THE PERFORMANCE ASSESSMENT OF THE JORDANIAN LOGISTICS SECTORS: A BALANCED SCORECARD APPROACH

Mohammad Falah Samar Aljaman [*],
Mohd Saiful Izwaan Bin Saadon [**],
Mohamad Rosni Bin Othman [**], Jehan Ahmad Kheiro Aburasul [***],
Ahmad Heider Hussein Issa [**], Aysheh Hassan Abu Ayyash [**]

[*] *Corresponding author*, Faculty of Maritime Studies, University Malaysia Terengganu, Terengganu, Malaysia
Contact details: Faculty of Maritime Studies, University Malaysia Terengganu, 21030 Kuala Nerus, Terengganu, Malaysia
[**] Faculty of Maritime Studies, University Malaysia Terengganu, Terengganu, Malaysia
[***] Faculty of Business, Economic and Social Development, University Malaysia Terengganu, Terengganu, Malaysia

OPEN ACCESS

Abstract

The challenges that businesses face in the modern market, as well as continuously changing economic realities, have forced management stakeholders to recognise the necessity for sophisticated and multi-faceted data. It would allow them to make well-justified decisions that could be implemented rapidly and effectively, resulting in economic benefits for the organisation. In light of the changes that are arising in the current international economy, the client expects that the delivered products or services fulfil their requirements of high quality, adequate quantity, significant time and place of delivery, as well as cost-effectiveness. The balanced scorecard (BSC) is a strategic management tool that began as a strategic measurement system. A BSC consists of strategic objectives and performance indicators that are in line with the organisation's mission and strategy. The literature on employing multicriteria decision-making methods (MCDM) to simulate a BSC is extensive. The goal of this research is to employ the BSC to undertake a conceptual analysis of the performance of logistics companies in Jordan. The proposed strategy was then implemented in a company that works in the food industry. Managers were questioned after the application regarding the method and the implementation procedure. They discovered that the procedure was useful, but that it took a long time.

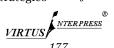**Keywords**: Balanced Scorecard, Logistic Companies, Performance Assessment

Authors' individual contribution: Conceptualization — M.F.S.A.; Methodology — M.S.I.B.S.; Investigation — J.A.K.A.; Resources — M.F.S.A., M.S.I.B.S., and A.H.A.A.; Writing — M.R.B.O.; Supervision — M.F.S.A.; Funding Acquisition — A.H.H.I.

Declaration of conflicting interests: The Authors declare that there is no conflict of interest.

1. INTRODUCTION

The balanced scorecard (BSC) theory (Eisenberg, 2018; Tuan, 2020), developed by Kaplan and Norton (1996), has become one of the most widely used strategies for controlling performance, particularly in large organisations (Gao et al., 2018). Various studies (Akkermans & van Oorschot, 2018; Massingham et al., 2019; Hristov et al., 2019; Camilleri, 2021; Raj & Singh, 2020) address some of the theory's

shortcomings and issues. Many studies have looked into the usage of the BSC as a performance management system (PMS) and its fundamental goal (which is to transform strategy into concrete actions) (Ayoub et al., 2021; Jassem et al., 2021; Abdelraheem & Hussien, 2022). Several studies (Kusrini et al., 2018; Vosoughi et al., 2021) have proved the validity and usefulness of its scientific application when paired with analytical and other systematic methodologies. These studies are aimed at determining the most significant key performance indicators (KPIs), as well as demonstrating and measuring the impact of company strategies and activities (Ali et al., 2022; Alqaraleh et al., 2022; Konstantinidis et al., 2022; Kostyuk, 2003).

Society increasingly combined technological advancements which have made logistics one of the most crucial components of efforts to meet human needs. The concept of logistics, according to Burg et al. (2023), is the integration of procurement, transportation, inventory management, and warehousing activities in providing cost-effective tools or ways to meet internal and external client needs. Meanwhile, Chami (2019) defines logistics as the systematic movement and storage of items, spare parts, and completed goods from suppliers, between firm locations, and to customers. Furthermore, Neri et al. (2021) use the BSC approach to evaluate supply chain performance, which aids in leveraging supply chains as a source of competitive advantage and provides management suggestions. The establishment of diverse logistics organisations is being aided by the growing need for aspects of logistics as a service that delivers a variety of human requirements to various places. Logistics companies arose with a wide range of transportation options and delivery times.

