instrument was not used because the respondent was not the vice chancellor for finance or the highest finance manager for private universities in Indonesia. The following is the respondent's data as shown in table 3 below:

Table 3: Respondent data

Provinces area	Amount of respondent
Central Java	159 respondents
West Java	78 respondents
East Java	83 respondents
Nort Sumatra	46 respondents
Bengkulu, Palembang, Lampung dan Bangka Belitung	59 respondents
Papua Barat dan Papua, Maluku dan Maluku Utara	43 respondents

3.2. Descriptive Statistics, Validity, and Reliability

The data processing uses SPSS to present descriptive statistics, and the results of the reliability and validity test with product moment pearson are presented in Table 4. The result indicates that there are no data multicollinearity concerns.

Table 4: Descriptive statistics, validity, and reliability

Code	Variables, Indicators, Sub Indicators	Descriptive		Validity		Reliability Cronbach's Alpha
		mean	Stand. Dev	Correlation	Sig	
Y	Financial Sustainability					0.862
Y1	Liquidity	15.86	4.148	0.902**	0.000	0.812
Y1iA	FSliquidity1			0.720**	0.000	
Y1iB	FSliquidity2			0.796**	0.000	
Y1iC	FSliquidity3			0.805**	0.000	
Y1iD	FSliquidity4			0.714**	0.000	
Y1iD	FSliquidity5			0.743**	0.000	
Y2	Solvability	17.93	4.934	0.942**	0.000	0.862
Y2iA	FSSolvability1			0.694**	0.000	
Y2iB	FSSolvability2			0.805**	0.000	
Y2iC	FSSolvability3			0.803**	0.000	
Y2iD	FSSolvability4			0.805**	0.000	
Y2iE	FSSolvability5			0.791**	0.000	
Y2iF	FSSolvability6			0.707**	0.000	
Y2	Growth	9.03	2.68	0.864**	0.000	0.832
Y2iA	FSGrowth1			0.862**	0.000	
Y2iB	FSGrowth2			0.902**	0.000	
Y2iC	FSGrowth3			0.807**	0.000	
X1	Income Diversification				0.000	0.896
X1A	Goods and Services	13.04	4.893	0.922**	0.000	0.937
X1iA1	goods and Services1			0.866**	0.000	
X1iA2	goods and Services2			0.933**	0.000	
X1iA3	goods and Services3			0.939**	0.000	
X1iA4	goods and Services4			0.925**	0.000	
X1iA5	goods and Services5			0.813**	0.000	
X1B	Endowment	5.27	1.932	0.850**	0.000	0.705
X1i1	IDendowment1			0.878**	0.000	
X1i2	IDendowment2			0.808**	0.000	
X1C	IntellectualComm	12.47	4.722	0.948**	0.000	0.944
X1iC1	IDIntellectualComm1			0.933**	0.000	
X1iC2	IDIntellectualComm2			0.906**	0.000	
X1iC3	IDIntellectualComm3			0.925**	0.000	
X1iC4	IDIntellectualComm4			0.843**	0.000	
X1iC5	IDIntellectualComm5			0.881**	0.000	
X1D	CommContracts	5.51	1.978	0.858**	0.000	0.912
X1iD1	IDCommContracts1			0.938**	0.000	
X1iD2	IDCommContracts2			0.902**	0.000	
X1iE	ProfitableFM	7.8	2.732	0.892**	0.000	0.825
X1iE1	IDProfitableFM1			0.855**	0.000	
X1iE2	IDProfitableFM2			0.871**	0.000	
X1iE3	IDProfitableFM3			0.851**	0.000	
X2	IT Capability				0.000	0.894
X2A	infrastructures	21.88	4.656		0.000	0.916
X2iA1	ITInfrastructures1			0.792**	0.000	
X2iA2	ITInfrastructures2			0.826**	0.000	
X2iA3	ITInfrastructures3			0.854**	0.000	
X2iA4	ITInfrastructures4			0.871**	0.000	
X2iA5	ITInfrastructures5			0.863**	0.000	
X2iA6	ITInfrastructures6			0.837**	0.000	

Code	Variables, Indicators, Sub Indicators	Descriptive		Validity		Reliability Cronbach's Alpha
		mean	Stand. Dev	Correlation	Sig	
X2B	IT Knowledge	14.68	2.982		0.000	0.878
X2iB1	ITKnowledges1			0.801**	0.000	
X2iB2	ITKnowledges2			0.888**	0.000	
X2iB3	ITKnowledges3			0.855**	0.000	
X2iB4	ITKnowledges4			0.881**	0.000	
X2C	operations	20	5.185		0.000	0.949
X2iC1	ITOperations1			0.904**	0.000	
X2iC2	ITOperations2			0.922**	0.000	
X2iC3	ITOperations3			0.866**	0.000	
X2iC4	ITOperations4			0.922**	0.000	
X2iC5	ITOperations5			0.871**	0.000	
X2iC6	ITOperations6			0.922**	0.000	

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

3.3. Classic Assumption Test

The pre-analysis test was carried out to meet the normality of the data, free of multicollinearity, autocorrelation, and heteroscedasticity with sig 0.326 > 0.05, VIF value < 10, and Tolerance > 0.01 in the Collinearity Statistics test, Durbin Watson obtained a value of 2.020 and a Chi-Square value of 239.19 under Chi. Square Table with df-1. Therefore, the analysis can be continued to the next stage.

