

Use balanced scorecard for measuring competitive advantage of infrastructure assets of state-owned ports in Indonesia

Case in Pelindo IV, Indonesia

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Abstract

Purpose – The purpose of this paper is to analyze the balanced scorecard (BSC) for measuring the competitive advantage of infrastructure assets of state-owned port in Indonesia: Pelindo IV, Makassar, Indonesia.

Design/methodology/approach – This investigation adopts an explanatory and exploratory qualitative case study method to analyze the effectiveness of the BSC over the strategy management processes. For data collection, the researchers used semi-structured interviews, direct observation and document collection. Data collection was made for a six-month period, which allowed deep knowledge to be gained of the culture and management methods used in Pelindo IV Makassar Branch. Other data collected refer to the company's documentation and reporting of online media publications. Detailed interview data were the main data sources, allowing the authors to obtain a detailed and holistic understanding of the experience, opinions, and attitudes of the interviewees. Interviews focus on asset management to determine the relationship between various factors. This study adopts an ideal BSC principle (four perspectives) in order to develop a strategic map for infrastructure assets of Pelindo IV.

Findings – The results showed that the management performance of Pelindo IV in the financial sector over the next five years was expected to increase by 3.5 times with the business profit reaching an amount of Rp.1.64 trillion in 2017. In the next five years, the target of the customer's perspective set was zero complaints and zero claim with waiting time meeting the ideal standard, which is a maximum of one-hour service, and the number of containers were expected to witness an average growth of 30 percent per year; the growth ship traffic visit history showed that the flow of goods increased by 4 percent and the number of passengers was targeted to grow up to 30 percent. A historical growth rate of 6 percent was also expected both for the human resources and personnel scout.

Originality/value – In this paper, the Sobel test was used to test the significance of a mediation effect and balanced scorecard was used for measuring competitive advantage of infrastructure assets of state-owned ports in Indonesia. Previously, no research has been undertaken to examine the relationship between the location of the study and competitive advantage of infrastructure assets in the context of PELINDO IV, Makassar branch, Indonesia.

Keywords Balanced scorecard, Competitive advantage, State-owned port, Pelindo 4 Indonesia

Paper type Research paper

1. Introduction

Construction services can be categorized as one of the services that play an important role in the process of economic development of a country. Before the multi-crisis hit Indonesia in 1995-2005, the construction sector absorbed an investment of ± 65 percent of the total value of national infrastructure development (Widayatin, 2005) and 50 percent of them were contributed to the construction sector widespread across the country both to national and multinational business entities. In the last ten years, rapid construction developments have not been balanced with the adequate service quality, regarding the quality of products and services that is relatively low and less competitive.

Indonesia as an archipelago country could not be separated with the sea transportation system development. In such case, port infrastructure plays an important role (Syafi'i *et al.*, 2005). A port is an infrastructure to activate the mobilization of commodities and passengers



inside and outside the area. Therefore, to improve services competitiveness, port authorities need to consider and integrate many aspects, such as ship services, port infrastructures, such as the container yard, the potential of the region, and the network of land transportation to hinterland region, etc. (Notteboom, 2009).

In Indonesia, most of the ports are managed by PT. Pelabuhan Indonesia (Pelindo), a port agency of the Indonesian Government. PT. Pelindo IV authority is widespread in the central and eastern parts of Indonesia. The company manages 21 ports across 11 provinces. In this regard, the total area of the regions is 45.76 percent of the total area of Indonesia. The annual growth rate of commodities flow on the ports during 2005-2010 increased by an average of 9.66 percent. Particularly, the container throughput had an average annual growth of 13.42 percent during that period. The main office of Makassar port is the biggest port in the region, the container throughput increased from 23.83 to 39.84 percent.

In today's era of intense global competition, many organizations are facing increasingly knowledgeable and demanding customers of shareholders who have changed the competitive environment of competition based on the ability to invest and manage physical assets (Ghosh and Mukherjee, 2006). It is no wonder that for efficient performance, companies should not only collect and evaluate data but they should also begin to develop data and then utilize and implement in the company's strategy and vision (Ahmadi *et al.*, 2012).

In competition itself, it requires a competitive advantage which is used as a distinction between its competitors (Tracey *et al.*, 1999). The company's ability to create competitive advantage will strengthen the company's position in long-term business competition. In achieving the competitive advantage, there are five dimensions that are used to assess how good a company's competitive advantage is. Li *et al.* (2006) defined five dimensions of competitive advantage: price, quality, dependable delivery, production innovation, and time to market. Helms (1996) considered that quality and productivity can be used as a strategic weapon to achieve competitive advantage.