Various types of items, such as food, automobiles, even pets, can be sent through logistics services that are all around us. Logistics services use a variety of transportation equipment to deliver items to customers on time via trains, buses, trucks, box cars, motorcycles, and other types of transportation modes. Small and medium enterprise (SME) procurement, internal operations, product creation, and stewardship are all limited in SMEs (Schmidt et al., 2021; McDougall et al., 2022). The ability to measure an organisation's performance, in this case, a logistics company, is one of the keys to its success. To monitor and control, communicate organisational goals in the form of a chain in the supply chain, look everywhere, about the organisation associated with the objectives and achieve the goals to be achieved, and determine the direction of improvement to achieve competitive goals, a performance measurement system was required (Al Tarawneh et al., 2023).

A logistics scorecard (LSC) can be used to simulate performance measurement systems. Since 2001, the Tokyo Institute of Technology (Tokyo Tech) has collaborated with the Japan Institute of Logistics System to establish the SCM-LSC — JILS. The LSC has evolved into a useful instrument for examining the link between a company's supply chain and managerial performance (Oliveira-Dias et al., 2022). Perspective logistics performance measuring factors, such as business strategy orientation, planning and implementation capability,

logistics efficiency and productivity, information technology implementation, and supply chain collaboration are included in the main index of competitiveness. The use of 23 KPIs to measure 5 viewpoints is intended to present facts, numbers, and qualitative answers concerning supply chain processes in businesses.

These authors have also identified a number of issues and constraints, including sample size (which indicates a long time to collect enough data), information uncertainty, and a high level of knowledge required to employ this particular strategy. The scorecard's KPIs show how each period performed. The goal is to highlight how the processes behind each KPI perform across different operating systems (OS) or dimensions (Sánchez-Márquez et al., 2018). This is because monthly data are based on samples that help to predict the KPIs, random fluctuations (shifts and drifts) are to be expected. In the sense that the same indication may be evaluated on a weekly or bi-monthly basis, the one-month cut off is artificial.

The likelihood of having exactly the same number in a continuous variable is theoretically zero. The higher the sample size in KPI estimation, the lower the data uncertainty. To distinguish between natural random fluctuation owing to sample size and systemic significant changes performed on purpose for process improvements or due to unforeseen decay processes, the determination of a confidence interval (CI) and procedures for trend detection are required. The usual method of analysing scorecard KPI changes is perplexing. Because of the sample size, data uncertainty leads to incorrect conclusions and, as a result, incorrect judgments or inaction. Current techniques, which are based on a deterministic approach, must be replaced with methods that deal with data uncertainty caused by sample size. Hence, this paper aims to use the BSC to undertake a conceptual analysis of the performance of logistics companies.

The structure of the paper is as follows. The introduction is in Section 1 and the literature review is presented in Section 2. A methodological framework is in Section 3. Section 4 reviews a balanced scorecard in the field of logistics sectors. The results and discussion of findings are in Section 5. Finally, Section 6 concludes the paper.

2. LITERATURE REVIEW: THE LOGISTICS PERFORMANCE IN JORDAN

According to its own aims and objectives, each organisation develops a performance definition and sets performance indicators and a performance measurement system. The performance of logistics organisations was measured in a seven-dimension approach in research conducted in the United States by Wilkinson (2022). Value, money, promotion, human capital, growth potential, commercial loss recompense, and bureaucracy are the dimensions. Performance measures like procurement time, stock maintenance expenses, and shipment were used in the study. Meanwhile, Chung et al. (2018), Fernando and Chukai (2018), and Toklu (2021) identified security, reliability, on-time delivery, cost savings, and standard compliance as logistics performance metrics (Sithole, 2020; Fernando et al., 2022).

