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Managing Intellectual Capital in Public Hospital: Effects on Financial Performance

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Abstract

This study examines effect of intellectual capital on the financial performance of public hospitals in Indonesia. The effect is proxied through Value Added Intellectual Coefficient (VAIC™), consisting of Value-Added Capital Employed (VACA), Value Added Human Capital (VAHU), and Structural Capital Value Added (STVA). In addition, this study identifies differences in the influence on general and special hospitals. This study analyses the audited financial statements of 20 public hospitals with random effects approach. The results showed that VACA and STVA positively affected financial performance. In contrast, VAHU negatively affected the financial performance of all public hospitals. Although general and special hospitals have several different business models, the effect of intellectual capital on the financial performance is similar. This study provides theoretical implication to the rising stream of literature on intellectual capital in public service agencies, especially public hospitals. Public hospitals are expected to develop human capital to create added value for the organization by employing their flexibility in human resource management.

INTRODUCTION

Intellectual capital management in government organizations is essential because intangibles provide more excellent added value to the public sector than private (Cinca et al., 2003). Cinca and his colleagues proposed several reasons for this. First, public sector administration, unlike the private sector whose main objectives are profitability and firm value, tends to have nonfinancial objectives. Second, because even if both the public and the private sectors use the same production inputs – human resources, knowledge, money, raw materials, and plant – the public sector makes more intensive use of human resources and knowledge, and these are intangible. Third, the output of the public sector is generally a service for the community, which is essentially intangible.

In Indonesia, most public hospitals are operated under the governance of public service agency, or Badan Layanan Umum (BLU). The establishment of BLU in Indonesia was motivated by the concept of New Public Management (NPM), which has been implemented in various developed countries. NPM concepts include institutional arrangements, staffing, and management of state finance (Waluyo, 2014). Inspired by NPM doctrines, entrepreneurial orientation from the private sector is introduced into these agencies with several adjustments, the so-called agencification (Poole et al., 2006).

The term 'agencification' covers both the process and the outcome (Vining et al., 2015). The NPM doctrine refers to agency reform not only in relation to agency creation but also agency governance (Verhoest, 2018). In other words, agencification is understood not just as organi-

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zational decoupling, but also how to deliver innovative behavior, customer orientedness, higher quality of service, and efficiency of public service (see e.g. Freddy et al., 2022). Agencification practice has been high on the agenda of administrative policymakers, and has attracted considerable scholarly attention over the past two decades (Trondal, 2014) after the 'high' managerialism of the 1980s (Elston, 2014), which was concerned with re-establishing the primacy of managerial practices over bureaucracy.

This article will discuss public hospitals in the context of BLU (hereafter "public hospital"). In Indonesia, based on the type of service provided, hospitals are categorized into general and special hospitals. General hospitals provide health services in all fields and types of diseases, while special hospitals provide primary services in one field or one disease based on scientific discipline, age group, organ, type of disease, or other specificities. General hospitals and special hospitals can also be classified based on the number of beds, consisting of class A, class B, class C, and class D.

The difference between general and special hospitals lies in the services provided, human resources, buildings and infrastructure, and equipment owned. General hospitals have more diverse types of human resources. Buildings, infrastructure, and equipment owned by general hospitals are more diverse because the services of general hospitals are more comprehensive. Despite having different types of services and other criteria, the financial performance of general and special hospitals in the form of public service agencies uses the same performance assessments.

This study could be considered an attempt to provide a step toward a better understanding of intellectual capital in the BLU, especially hospitals, by analyzing the implementation of intellectual capital in public hospitals as semi-autonomous organizations. This study provides some understanding for managers in public hospitals who want to develop their intellectual capital management. Our study results can be applied in other jurisdictions where the public hospital is run by semi-autonomous organizations and adopt business-like practices like in Indonesia's public hospitals.

Previous studies have distinguished general hospital and special hospital. Lee (1974) stated that general hospital produces diversified types of services, each of which is a set of highly specialized activities. A general hospital does not have a unique production function of the type postulated for a single product firm. Ostermann and Schuster (2015) classified hospitals based on their diagnostic diversity into primary, secondary, tertiary, and specialized hospitals. Ostermann and Schuster (2015) stated that specialized hospitals offer the best medical therapy and care for a limited range of diagnoses, including the referral of complicated cases.

