Do Intellectual capital and enviromental uncertainty affect firn performance A mediating role of value chain

by Bob Foster

Submission date: 01-Jul-2022 03:10PM (UTC+0700)
Submission ID: 1865363089
File name: inty_affect_firn_performance_A_mediating_role_of_value_chain.pdf (361.84K)
Word count: 6150
Character count: 36085

Uncertain Supply Chain Management 10 (2022) ****–****

Contents lists available at GrowingScience

Uncertain Supply Chain Management

homepage: www.GrowingScience.com/uscm

Do intellectual capital and environmental uncertainty affect firm performance? A mediating role of value chain

Bob Foster [a], Jumadil Saputra[b], Muhamad Deni Johansyah[c] and Zikri Muhammad[b*]

[a]*Faculty of Economics, Universitas Informatika dan Bisnis Indonesia, Kiaracondong, Bandung City, West Java 40285, Indonesia*
[b]*Faculty of Business, Economics and Social Development, Universiti Malaysia Terengganu, 21030 Kuala Nerus, Terengganu, Malaysia*
[c]*Faculty of Mathematics and Natural Sciences, Universitas Padjadjaran, Jatinangor, Sumedang, Jawa Barat 45363, Indonesia*

A B S T R A C T

Article history:
Received December 2, 2021
Received in revised format December 17, 2021
Accepted February 11 2022
Available online February 11 2022

Keywords:
Intellectual capital
Environmental uncertainty
Value chain
Firm performance

A value chain plays a crucial role in increasing production efficiency due to business uncertainty and high competition between business entities. Of these, the business must carry out the activities effectively and efficiently to achieve maximum profit. However, the study that focuses on the moderating role of the value chain in its relationship to firm performance is still limited. Thus, the present study aims to examine the effect of intellectual capital and environmental uncertainty toward firm performance and the mediating role of the value chain in the relationship between intellectual capital and environmental uncertainty to firm performance. This study was designed using a quantitative approach through an online survey. A total of 207 staff from non-financial state-owned enterprises consists of 10 clusters and 76 companies. The data were analyzed using the Structural Equation Modeling with Partial Least Square method (SEM-PLS) and assisted by statistical software, namely SmartPLS 3.3.3. The result indicated that intellectual capital and environmental uncertainty have a significant effect on firm performance. Also, this study found that a value chain moderates the relationship of intellectual capital and environmental uncertainty toward firm performance. In conclusion, this study has successfully examined the effect of intellectual capital and environmental uncertainty on firm performance—also, the role of a value chain in the relationship of studied variables. In addition, the findings of this study showed that a value chain is an important tool for companies to improve their business performance.

1. Introduction

The company's competitive advantage is evidence of realizing the company's goals, such as achieving maximum profit, which means that the company must carry out activities effectively and efficiently. Companies must improve their performance by using resources more effectively and efficiently to create value-added and compete in a competitive market. The company must compete to improve its performance and focus on two things, namely financial and non-financial. It must work in harmony to achieve comprehensive performance. The balanced scorecard (BSC) is a performance measurement system introduced by Kaplan and Norton (1996). BSC prepares managers to have a quick and comprehensive view to determine the results of business operations. BSC measurement using multidimensional performance consists of financial and non-financial measures that include four perspectives. There are financial perspectives, customer perspectives, internal business process perspectives, and learning and growth perspectives. Economic developments cause business uncertainty and tight competition between business entities. To win in a dynamic business competition, companies must develop a competitive advantage and implement innovative strategies. Porter (1991) explained that competitive advantage could not be understood only by looking at a company. Instead, competitive advantage is formed from the company's activities in designing, producing, marketing, delivering, and providing support services for its products. Also, internal factors and external factors can influence firm performance (van Veen-Dirks & Lillis, 2018).

* Corresponding author
E-mail address: zikri@umt.edu.my (Z. Muhammad)

doi: 10.5267/j.uscm.2022.2.006

A study related to resource-based theory by Barney (2001) stated that the company's internal resources are important factors for companies to achieve and maintain competitive advantage. These resources consist of physical capital resources, human resources, and organizational resources. One approach used in assessing and measuring knowledge assets is intellectual capital (IC), which has become the focus of attention in various fields, including management, information technology, sociology, and accounting (Petty & Guthrie, 2000). The elements of intellectual capital and measurement design consist of human capital, structural capital, and relational capital (Bontis et al., 2000; Chen & Zhu, 2004; Petty & Guthrie, 2000)

Bose and Thomas (2007) studied the relationship between intellectual capital and company performance using the balanced scorecard. He found that intellectual capital has a positive relationship to company performance. It is in line with research (Mehralian et al., 2018) which shows that intellectual capital models measured using human capital, structural capital, and relational capital can lead to increased financial and non-financial performance. Hariyati et al. (2019) conducted a study on the relationship between intellectual capital and company performance with the population of all manufacturing companies in Java. Prior studies show that intellectual capital is a crucial factor for increasing firm performance.