Five primary performance criteria that are thought important for an organisation to be successful in logistics activities are outlined in traditional performance measurement systems. In the evaluation of logistics functions, specific metrics from each main performance criterion are applied. The following are the criteria and measurements utilised in the evaluation (Shao et al., 2020):

1. *Asset management*: Capacity utilisation and return on investment.

2. *Cost*: Per-unit charges as well as shipping costs.

3. *Customer service*: Average transfer time and transfer time variability.

4. *Productivity*: Measured by the number of deliveries made per vehicle.

5. *Quality*: Damages incurred during shipment and paperwork accuracy. Another factor to examine when evaluating the performance of logistics efforts is whether or not the success is long-term.

The concept of sustainable growth is influencing research in a wide range of disciplines and scientific fields, and it is becoming essential. These advances have had an impact on the logistics sectors in recent years, and the sustainability idea has become one of the most important principles of logistics management (Golpîra et al., 2021). The Association of International Forwarding and Logistics Service Providers (*Uluslararası Taşımacılık ve Lojistik Hizmet Üretenleri Derneği* — UTIKAD), one of the most prominent organisations in the Turkish logistics sector, has launched a programme aimed at assisting all logistics and transportation companies in their long-term growth. The initiative is run in collaboration with Bureau Veritas, an independent certification and inspection organisation, and UTIKAD. It is carried out a certification programme that will contribute to the long-term sustainability of logistics enterprises' environmental, social, and financial survival. Companies interested in obtaining a Sustainable Logistics accreditation must first attend a seminar to learn about the broad standards of sustainability. Within the scope of the evaluation, management's commitment to sustainability, the company's environment, energy, occupational health and safety, employee rights, road safety, asset, and customer feedback management are assessed. Companies that are judged appropriate after the inspection procedure are awarded a Sustainable Logistics accreditation (Thuneibat et al., 2022).

The Logistics Performance Index (LPI) is a comprehensive index designed to assist countries in identifying the issues and possibilities they may encounter. The LPI is created by the World Bank and published when it has been transformed into a report. It is a multi-faceted assessment of logistics performance. The worst score in the evaluation is one, and the best grade is five. The Index combines evaluations conducted by more than 5,000 employees of about 1,000 multinational logistics organisations to compare the logistics performance of 155 nations. The performance of countries in terms of logistics was evaluated across seven dimensions in this research. The effectiveness of customs procedures, logistic infrastructure possibilities, ease of shipment and transportation, quality of logistic services, shipment follow-up and traceability, on-time delivery, and domestic logistics expenses are the seven dimensions. Domestic logistic expenses were omitted from the measurement in Free and Qu (2011), and the number of criteria was decreased to six.

3. METHODOLOGICAL FRAMEWORK

Kaplan and Norton (1992) created the balanced scorecard. The authors organised a study of a number of organisations with the goal of examining new performance evaluation methodologies. The study was important because there was a growing conviction that financial performance indicators were useless for modern businesses. Representatives from the study companies, as well as Kaplan and Norton, were convinced that their potential to generate value was harmed by their reliance on financial measurements of performance. The group debated several options before settling on a scorecard with performance measurements reflecting actions from across the corporation, including customer issues, internal business procedures, staff activities, and, of course, shareholder concerns. The balanced scorecard was introduced by Kaplan and Norton (1992), and the concept was later detailed in the first of three Harvard Business Review articles, "The Balanced Scorecard Measures That Drive Performance". In both the charity and public sectors, the balanced scorecard has been translated and successfully applied. Success stories are starting to emerge, and studies show that the balanced scorecard is beneficial to both of these types of organisations. What is a balanced scorecard, and how does it work? The balanced scorecard can be thought of as a management system organised around the management circle's logic ("plan-do-check-act").