Unlike the other governance of public organization, BLU has the flexibility to adopt business-like practices to improve services to the community based on efficiency and productivity principles. BLU in Indonesia has features that provide flexibilities in the form of: revenue can be spent directly, the use of flexible budget, short-term investment for cash management, short term debt, the surplus can be used in the next fiscal year, it can hire professionals, the management of goods can be excluded from general procurement rules, and remuneration can be given according to the level of responsibility and professionalism. Several requirements must be met to be assigned as a BLU. First is the substantive requirement. The government organization must provide public goods and/or services, manage special funds, or manage areas or regions. The second is technical requirement. The government organization must have a service performance that is feasible to be managed and a fair financial performance. Third, administrative requirements. BLU status can be dismissed if one of the criteria is no longer met.

BLU carries out its activities without prioritizing profit. Although BLU does not prioritize profit, it is required to have a healthy financial performance. The performance assessment of public hospitals is regulated in The Directorate General of Treasury Regulation Number 24 year of 2018. In this regulation, their performance is defined by the annual assessment of financial and service performance. The financial aspects of BLU's financial statements include evaluating financial ratios and compliance with regulations, but this study only focuses on financial ratios.

Intellectual capital represents the collective knowledge of an organization embedded in employees, organizational routines, and network relationships of an organization. Intellectual capital is an asset that is not recognized in the financial statements, but its existence can support organizational performance (Kamaruddin and Abeysekera, 2013). Festa and his colleagues stated that intellectual capital could support financial stability (Festa et al., 2020). In other research, Momani and her colleagues (2020) proved that there is a positive influence of intellectual capital on organizational financial performance.

Intellectual capital has characteristics as a unique resource in creating value added that leads to an organization's competitive advantage. Therefore, the higher the intellectual capital and the better the management, the organization tends to get an increase in performance (Ramadhani and Agustin, 2021). Previous research divided intellectual capital into different components, as described in Table 1.

Table 1. Comparison of Intellectual Capital Components

Researchers	Intellectual capital component
Edvinsson and Sullivan (1996)	human capital, organizational capital, customer capital
Sveiby (1997); Kamaruddin and Abeysekera (2014)	external capital, employee competence, internal capital,
Bontis (1998)	human capital, customer capital, structural capital
Gravili et al. (2020); Huang et al. (2020)	human capital, relational capital, structural capital

Human capital is a set of knowledge that can bring long-term benefits in the future (Castro et al., 2021). Human capital depends on various variables, including the number of employees of the organization, the education of employees, and the experience of employees of the organization (Lee and Lin, 2019). Organizational efforts to develop human capital start from employee recruitment, followed by quality development through training and development activities.

Structural capital includes all sources of knowledge that are not derived from humans, such as organizational structures, databases, operational and administrative procedures, strategies, and other things that can add value to the organization (Suwiji and Rachmawati, 2017). Structural capital supports infrastructure for human capital to improve employee performance (Huang et al., 2020). Structural capital can provide an environment that encourages human resources to create and utilize their knowledge to improve organizational performance (Edvinsson and Sullivan, 1996).

Relational capital involves human resources that are utilized in determining and managing the organization's relationship with the external environment (Martini et al., 2016). In organizations that provide health services, the role of the organization's relationship with the external environment is even more important than in other organizations. This is because the value chain is formed by more actors and competencies (Huang et al., 2020). Relational capital in organizations that provide health services, such as the capacity to negotiate with commercial partners and the ability to push products or the reliability of medical devices (Pirozzi and Ferulano, 2016).

This study adopts the configuration of intellectual capital by Gravili et al. (2020) and Huang et al. (2020), which consists of human capital, relational capital, and structural capital. Gravili et al. (2020) and Huang et al. (2020) have used this configuration to analyze intellectual capital in health care organizations. Previous studies (see e.g. Dharma and Pangestu, 2020; Islamiyah, 2015; Pirozzi and Ferulano, 2016; Ramadhani and Agustin, 2021; Rosiana and Mahardika, 2020; Suwiji and Rachmawati, 2017) used Resource-based view (RBV) theory to explain the influence of intellectual capital on organizational financial performance. RBV theory was developed to analyze organizational strengths and weaknesses in conducting business competition by utilizing tangible and intangible assets controlled by the organization (Gamerschlag, 2013). Organizations can reach their competitive advantages and good financial performance if their strategic assets, both tangible and intangible, are controlled and appropriately utilized (Ramadhani and Agustin, 2021).

RBV theory defines four characteristics of resources needed by organizations to achieve competitive advantages: valuable, rare, difficult to imitate, and non-substitutable (Suwiji and Rachmawati, 2017). Intellectual capital meets the criteria as valuable and unique resources to create competitive advantages and added value for the organization (Ramadhani and Agustin, 2021).