4. Result and Discussion

The results of multiple regression of each hypothesis are detailed in 7 (seven) research models. Model 1 shows that all income diversification activity variables have a significant positive effect on the financial sustainability of private universities in Indonesia, namely 1). Good and Services have a significant effect of 0.000 on financial sustainability, 2) Endowment has a significant effect of 0.033 on financial sustainability, 3). Intellectual Commercial has a significant effect of 0.017, 4) Commercial Contracts has a significant effect of 0.014 on financial sustainability, and 5). Profitable Financial Management has a significant effect of 0.004 on the financial sustainability of private universities in Indonesia. This result shows the support for all income diversification activities in increasing the financial sustainability of universities institutions. The results of model 1 are in line with research (Kuffour & Peprah, 2020). This effect is positive (0.714), meaning that every increase in income diversification activities that contribute to universities will increase the financial independence of universities. Model 1 has an R2 value of 0.649 with an explanation of 64.9% income diversification activities affect financial sustainability beyond other factors such as good governance

(Comit  et al., 2017; Sepasi et al., 2018; Peter & Kamanzi, 2019; Arslan & Alqatan, 2020), efficiency (Sabandar et al., 2018), and IT support (Henning & Jordaan, 2016). With a percentage yield of 64.9%, developing income diversification activities needs to be a concern for private university managers to avoid financial vulnerabilities. With the lack of government funding, private universities' managers must be agile in managing all the resources owned by universities, both demand, and supply.

Model 2 shows only 2 (two) activities that have a significant positive effect on liquidity, namely Goods and Services with a significance of 0.000 and Profitable Financial Management of 0.004; other indicators were found to have no significant effect, namely Endowment, Intellectual Commercial, and Commercial Contracts. Goods and services are revenue-generating activities for universities that can take the form of selling goods and services to serve external parties of universities and their own internal needs. Goods and Services activities that have been well managed, let alone have legal entities, are proven in this study to support universities liquidity. According to Sazonov et al. (2015), the liquidity aspect is described as short-term operational adequacy without involving external assistance. Goods and services activities align with financial management activities that benefit the university's current cash flow to meet short-term financial needs. This support was not obtained from endowment activities or intellectual commercial and commercial contracts. However, the results of testing model 3 show empirical data that this activity supports the solvency of universities except for endowments. Support for universities solvency is also obtained from Goods and Services and Profitable Financial Management activities with a significance of 0.000 and 0.001.

Furthermore, model 4 analyzes the effect of income diversification activities on universities growth; from the results of the analysis obtained the results of 3 activities that

have a significant effect, namely Goods and Services (0.000), Endowment (0.002), and Commercial Contracts (0.007). Different results were obtained from commercial, intellectual activities, and profitable financial management. Financial sustainability from the growth aspect is represented by the growth in the number of students and university income. The goods and services activities carried out by universities, positive endowment management, and cooperation contracts with the commercial world have created positive publications for universities. This supports the level of public trust in universities. On the other hand, this activity supports the increase in the income of universities institutions.

Hypothesis models 5,6 and 7 are moderation analysis regression (MRA) with IT Capability as a moderating variable between the effect of income diversification on the financial sustainability of private universities in Indonesia. IT Capability with indicators of IT Infrastructures, IT knowledge, and IT Operations strengthens the role of

income diversification on the financial sustainability of private universities in Indonesia with a significance of 0.000 each. These results reflect significant positive support for IT Capability in strengthening the effect of income diversification on financial sustainability. Universities that have human resources who have good technological capabilities with the support of supportive technology infrastructure will harmonize management functions in controlling and coordinating university business. Technology will also support innovation in developing universities sources of income. Therefore, the results of this study become one of the supports the development of information technology in line with the development of revenue-generating universities.

Furthermore, the model indications can be seen in Table 5 which shows model 1 with R Square of 0.649, R Square of model 2 of 0.413, model 3 of 0.674, model 4 of 0.532, and model 5 of 0.566, model 6 of 0.549 and model 7 of 0.566.