Today, the company faces many challenges due to continuous environmental changes. Managers must be more professional to maintain and improve firm performance from the influence of external environmental uncertainty. As uncertainty in the external environment increases, managers have to adapt quickly. This uncertainty is caused by environmental complexity, like changing the customer preferences and the challenges from the competitors, which makes the manager more innovative in developing products. The variety of suppliers make managers more selective in choosing. Environmental changes can cause environmental uncertainty like unpredictable economic change, rapid technological change, and government policy. The economic changes make the management make better decisions.

The rapid expansion of technology and its application into various economic activities has opened new business opportunities. Especially, the introduction of multiple techniques of devices has increased productivity in the company. On the other hand, the business company depends on policies from the local government that usually change following economic conditions. In an uncertain environment, firms need to act fast and more efficiently from the manager. BSC can use management to measure and increase the firm performance comprehensively. Lamboll et al. (2018) suggested that the external environment (customer needs and competitor challenge) will affect the value chain. Latan et al. (2018) found a positive relationship between environmental uncertainty and financial performance. A state-owned enterprise (SOE) is a business entity that has an essential role in organizing the national economy to realize the community's welfare.

In developing countries, the state-owned enterprise sector is an integral part of socio-economic activity. Most state-owned enterprises have been established to fulfill the social objectives of the state rather than to maximize profits. Nevertheless, Indonesian state-owned enterprises have made a significant contribution to the Indonesian economy. SOEs in Indonesia are expected to become agents of driving the country's economic development. Since 2019, Indonesia has had 114 SOEs with 16 SOEs listed at Indonesia Stock Exchange, 84 SOEs non-listed, and 14 SOEs with unique purpose entities. The ministry of state-owned enterprises divided SOEs into 12 clusters. Thus, the present study aims to examine the effect of intellectual capital and environmental uncertainty toward firm performance and the mediating role of the value chain in the relationship between intellectual capital and environmental uncertainty to firm performance.

2. Literature Review

Kaplan and Norton (2012) conducted a study for performance measurement. The study results showed that measurements using a financial perspective alone no longer comprehensively represent the company's financial condition. The balanced scorecard is divided into four different perspectives, formed for short-term and long-term purposes. These perspectives are (1) financial perspective, (2) customer perspective, (3) internal business processes perspective, (4) learning and growth perspective. Porter (1991) developed a value chain theory to explain the core competencies that can explain cost behavior based on a generic strategy. Companies can use it to identify the relationship between value-creating activities based on the highest value expected consumers. The value chain is used for various purposes, namely to understand the behavior of the costs and the sources of differentiation (Shank and Govindarajan, 1993). Porter (1991) classifies it into two activities, namely primary activities (covering inbound logistics, operations, outbound logistics, sales and marketing, services) and supporting activities (covering procurement, research, and technology, human resources, firm infrastructure).

2.1. Intellectual capital and firm performance

Intellectual Capital refers to intangible assets. The development of the global economy has made intellectual capital necessary as a company's main asset in its business sustainability (Bontis et al., 2000). The balanced scorecard is a strategic performance measurement framework and methodology that focuses on developing and monitoring strategies through performance measures. Bose & Thomas (2007); Do Rosário Cabrita & Bontis (2008) stated that the learning and growth perspective is strongly supported by increasing human resources' competence, which is very much needed. The existence of high knowledge and experience makes a human resource able to work optimally. Liu (2017) states that intellectual capital shows that this intangible resource improves company performance. This study recommends the application of intellectual capital to increase

the competitive advantage. Based on the concepts and results of previous research that have been described above, the hypothesis is formulated as:

H_1: *Intellectual capital has a significant effect on firm performance.*

2.2. Environmental uncertainty and firm performance

According to Milliken (1987) in Astuti (2007), environmental uncertainty is a person's inability to predict something accurately from all social and physical factors that directly influence the behavior decision-making of people in the organization. Variable uncertainty environments are measured using indicators: lack of information, inability to know results, and inability to determine possibility. Environmental uncertainty was identified as an important factor because of conditions. It can make planning and control difficult. They were planning to be troubled in uncertain operating situations due to the unpredictability of future events. Therefore, managers must predict what will happen in the future that can impact the company, then provide broad-scope information, timeliness, aggregate, and integration which will be useful for managers when faced with making decisions that impact several segments of the company. Which is basically, the decision taken by the manager is based on environmental uncertainty internally and externally. Chenhall and Morris (1986) and Fisher (1996) in Astuti (2007) states that the environmental uncertainty faced by a manager will affect the characteristics of the information it needs. The control environment is the collective impact of various factors towards creating, enhancing, or reducing policy effectiveness and certain procedures.