Intellectual capital measurement in this study is carried out using the Value-Added Intellectual Coefficient (VAIC™) model approach. Pulic (2000) developed VAIC™ in 1997 as a quantitative measurement model used to describe the relationship between intellectual capital and financial performance. VAIC™ generate information about value creation efficiency for tangible and intangible assets using accounting-based numbers.

VAIC™ combines human capital, physical capital, and structural capital to measure organizational performance. The higher the value creation efficiency, the better the organization's resources are managed. VAIC™ consists of Value-Added Capital Employed (VACA), Value Added Human Capital (VAHU), and Structural

Capital Value Added (STVA). VACA represents the organization's tangible assets, while VAHU and STVA represent the organization's intangible assets. The added value of this combination of tangible and intangible assets is in the form of better performance in the organization. Thus, companies that have higher intellectual capital will have better future performance (Ramadhani and Agustin, 2021).

Gravili and her colleagues (2020) stated that most of the research on intellectual capital in health care resulted theoretical contributions and qualitative analysis results. They showed that all components of intellectual capital had a positive and significant effect on the performance of health organizations. Evans and her colleagues identified the advantages of intangible resources in healthcare organizations, especially in systematically managing these resources together, and their mutually increasing interactions to promote innovation (Evans et al., 2015).

Huang and his colleagues showed that three knowledge-based activities of the healthcare ecosystem shape the basis of the proposed conceptual framework. First, a value co-creation strategy to develop capabilities for each health stakeholder is intended as human capital. Second, the market access approach to promote innovation is reported to the relational capital. Third, a digital servitization strategy is referred to the structural capital (Huang et al., 2020). Edvinsson and Sullivan (1996) have also researched intellectual capital and revealed that the intellectual capital perspective could be used to calculate the value of a sustainable company.

Previous studies have explored intellectual capital, financial performance, and public hospitals. Rosiana and Mahardika (2020) examined the effect of intellectual capital on organizational financial performance. Gravili et al. (2020) and Huang et al. (2020) analyze intellectual capital in health care organizations. In the public sector in Indonesia, Atidira and Priyono (2020) and Cahyadi and his colleagues (2020) has analyzed intellectuals in BLU.

In the health sector organization in Southeast Asian countries, Ramesh and Wu (2008) compared health policy trends in Indonesia, Malaysia, Philippines, and Thailand. They suggested that improving public sector efficiency help organizations to achieve true health care reform. Developing countries, such as Indonesia, Vietnam, and Singapore are implementing autonomy reforms to improve accountability and hospital efficiency (Maharani and Tampubolon, 2017; Ravaghi et al., 2018;).

Empirical studies suggest that intellectual capital is linked to subjective process and performance indicators in healthcare organizations (Evans et al., 2015). In the public sector, Cahyadi and his colleagues (2020) examined the effect of intellectual capital on BLU financial performance and revealed empirical evidence of a positive influence. Furthermore, Ramadhani and Agustin (2021) and Rosiana and Mahardika (2020) examined the influence of intellectual capital on financial performance, and their results empirically proved that there is an influence of intellectual capital on the company's financial performance. This study aims to analyze the effect of intellectual capital on the financial performance of public hospitals as a type of BLU in Indonesia. This study also examines the effect of intellectual capital on the financial performance of general and special hospitals separately. Separate tests were conducted to determine the effect of intellectual capital on the performance of general and special hospitals separately and to analyze the differences.

The present study was conducted at public hospitals, which consist general and special hospitals, under the Ministry of Health from 2018 to 2020. The selection of this period is related to the implementation of Government Accounting Standards at BLU, which will be carried out at the latest in the 2018 financial statements.

The study contributes to the rising literature on intellectual capital and financial performance in BLU, especially public hospitals, by comprehending the previous study (see e.g., Budiarso, 2019; Cahyadi et al., 2020; Nurliah et al., 2020). Indeed, our research question is: "Does intellectual capital affect the financial performance of public hospital? Is there any difference in the influence of intellectual capital on financial performance in general hospitals and special hospitals?".

Using a quantitative approach with multiple linear regression, the data in this study be tested on all samples of public hospitals and proceeded to test general hospitals and special hospitals separately to analyze the differences. As a result, intellectual capital has a significant influence on financial performance of public hospitals. Although general and special hospitals have several different business models, the effect of intellectual capital on the financial performance is similar.