The balanced scorecard is designed to look like a traditional management style. Van den Heuvel and Broekman (1998), for example, noted that a self-respecting organisation obviously can no longer do without the balanced scorecard, and Hers (1998) cited a plethora of congresses, seminars, and publications on the subject. Commentators spoke of "an actual trend" (Koning & Conijn, 1997), "a fad-like impression" (Lewy & du Mee, 1998), and "a true hype" (Koning & Conijn, 1997). Hers's (1998) assertions imply that the balanced scorecard has gained traction and influenced a wide range of enterprises. If the authors' references are right, the balanced scorecard may even resemble a standard management style. The balanced scorecard is positioned by Kaplan and Norton as a tool for organisations to manage stakeholder demands and transfer strategies into execution ("from strategy to action"). Shareholders, customers, and employees are all possible stakeholders who are strategically important.

Their demands are incorporated into company core management from a "financial", "customer", "learning", or "process" standpoint. As a result, the frame of a balanced scorecard is made up of four perspectives. Each perspective includes strategic goals, indications, and metrics for achieving them. It is worth noting that the notion is still open to include additional relevant parties or perspectives, such as an environmental perspective (Kaplan & Norton, 1997). When Kaplan and Norton (1996)

created the BSC, they claimed that businesses lacked sophisticated methods for managing intangible and qualitative assets (e.g., customer satisfaction, process quality, infrastructures, know-how). Intangible assets, on the other hand, appear to be critical for future competitiveness. As a result, the balanced scorecard delivers "enablers" that show the effectiveness and efficiency of past measures by focusing on the attainment of strategic goals in the future (leading indicators), as well as results (lagging indicators).

4. A BALANCED SCORECARD IN THE FIELD OF LOGISTICS SECTORS

The balanced scorecard is a modern business management concept that gives a mechanism for defining an organization's strategy. The BSC is the foundation for strategic control in businesses (Bénet et al., 2019). By defining the objectives and measures in the business there are four perspectives: financial perspective, customer perspective, internal processes perspective, and growth and development perspective (Terziev et al., 2020; Alqaraleh et al., 2020); this method allows the company's strategy, mission, and vision to be translated into operational activities. The formulation and implementation of organisation strategy as a whole are enabled by achieving consistency and balance of objectives, activities, and results in these four areas (Oliveira et al., 2021). The financial perspective examines the entire financial area of the firm. It permits monitoring of the achievement of planned financial targets (e.g., income, return on capital) using measurements that evaluate a company's financial condition at the same time.

The viewpoint of customers allows for the identification of the origins of the existing company's market position, as well as an examination of customer happiness. The most effective activities are determined by the internal process's perspective. Internal processes, which form part of the BSC, are divided into three categories: innovative processes, operational processes, and after-sales service processes. The research and development perspective, on the other hand, looks at the company's potential to make new changes. It enables the organisation to identify and capitalise on growth opportunities by investing in resources that the company already has or plans to acquire. Banabakova and Georgiev (2018), on the other hand, suggested a broader view of the BSC in their work, noting that each organisation can establish more than four core views. They described competitive perspective as an aspect that permits the attainment of set goals in their job. The design and implementation of the BSC approach have been extensively studied in the literature. Interest in implementing the BSC technique may be found in both the business and public sectors, as well as in local government bodies (Muda et al., 2018).

Jin et al. (2018) presented a comprehensive evaluation of the literature in this field, which included 181 publications published between 1992 and 2011. A description of the explored concerns, theoretical foundation, applied research methods, and data analysis techniques were all covered in the literature review. As a result, existing holes in

the research domain can be identified, allowing future research projects to be defined. Dwivedi et al.'s (2021) study is one of the first to apply the BSC technique to the performance of transportation businesses. The authors proposed a BSC card proposal for evaluating the degree of performance of public transportation systems, specifying evaluation metrics in three primary areas: efficiency, effectiveness, and prospects for the environmental impact of actual transportation services. Lin (2022), on the other hand, focused on the explanation of techniques for developing and implementing the BSC approach for public transportation businesses. Examples of BSC cards for departments purchasing local self-government non-profit units providing the local public transportation system for the Ann Arbor-Ypsilanti agglomeration were shown in the study.

