Article

The influence of Intellectual capital (IC) disclosure and geographic location on the sustainability of higher education: A case in Southeast Asian universities

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Abstract: Purpose: This research aims to examine the influence of intellectual capital disclosure and the geographical location of universities on the sustainability of higher education institutions in Southeast Asia. **Design/methodology/approach:** This research is quantitative and uses secondary data obtained through the annual reports of universities that have the Universitas Indonesia Green Metric Rank. This research uses two stages of data analysis techniques, namely the content analysis stage to determine the number of Intellectual Capital disclosures and the hypothesis testing stage. The analysis tool uses the SPSS version 23 application. The population of this research includes all universities in Southeast Asia that are included in the UI Greenmetric World University Rankings. The sampling technique used was purposive sampling technique, which resulted in 86 analysis units of higher education institutions in Southeast Asia. **Findings:** The research results prove that the geographical location of universities has a negative and significant influence on Universitas Indonesia Green Metric's performance in Southeast Asia and human capital has a positive influence on UIGM's performance in Southeast Asia. However, the structural capital and relational capital components do not affect the UIGM performance of universities in Southeast Asia. **Originality/value:** The originality of the research is the use of higher education sustainability variables with UIGM proxies and modified IC indicators for universities and geographical areas that have not been widely used to see whether there are fundamental differences in the disclosure of intellectual capital for higher education institutions in Southeast Asia.

Keywords: intellectual capital; UIGM; human capital; structural capital; relational capital

1. Introduction

The expansion of the function of higher education institutions (PT) is not only as research centers and teaching centers, but universities have the autonomy to provide sufficient funding so that all their functions are fulfilled (Sanchez and Elena, 2006). Universities face competition like business entities in general. Some of the competition faced by universities is the growth of universities, attracting the interest of prospective students and the number of professors as educators and raising funds. One of the mechanisms for universities to face this competition is to showcase their strengths and resources (Puspitosari et al., 2017). One of the benchmarks for the success of higher education institutions is the level of accreditation obtained from the National Higher Education Accreditation Board High (BAN-PT) (Wahyudin and Nurkhin, 2017). However, will obtaining accreditation guarantee an increase in interest from prospective students and increase the sustainability of a higher education institution? Facts that occur in society prove that a prospective student in higher

education does not only look at the level of tertiary accreditation, but management of intellectual capital is the main consideration (Solikhah et al., 2020; Wahyudin and Nurkhin, 2017). For example, the level of acceptance of university graduates in the world of work, how much technology is used in universities and the innovation carried out by universities (Strazzullo et al., 2022). The factors above are intangible factors that universities use to become capital. Intellectual capital (IC) is an intangible asset owned by an organization. The form of IC can be information or knowledge embedded in an entity. Universities as a form of organization have intangible assets. Intangible asset factors in higher education are in the form of knowledge, innovation, and intellectual capital (Herli and Tjahjadi, 2022). As an organization that sells services in the education sector, the main capital that must be owned is the academic community. The more the academic community has high quality and competence, the more it will provide high selling value to the university. Intellectual capital in a university becomes a mechanism and instrument aimed at building sustainable competitiveness. Intellectual capital is believed to be able to strengthen innovative capabilities so that competitive advantage can be achieved. The sustainability of a university is one of the university ranking assessments. University sustainability reports can reflect the university profile, higher education management practices, university strategic management plans, and operational performance results (Sudaryati and Raharja, 2022).

Intellectual capital (IC) is an intangible asset owned by an organization. Higher education as a form of organization has intangible assets. Intangible asset factors in higher education are knowledge, innovation and intellectual capital (Herli and Tjahjadi, 2022). As an organization that sells services in the education sector, the main capital that must be owned is the academic community. The more the academic community has high quality and competence, the more it will provide a high selling point for higher education. Intellectual capital disclosure is a mechanism and instrument aimed at building sustainable competitiveness (Craig, 2010; Jiao et al., 2023; Parthenope et al., 2021). Research by Craig (2010) found evidence that disclosing IC information in an organization is a form of corporate sustainability reporting that has a level of implementation of the Global Reporting Initiative (GRI). This research also provides practical implications that the pattern of disclosure of IC information is a form of preparation for sustainability disclosure. The development of research on the relationship between IC and sustainability reporting reported by Parthenope et al. (2021) shows that IC is a long-term value concept, so that the potential for development in IC disclosure is aimed at fulfilling the sustainable development agenda. Chen and Chen (2008), Jiao et al. (2023) conducted research on the influence of green intellectual capital on competitive advantage and sustainability. Human capital as an IC component has a determining factor, namely employee abilities and their commitment to improving employees' skills, knowledge and awareness of environmental protection

In higher education, ranking of business sustainability is one of the indicators that is taken into account. Research by Francesca et al. (2023) states that there are several rankings used by universities to indicate the existence of sustainable development programs. There are quite a lot of rankings such as UI green Metric World University Rankings, QS World University Rankings, Best College Rankings, Times Higher

Education Impact Rankings, Top 10 Global Schools for Environment Ecology. The practice of ranking is one of the target indicators for the business sustainability of a university. University sustainability reports can reflect the university profile, higher education management practices, university strategic management plans, operational performance results (Sudaryati and Raharja, 2022). UI Green Metric as one of the sustainable reporting guidelines for universities. UI Green Metric (UIGM) is ranked the first and only one to have established voluntary standards to improve higher education infrastructure and act towards sustainable campuses worldwide. There are 6 categories, namely setting and infrastructure, energy and climate change, waste, water, transportation and education and research (Fatriansyah et al., 2021). The education and research category is one of the components that is an indicator in the 3 IC components. According to Parthenope et al. (2021) the use of IC still receives little attention in relation to the goals set in the 2030 agenda and the guidelines set for companies, as well as the relationship between IC and sustainability, so further research is needed. The wider the disclosure of the university's efforts, the greater the guarantee of business continuity. Research regarding the relationship between IC disclosure and the Universitas Indonesia Green Metric ranking of a university has never been carried out. The focus of this research is optimizing intellectual capital (IC) disclosure on university sustainability which is proxied as the UIGM ranking.