METHOD

This research employs a quantitative approach with multiple linear regression. The data

includes the financial statements of public hospitals under the Ministry of Health from 2018 to 2020, consisting of balance sheets, operational reports, reports of changes in equity, and notes to financial statements. Starting from 2018, all BLUs must apply Government Accounting Standards for accrual-based financial reporting.

The population of this study was 33 public hospitals under the Ministry of Health, consisting of 16 general hospitals and 17 special hospitals. The financial statements used in this study is obtained from the Directorate General of Treasury. The research sample was selected through a purposive sampling approach.

Based on the sampling process, twenty samples are selected, i.e. 10 general hospitals and 10 special hospitals. The first criteria are to eliminate hospitals that did not provide their complete financial statements from 2018 to 2020. The second criteria are to eliminate hospitals whose financial reports are not audited by the Audit Board of the Republic of Indonesia, or an external auditor appointed. The third criteria are to eliminate hospitals that have not implemented Government Accounting Standards. The last criteria are that the hospital does not have outlier data.

From sampling results, hospitals are grouped based on the type of services provided. In this study, the samples obtained were grouped into three groups to answer research questions. The first data group is 20 hospitals, the second data group is 10 general hospitals, and the third data group is 10 special hospitals. The research object is provided in Table 2.

Table 2. Research Object

No.	Hospital's Name	Class	Total assets (IDR million, 2020)	Total employee
General Hospitals				
1	Dr. Tadjudin Chalid	B	735,907	639
2	Cipto Mangunkusumo	A	8,011,769	16,521
3	Fatmawati	A	6,024,107	2,306
4	Persahabatan	A	4,513,934	2,192
5	Dr. Hasan Sadikin	A	3,739,124	2,792
6	Dr. Marzoeki Mahdi	A	4,611,845	924
7	Dr. M. Djamil	A	1,021,947	3,338
8	Dr. Moh. Hoesin	A	5,631,479	5,609
9	Sanglah	A	2,243,102	2,728
10	Prof. Dr. R. Kandou	A	1,863,604	8,908
Special Hospitals				
1	Stroke Nasional	B	323,511	1,116
2	Paru Dr. H.A. Rotinsulu	A	678,637	363
3	Mata Cicendo	A	685,597	457
4	Paru Dr.M. Goenawan Partowidigdo	A	338,394	457
5	Kusta Sitanala	A	2,190,187	505
6	Paru Dr. Ario Wirawan	A	373,169	479
7	Orthopaedi Prof. Dr.R. Soeharso	A	1,222,394	526
8	Jiwa Dr. Radjiman Wediodiningrat	A	794,442	627
9	Ketergantungan Obat	B	128,562	180
10	Kanker Dharmais	A	3,366,271	3,313

The dependent variable in this study is the financial performance. The proxy used in measuring the dependent variable is the financial ratio. The financial ratio proxy was chosen because this ratio is one of the critical variables with a total score of 19 out of 30 or 63 percent in assessing the performance of the financial aspect. The closer to nineteen means that the public hospital has better financial performance.

Financial ratios are calculated from the total score of each component of financial ratios: cash ratio, current ratio, collecting period, fixed asset turnover, return on fixed assets, return on equity, inventory turnover, and nontax state revenue to operating costs ratio. Each financial ratio is calculated and converted into scores and added up in total and become the total score for calculating financial performance proxies.

The independent variable in this study is intellectual capital. Intellectual capital testing in this study was carried out separately to determine what components had the most influence on intellectual capital. Intellectual capital measurement is carried out using the Value-Added Intellectual Coefficient (VAIC™) model approach. VAIC™ is the sum of VACA, VAHU, and STVA. Variables' operational definition in this study is explained in Table 3.

Various studies that apply the VAIC™ methodology showed a positive relationship between intellectual capital and several financial performance measures (Cahyadi et al., 2020;

Momani et al., 2020; Ramadhani and Agustin, 2021; Rosiana and Mahardika, 2020; Ulum et al., 2014). Previous studies also decomposed the components that made up VAIC™ and conducted partial tests to determine the most significant component.

The regression equation model in this study includes three models tested on three data groups: the entire hospitals, the general hospitals, and the special hospitals. The first model is used to answer the first research questions, "Does intellectual capital affect the financial performance of public hospital?".

$$FP\_Hi,t = \beta0 + \beta1VACAi,t + \beta2VAHUi,t + \beta3STVAi,t + \varepsilon \quad (1)$$

where, FP_Hi,t is financial performance for all hospitals.