The era of globalization makes the business environment more competitive in the services sector to seize the market among employers. The level of competition is a major challenge in the management of business assets. Pelindo IV as a state-owned enterprise (*Badan Usaha Milik Negara*) provides port facilities and infrastructure with the implementation of a comprehensive management strategy and works together to support the smooth flow of ships, passenger transport, and loading-unloading activities in the regional authority operations. The strategic role of Pelindo IV is maintaining the wisdom of government programs in economics and development through a port service, including the provision and/or services pools and water ports for traffic and vessel berthing places.

Based on the background presented above, this study aimed to analyze the balanced scorecard (BSC) for measuring the competitive advantage of infrastructure assets of state-owned port in Indonesia: Pelindo IV, Makassar, Indonesia. The originality of this study was seen in three points as follows: first, the measurement of competitive advantages. The previous studies are using the measurements of cost leadership strategy, differential strategy, and focus strategy as competitive advantages measurements (Porter, 1985; Warf and Stutz, 2007; and Clulow *et al.*, 2003). This study used BSCs with four indicators (financial perspective result, customer perspective result, internal process perspective result, and learning perspective). Second, several studies have investigated the use of BSCs for performance measurement (Ozturk and Coskun, 2014; Malgwi and Dahiru, 2014; Binden, *et al.*, 2014). Third, this study used factor analysis to measure the competitive advantage by BSCs; thus, this study is different from the analysis of previous studies.

Several previous studies were used as references in this research, such as the BSC perspectives by Chavezet *al.* (2013), Feng *et al.* (2013), Gambi *et al.* (2015), Truong *et al.* (2017), and Uhrin *et al.* (2017); specifically with financial perspective performance by Fullerton *et al.* (2009), Cohen *et al.* (2008), Hoberg *et al.* (2017), and Nawaz and Haniffa (2017); customer

perspective performance by Eng (2004), Tucker and Pitt (2009), Mokhtar (2013), Heinonen (2014), and Grace and Lacono. (2015); internal processing perspective performance by Gersch *et al.* (2011) and Kohlbacher and Gruenwald (2011); learning perspective performance by Arunprasad (2017), Adhikari *et al.* (2017), Bohanec *et al.* (2017), Anjomshoae *et al.* (2017), and Haemer *et al.* (2017); and competitive advantage by Chavan (2009), Soderberg *et al.* (2011), Kaplan (2012), and Hladchenko (2015). The originality for this paper shows the BSC perspective comprehensively and its implication to competitive advantage.

2. Literature review

As companies around the world transform themselves for competition that is based on information, their ability to exploit intangible assets has become far more decisive than their ability to invest in and manage physical assets (Kaplan and Norton, 2007). Several years ago, in recognition of this change, they introduced a concept called BSC. The BSC supplements traditional financial measures with criteria that measure performance from three additional perspectives – those of customers, internal business processes, and learning and growth. It therefore enables companies to track financial results while simultaneously monitoring progress in building the capabilities and acquiring the intangible assets they would need for future growth. The scorecard is not a replacement for financial measures; it is their complement. The BSC is a strategic tool for measuring whether the smaller-scale operational activities of a company are aligned with its larger scale objectives in terms of vision and strategy (Kaplan and Norton, 2007).

The use of non-financial metrics is not new. In the 1950s, General Electric used non-financial indicators to associate and balance short-term and long-term objectives (Anthony and Govindarajan, 1998); and in the 1930s, French companies used the Tableau de Bord to complement financial indicators with non-financial indicators (Bourguignon *et al.*, 2004). For some years, various studies and publications have drawn attention to the insufficiency of financial indicators and the need for non-financial indicators (e.g. Eccles, 1991; Johnson and Kaplan, 1987; Neely, 1999). The emergence and use of non-financial indicators had a more prominent role in the 1990s (Ittner and Larcker, 1998; Neely, 2005). Since then, management consultants and researchers have developed performance management and measurement models that reinforce the relationship between financial and non-financial metrics. These models demand the identification of sustainable performance drivers, which are normally translated into non-financial indicators, but are related naturally with the financial performance of organizations. One of the principles underlying these performance measurement systems is that the improvement of quality, customers, and employee satisfaction and innovation is not translated directly by classic financial indicators.