Jusoh (2008) studied 120 manufacturing companies listed on the Kuala Lumpur Stock Exchange (KLSE). Environmental uncertainty is measured based on the complexity of customers, suppliers, and competitors and environmental changes consisting of government, economic and technological regulations. The study results indicate that environmental uncertainty has a significant and negative effect on company performance as measured by the balanced scorecard. Latan et al. (2018) argue with an analysis unit of Indonesian companies, showing a negative relationship between environmental uncertainty and performance measurement. Another researcher Gosselin (2011), indicated a significant influence between environmental uncertainty and company performance and suggests that a company manager should be able to make balanced measurements the financial and non-financial sides. Based on the concepts and results of previous research that have been described above, the hypothesis is formulated as:

H_2: *Environmental uncertainty has a significant effect on firm performance.*

2.3. Intellectual capital and value chain

Porter (1991) developed a value chain theory to explain in detail the core competencies that can explain cost behavior based on a generic strategy so that companies can use it to identify the relationship between value-creating activities based on the highest value expected consumers. The value chain is used for various purposes, namely to understand the behavior of the costs and the sources of differentiation (Shank and Govindarajan:1993). Porter (1991) classifies it into two activities, namely primary activities (covering inbound logistics, operations, outbound logistics, sales and marketing, services) and supporting activities (covering procurement, research, and technology, human resources, firm infrastructure).

Research related to intellectual capital on the value chain was carried out (Bornemann & Wiedenhofer, 2014); the results of this study stated that the support of intangible resources could be a determining factor in a value chain. In addition, Carlucci, Marr, & Schiuma (2004) stated that intellectual capital is knowledge management that can carry out company business activities that provide added value. Human resource management in Stated-Owned Enterprises is inseparable from the dimensions of human capital, structural capital, and relational capital. The process of hiring employees with the minimum requirements is needed for a job and its level, adequate company infrastructure, and company external relations. The implementation of intellectual capital can support all activities in the company. So, the hypothesis relationship between intellectual capital and value chain on Indonesia SOEs:

H_3: *Intellectual capital has a significant effect on the value chain.*

2.4. Environmental uncertainty and value chain

Environmental uncertainty is identified as a factor important because such conditions can make planning and control difficult. Planning becomes problematic in uncertain operating situations because of unpredictable future events. Therefore, managers must predict what will happen in the future and impact the company, then provide information that is timeliness, aggregate, and integrated, which will be useful for managers when faced with making decisions that impact several segments of the company. Environmental uncertainty is a factor that can affect the value chain (Sawhney, 2006). In this study, one of the roles of managers in the company is how they can unite all opinions in the face of environmental uncertainty from the entire value chain. Lamboll et al. (2018) state that the success of the value chain is determined by how managers can adapt to

environmental changes that have much uncertainty. This environmental uncertainty must be addressed immediately with rapid adaptation by managers. Based on the description above, the hypothesis is proposed as:

H4: *Environmental uncertainty has a significant effect on the value chain.*

2.5. A value chain and firm performance

A value chain describes the relationship between all company activities, divided into primary activities and supporting activities. Abdullah, Salman, & Ahmed (2019) and Barton (2017) argued that a value chain is a series of interrelated activity systems that have added value to meet company needs. Using the value chain can improve company performance using a balanced scorecard. The implementation of the value chain is a key factor in the company's competitive advantage, and all primary activities will be able to increase the company's competitive advantage (Helm & Jones, 2010). Based on the description above, the hypothesis is proposed as:

H5: *Value chain has a significant effect on firm performance.*

2.6. The mediating role of the value chain in the relationship between intellectual capital and firm performance

Competitive advantage can be achieved supported by the company's value chain; all activities starting from the procurement of raw materials, the production process into finished materials that are ready to be sold is well implemented (Porter, 1991). The implementation of the company's activities is supported by the resources owned by the company measured using intellectual capital. In their research results, do Rosário Cabrita & Bontis (2008) explain that in Malaysia, intellectual capital can affect the performance of companies based on the balanced scorecard? All perspectives in the balanced scorecard could be applied if the activities go according to the company's plan (value chain). Intangible assets support the implementation of this value chain, in this case, Human Resources, who have competence in their fields and are supported by their capabilities. The company's infrastructure is measured using intellectual capital. Thus, it is the hypothesis that:

H6: *Value chain has a mediating role in the relationship between intellectual capital and firm performance.*

2.7. The mediating role of the value chain in the relationship between environmental uncertainty and firm performance

The empirical studies from Sawhney (2006) and Lamboll et al. (2018) state that the success of the value chain is due to the ability of managers to adapt to environmental changes that occur. The ability of managers to adapt to the complexity of the environment caused by producers, consumers, and competitors and environmental changes (due to changes in technology and policies) can support the smooth running of the company's activities. Latan et al. (2018) researched companies in Indonesia, with research results showing that environmental uncertainty can affect company performance. The higher the level of environmental uncertainty becomes a challenge for managers to adapt. The ability of managers to adapt can affect the four perspectives in the balanced scorecard. Thus, the next hypothesis in the context of the SOES in Indonesia is that:

H6: *Value chain has a mediating role in the relationship between environmental uncertainty and firm performance.*

The relationship between variables and structural models was tested, as shown in Fig. 1.

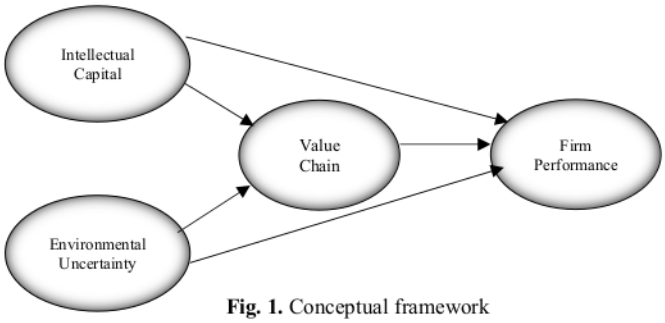

Fig. 1. Conceptual framework

3. Materials and Methods

This study uses a quantitative approach and aims to provide empirical evidence of the influence of intellectual capital and environmental uncertainty on firm performance through the value chain in non-financial state-owned enterprises in Indonesia. This study used a survey method, and data collection was carried out using a questionnaire submitted to respondents via a

google form. The population in this study is non-financial state-owned enterprises consisting of 10 clusters and 76 companies. The non-probability sampling technique used is the saturated sample technique. The observation unit consists of the Human Resources Division, the Finance Division, and the Business Development Division, with directors or General Managers as respondents for each division. Human Capital Manager/Director was chosen as the respondent because they are considered to have adequate professional knowledge related to human resource management. Financial managers are selected because they are responsible for the accounting and finance of the company. Business Development managers were selected because s/he leads and has the authority about innovation strategy. The collected questionnaires were analyzed for completeness and then tabulated. A total of 207 respondents filled out the questionnaire completely.

The operationalization of this research variable is as follows: First, intellectual capital, consisting of 3 dimensions, namely human capital, structural capital, and relational capital using an instrument with a total of 8 statements adopted from (Bontis et al., 2000); (Petty & Guthrie, 2000); (Chen & Zhu, 2004). Respondents were asked about intellectual capital related to competency, skills, attitude, infrastructure, and company relationships. Secondly, environmental uncertainty was measured using six questions (Daft, 2010; Milliken, 1987; Robbins & Judge, 2018; Wagner III & Hollenbeck, 2010). Respondents were asked to provide feedback related to environmental complexity and environmental changes faced by companies related to market demands, competitors, suppliers, technological developments, and changes in government policies. Thirdly, Value chain variables, measured using nine statements adopted from (Porter, 1991; Shank & Ghovindarajan, 1993; Hoque, 2004).

Respondents were asked about the implementation of primary activities and supporting activities. Finally, to measure firm performance variables, using an instrument with a total of 8 statements adopted from (Jusoh, 2008); (Do Rosário Cabrita & Bontis, 2008), (Bose & Thomas, 2007). Respondents were asked about their firm performance related to the financial perspective from Return on Assets and Return on Equity (based on KEP-100/MBU/2002), customer perspective, internal business processes perspective, learning, and growth perspective. Data analysis using Structural Equation Modeling (SEM) based on variance, with Partial Least Square (PLS) tool. (Hair, 2016) states that PLS uses 2 measurement stages, namely (1) evaluation of measurement model and (2) evaluation of the structural model. Our measurement model measures the level of validity (convergent and discriminant validity) and data reliability. In addition, for demographic data, the descriptive analysis uses SPSS.