The second and third model are used to answer second research questions, "Is there any difference in the influence of intellectual capital on financial performance in general hospitals and special hospitals?"

$$FP\_GHi,t = \beta0 + \beta1VACAi,t + \beta2VAHUi,t + \beta3STVAi,t + \varepsilon \quad (2)$$
$$FP\_SHi,t = \beta0 + \beta1VACAi,t + \beta2VAHUi,t + \beta3STVAi,t + \varepsilon \quad (3)$$

where FP_GHi,t is financial performance of general hospitals, and FP_SHi,t is financial performance of special hospitals.

To verify the robustness of the models, we use White cross-section method that clusters observations by period, to indicate if there was contemporaneous correlation between cross-section units. The White cross-section method assumes that the errors are cross-sectionally correlated. The method treats the pool regression as a multivariate regression and computes robust standard errors for the system of equations. This estimator is robust to cross-equation correlation and heteroskedasticity (Wooldridge, 2002).

RESULT AND DISCUSSION

Descriptive statistics analysis was carried out on the data to present an overview for more accessible analysis. The results of descriptive statistics are shown in Table 4. Based on the results of descriptive statistical tests, VAHU is the most significant component of the VAIC™ in all models. The results of this test support the previous research by Momani et al. (2020). In another study, Nassar (2018) found the main component in VAIC™ is STVA.

The VACA variable is the ratio of the contribution of each unit of physical capital to value-added (Pulic, 2000). Increasing the value of VACA will increase the value-added generated by each capital employed. In Model 1, the mean value of 0.19185 means that each unit of capital employed produces 0.19185 on average value-added for the organization.

The VAHU variable is a ratio that shows the contribution of human capital to the organization's value-added (Pulic, 2000). In model 1, the mean value is 1.60906, which means each unit of human capital produces 1.60906 on average value-added for the organization.

The STVA variable shows the share of structural capital in the resulting added value. In all models, the minimum value of STVA has a negative score. The negative score of STVA comes from the negative structural capital value. The negative score of structural capital indicates a budget deficit, where operating profit is smaller than operating expenses. A negative STVA value means that structural capital has a negative share in value creation, or structural capital reduces that value creation.

This study uses panel data regression to test the effect of the independent variable on the dependent variable. The fitted regression model was determined by performing the Chow test, Hausman test, and the Breusch-Pagan Lagrange Multiplier test. The test results conclude that the cross-section random effect model is the most fitted model for testing H1, H2, and H3.

All models in this study do not have strong multicollinearity between variables since the correlation values were less than 0.90 (Ghozali and Ratmono, 2017). The results of the multicollinearity test are shown in Table 5. The heteroscedasticity test in this study was carried out through the Glejser test. The results show that all models in this study do not have heteroscedasticity problems since the probability value for each independent variable is greater than 0.05 (Ghozali and Ratmono, 2017). The results of the heteroscedasticity test are shown in Table 6.

Table 3. Operational Measurements

Variables	Measurements	Previous Studies
Financial performance (FP)	Cash ratio + Current ratio + Collecting period + Fixed asset turnover + Return on fixed assets + Return on equity + Inventory turnover + Nontax state revenue to operating costs ratio	(Cahyadi et al., 2020; Nurliah et al., 2020; Syahrom and Cheisviyanny, 2020)
Cash ratio	(Cash and cash equivalent)/ (Short term liabilities) x100%	
Current ratio	(Current Assets)/(Short term liabilities) x100%	
Collecting period	(Account Receivables x 360 days)/(Income from operations)	
Fixed asset turnover	(Income from operations*)/ (Fixed Assets) x100% *Does not include income from the state budget and grants	
Return on fixed assets	(Surplus or deficit before gain or loss)/(Fixed Assets) x100%	(Cahyadi et al., 2020; Castro et al., 2021)
Return on equity	(Surplus or deficit before gain or loss)/(Equity-Surplus or deficit before gain or loss) x100%	(Cahyadi et al., 2020; Ramadhani and Agustin, 2021)
Inventory turnover	(Inventory x 365 days)/ (Total Income)	(Cahyadi et al., 2020; Syahrom and Cheisviyanny, 2020)
Nontax state revenue to operating costs ratio	(Nontax state revenue)/ (operating cost) x100%	
Value Added	OUT-IN	(Pulic, 2000)
VAIC™	VACA+VAHU+STVA	(Castro et al., 2021; Gravili et al., 2020; Momani et al., 2020; Pulic, 2000)
VACA	VA/CE	
VAHU	VA/HC	
STVA	SC/VA	