Table 5: Research Model Regression Results

Code	Model	Model1	Model2	Model3	Model4	Model5	Model6	Model7
Regression Analysis								
Y	Financial Sustainability							
Y1	Liquidity							
Y2	Solvability							
Y3	Growth							
X1	Income Diversification	0.000(.741)**						
X1A	Goods and Services	0.000(.337)**	0.000(.371)**	0.000(.337)**	0.000(.290)**			
X1B	Endowment	0.033(.081)**	0.226(.064)**	0.565(.23)**	0.002(.158)**			
X1C	IntellectualComm	0.017(.068)**	0.602(.036)**	0.002(.161)**	0.223(.081)**			
X1D	CommContracts	0.014(.092)**	0.404(.043)**	0.008(.103)**	0.007(.134)**			
X1E	ProfitableFM	0.004(.124)**	0.011(.154)**	0.001(.147)**	0.188(.076)**			
Moderation Regression Analysis								
X2	IT Capability					0.000(.199)**		
X2A	IT Infrastructures					0.000(.171)**		
X2B	IT Knowledge						0.000(.162)**	
X2C	IT Operations							0.000(.102)**
Constant		1.206	1.534	0.97	1.058	1.683	1.609	1.908
Indices Model								
R Square		0.649	0.413	0.675	0.532	0.566	0.546	0.566
Significant model (p)		<0.000	<0.000	<0.000	<0.000	<0.000	<0.000	<0.000

1. Number of samples = 468

2. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$ (one-tailed test).

In general, the results of the analysis show the significant role of income diversification activities of private universities in Indonesia in improving financial sustainability, as Irvine and Ryan's (2019) research in Australian universities, in England (Garland, 2019), Poland (Piotrowska & Kozlowski, 2020) and in Ghana (Kuffour & Peprah, 2020). Thus, universities must set a strategy to form strategic funding sources, especially in the face of

unpredictable environmental fluctuations such as the 19th pandemic (Kapustian et al., 2021) and other unpredictable conditions. Complementing the previous study, this study obtains additional information about the moderation of IT Capability to increase the role of Income Diversification on the Financial Sustainability of universities in Indonesia, with the IT Infrastructure indicator having a significance value of 0.00 $p > 0.05$ 0.171, IT knowledge with a

significance value of 0.00 $p > 0.05$ 0.162 and an IT Operations indicator 0.00 $p > 0.05$ 0.102.

5. Conclusion

This study concludes the positive role of income diversification consisting of several activities that can be distributed by private universities in Indonesia in improving financial sustainability. The results of the analysis show that all income diversification distribution activities consisting of the sale of goods and services, use of waqf, intellectual commercialization, commercial contracts, and profitable financial management have a significant positive effect on financial sustainability. However, the research found that the type of income diversification activity affects financial sustainability from different aspects. There are two activities that have a significant positive effect on the liquidity aspect of the college, namely the sale of goods and services and profitable financial management. Furthermore, the solvency aspect is significantly positively affected by the sales activities of university goods and services, commercial intellectuals, commercial contracts and profitable financial management.

The results of the test of higher education growth indicators on three activities have a significant positive effect, namely Goods and Services, Endowments, and Commercial Contracts.

The study also found the important role of IT Capability as a moderating relationship between income diversification and financial sustainability of private universities in Indonesia. This study's results corroborate the Akhmadi and Pratolo (2021) findings about the role of technology in campus-run businesses.

Income diversification activities, as stated in the accreditation assessment of universities in Indonesia as income-generating activities, need to be strengthened along with campus technology capabilities. Both play a significant positive role in improving the financial health of private universities in the form of growth in liquidity, solvency and financial sustainability.

Financial sustainability is very important to support the sustainability of university operations. The conventional model of SPP-based higher education management must be abandoned, so it is necessary to explore the diversification of higher education income. Many studies on the financial sustainability of private universities have been carried out, but empirically exploring income diversification activities in private universities has not been widely carried out. This focus is a new finding that must be developed along with the increase in campus technology capabilities. The purpose of this research is filled with recommendations to increase income diversification of higher education activities in line

with the role of technology because business in universities can disrupt academic activities if not done properly. Therefore, it is important to strengthen the technology-based support system aspect for its implementation. This aspect is proven in the empirical study of this research.

Private universities in Indonesia are urgently needed because the government has not fully met the availability of higher education. However, the increasing dependence on tuition fees as the primary funding source poses problems. Therefore, the results of this empirical study can be used as recommendations for university managers to increase the distribution of profitable income diversification activities to support campus financial sustainability. These activities must be aligned with IT capabilities that must be continuously improved. Technology-based support systems are essential in managing campus business activities.

This study uses a survey method to assess financial sustainability and income diversification. Despite the difficulties encountered, researchers understand that the best way to assess the financial aspect is to look directly at the financial statements. Therefore, this weakness can be used as a recommendation for further researchers by looking at empirical data based on a study of the financial statements of each university. In addition, other aspects as antecedents of financial sustainability of private universities are recommended to be explored further.

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