Geographic area is a factor that has not been widely used to see whether there are fundamental differences in the disclosure of university intellectual capital (IC). Differences in management culture within a university are thought to be able to influence management style in disclosing and reporting its intellectual capital (IC) (Strazzullo et al., 2022). There are 11 countries in the Southeast Asia area, including Indonesia, that report and disclose their intellectual capital (IC). Research related to how intellectual capital (IC) is disclosed at universities in Southeast Asia has so far not been found, so research is urgently needed that is able to explain how the intellectual capital (IC) disclosure model is at universities in Southeast Asia.

Based on the explanation above, the formulation of this research question is:

RQ1 = What is the relationship between human capital disclosure and UI GM performance rankings at a university?

RQ2 = What is the relationship between structural capital disclosure and UI GM performance ranking in a university?

RQ3 = What is the relationship between relational capital disclosure and UI GM performance rankings at a university?

RQ4 = What is the relationship between geographic location and UI GM performance ranking in a university?

2. Conceptualization and hypothesis design

2.1. A knowledge-based economy approach

Another view reveals that intellectual capital can drive the value of a company so that the biggest challenge for universities is whether and how to manage higher education performance and the intellectual capital disclosure component of higher education value (Rahayu and Sudaryono, 2022; Sanchez and Elena, 2006). Legitimacy theory explains how legitimation dialogue occurs as a result of the interaction between

the power held by the organization and the audience's reaction (Hamm et al., 2022). The application of this theory in the context of university organizations provides support that universities can operate if society supports their goals. Failure to meet community expectations can result in sanctions imposed by the community. One of the instruments used to publicize university operations is disclosure in the annual report. The greater the proportion of disclosure, the greater the probability that the audience will respond to the existence of the university.

This research uses a knowledge-based economy approach. This approach views intangible elements are important elements for value creation in higher education and economic wealth (Aulia et al., n.d.; Rahayu and Sudaryono, 2022; Ulum et al., 2016). A knowledge-based economic approach encourages increased growth of intellectual capital as a form of business sustainability (Rahayuningtyas and Triana, 2017). Another view reveals that intellectual capital can drive the value of a company so that the biggest challenge for universities is whether and how to manage higher education performance and the intellectual capital disclosure component of higher education value (Rahayu and Sudaryono, 2022; Sanchez and Elena, 2006). This research develops a conceptual framework related to a knowledge economy-based approach operationalized at universities. Based on **Figure 1**, a university is seen as an economic entity that is faced with the fact that a consumer or prospective student has full information to make a college selection. On the other hand, universities have the challenge of having an accreditation-based performance measurement model either by government institutions or independent accreditation institutions. So, the balance of good governance is considered as a form of effort to reach the number of students and win competitiveness. However, as an intuition that provides public services. A university is required to provide transparency in all reporting it carries out. The form of disclosure is the focus of the view of legitimacy theory. This theory provides support that all disclosure efforts are aimed at gaining legitimacy from the public. At the higher education level, using legitimacy to increase the value of a university is an absolute requirement to increase competitiveness.
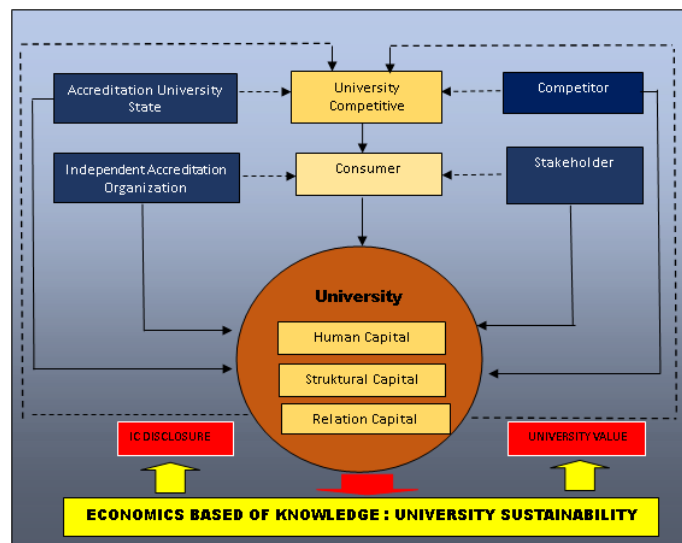

Figure 1. Conceptual framework.