4. Results

4.1. Measurement model

Thisstudy aims to determine the effect of intellectual capital and environment onfirm performance with the meditation role of the value chain. The data wereanalyzed using structural equation modeling (SEM) with Partial Least Square(PLS) to test the hypothesis. Beforetesting the hypothesis, the validity and reliability were tested. Validity testusing convergent validity to see the value of loading factor and average variancerestricted (AVE), discriminant validity using Fornell-Larcker Criterion. Thereliability test saw the value of composite reliability and Cronbach's Alpha.The values of loading factor, average variance extracted (AVE), andreliability are based on model measurements where the loading factor is higherthan 0.7; composite reliability is higher than 0.7, and AVE more than 0.50;this provision follows the rule of thumb (Hair, 2016). Table 1 shows allmeasurement items showing factor loading values above 0.7 and AVE above 0.50,composite reliability values above 0.7, and Cronbach's Alpha above 0.6. Allcomponents are above the recommended values.

Table 1
Results of construct validity and reliability

Factors/Items	Factor Loading	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Firm Performance		0.812	0.860	0.518
FP1	0.956			
FP2	0.956			
FP3	0.864			
FP4	0.868			
FP5	0.868			
FP6	0.831			
FP7	0.925			
FP8	0.921			
Value Chain		0.840	0.876	0.517
VC1	0.860			
VC2	0.883			
VC3	0.824			
VC4	0.852			
VC5	0.878			
VC6	0.871			
VC7	0.823			
VC8	0.865			
VC9	0.830			

Table 1
Results of construct validity and reliability (Continued)

Factors/Items	Factor Loading	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Intellectual Capital		0.890	0.913	0.574
IC1	0.908			
IC2	0.833			
IC3	0.882			
IC4	0.937			
IC5	0.902			
IC6	0.920			
IC7	0.878			
IC8	0.902			
Environmental Uncertainty		0.778	0.847	0.5001
EU1	0.881			
EU2	0.851			
EU3	0.886			
EU4	0.813			
EU5	0.840			
EU6	0.863			

After the validity and reliability tests of indicators and variables have been passed, the next step is to assess the results of the evaluation of the structural model and test the hypothesis.

4.2 Structural model

First, we do a collinearity test on the structural model using the VIF value. The recommended VIF value is < 5 for all predictor variables in the model. (Hair, 2016) Table 2 shows the VIF value of all variables below 10, so there is no collinearity in the research model. Next, evaluate the structural model by looking at the coefficient of determination (R2), effect size (f2), and prediction relevance (Q2). R2 describes the variance explained by the endogenous variable construct. Table 2 shows the R2 values of the value chain and firm performance variables are 0.347 and 0.672. This value indicates a strong relationship between the value chain and firm performance variables. The effect size (f2) value shows the number 0.481; 0.061; 0.234 falls into the small and large categories. Finally, Q-square predictive relevance (Q2) is used to measure how well the model's observed values and parameter estimates are generated. The value of Q2 (Table 2) shows a value greater than 0.00, which means the model has predictive relevance.

Table 2
Results coefficient determination, effect size, predictive relevance, and collinearity diagnostic

Constructs	R^2	f^2	Q^2	VIF
Intellectual Capital (IC)		0.481		1.192
Environmental Uncertainty (EU)		0.061		1.537
Value Chain (VC)	0.347	0.234	0.169	1.579
Firm Performance (FP)	0.672		0.305	

Test the hypothesis using the path coefficient, t-value, and p-value. Hypothesis testing can be seen from the t-statistics and p-value; with the criteria (t-statistics > 1.86) and (p-value < 0.05), the hypothesis is accepted. The path coefficient (β) shows the direction of the variable relationship. Table 3 shows the direct effect of H1, H3, H4, and H5 accepted. Intellectual capital has a positive effect on financial performance, with path coefficient (β) IC → FP value of 0.457 and p-value < 0.05 (H1). Intellectual capital affects the value chain; this result is indicated by a p-value < 0.05, which means that hypothesis 3 (H3) is accepted. Environmental uncertainty has a positive effect on the value chain, and the path coefficient value indicates this result (β) EU → VC of 0.508 and p-value < 0.05 (H4). The value chain has a positive effect on firm performance, and the path coefficient indicates this result (β) VC → FP of 0.367 a[illegible] p-value < 0.05 (H5). While environmental uncertainty does not affect financial performance, this result is indicated by the p[illegible]lue > 0.05, which means that hypothesis 2 (H2) is rejected. The indirect effect determines that the value chain mediates the relationship between intellectual capital and firm performance and the relationship between environmental uncertainty and firm performance. The mediation effect was confirmed to be statistically significant, where both the mediating hypothesis was accepted.