Some authors argue that non-financial indicators provide a more informed view of the investments and performance in these intangible aspects. These intangibles provide a source of sustainable competitive advantage, as they are resources held by the company that are not copied or mimicked easily (Marr *et al.*, 2004; Peteraf, 1993). An additional characteristic of the performance measurement systems is the alignment of performance metrics to strategy. Performance measurement models that structure the dimensions of performance assessment, the organization of indicators, and their connection to strategy or stakeholders are among other aspects. The methodologies of Skandia Navigator, IC-Index Approach, BSC, Performance Prism, and Tableau de Bord all provide examples of this.

Nowadays, the performance measurement of a company's strategic plan is mainly focused on the financial aspects, which is deemed no longer adequate. Performance measurement with this system leads to the company orientation only on short-term profits and tends to ignore sustainability life in the long term. The results of performance measurement within the Pelindo IV with the four perspectives illustrate that the performance has not been able to achieve the set targets. Therefore, the company is expected to further improve its performance

with balance between financial and non-financial aspects in order to realize its mission and vision.

From strategic issues mentioned above and performance management system's point of view, this paper attempts to study several factors that affect asset management of Pelindo IV, in order to measure the competitive advantage of infrastructure asset based on the principle of BSC. Divandri and Yousefi (2011) showed that the BSC is a valuable management system which is used for different companies to elucidate and translate their strategies into execution; nevertheless, the BSC has not been planned for container terminals and ports users' satisfaction in a great extent. This paper addresses the issue of deploying BSC as an accepted management tool for measuring competitive advantage of ports users with a focus on container terminals. The use of BSC helps port and terminal managers to better understand strategic vision as well as their own contribution to the implementation of strategic goals. The BSC can be used by the companies which are responsible for handling container terminals operation in order to achieve value, control core competencies, satisfy the terminal's users or customers, and offer bonus to the terminal's shareholders.

3. Methodology

This investigation adopted an explanatory and exploratory qualitative case study method to analyze the effectiveness of BSC over the strategy management processes. The researchers chose the case study method because it provides a good understanding and content theorization of the processes and context in which the practices of management control take place (Berry *et al.*, 2009). This research was conducted in PT Pelabuhan Indonesia so-called Pelindo IV (Persero) Makassar Branch, with the duration of approximately six months in 2016.

For data collection, the researchers used semi-structured interviews, direct observation, and document collection. The data collection was done during the six-month period, which allowed a deep knowledge to be gained of the culture and management methods. The other data collected referred to the company's documentation and reporting of online media publications. The detailed interview data were the main data sources, allowing us to obtain a detailed and holistic understanding of the experience, opinions, and attitudes of the interviewees. The interview focused on asset management to determine the relationship between various factors. Due to the limited number of respondents, the study samples were the entire population of employees of Pelindo IV Makassar Branch on common and supplies division of 45 people. The researchers took advantage of the visits to the business unit (BU) to observe management control practices pertaining to the use of the BSC. The researchers made numerous visits to the facilities and industrial operations and saw several sessions and internal meetings in which the strategic management process was discussed. In the evidence collection phase, the researchers adopted the following procedures: first, the researchers conducted the maximum number of interviews involving employees of the BU and corporate headquarters; second, the researchers resorted to data and method triangulation; third, the researchers considered the importance of data and sources; and fourth, the researchers resorted to key informers to validate collected evidence and the interpretations that were formulated. The data were coded using key theoretical constructs (Miles and Huberman, 1994) looking for patterns and exceptions.

4. Results and discussion

Indonesia is a maritime country and consists of thousands of big and small islands that make up the world's largest archipelago. Ports have a vital role in the country's economic development to facilitate its exports and imports. The quantity of sea cargoes in domestic and international scopes has continued to increase from year to year.

4.1 Indonesian state-owned ports profile

The history of organizational performance is described as follows. In 2012, The Company realized its real participation as the guard of East Indonesia gate and participated in developing the economy in the region of East Indonesia. The potential empowerment in sea sector and optimization of port services in the sea transportation sector could be taken to improve the economy of East Indonesia. In 2013, The Company had proven its success to become the locomotive of East Indonesia (*Kawasan Timur Indonesia*) with various performances such as investment acceleration, port services productivity, sustainable consolidated strengths, and international standard performance. In 2014, the Company stated its readiness to make “toll of sea” a success as part of the National Vision 2025 of MP3EI program. With the “toll of sea,” the connectivity acceleration of Indonesian regions could be achieved. In 2015, the Company continuously used every opportunity available to improve its performance in every aspect. One of the opportunities was the execution of Makassar New Port development as the main gate to accelerate the development of East Indonesia, especially Makassar.