Table 4. Descriptive Statistics

Variable	Sample	Mean	Median	Minimum	Maximum	Std. Dev.
Model 1 All hospitals						
FP_H	60	12.50733	12.47500	7.87000	17.00000	2.42117
VACA	60	0.19185	0.16730	0.02260	0.65810	0.12933
VAHU	60	1.60906	1.43746	0.69474	5.33128	0.73761
STVA	60	0.29308	0.30433	-0.43939	0.81243	0.22816
Model 1 All hospitals						
FP_GH	30	11.42300	11.77500	7.870000	14.75000	1.975413
VACA	30	0.176547	0.181000	0.022600	0.438200	0.112252
VAHU	30	1.638502	1.416333	0.879975	5.331282	0.891293
STVA	30	0.291175	0.293801	-0.1364	0.812428	0.218462
Model 3 Special hospitals						
FP_SH	30	13.59167	14.25000	8.500000	17.00000	2.364613
VACA	30	0.207150	0.155050	0.032500	0.658100	0.144722
VAHU	30	1.579622	1.494347	0.694739	3.160617	0.557403
STVA	30	0.294986	0.330732	-0.43939	0.683606	0.241204

Table 5. Multicollinearity test results

	VACA	VAHU	STVA
Model 1			
VACA	1.000000	0.232865	0.324777
VAHU	0.232865	1.000000	0.830728
STVA	0.324777	0.830728	1.000000
Model 2			
VACA	1.000000	0.346161	0.376564
VAHU	0.346161	1.000000	0.857555
STVA	0.376564	0.857555	1.000000
Model 3			
VACA	1.000000	0.142475	0.292288
VAHU	0.142475	1.000000	0.874502
STVA	0.292288	0.874502	1.000000

Table 6. Heteroscedasticity test results

VARIABLE	Prob. Model 1	Prob. Model 2	Prob. Model 3
VACA	**0.8680**	**0.8582**	**0.8507**
VAHU	**0.5519**	**0.7608**	**0.2897**
STVA	**0.4002**	**0.9828**	**0.5637**

Table 7 shows that the value of adjusted R2 in Model 1 is 0.608220 or 60.82%. This means the independent variable in Model 1 can explain 60.82% of the variation in the dependent variable. In comparison, 39.18% is explained by other variables which are not included in the model. The same interpretation applies to Model 2 and Model 3.

In the simultaneous significance test, the probability value of the F statistic in Model 1, Model 2 and Model 3 is 0. F statistic scores mean that the independent variables in all models simultaneously affect the dependent variable. The partial significance test results show that all probability values of VACA, VAHU, and STVA are less than 0.05. Thus, the decision taken is to reject H0 and accept H1 in all models.

Based on regression results, the equations formed for the models in this study are as follows:

FP_Hi,t = 10,43397 + 7,369562VACAi,t - 1,127763VAHUi,t + 8,441944STVAi,t (1)

FP_GHi,t = 9,967748+ 6,408511VACAi,t - 1,644866VAHUi,t + 10,36824STVAi,t (2)

FP_SPi,t = 12,53202+ 6,589968VACAi,t -1,852309VAHUi,t + 8,883419STVAi,t (3)

Table 7. Regression results

VARIABLE	MODEL 1		MODEL 2		MODEL 3	
	Coeff.	Prob.	Coeff.	Prob.	Coeff.	Prob.
C	10.43397	0.0000	9.967748	0,0000	12,53202	0,0000
VACA	7.369562	0.0006	6.408511	0,0024	6,589968	0,0055
VAHU	-1.127763	0.0079	-1.644866	0,0009	-1,852309	0,0108
STVA	8.441944	0.0000	10.36824	0,0000	8,883419	0,0000
R-squared	0.628141		0.666014		0.705039	
Adjusted R-squared	0.608220		0.627477		0.671005	
F-statistic	31.53157		17.28250		20.71571	
Prob (F-statistic)	0.000000		0.000002		0.000000	

The white cross-section robust test result shows coefficient point estimates and basic fit measures are unchanged. The only changes in results are in the estimated standard errors, the associated t-statistics, and probabilities. There is no difference in the level of significance effect after the robustness test is carried out.

Based on the results of regression testing, it can be concluded that VACA and STVA have a positive influence on the financial performance of the public hospitals. In contrast, the VAHU has a negative effect on the hospital's financial performance in all models. The VACA, VAHU, and STVA partially and simultaneously have a significant effect on financial performance. The test results in this study are relatively the same as those of Andriana (2014) and Budiarso (2019).