Table 3
Results hypothesis testing

Path analysis		Coeff (β)	Standard Deviation (STDEV)	t-stat	p-values	Decision
Direct Path						
H_1	IC → FP	0.457	0.086	5.317	0.000	Accepted
H_2	EU → FP	0.185	0.114	1.628	0.104	Rejected
H_3	IC → VC	0.199	0.120	1.665	0.007	Accepted
H_4	EU → VC	0.508	0.132	3.860	0.000	Accepted
H_5	VC → FP	0.367	0.111	3.295	0.001	Accepted
Indirect Path (Mediating)						
H_6	IC → VC → FP	0.073	0.047	1.563	0.009	Accepted
H_7	EU → VC → FP	0.186	0.078	2.381	0.018	Accepted

4.3 Discussion

The first hypothesis explains the influence of intellectual capital on firm performance on SOE in Indonesia. The results showed that there was a positive relationship between intellectual capital and firm performance. These results are in line with research (Bose & Thomas, 2007); (Mehralian et al., 2018); (Hariyati et al., 2019). The results of this study indicate that the role of human capital in terms of knowledge, skills, and attitude, supported by the company's infrastructure and the company's ability to communicate, can improve company performance. The learning and growth perspective is the basis for measuring the company's performance, supported by the appropriate placement of employees, which can improve the internal business processes perspective, supported by ownership of the company's infrastructure. A good business process will produce products that follow consumer desires to increase consumer loyalty so that the company's income does not decrease.

The second hypothesis shows that environmental uncertainty does not affect firm performance. SOEs are the companies with the highest share ownership owned by the government. For every policy issued by the government, both the central government, the Ministry of SOEs, and other related ministries, management must be able to anticipate and change. SOE is the first company to follow government policy changes, and it should be an example for other private companies. Currently, the development of technology is very fast, so that every company, including SOE, must quickly adapt to be able to compete with competing companies to retain consumers. SOE has a special policy issued by the Ministry of SOEs to determine suppliers, and each company management complies with the policies issued. Economic changes affect all business activities and apply to all entities, so SOE management must adapt quickly. Therefore, environmental uncertainty is not always able to affect the company's performance.

The third hypothesis showed that there was a positive relationship between intellectual capital and the value chain. These results are in line with research (Bornemann & Wiedenhofer, 2014). In addition to knowing, employees must have the ability to cooperate in teams (small teams and between divisions and external companies). All actors (in this case, employees) have a role in supporting all activities within the company. In addition, the company provides opportunities to develop employee ideas and innovations to produce better products. The fourth hypothesis explains the effect of environmental uncertainty on the value chain on SOE in Indonesia. The results showed that there was a positive relationship between intellectual capital and the value chain. These results align with research (Sawhney, 2006) and (Lamboll et al., 2018), stating that external uncertainty is a major factor in value chain implementation. Companies are always faced with conditions of uncertainty, both the complexity of consumers and competitors and changes in the economy, government policies, and technological developments. When management can adapt to these changes, it will affect the better business processes measured using the value chain.

The fifth hypothesis explains the effect of the value chain on environmental uncertainty in SOE in Indonesia. The results show that there is a positive relationship between the value chain and firm performance. This result is in line with research (Helm & Jones, 2010) which states that the integrity of the company's activities will improve firm performance, supported by (Cinquini & Tenucci, 2010) that the value chain supports the implementation of the company's strategic management. In line with (Abdullah et al., 2019), measuring the value chain using the Porter concept and the study results show that applying all activities in the value chain can produce a good performance. Intellectual capital is a resource owned by the company to improve company performance.

The sixth hypothesis in this study is related to whether intellectual capital affects firm performance through applying the value chain. Based on the statistical analysis results, the value chain positively mediates the relationship between intellectual capital and firm performance. The results of this study are in line with research (Mehralian et al., 2018) which states that one of the factors that can improve company performance is intellectual capital and value chain. In addition, through intellectual capital, employee management can produce value chain integration (Carlucci et al., 2004). Therefore, the value chain can use as a tool for companies to improve their performance.

The seventh hypothesis in this study is related to whether environmental uncertainty affects firm performance through applying the value chain. The statistical analysis results show that the value chain positively mediates the relationship between environmental and firm performance. These results show the important role of the value chain concerning firm performance. It means the management's ability to adapt to environmental uncertainty, both the complexity of consumers and competitors as well as economic changes, government policies, and technological developments that keep the company's activities running well (Lamboll et al., 2018) so that the company's performance is always maintained. This argument explains the reasons for the relationship between environmental uncertainty – value chain – firm performance empirically.