This issue was continued by Nadi and Murad (2019). Graehler et al. (2019) and Nikitas et al. (2020) also looked into the urban transportation system. The primary purpose of these studies was to apply the BSC technique to the performance of sustainable transportation systems in some countries (Illahi & Mir, 2020). The authors offer the viewpoints of BSC implementation in TSL enterprises the next year, along with an example of total analytical performance. They are still debating whether or not to use the BSC technique to assess participation and the influence of established enterprise resource planning systems on the implementation level of the company's strategic objectives, as described in Han (2021). Delen et al. (2020), on the other hand, discussed the possibilities of using the BSC technique in the management processes of transportation businesses in connection to specific transport services and lowering the level of business risk. Dwivedi et al. (2021) proposed a BSC implementation strategy for enterprise resource planning logistics service companies in 2012.

Furthermore, Olszańska and Prokopiuk (2021) offered the BSC objectives and measures for a transport firm that provides freight transportation services. The purpose of the study was to illustrate the benefits of employing computer software called "Result Scorecard", which is based on the BSC, to monitor an organisation's strategy. The BSC technique was presented by Lu et al. (2018) for a corporation that provides international freight transport services. The authors established a strategic scorecard and analysed the efficacy of the controlling system implementation in the audited company based on the formulation of the company's strategic objectives and the usage of strategy maps. Simultaneously, studies of BSC technique development for rail transport firms (Lin & Cheng, 2020), seaport management companies (Alghaffari, 2019), and air transport service providers can be found in the literature (Lafkihi et al., 2019).

To summarise, the present literature study demonstrates that the use of the BSC technique has contributed to the development of organisational processes in various modes of transportation. As a result, the authors conducted preliminary interviews with top executives from big road passenger transportation companies (when?). The study focused on identifying managers' information needs in conjunction with determining the degree to which the adopted business strategy

was being implemented. The perspectives that prevailed were that the boards of these companies do not now have the means to explicitly assign activities in order to achieve their goals and then monitor the degree to which they are being implemented. The finance section is currently the only area that is under control. Managerial representatives recognise that evaluating their business plan from such a restricted perspective is insufficient to check the actual efficiency and correctness of the business performance.

5. RESULTS AND DISCUSSION

On the basis of logistical principles, Perminova and Lobanova (2018) produced methodological guidelines for balanced scorecard practical implementation into activities of Russian oil-producing service firms under current conditions. The essay proposes prospects for the construction of a balanced scorecard based on logistics principles and strategic management idiosyncrasies of oil-producing service businesses. It is suggested that indicators and their characteristic values be used to coordinate operational and strategic management and have a synergistic effect. In order to increase effective cooperation between service organisations of vertically integrated oil firms, the authorial methodology of balanced scorecard use for oil-producing service organisations was established as a result of the study.

Sánchez-Márquez et al. (2018) focused on the creation of a graphical method for detecting significant trends and changes in key performance indicators from balanced scorecards utilising statistical non-parametric tests for randomness and parametric testing. It gives managers and executives a way to see if their processes are improving or deteriorating. The strategy addresses the problem of data uncertainty due to sample size for key performance indicators on scorecards, which has remained unsolved until now. The method was created and tested utilising scorecard data from two full years as a case study methodology to test validity and efficacy in a multinational manufacturing organisation.

Quezada et al. (2019) proposed using the analytical network process (ANP) to combine the strengths, weaknesses, opportunities, and threats (SWOT) analysis with the BSC to analyse a company's performance (ANP). The BSC is a strategic management system. A BSC consists of strategic objectives and performance indicators that are in line with the organization's mission and strategy. The literature on employing MCDM to simulate a BSC is extensive. The SWOT analysis, on the other hand, is a process for examining a corporation from both an internal and external perspective in order to develop plans for the company. It has also been mathematically modelled in order to generate strategies. This paper outlines a strategy for evaluating a firm that combines quantitative BSC and SWOT analysis. In a company in the food industry, the proposed method was implemented. Managers were questioned after the application regarding the method and the implementation procedure. They discovered that the procedure was useful, but that it was time-consuming.