Several researchers have conducted research related to efforts to increase the competitiveness of higher education institutions. Research by Bhuiyan et al. (2023) proves that the competitiveness of higher education comes from the competitive advantages possessed by the university. Alwi's (2022) research proves that transformational leadership is one of the factors needed to increase university competitiveness. Another view regarding competitiveness was provided by Beigi et al. (2023) who stated that sustainable competitive advantage is a mediating variable in the relationship between knowledge management and dynamic capacity on a university's performance. Furthermore, according to Suryanto et al. (2021), green campus, green intellectual capital, and green management are determining factors for a campus's reputation. Other research reveals that the age of higher education has an effect on intellectual capital disclosure and there are differences in intellectual capital disclosure at state and non-state universities (Puspitosari et al., 2017). Next, there is research that proves that there are differences in how intellectual capital is disclosed in higher education institutions based on their management patterns (Rahayu and Sudaryono, 2022). However, there is another view that states that the three components of intellectual capital are correlated with each other so that when used as independent variables they must be reciprocal (Strazzullo et al., 2022). So far there has been no research regarding the influence of each component of higher education intellectual capital and the influence of geographic area on the sustainability of a university in the Southeast Asia area.

2.2. Legitimacy theory

This research also uses legitimacy theory as a basis for formulating hypotheses. Legitimacy theory explains how legitimation dialogue occurs as a result of the interaction between the power held by the organization and the audience's reaction (Hamm et al., 2022). Legitimacy theory is a mechanism that supports organizations in implementing and developing voluntary social and environmental disclosures to fulfill their social contract in order to gain recognition for the purpose of the organization's founding and maintain the survival of the organization (Burlea-schiopoiu, 2016). The legitimacy obtained by an organization will have a direct impact on the organization's sustainability (Thomas and Lamm, 2012). It was further explained that the dimension of legitimacy is pragmatic legitimacy which reflects the assessment of capabilities felt by stakeholders when there are organizational actions or attributes that increase resources efficiently, improve the image of the organization so that it can help the sustainability of the organization. Another view suggests that the application of legitimacy theory in research assumes that the organization has compliance with the expectations of society or stakeholders so that this organization will have efforts to meet the expectations of stakeholders. If the organization is unable to meet these expectations, it will experience restrictions and will not be legitimized in society (Deegan, 2019). The application of this theory in the context of university organizations provides support that universities can operate if society supports their goals. Failure to meet community expectations can result in sanctions imposed by the community. One of the instruments used to publicize university operations is disclosure in the annual report. The greater the proportion of disclosure, the greater

the probability that the audience will respond to the existence of the university.

2.3. Intellectual capital

The organization's efforts to fulfill public legitimacy by disclosing intellectual capital (IC). IC is an intangible asset and is in the form of information and knowledge resources to increase competitiveness and this can improve the performance of a company or organization (Rahayu and Sudaryono, 2022). The intellectual capital (IC) component has been categorized into three basic, interconnected berhubungan (Aulia et al., 2019; Hermawan et al., 2021; Ulum et al., 2016; Ulum, 2019) parts as follows:

2.3.1. Human capital

Human capital is a resource for innovation and knowledge development. Human resources refer to expertise or various knowledge and experience provided by an organization to add value to the knowledge of human resources.

For universities, human capital is human capital which includes all the hidden knowledge of academic staff (lecturers, structural officials, educational staff) obtained through formal and non-formal education (Rahayu and Sudaryono, 2022). So, universities are competing to compete to improve the quality of education, especially their teaching staff as a source for creating graduates who are able to compete in the world of work. The better and better the quality of human resources a university has, the more competitive graduates it will create compared to graduates from other universities. So, in legitimacy theory, if a university has good and quality human capital, it will produce good performance for the university by producing graduates who are able to compete in the world of work. So that universities will gain legitimacy from the public, because universities have human capital that is able to provide the best graduates to universities. According to Šlaus and Jacobs (2011) human capital is an important factor that determines long-term sustainability and is an effort that can accelerate the achievement of sustainability through human awareness that emerges from each individual. In the context of universities as educational institutions, human capital is a natural resource that has the potential for sustainability goals in the future. The better the organization manages human capital and the public knows about its human capital management, the greater the potential for sustainability (Donald, 2014). This is in line with research conducted by Sofyani and Khairunisa (2021), Bananuka (2023). So, the hypothesis set is:

H1: High disclosure of human capital will increase the sustainability in higher education.

2.3.2. Structural capital

Structural capital is explicit knowledge related to the process of internal dissemination, communication, and management of scientific knowledge and technical knowledge in higher education. Structural capital is divided into two, namely organizational capital and technological capital.

Structural capital in higher education is divided into two, namely organizational capital (operational environment that originates from interactions between research, management and organizational processes, organizational routines, culture and company values, etc.) and technological capital (technological resources available on the internet of institutions Higher education such as bibliographic and documentary

resources, archives, etc.). So that the existence of structural capital will support human capital to provide quality graduates for universities. The relationship between IC and UI GM measurements can be seen, for example, in the first indicator, namely investment in online libraries. This policy certainly supports the sustainability of universities based on UI GM. This is because one of the measurements in UI GM is how little the university saves on paper usage. The more universities prioritize activities that require minimal paper, the better their sustainability Based on legitimacy theory, universities will gain good public legitimacy, because they have good structural capital as support and support for the work carried out by human capital. Donald's (2014) research examining the influence of IC on sustainability proves that IC has an influence on social sustainability, environmental sustainability and economic sustainability. However, Bananuka's (2023) research shows that structural capital has no significant effect on sustainability. Other research, examining the relationship between structural capital and sustainability, shows a positive influence (Barak and Sharma, 2023; Martínez García de Leaniz and Rodríguez del Bosque, 2013; Sofyani and Khairunisa, 2021). On the basis of previous research, the hypothesis is prepared as follows:

H2: High disclosure of structural capital will increase the sustainability in higher education.