5. Conclusion

In conclusion, this study has successfully examined the effect of intellectual capital and environmental uncertainty on firm performance—also, the role of a value chain in the relationship of studied variables. In addition, the findings of this study showed that a value chain is an important tool for companies to improve their business performance. Besides that, we argue that it is necessary to manage resources using intellectual capital and look at environmental uncertainty (external

environmental) and value chain implementation to improve company performance. The study results explain that intellectual capital, environmental uncertainty, and value chain can directly improve company performance. Empirical evidence shows a significant positive effect between intellectual capital and environmental uncertainty on the value chain, and the value chain can improve firm performance. The results of the PLS analysis show that intellectual capital can improve firm performance directly and through the value chain. Meanwhile, environmental uncertainty does not directly affect firm performance, but environmental uncertainty can increase firm performance with the value chain. Practically, the findings of this study provide an understanding of how state-owned enterprises in Indonesia improve their performance by applying appropriate intellectual capital (starting from the recruitment process to management during work) and the anticipation of managers in facing environmental uncertainty by using value chain mediation. In addition, these results can provide a reference to decision-makers within the company to continuously improve performance. However, the limitation of this research is the relatively small number of samples, only taking non-financial state-owned enterprises.

Acknowledgment

The authors would like to thank the Ministry of Higher Education of Indonesia and Yayasan Ganesha Nusantara for granting this research with VOT No: 53371 and Universiti Malaysia Terengganu for supporting this research publication, also one form of research collaboration with Universitas Informatika dan Bisnis Indonesia (UNIBI).

References

Abdullah, H. S., Salman, A. J., & Ahmed, I. A. (2019). Integrating the value chain and balanced scorecard to evaluate the overall performance of a tourism organization. *African Journal of Hospitality, Tourism and Leisure*, *8*(5), 1–11.

Barney, J. B. (2001). Resource-based theories of competitive advantage: A ten-year retrospective on the resource-based view. *Journal of Management*, *27*(6), 643–650. https://doi.org/10.1177/014920630102700602

Barton, D. (2017). Refocusing capitalism on the long term: Ownership and trust across the investment value chain. *Oxford Review of Economic Policy*, *33*(2), 188–200. https://doi.org/10.1093/oxrep/grx025

Bontis, N., William Chua Chong, K., & Richardson, S. (2000). Intellectual capital and business performance in Malaysian industries. *Journal of Intellectual Capital*, *1*(1), 85–100. https://doi.org/10.1108/14691930010324188

Bornemann, M., & Wiedenhofer, R. (2014). Intellectual capital in education: A value chain perspective. *Journal of Intellectual Capital*, *15*(3), 451–470. https://doi.org/10.1108/JIC-05-2014-0060

Bose, S., & Thomas, K. (2007). Applying the balanced scorecard for better performance of intellectual capital. *Journal of Intellectual Capital*, *8*(4), 653–665. https://doi.org/10.1108/14691930710830819

Carlucci, D., Marr, B., & Schiuma, G. (2004). The knowledge value chain: How intellectual capital impacts on business performance. *International Journal of Technology Management*, *27*(6–7), 575–590. https://doi.org/10.1504/IJTM.2004.004903

Chen, J., & Zhu, Z. (2004). Measuring intellectual capital: A new model and empirical study. *Journal of Intellectual Capital*, *5*(1), 195–212. https://doi.org/10.1108/14691930410513003

Cinquini, L., & Tenucci, A. (2010). Strategic management accounting and business strategy: A loose coupling? *Journal of Accounting & Organizational Change*, *6*(2), 228–259. https://doi.org/10.1108/18325911011048772

Daft, R. L. (2010). *Organization Theory and Design ' SPfi liriii*.

Do Rosário Cabrita, M., & Bontis, N. (2008). Intellectual capital and business performance in the Portuguese banking industry. *International Journal of Technology Management*, *43*(1–3), 212–237. https://doi.org/10.1504/IJTM.2008.019416

Gosselin, M. (2011). Contextual factors affecting the deployment of innovative performance measurement systems. *Journal of Applied Accounting Research*, *12*(3), 260–277. https://doi.org/10.1108/09675421111187692

Hair, J. F. (2016). *PLS Hair.pdf*.

Hariyati, Tjahjadi, B., & Soewarno, N. (2019). The mediating effect of intellectual capital, management accounting information systems, internal process performance, and customer performance. *International Journal of Productivity and Performance Management*, *68*(7), 1250–1271. https://doi.org/10.1108/IJPPM-02-2018-0049

Helm, C., & Jones, R. (2010). Extending the value chain - A conceptual framework for managing the governance of co-created brand equity. *Journal of Brand Management*, *17*(8), 579–589. https://doi.org/10.1057/bm.2010.19

Jusoh, R. (2008). Environmental Uncertainty , Performance , and the Mediating Role of Balanced Scorecard Measures Use : Evidence from Malaysia. *International Review of Business Research Papers*, *4*(2), 116–135.