Pakurár et al. (2019) developed a theoretical approach to performance measurement (PM) in supply chains for the Industry 4.0 age based on the BSC. They merged PM literature, specifically BSC literature with literature on supply chain dimensions in the context of Industry 4.0. The four viewpoints of the BSC were found to be strongly aligned with dimensions taken from the literature based on supply chains in the context of Industry 4.0, making it appropriate for use as a PMS for supply chains in this new environment. This work adds to the little literature on PM for supply chains in the Industry 4.0 age from a theoretical standpoint. The report suggests a supply chain 4.0 scorecard and strongly encourages researchers to perform further empirical studies to gain a better understanding of PM in supply chains in the Industry 4.0 era. As a restriction, the suggested theoretical framework requires additional empirical research to be validated and new insights gained from the inquiry undertaken and provided in this paper.

Through the interplay of several layers of business views, Dwivedi et al. (2021) offered an application of the BSC model in an insurance organisation for coordinating and controlling its corporate vision, mission, and strategy with organisational performance. In the following stage, for the first time in the insurance industry, a framework to unify both BSC and best-worst method (BWM) models is implemented to examine its performance across two time periods. The combined BSC-BWM model can assist managers and decision-makers in determining and interpreting the enterprise's competing strengths, as well as expediting inefficient and persuasive decision-making. Nonetheless, this integrated model has been adopted and chosen for a specific type of organisation, and there is enough room for it to be applied to other industries in the future.

De Sousa et al. (2020) provided an overview of academic production and study trends on BSC for supply chain performance evaluation. The findings assist academics and management in understanding the current state of the art, identifying gaps, and predicting future trends. The findings also demonstrated the evolution of research throughout time. It has also been noted that publications in journals with an impact factor (Thomson Reuters) predominate. The development of the subject in emerging countries may be beneficial to their companies' competitiveness. In conclusion, this study may influence future investigations and publications by scholars interested in BSC-based performance evaluation of supply chains, as well as orient new researchers to which journals to consult and technical processes to investigate.

Quezada et al. (2021) presented a system for generating performance indicators for manufacturing locations within organisations that supports a process. Frameworks for selecting performance indicators are presented in the extant literature on the subject of performance management. The use of MCDM methods for selecting indicators from a set of predetermined ones is highlighted in the literature. This research goes a step further by proposing a mechanism to aid in the production of manufacturing performance indicators. The ANP

aids this procedure. Long-term objectives, strategic business units, essential success factors, manufacturing decision areas, and human resource management are among the nodes in the network model, which is based on a BSC framework. The suggested method entails allocating weights to manufacturing decision areas, diagnosing these regions, and providing performance indices that are ordered from high to poor. Managers can use the proposed method to establish manufacturing performance indicators that are in line with the company's long-term strategic goals. This is accomplished through the application of an ANP model, which captures the intricate linkages that exist between the many strategic objectives of a company's strategy map. An application in a pork-based food manufacturing industry is provided as an example. The proposed strategy was straightforward to grasp and follow, and it was useful for developing performance measurements, according to the management.

Supply chain management, according to Balaji et al. (2021), plays a critical role in improving organisational efficiency and effectiveness. A well-functioning supply chain can result in lower costs, increased market share, enhanced transactions, and long-term client connections. However, constructing a supply chain may be insufficient in improving an organization's overall performance, which can only be enhanced through review. Apart from the supply chain operations reference (SCOR), analytic hierarchy process (AHP), data envelopment analysis (DEA), and heuristic techniques-based models, the BSC is an effective instrument for determining supply chain performance. Modern businesses are unable to compare their actual performance to the expected performance. Real performance is either higher or lower than expected, resulting in uncertain and delicate supply chains. The focus of this study effort is to account for this ambiguity and improve supply chain performance using the BSC model, which provides an approach to inspect value creation from four perspectives: financial, customer, internal business process, learning, and growth. The drag factors that affect the above four viewpoints have been investigated and eliminated in this research in order to improve the supply chain and increase revenues.