2.3.3. Relational capital

Relational capital is an extensive collection of economic, political, and institutional relationships that are built and developed between higher education and its non-academic partners. Relational capital in higher education consists of long-term relationships with consumers (students, alumni, etc.), colleagues (memberships, external collaboration projects), the public (relationships with the industrial world) and other educational institutions in order to improve the quality of education and competitiveness of graduates (Ulum, 2019). Universities will gain good public legitimacy as a result of long-term relationships with consumers, the public, co-workers and other educators (Bananuka, 2023; Rahayuningtyas and Triana, 2017; Puspitosari et al., 2017; Fazlagic, 2014). This is in line with legitimacy theory, that universities will gain public or community recognition due to increased disclosures related to relational capital in annual reports. Based on this, the hypothesis is structured as follows:

H3: High disclosure of relational capital will increase the sustainability in higher education.

2.4. Geographies

Based on **Figure 1**, universities are faced with competitors who originate either in Indonesia or from outside Indonesia. Competitors from different countries have relatively different IC disclosure tendencies. So, it is necessary to test based on geographic location. Geographical location is one of the external factors that can influence higher education performance and intellectual capital (IC) disclosure. Cultural differences in the management of a university are thought to be able to influence management style in disclosing and reporting the intellectual capital it has (Strazzullo et al., 2022). Prospective students in determining which university to go to

will evaluate the university's performance and consider various geographical factors such as country area, region, social sphere, etc. If the geographical environment has good synergy, then this will be able to increase the competitiveness of higher education which will affect the performance of the higher education itself. When a university is in a high-demand location, this will increase profits which will have an impact on the university's performance which will increasingly improve. In line with legitimacy theory, if a university has good geography, it will gain public legitimacy because universities have high competitiveness due to differences in intellectual capital disclosure and reporting at each university.

H4: The geographic location of universities influences the sustainability of universities.

3. Methodology

This research focuses on developing a model for optimizing intellectual capital (IC) disclosure on sustainability at universities in Southeast Asia. The research population is universities in Southeast Asia that are included in the UI Greenmetric World University Rankings in 2022. This research is quantitative research, which uses secondary data obtained through annual reports of state universities in 2022 which can be obtained from the websites of each university. This research uses 2 stages of data analysis techniques, namely the validation stage and the hypothesis testing stage. Model testing used the SPSS version 23 application. The sampling technique used purposive sampling technique which resulted in 86 analysis units of higher education institutions in Southeast Asia with the following criteria:

1) Registered in the UI Greenmetric world university rankings in 2022.
2) Universities present accessible annual reports in 2022.

Table 1. Sample selection.

NO.	Information	Number of universities
1	Universities in Southeast Asia that are included in the UI Green Metric World University Rankings.	103
2	Universities in Southeast Asia that are ranked in the UI Green Metric World University Rankings have incomplete and inaccessible data.	17
	The number of universities in Southeast Asia that publish annual reports that are accessible and have complete data.	86
	State-owned universities	63
	Private universities	23

The research population consisted of 103 universities in Southeast Asia that were included in the UI GM rankings. A total of 7 universities do not have data in accordance with intellectual capital disclosure and 10 universities do not provide annual reports on the official website. So that the universities included in the research sample were 86, with a composition of 63 being state universities and 23 being private universities (**Table 1**).

The independent variables of this research are:
1) Human capital

The amount of explicit and latent knowledge of higher education staff (lecturers,

structural officials, education staff), obtained through formal and non-formal education

The human capital indicator consists of the following 8 indicators:

    a) Number of full-time professors

    b) Amount and type of training

    c) Number of permanent lecturers

    d) Number of non-permanent lecturers (guest lecturers, extraordinary lecturers, expert lecturers)

    e) Lecturer achievements (awards, grants, program funding)

    f) Qualifications (number of positions) of academic lecturers

    g) Competency of academic lecturers (number of educational levels of lecturers S1, S2, S3)

    h) Number of non-academic staff (librarians, laboratory assistants, technicians, operators

2) Structural capital

Explicit knowledge related to the process of internal dissemination, communication and management of scientific knowledge and technical knowledge in higher education. The indicator consists of 23 items as follows:

    a) Invest in an electronic media library

    b) Income from licensing

    c) Number of licenses granted

    d) Laboratory measurements and services

    e) Study program vision

    f) Study program mission

    g) Goals and objectives

    h) Achievement strategy

    i) Technology used in learning

    j) Syllabus and lesson plans

    k) Learning techniques

    l) Facilities, infrastructure, funds for learning

    m) Learning evaluation system (attendance of lecturers, students

    n) Guardianship system

    o) Average study period

    p) Number of lecturers per student

    q) Drop out ratio

    r) Average students per supervisor

    s) Average number of meetings/supervisors

    t) Academic qualifications of supervising lecturers

    u) Availability of a final assignment mechanism guide

    v) Target time for writing the final assignment

    w) Number of graduates/graduates

3) Relational capital

An extensive collection of economic, political and institutional relationships established and developed between higher education and its non-academic partners (for example: companies, non-profit organizations, local governments and society at large). The indicators consist of 15 as follows:

a) Number of 3rd party research grants abroad
b) Number of research by 3rd party directorate general of higher education
c) International scientists at the University
d) Number of conferences held
e) Research/community service
f) Scientific publications in international journals
g) Scientific publications in accredited organizational journals a
h) Scientific publications in local journals
i) Internet site hits
j) E-learning
k) Number of academic achievements and reputation, interests and talents of students
l) Student services
m) Services and utilization of graduates
n) Recording graduate data
o) Graduate participation in academic development.