To achieve the targets that have been set in assets optimization and development, business and logistic development, financial aspect, and health level of the company, the management set up corporate strategy and policy in 2016 was developed which focused on the service to customers (customer focus) and the encouragement of excellent service operations. It was henceforth upgraded in the next year on an ongoing basis after periodical review as strategic and tactical steps to anticipate any future possibilities that can potentially interfere with the overall company's performance, it included: customer focus (continuing the implementation of the SLG/SLA for ship services and container ship service, ensuring the availability of loading-unloading integrated planning of maintenance contract and survey, implementation of technical survey, evaluation and cooperation service monitoring), excellent operation (improvement and development of business process, development of information and communication technology, compliance of certification and environmental document, occupation health, and safety management), organization fit (evaluation of organization and regulations of board of directors, improvement of the quality of GCG implementation, development of subsidiary, internal and external audit), leadership and human resource development (improvement of performance and employee welfare, training and comparative study, application of performance management system and talent management, HR competency assessment and mapping as well as career planning blue print).

In performing its business activities, the Company faced several obstacles and strategic issues, such as Shipping Law No. 17 (2008) on the voyage which reduces the entry barrier that would enable competition and reduce the scope of port services, and can reduce the potential for the Company to earn income; the Company's obligation to deposit a proportion of revenue as non-tax revenue; idle Company's assets were still found, especially land and buildings; the capacity of the pier and container yard at several ports were close to its maximum, so that the improvement of a jetty, courts, equipment is necessary; and the existence of the gap between performance and the behavior of personnel in serving and meeting the expectations of service users.

Pelindo IV believes that the port business in the future will be growing and promising. This belief is supported by the development of historical data of container flows in the last five years that has reached > 10 percent per year. Since KTI is very rich in export-oriented natural resources such as coal, LNG, etc., it can make opportunities in opening new special commodity terminals, increasing investment funding both internal and external, and completion of three container terminals (TPK) and the Port of Jayapura with modern container port infrastructure.

The Company has prepared a document of long-term plan of the Company (RJPP) for the period of 2015-2019, and it has been signed by the Board of Directors and Commissioners on September 25, 2014, and was presented to the shareholders by a letter No.7/ PR.003/1/

DUT-2014 dated September 30, 2014. The RJPP was composed by an approach to the business segments and subsequently was constructed into the company's work program for the next five years (2015-2019). The projections are made in three scenarios, namely, pessimistic, moderate, and optimistic, for projections of flow of goods and vessels.

4.2 BSC perspectives of Pelindo IV

Measurement-based scorecards almost always report on operational performance measures, and offer little strategic insight into the way an organization creates value for its customers and other stakeholders. A strategic performance scorecard system is an organization-wide integrated strategic planning, management, and measurement system. The initial stage of the strategic planning cycle, more specifically the strategy maps of the BSC, helps BU executive managers to structure their strategic thinking and translate strategy.

The typical categories include financial measures and customer, process, and organization capacity measures. Through the BSC, an organization monitors both its current performance (finance, customer satisfaction, and business process results) and its efforts to improve processes, motivate and educate employees, and enhance information systems – its ability to learn and improve.

4.2.1 Financial perspective performance. This element represents the cost for each income component to spend one rupiah of their customer's funds. Target financial perspective on Pelindo IV includes revenue targets for each service activities such as ships, container services revenue, conventional goods service, passenger service charge income, and miscellaneous income of the business.

Conditions achievement in 2012 operating revenues of these activities was IDR 1.3 trillion; in the next five years, the income of Pelindo IV was expected to increase to IDR3.7 trillion with the consistent growth of other activities. The achievement of business profit of Pelindo IV in 2012 reached IDR0.44 trillion and was estimated to increase to IDR1.64 trillion in 2017. Accordingly, the management performance of Pelindo IV in the financial sector over the next five years was expected to improve with an increase of 3.5 times.