Kaplan, R. S., & Norton, D. P. (1996). Strategic learning & the balanced scorecard. *Strategy & Leadership*, 18–24.

Lamboll, R., Martin, A., Sanni, L., Adebayo, K., Graffham, A., Kleih, U., Abayomi, L., & Westby, A. (2018). Shaping, adapting and reserving the right to play: Responding to uncertainty in high quality cassava flour value chains in Nigeria. *Journal of Agribusiness in Developing and Emerging Economies*, *8*(1), 54–76. https://doi.org/10.1108/JADEE-03-2017-0036

Latan, H., Jabbour, C. J. C., Jabbour, A. B. de S., Wamba, S. F., & Shahbaz, M. (2018). Effects of environmental strategy, environmental uncertainty and top management's commitment on corporate environmental performance: The role of environmental management accounting. *Journal of Cleaner Production*, *180*, 297–306. https://doi.org/10.1016/j.jclepro.2018.01.106

Liu, C. H. (2017). The relationships among intellectual capital, social capital, and performance - The moderating role of business ties and environmental uncertainty. *Tourism Management*, *61*, 553–561. https://doi.org/10.1016/j.tourman.2017.03.017

Mehralian, G., Nazari, J. A., & Ghasemzadeh, P. (2018). The effects of knowledge creation process on organizational performance using the BSC approach: the mediating role of intellectual capital. *Journal of Knowledge Management*, *22*(4), 802–823. https://doi.org/10.1108/JKM-10-2016-0457

Milliken, F. J. (1987). Three Types of Perceived Uncertainty About the Environment: State, Effect, and Response Uncertainty. *Academy of Management Review*, *12*(1), 133–143. https://doi.org/10.5465/amr.1987.4306502

Petty, R., & Guthrie, J. (2000). Intellectual capital literature review Measurement, reporting and management. *Journal of Intellectual Capital*, *1*, 155-176.

Porter, M. E. (1991). Towards a dynamic theory of strategy. *Strategic Management Journal*, *12*.

Robbins, S. P., & Judge, T. A. (2018). *Organizational Behavior*.

Sawhney, R. (2006). Interplay between uncertainty and flexibility across the value-chain: Towards a transformation model of manufacturing flexibility. *Journal of Operations Management*, *24*(5), 476–493. https://doi.org/10.1016/j.jom.2005.11.008

van Veen-Dirks, P. M. G., & Lillis, A. M. (2018). Do the motives for adoption of the balanced scorecard affect its development and use? *Studies in Managerial and Financial Accounting*, *33*, 15–37. https://doi.org/10.1108/S1479-351220180000033002

Wagner III, J. A., & Hollenbeck, J. R. (2010). *Organizational Behavior, Securing Competitive Advantage*.

Do Intellectual capital and enviromental uncertainty affect firn performance A mediating role of value chain

ORIGINALITY REPORT

12%	16%	9%	4%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	pdfs.semanticscholar.org Internet Source	2%
2	www.bircu-journal.com Internet Source	2%
3	Usir.Salford.Ac.Uk Internet Source	1%
4	bibliotekanauki.pl Internet Source	1%
5	etd.uum.edu.my Internet Source	1%
6	link.springer.com Internet Source	1%
7	iosrjournals.org Internet Source	1%
8	Almothanna Jamil Abu Allan, Nor Aziah Abu Kasim, Mazlina Mustapha, Sabarina Mohammed Shah, Suzan Abed. "Mediating role of balanced scorecard on the relationship	1%

between uncertainty and performance in the manufacturing companies in Jordan", International Journal of Management Practice, 2021
Publication

9	Benny Hutahayan. "The mediating role of human capital and management accounting information system in the relationship between innovation strategy and internal process performance and the impact on corporate financial performance", Benchmarking: An International Journal, 2020 Publication	1 %
10	Submitted to Universiti Teknologi MARA Student Paper	1 %
11	erepository.uonbi.ac.ke Internet Source	1 %
12	Mohammad hosein Chizari, Rasool Zare Mehrjardi, Mohammad Mirmohammadi Sadrabadi, Fatemeh Kalantar Mehrjardi. "The impact of Intellectual Capitals of Pharmaceutical Companies Listed in Tehran Stock Exchange on their Market Performance", Procedia Economics and Finance, 2016 Publication	1 %
13	repository.unimar-amni.ac.id Internet Source	1 %

14	Submitted to Universitas Tidar Student Paper	1 %

Exclude quotes	On	Exclude matches	< 1%
Exclude bibliography	On		