Disclosure of IC information is weighted according to its projection using a numerical code (five-way numerical coding system) as follows: 0 is a code for items that are not disclosed, 1 is a code for items that are disclosed in narrative form, 2 is a code for items that are disclosed in narrative form. numeric, 3 is a code for items expressed in monetary value, and 4 is a code for items expressed in graphic or image form.

4) Geographic area variable

Is the country of origin of the university. Measurements use a nominal scale using numbers as category symbols. The measurement procedure is as follows:

1 = Higher education in Indonesia
2 = Higher education in Malaysia
3 = Higher education in Thailand
4 = Higher education in the Philippines
5 = Higher education in Vietnam

The independent variable of this research is the sustainability performance of higher education institutions, which is proxied by the UI Greenmetric World University Rankings score.

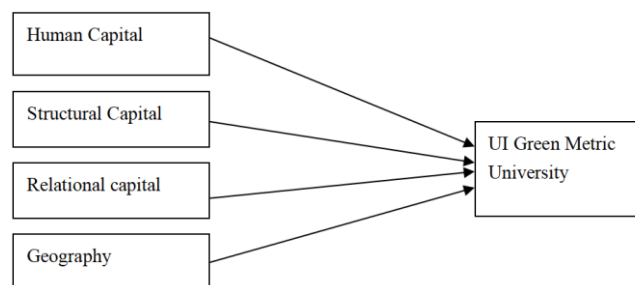The research design is presented in **Figure 2**.

Figure 2. Research design.

4. Findings

The results of data analysis related to descriptive statistics are presented in **Table 2**.

Table 2. Descriptive analysis test results (Source: SPSS 23 Output, 2023).

	N	Minimum	Maximum	Mean	Std. deviation
HC (X1)	86	0.21875	0.90625	0.5232558	0.15318209
SC (X2)	86	0.086956521739130	0.380434782608696	0.221183013144591	0.058183505957034
RC (X3)	86	0.216666666666667	0.583333333333333	0.374806201550388	0.061396822747120
Geografi (X4)	86	1	5	2.16	1.115
UIGM (Y)	86	4190	8800	7285.17	1183.993
Valid N (listwise)	86				

This research uses the UI Green Matric variable as the dependent variable. Based on the table, it states that the average value of the UI green matrix variable is 7285.17. The maximum value of the UI green matric fraud variable is 8800, while the minimum value of the UI green matric variable is 4190. The standard deviation value is 1183.993 which is smaller than the average value illustrating that Ui Green Matric has a fairly small data deviation and a homogeneous data distribution.

Human capital has an average value of 0.52, a maximum value of 0.90625, and a minimum value of 0.21875. The standard deviation value of human capital is 0.159 which is smaller than the average value and illustrates that human capital has a fairly small data deviation and a homogeneous data distribution.

Structural capital has an average value of 0.221, a maximum value of 0.38, and a minimum value of 0.086. The standard deviation value of structural capital is 0.058183505957034 which is smaller than the average value and illustrates that structural capital has a fairly small data deviation and a homogeneous data distribution.

Relational capital has an average value of 0.374, a maximum value of 0.58, and a minimum value of 0.217. The standard deviation value of relational capital is 0.061 which is smaller than the average value and illustrates that relational capital has a fairly small data deviation and a homogeneous data distribution.

The location of the university has an average value of 2.16, the maximum value is 5, while the minimum value is 1. The standard deviation value of the location of the university is 1.115 which is smaller than the average value, illustrating that the location of the university has a fairly small data deviation and data distribution homogeneous data distribution.

The next test is the classic assumption test. This test is used so that the regression model used can be an appropriate predictor. The results of the normality test are presented in **Table 3**.

Based on **Table 3** Kolmogorov-Smirnov test results table above, the results of Asymp. Sig. (2-tailed) of 0.002. This result shows that the residual data in this study is not normally distributed because of the Asymp value. Sig. (2-tailed) is smaller than 0.05.

Table 3. Normality test (Source: SPSS 23 Output, 2023).

		Unstandardized residuals
N		86
Normal parameters[a,b]	Mean	0.0000000
	Std. deviation	1070.79538546
Most extreme differences	Absolute	0.127
	Positive	0.061
	Negative	−0.127
Statistical tests		0.127
Asymp. Sig. (2-tailed)		0.002[c]

Based on the **Table 4**, the human capital variable has a Variance Inflation Factor (VIF) value of 1.167, structural capital has a VIF value of 1.182, relational capital has a VIF value of 1.257, and the university location variable has a VIF value of 1.273. So, it can be concluded that the variables human capital, structural capital, relational capital, and university location have a VIF value of less than 10 and a tolerance value greater than 0.1 so there are no symptoms of multicollinearity between the independent variables in this study.

Table 4. Multicollinearity test (Source: SPSS 23 Output, 2023).