VACA has a positive effect on the financial performance of all hospitals, general hospitals, and special hospitals. The positive effect of VACA means that the greater the added value of the organization's physical resources, the higher the value of the organization's financial performance. The results can be interpreted that physical capital in hospitals is a resource that has an important role in improving financial performance. The hospital's physical capitals are buildings, tools and equipment in outpatient rooms, inpatient beds, office equipment, and supporting equipment for other hospital facilities.

The Dr. M. Djamil Hospital and the Ketergantungan Obat Hospital have the highest VACA scores in their data group. When viewed from the value of total assets, these hospitals have total assets below the average of other hospitals in the data group. However, The Dr. M. Djamil Hospital and the Ketergantungan Obat Hospital can generate the maximum value-added from each capital they have. If we trace the financial ratios of these hospitals, we can identify the causes of the high-efficiency value creation in the Dr. M. Djamil Hospital and the Ketergantungan Obat Hospital. First, both hospitals have a higher fixed asset turnover ratio, higher fixed asset return ratio, and higher equity return ratio among other hospitals in their data group.

When associated with RBV theory, all hospitals in these models can utilize their physical resources to encourage organizational performance. The results of this study are in line with the research of Alimy and Herawaty (2020) and Budiarso (2019) but differ from the research conducted by Castro and his colleagues (2021). The differences in research results can be seen from the variation in the characteristics of the research object, the selection of proxies, and the number of samples.

VAHU has a negative effect on the financial performance of public hospitals in all models. The results of this study are in line with previous research by Budiarso (2019). When viewed from the RBV theory, human capital should be considered the main factor in organizational competitiveness (Gamerschlag, 2013). The negative effect of VAHU means that an increase in the value of VAHU will cause a decrease in the financial performance of the organization. Alternatively, we interpret that to increase the financial performance, managers should degrade the human capital. This is because the denominator of the VAHU measurement is employee expense as the proxy of human capital, which is part of the organization's input. The greater the human capital, the smaller value-added creation from human capital.

In Table 2, the Cipto Mangunkusumo Hospital and Dharmais Cancer Hospital have the highest number of employees compared to other general and special hospitals in the data group. This large number of employees also makes Cipto Mangunkusumo Hospital and Dharmais Cancer Hospital have the most significant number of employees. Compared with its total operating expenses, Cipto Mangunkusumo Hospital has an average of 39% of the total operating expenses, and the Dharmais Cancer Hospital has an average of 41% of the total operational expenses.

In addition to the high employee expense, Budiarso (2019) said that an organization's type of ownership can also be a barrier in maximizing human capital since each type of ownership has different institutional constraints. The financial management in BLU provides flexibilities on staffing. First, flexibility in determining the composition and number of employees. The composition of employees in the BLU is different from other government organization in Indonesia. BLU can employ civil servants and noncivil servant profes-

sionals. The number and composition of noncivil servant employees can be proposed by the BLU leader and determined after obtaining approval from the Minister of Finance. BLU leaders also regulate the recruitment and dismissal of managing officers and noncivil servant employees. Noncivil servant employees can be dismissed if they cannot meet their performance targets or cannot carry out their duties properly.

Second, the BLU leader can propose employee remuneration. Remuneration is employee benefits provided in the following components: salary, honorarium, fixed allowances, incentives, bonuses for achievements, severance pay, pensions, thirteenth-month remuneration, holiday allowances, overtime pay, and meal allowances. The remuneration given to employees can be sourced from the state budget and nontax state revenue from BLU. The decree of the BLU leader determines remuneration originating from nontax state revenue.

These two flexibilities give BLU specificity to manage human capital because this flexibility does not apply to other government organizations. With these two flexibilities, BLU leaders can determine employee number, composition, and remuneration under the best conditions to improve financial performance.

STVA has a positive effect on the financial performance of public hospitals that tested in all models. The positive effect of STVA means the more significant the STVA value, the higher the organization's financial performance value. The results mean that the hospital's structural capital can support their employees to improve their performance (Huang et al., 2020). Structural capital in the hospital includes organizational structure, work procedures, and application systems for information management.

Hospitals with the highest STVA are Dr. Tadjudin Chalid Hospital and Kusta Sitanala Hospital. This result shows that both hospitals can utilize their organizational structural capital to create the most significant added value compared to other hospitals in their data group. In this study, all hospitals have received plenary accreditation from the Komisi Akreditasi Rumah Sakit (KARS, in English, Hospital Accreditation Commission). One of the criteria for obtaining this accreditation is good hospital management, a form of structural capital. Obtaining a plenary accreditation shows that hospital management has appropriately implemented and fulfilled at least 80 percent of the good hospital management criteria.