4.2.2 Customer perspective performance. Components of the target measurement-based customer perspective include the following aspects: level of customer satisfaction, number of complaints, number of claims, service time (waiting time and ship time services), and stevedoring productivity (conventional goods and goods containers). Several aspects were subjected to the achievement of the customer's perspective, one of which is customer satisfaction, which in 2013 had reached 90 percent and was estimated to be 95 percent by the end of 2017. In 2012, the number of complaints was 0.20 percent (in call) and the number of claims was 0.10 percent of the income. The target of the customer's perspective set for the next 5 years (2017) was zero complaint and zero claim.

The target of increasing the service time was also included in the consumer's perspective as it is known that consumers will demand quick service. Waiting time target for the year 2017 to the ideal standard was no more than one-hour service. The goal of setting of time of services of ships and conventional stevedoring productivity will adjust on each port. Stevedoring productivity targets were divided into productivity in conventional general cargo, cargo bags, liquid bulk, and dry bulk. The determination was also adapted to the increase in the number of containers to be served, with an average of 30 percent growth per year. Productivity of unloaded containers in 2017 was expected to be 91.26 boxes/crane/hour.

4.2.3 Internal process perspective performance. The achievements of the internal process perspective on Pelindo IV include: target ship traffic on public piers and docks specifically, target flow of goods for conventional general cargo, bag cargo, liquid bulk, and dry bulk, target container flows, target passenger flow, target port facilities, target information

technology such as application of SIMPAT/E-BTOS/CTOS, target accident rate handling of goods and the level of security, and target max depth of the main pool port.

An overview growth of ship traffic in Pelindo IV for the next five years and the average annual growth in ship traffic based on historical data is 4 percent. If it is based on a specified target by 30 percent, then, in 2017, the number of ship visits in Pelindo IV amounted to 242,828 (in call). The growth of history also shows the flow of goods to increase by 4 percent, but with a target of 30 percent per year, the number of flows of goods of Pelindo IV at the end of 2017 was 51,930,004 tons. The average flow growth is higher than the historical container ship traffic and the flow of goods, amounting to 7 percent per year. If Pelindo IV considers the target for the year 2017, then it could achieve only 2,025,927 TEUs of containers, but if it considers a target of 30 percent, then the amount will be equal to 5,363,172 TEUs of containers. The number of passengers was also targeted to increase by 30 percent. It should be achieved because improvements will be made in terms of facilities and services. So, the strategy that has been designed with the growth in the number of passengers on all ports amounted to 24,604,099 people. The expansion of port facilities as well as supporting tools is also a goal that must be achieved by Pelindo IV. The application of information technology is expected to be utilized by several branches to work optimally. The accident rate of handling of goods and the number of the cases related to security at the end of 2017 was expected to be only two per port.

4.2.4 Learning perspective performance. Targets in the perspective of learning and development include the amount of human resources (SDM) and the number of scout personnel. The human resources in 2012 were 1,403 people with 103 scout personnel. With the historical growth rate of 6 percent, it was expected that at the end of 2017, the number of human resources of Pelindo IV will be about 1,877 people and the number of scout personnel will increase to 137 people.

4.3 The relationship between balance scorecard perspective and competitive advantage

The relationship between BSC perspective and competitive advantage was analyzed by using simple regression analysis tools and factor analysis, with the data used were the last 15 years (2002-2016). The BSC measurement perspective includes four aspects: financial perspective result, customer perspective result, internal process perspective result, and learning perspective result, and the measurement of competitive advantage includes two aspects: business competitive and financial competitive (Figure 1).

First, the result of factor analysis result showed that BSC was measured significantly by four factors, and the dominant factor (highest loading factor) was financial perspective which contributed 26.77 percent to BSC perspectives of Pelindo IV from 2002 to 2016. On the other hand, the result of competitive advantage factor analysis showed that competitive

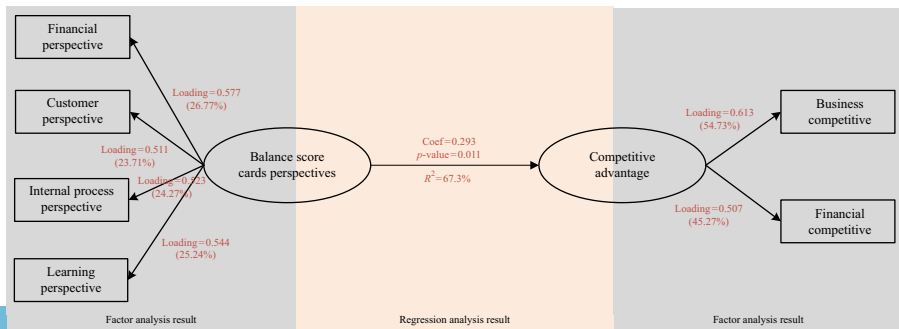


Figure 1. Analysis result

advantage was measured significantly by two factors, and the dominant factor (highest loading factor) was business competitive which contributed 54.73 percent to competitive advantage of Pelindo IV.