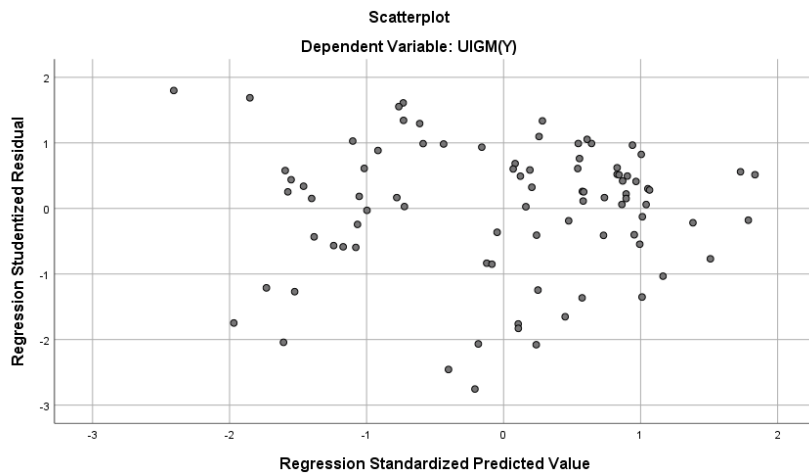| Model		Collinearity statistics	
		Tolerance	VIF
1	(Constant)	-	-
	HC (X1)	0.857	1.167
	SC (X2)	0.846	1.182
	RC (X3)	0.796	1.257
	Geografi (X4)	0.785	1.273

Figure 3. Heteroscedasticity test.

Based on **Figure 3**, the results of the Scatterplot are used to see whether or not there are heteroscedasticity symptoms in the regression model. From the results above, it can be seen that the points in the scatterplot are spread in a random or unclear pattern

so it can be concluded that there is no heteroscedasticity problem in the regression model.

Table 5. Multiple linear regression test (Source: SPSS 23 Output, 2023).

Model		Unstandardized coefficients		Standardized coefficients	Q	Sig.
		B	Std. error	Beta		
	(Constant)	8158.051	812.146		10,045	0.000
	GEOGRAPHICAL	−1257.068	255,656	−0.509	−4.917	0.000
1	H.C	43,649	24,265	0.181	1.799	0.076
	S.C	34.122	21,552	0.154	1.583	0.117
	RC	−9.892	34,022	−0.031	−0.291	0,772

Based on the **Table 5**, the multiple linear regression equation model that can be developed in this research is as follows:

$$UIGM = 8158.051 − 1257.068 GEOGRAPHIC + 43.649 HC + 34.122 SC − 9.892 RC + e$$

information:

UIGM = UI Green Matric

GEOGRAPHIC = Location of universities

HC = Human capital

SC = Structural capital

RC = Relational capital

e = Error

From the results of the regression equation model above, the following conclusions can be drawn:

1) The constant (α) is 8158.051, meaning that if all the independent variables in the research have constant or constant values, then the Ui Green Matric (UIGM) value is 8158.051.

2) The regression coefficient for University Location (GEOGRAPHIC) is −1257.068. A negative value on the coefficient indicates that the location of the university has a negative effect on the Ui Green Matric. Therefore, it can be interpreted as the location of the college If there is an increase of one unit, the Ui Green Matric will decrease by 1257.068 with the assumption that other variables are constant. The university location variable has a probability value of 0.000 which is smaller than the significance value of 0.10. Based on these results, it can be concluded that the location of the university influences Ui Green Matric.

3) The human capital (HC) regression coefficient is 43,649. A positive value on the coefficient indicates that human capital has a positive effect on the Ui Green Matric. Therefore, it can be interpreted that when human capital increases by one unit, it will increase the Ui Green Matric by 43,649 assuming that other variables are constant. The human capital variable has a probability value of 0.076, which is smaller than the significance value of 0.10. Based on these results it can be concluded that human capital influence on Ui Green Matric.

4) The structural capital (SC) regression coefficient is 34,122. A positive value on the coefficient indicates that structural capital has a positive effect on the Ui Green Matric. Therefore, it can be interpreted that when structural capital

increases by one unit, it will increase the Ui Green Matric by 34,122 assuming that other variables are constant. The structural capital variable has a probability value of 0.117 greater than the significance value, namely 0.10. Based on these results it can be concluded that structural capital does not affect Ui Green Matric.

5) Relational capital regression coefficient (RC) of −9.892. The negative value of the coefficient indicates that relational capital has a negative effect on the Ui Green Matric. Therefore, it can be interpreted that when relational capital increases by one unit, the Ui Green Matric will decrease amounting to 9.892 assuming that other variables are constant. The relational capital variable has a probability value of 0.772 greater than the significance value, namely 0.10. Based on these results it can be concluded that relational capital does not affect Ui Green Matric.

5. Discussion

Specifically, a summary of the results of hypothesis testing is in **Table 6**. The test results show that there are 2 hypotheses that are accepted, namely H1 and H4.

Table 6. Summary of hypothesis test results (Source: Data processing results, 2023).

Variable	Sig.	Information
H1: Human capital disclosure influences university sustainability	0.076*	Accept
H2: Structural capital disclosure influences university sustainability	0.117	Rejected
H3: Relational capital disclosure influences university sustainability	0.772	Rejected
H4: The geography of a university influences the university's sustainability	0.000	Accept

*Sign at 10%.

The human capital variable has a positive direction towards higher education sustainability because the human capital variable has a significance value of 0.076, which has a value smaller than 0.10. So H1 is accepted. The results of this research are in line with legitimacy theory, where if universities reveal more human capital in more detail, the UIGM level is predicted to be higher and therefore more sustainable. As a consequence, universities will gain public legitimacy. The results of this research are in accordance with legitimacy theory. On 8 indicators of the human capital variable, universities in Indonesia have disclosure scores in category 2, namely disclosure in numerical form. Meanwhile, universities in Malaysia disclose more numerical and nominal values in monetary amounts. By disclosing human capital, universities whose legitimacy is not yet sufficient can use the information disclosed in public disclosure to improve their legitimacy in the eyes of the public or society (Kiswara et al., 2020). Disclosure regarding intellectual capital expressed by universities can be used as a university tool to convince external parties of the university's legitimacy. The results of this research are in line with research conducted by Sofyani and Khairunisa (2021), Putri and Anggraini (2021), Bananuka (2023).