When associated with RBV theory, the success of structural capital facilitating human capital in creating value can lead to better financial results. This finding is in line with the results of research by Andreeva and Garanina (2016) and Gravili et al. (2020) but different from the results of research by Budiarso (2019) and Castro et al. (2021).

Inkinen (2015) asserted that intellectual capital positively influences organizational outcomes and innovation performance. In addition, existing research shows that different elements of intellectual capital can interact with each other and increase the simultaneous impact on performance (Andreeva and Garanina, 2016). This is in line with the results of the F-test in this study. The results show that VACA, VAHU, and STVA have a simultaneous effect on the financial performance of all public hospitals. Therefore, it can be concluded that intellectual capital influences the financial performance of the hospital.

The difference in the effect of intellectual capital on financial performance between general hospitals and special hospitals lies only in their VACA, VAHU, and STVA coefficients. The regression results show that STVA has the most significant coefficient compared to other components of intellectual capital in all models. These results mean that public hospital's most effective value creation comes from structural capital. The results of this study align with previous research, namely Baroroh (2013), Cahyadi et al. (2020), Momani et al. (2020), and Nassar (2018). However, the results of this study differ from those of Castro et al. (2021), which states that VAIC™ does not affect the organization's financial performance.

This study provides some understanding for managers in public hospitals who want to develop their intellectual capital management. Statistically, VAHU is the most significant component of intellectual capital in the sample of this study with a negative coefficient. This study indicates that to improve financial performance in the public sector, managers need to reduce the amount of human capital. Managers should maximize the staffing flexibilities that have been provided by the government. Managers should start from the recruitment process by arranging the composition and number of employees according to the organization's needs. In addition, the remuneration given to employees must be based on the performance of each employee. Thus, human capital, which is calculated from employee expenses, can reach the ideal amount to facilitate the improvement of financial performance.

Our study results can be applied in other

jurisdictions where the public hospital is run by semi-autonomous organizations and adopt business-like practices like in Indonesia's public hospitals. In the context of Southeast Asia countries, such as Malaysia, Philippines, and Thailand, where the government has a vital role in the healthcare sector (Ramesh and Wu, 2008) and adopts business-like practices, our managerial implications can help managers improve financial performance through managing intellectual capital, especially human capital.

This study could be considered an attempt to provide a step toward a better understanding of intellectual capital in the BLU, especially hospitals, by analyzing the implementation of intellectual capital in public hospitals as semi-autonomous organizations. The study contributes to the rising literature on intellectual capital and financial performance in public service agencies, especially in healthcare organizations, from the previous study (Budiarso, 2019; Cahyadi et al., 2020; Nurliah et al., 2020).

CONCLUSIONS AND RECOMMENDATIONS

This study results show a significant effect of intellectual capital on the financial performance of public hospitals. Physical capital and structural capital showed a positive effect, while human capital showed a negative effect. Structural capital has the most significant coefficient compared to other components of intellectual capital in all models, which means that the most extensive value creation in public hospitals comes from good utilization of structural capital. Considering from the intellectual capital components, human capital is the largest component of intellectual capital and negatively influences financial performance. To improve financial performance, managers must reduce the human capital which is proxied through the employee expense. This can be pursued through the flexibility within the public hospitals, namely the management of the number, composition, and remuneration of its employees. Finally, our test results show that although general hospitals and specialty hospitals have different services provided, results show that the influence of intellectual capital on the financial performance is similar.

This study has a limited period of data, which is only three years. This limitation can cause the phenomenon of the effect of intellectual capital on performance not fully explained as it might not directly affect organizational performance within three years. The research samples were only 20 hospitals and were limited to public hospitals under the Ministry of Health.

Further research can be developed through qualitative methods such as interviews or adding research instruments in questionnaires. Similar research can also be carried out to different classes of public hospitals. In addition, similar research can be carried out on other BLU sectors, government organizations, or the private sector using different proxies. Intellectual capital can be assessed through patents (Festa et al., 2020). VACA can be assessed by the availability of beds in hospitals. VAHU can be assessed by the number of medical doctors, while STVA can be assessed by the number of scientific publications (Gravili et al., 2020), and financial performance can be assessed by return on assets (Castro et al., 2021).

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