Second, the results of regression analysis to measure competitive advantage showed regression coefficient of 0.293 and p -value of 0.011. Based on p -value < 0.05 and positive coefficient, it indicated that there was a significant and positive effect between BSCs' perspective and competitive advantage in Pelindo IV; BSC's contribution to competitive advantage was of 67 percent. The higher the BSCs' perspective (especially financial perspective result), the higher the competitive advantage (especially business competitive).

Based on the actual information, we realized that the growth in container volumes at Pelindo IV port operations will be about 0.6 times of our GDP forecast for Indonesia in 2015, and will rise to about 0.8 times in 2016. The growth in container and cargo tariffs will follow our forecast for consumer price inflation over the next two years. Pelindo IV's revenue growth will be in mid-single digits in 2016 and 2017. Cost inflation will persist and the reported EBITDA margins will be 24-25 percent. The revised joint-venture agreements and the CT-1 terminal will make full-year contributions from 2016 onwards.

Based on the evaluation of the achievement of Pelindo IV (Persero), the target on the basis of BSC was drafted which consists of four perspectives, namely, financial perspectives, the consumer perspective, internal process perspective, and the perspective of learning and development.

The target set in the perspective of learning and development is on the readiness of the infrastructure, facilities and infrastructure, human resources, information, and system which includes standard operating procedure, and finally, the readiness of funding. The achievement of this target will be able to support the objectives achievement on internal processes. On target internal processes within five years, Pelindo IV should be able to achieve zero accident and zero loss. Thus, the level of complaints and claims costs decreased. Increased speed of service is also a major target in achieving the internal process. The speed of services include services of scout ship, tug, and mooring, services and conventional containers, service to the passenger terminal and administration services.

Indonesia as an archipelago country could not be separated with the problem of sea transportation system development, where port infrastructure plays an important role to activate the mobilization of commodities and passengers inside and outside the area. To improve services competitiveness, port authorities need to consider and integrate many aspects, so that strategic plan for asset management would be comprehensively advantaged. Considering the strategic prospective of BU of Pelindo IV as a state-owned port in Indonesia adopting a reliable tool of BSC method, the results showed that: the management performance of Pelindo IV in the financial sector over the next five years was expected to increase by 3.5 times with the business profit reaching an amount of Rp.1.64 trillion in 2017. In the next five years, the target of the customer's perspective set was zero complaints and zero claim with waiting time meeting the ideal standard, which is a maximum of one-hour service, and the number of containers were expected to witness an average growth of 30 percent per year; the growth ship traffic visit history showed that the flow of goods increased by 4 percent and the number of passengers was targeted to grow up to 30 percent. A historical growth rate of 6 percent was also expected both for the human resources and personnel scout.

5. Conclusion and recommendation

The paper aims to advance the knowledge and the effectiveness of the BSC approach over strategy management processes in a state-owned port company named Pelindo IV. Considering the previous inquiry on the problem of asset management performance of port infrastructure in Pelindo IV which had been identified, several conclusions could be advantaged.

Using BSC concept improves the execution of strategy management processes, particularly regarding clarification and strategy description, communication of strategy to the BU, organizational alignment, and monitoring of objectives and strategic learning. The execution of former strategies takes place (strategic learning effect) to promote strategic dialogue and interaction. The information and the knowledge gathered support the process of formulation/revision of future strategies and the formation of emerging strategies. There was a significant and positive effect between BSCs' perspective and competitive advantage in Pelindo IV; BSC's contribution to competitive advantage was 67 percent. The higher the BSCs' perspective (especially financial perspective result), the higher the competitive advantage (especially business competitive).

This research recognized that the implementation of the BSC, on its own, does not assure its success. The benefits over financial performance are not automatically gained and are difficult to measure. Practitioners should be aware that the method may result in the benefits for the organization, but that these depend on the implementation. Some limitations of this research should be noted. The reliance on a unique case study has prevented a comparison of results with other studies in companies in the same industry or different industries. Nevertheless, the studies in which each of the hierarchical levels perceives and uses the BSC would be useful.

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