In this research, structural capital has no effect on higher education sustainability because the significance value is above 0.10. So H2 is rejected. The results of this research are not in line with legitimacy theory, which states that if a university obtains good public legitimacy, it is because it has good structural capital as support and

support for the work carried out by human capital. Research data shows that the level of structural capital disclosure in universities is 0.2 and the standard deviation is relatively low at 0.05. This shows that the data tends to be homogeneous, which can give rise to a tendency to not find the effect of structural capital disclosure on higher education sustainability. The results of this research are inversely proportional to research conducted by Sofyani and Khairunisa (2021), Melsia and Dewi (2021), Martínez García de Leaniz and Rodríguez del Bosque (2013), Barak and Sharma (2023).

Research data shows that universities in Indonesia often reveal structural capital variables in the study program vision and mission indicators, goals and objectives and achievement strategies with a weight of 1. This means that universities in Indonesia express study program vision and mission indicators, goals and objectives. and achievement strategies are only expressed in narrative form and all indicators are still not disclosed by universities in Indonesia. Meanwhile, for universities that are not in Indonesia, structural capital is widely expressed in indicators of study program vision and mission, goals and objectives, achievement strategies, technology used in learning, syllabus and work plans, learning techniques, learning evaluation systems (attendance of lecturers and students), as well as the availability of a final assignment mechanism guide with a weight of 1. This can be interpreted as meaning that universities that are not in Indonesia disclose indicators of the vision and mission of the study program, goals and objectives, achievement strategies, technology used in learning, syllabus and work plans, learning techniques, learning evaluation systems (attendance of lecturers and students), as well as the availability of guidelines for final assignment mechanisms are only disclosed in narrative form and all indicators are still not disclosed by universities that are not in Indonesia.as proxied by UIGM. However, the results of this research are not in line with legitimacy theory, according to which if a university obtains good public legitimacy, it is because it has good structural capital as support and support for the work carried out by human capital. This is because universities need to continue to gain legitimacy in society or the public so that they remain and can increase their competitiveness (Kiswara et al., 2020). The results of this research are inversely proportional to research conducted by Sofyani and Khairunisa (2021) and Melsia and Dewi (2021) that structural capital influences company performance.

At universities in Indonesia, the structural capital variable is mostly expressed in the study program vision and mission indicators, goals and objectives, and achievement strategies with a weight of 1. This means that universities in Indonesia reveal the study program vision and mission indicators, objectives and targets, and achievement strategies are only expressed in narrative form and universities in Indonesia still lack disclosure for all indicators. Meanwhile, for universities that are not in Indonesia, structural capital is widely expressed in indicators of study program vision and mission, goals and objectives, achievement strategies, technology used in learning, syllabus and work plans, learning techniques, and learning evaluation systems (attendance of lecturers and students), as well as the availability of a final assignment mechanism guide with a weight of 1. This can be interpreted as meaning that universities that are not in Indonesia disclose indicators of the vision and mission of the study program, goals and objectives, achievement strategies, technology used

in learning, syllabus and work plans, learning techniques, learning evaluation systems (attendance of lecturers and students), as well as the availability of guidelines for final assignment mechanisms are only disclosed in narrative form and all indicators are still not disclosed by universities that are not in Indonesia.

Based on data processing, the relational capital variable has a coefficient value of −9.892 and it can be interpreted that the relational capital variable has a negative direction towards higher education performance. Looking at each variable, the significance level for each variable is 0.10 or 10%. So, the relational capital variable has a significance value of 0.772, which has a value greater than 0.10. So, it can be concluded that structural capital has no effect on higher education performance and H3 is rejected. The results of this research are not in line with legitimacy theory, where universities will gain public or community recognition due to the increase in the value of a university, which is an absolute requirement to increase its competitiveness. The results of this research are inversely proportional to research conducted by Sofyani and Khairunisa (2021), Melsia and Dewi (2021), Puspitosari et al., (2017), Rahayuningtyas and Triana (2017), Fazlagic (2014), Bananuka (2023).

Based on research data, for universities in Indonesia, the relational capital variable is mostly disclosed in the graduate data recording indicators with a weight of 2. This means that universities in Indonesia in disclosing graduate data recording indicators are only expressed in numerical form and for all indicators they are still not disclosed enough. by universities in Indonesia. Meanwhile, for universities that are not in Indonesia, relational capital is mostly expressed in indicators of the number and type of research with a weight of 2. This can be interpreted that universities that are not in Indonesia disclose indicators of scientific publications in international journals, scientific publications in journals of organizations accredited A, scientific publications in local journals, and recording of graduate data is only disclosed in numerical form and for all indicators it is still not disclosed by universities that are not in Indonesia.

The geographical variable or location of universities is measured using weights for each university in Southeast Asia, where this is based on the body of universities in Indonesia, it will be given a weight of 1, and for universities outside Indonesia, it will be given a weight of 2. Based on the *T*-test, it has a coefficient value of −1257.068 and it can be interpreted that the geographical variable has a negative direction towards sustainability which is proxied by UIGM. The significance level is 0.10 or 10%. Geographical variables or university location has a significance value of 0.000 which has a value smaller than 0.10. So, it can be concluded that H4 is accepted. The geography or location of universities has a negative and significant influence on sustainability as proxied by UIGM. However, the results of this research are in line with legitimacy theory, where if a university has good geography, it will gain public legitimacy These results show that geographic location has an influence on the sustainability of a university. This research differentiates geographically into 5 countries, namely Indonesia, Malaysia, Thailand, the Philippines and Vietnam. In **Figure 4**, it can be concluded that Malaysia has the highest disclosure among all the countries observed.
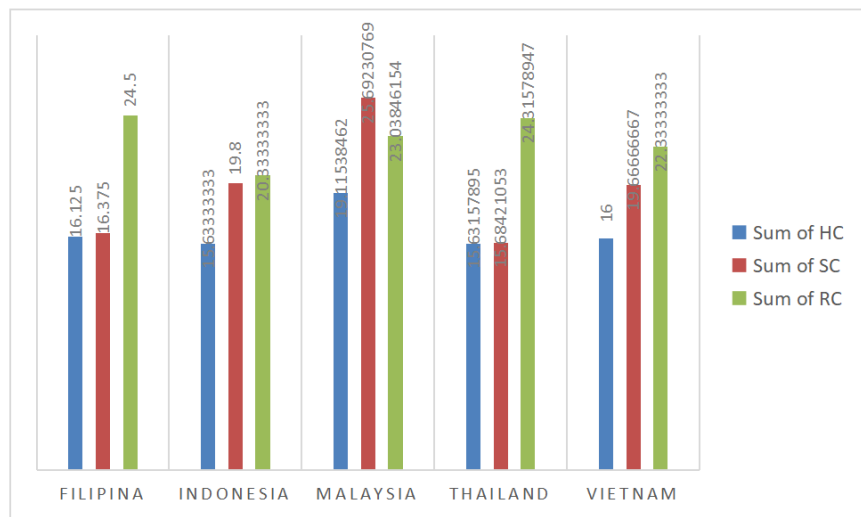
Figure 4. Average level of IC disclosure in Southeast Asia (Source: Data processing results, 2023).

Based on the disclosure picture above, it can be seen that universities in Malaysia have higher intellectual capital disclosures than universities in Indonesia, Thailand, the Philippines, and Vietnam. These results also explain that the components of human capital and relational capital disclosure revealed at universities in Vietnam are higher than at universities in Indonesia. The highest disclosure of human capital in Southeast Asia is at universities in Malaysia and followed by universities in the Philippines. The disclosure of structural capital is mostly carried out by universities in Malaysia, followed by Indonesia and Vietnam. Meanwhile, the highest disclosure of relational capital was made by universities in the Philippines.

Based on research data, for universities in Indonesia, the relational capital variable is mostly disclosed in the graduate data recording indicators with a weight of 2. This means that universities in Indonesia in disclosing graduate data recording indicators are only expressed in numerical form and for all indicators they are still not disclosed enough. by universities in Indonesia. Meanwhile, for universities that are not in Indonesia, relational capital is mostly expressed in indicators of the number and type of research with a weight of 2. This can be interpreted that universities that are not in Indonesia disclose indicators of scientific publications in international journals, scientific publications in journals of organizations accredited A, scientific publications in local journals, and recording of graduate data is only disclosed in numerical form and for all indicators it is still not disclosed by universities that are not in Indonesia.

In-depth analysis carried out for each country, shows that universities in the Philippines prefer disclosure of relational capital compared to disclosure of human capital and structural capital components. This shows that university management considers presenting information related to the university's ability to produce output in the form of scientific publications, research grants obtained and the reputation of graduates to be something that must be expressed using graphs, figures and narratives. For universities in Indonesia, the highest disclosure of the intellectual capital component is relational capital and the lowest disclosure is human capital. This pattern of behavior shows that university management considers that detailed disclosure of relational capital is the most important part to convey to readers of the annual report.

In particular, disclosure of relational capital, which tends to show the output of a university, is a delivery related to the performance of the university's output. In Indonesia, the relational capital component is an element of university performance indicators which must be published as a form of performance achievement.

Differences in disclosure patterns occur at universities in Malaysia. The results of the content analysis show that universities in Malaysia tend to provide more detailed and in-depth disclosures on structural capital components. University management tends to reveal the university's vision, mission, goals and strategies. They also revealed the learning system and technology, including scholarship services, which are used to achieve competitive graduates. However, universities in Malaysia as a whole have a higher awareness of intellectual capital disclosure compared to universities in the four universities in the sample.

6. Conclusion

Based on the research results, it can be concluded that geography has a negative and significant influence on the sustainability of universities in Southeast Asia and human capital has a positive influence on the performance of universities in Southeast Asia. Meanwhile, structural capital and relational capital do not affect the sustainability of universities in Southeast Asia. Quite interesting results from this research are related to the phenomenon that IC disclosure in Vietnam is higher than IC disclosure in higher education institutions in Indonesia. Meanwhile, higher education IC disclosure in Malaysia is ranked highest in the Southeast Asia region. The results of this research have implications for higher education management policies in carrying out annual reporting to ensure the sustainability of universities, namely that human capital disclosure is one component of intellectual capital that is able to contribute to the sustainability of a university's business. Therefore, human capital disclosure can be used as mandatory disclosure for universities. This research uses IC measurements based on accreditation in Indonesia. Future research is expected to use IC measurements adopted from international accreditation bodies using sustainability performance proxies other than UIGM.

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