Olszańska and Prokopiuk (2021) looked at a transport company in the Podkarpackie Voivodship and used the strategic scorecard to analyse it. The goal of this article was to develop a strategic scorecard for a transportation company in order to streamline transportation processes while also enhancing customer service quality and maximising financial returns. Istiqomah et al. (2021) created a logistics performance measurement model based on the LSC perspective, which is separated into 2 stages: determining the logistics supply chain business strategy in order to get KPIs and constructing a model to measure logistics performance. According to the 5 LSC viewpoints, there are 23 KPIs. The proportion of overall results for each organisation may be calculated using the logistic scorecard, and indicators that need to be improved can be highlighted. The design of this model can provide positive input for firms to increase performance in certain areas. This is done so that the logistic services that have been studied

can continue to develop and become one of the companies that have good performance in serving consumers.

In India, Saroha et al. (2022) used the modified balanced scorecard technique to identify the circular supply chain performance indicators. For the implementation of circular supply chain management toward sustainability, seven headings, and associated key performance indicators have been explored. The findings will aid managers, industrialists, and strategy makers in evaluating critical indicators in the implementation of circular supply chain management for long-term sustainability. It will also have ramifications for scholars who wish to do more research on these indicators using various techniques.

The sustainability balanced scorecard (SBSC) was studied by Mio et al. (2022) as a performance evaluation and management control instrument that can help firms achieve their sustainability goals. Previous research on the SBSC has been divided into four stages: design, implementation, use, and evolution. The goal of this research is to systematise knowledge at the use stage. It focuses on the factors that influence SBSC adoption, the strategies firms use to implement SBSCs, and the outcomes it produces in terms of sustainability control and management. The study was carried out using a systematic literature analysis that looked at 65 articles published in ABS-ranked journals between 2000 and 2020. The findings contribute to the body of knowledge on the SBSC in management and accounting domains by providing an overview of current research, mapping research streams, proposing prospective future research pathways, and highlighting managerial implications.

Lin (2022) evaluated the risk analysis of marine accidents by combining BSC concepts with the decision-making trial and evaluation laboratory (DEMATEL) process (ANP). The balanced scorecard could be used as a marine procedure management tool in maritime risk analysis, according to the empirical findings. Using a scholarly questionnaire, a total of 30 questions were collected, and 5 criteria or essential elements for improving risk assessment of marine accidents were identified. The risk analysis criteria developed, according to the use of BSC, can aid marine authorities in reducing maritime accidents.

6. CONCLUSION

A BSC's strategic objectives are formed from past research and the degree to which they have been met. As companies' worldwide activities have grown, logistics has become an increasingly crucial sector for their long-term international viability. When a logistics company performs well, it gains a competitive edge for both the company and the country. As a result, it is critical to assess the performance of logistics firms. The success of logistics activities is measured using a variety of approaches. Because the goal of this study was to assess the performance of logistics organisations, the logistic capabilities of the countries are included in the measurement. The Logistics Performance Index, which is produced by the World Bank and exhaustively measures a country's logistics performance, was employed to do this. It was

designed largely as a measurement system and as a response to criticism of a company's performance capabilities being measured unilaterally. It was broken down into four sections: financial, customer, internal, and learning. A new strategic management system is built on the foundation of the balanced scorecard. Organizations can use the scorecard to implement new governance and renew processes that are focused on strategy. It does not rely solely on short-term financial measures to assess performance; instead, it performs the following extra duties.

One of the limitations that this study faced was the lack of studies specialized in the subject. Therefore, this study recommends the necessity of repeating the study in other countries and using other methods.

REFERENCES

1. Abdelraheem, A. A. E., & Hussien, A. M. (2022). The effect of application of non-financial dimensions of balanced scorecard on performance evaluation: An empirical study from Saudi Arabia. *The Journal of Asian Finance, Economics and Business, 9*(4), 63–72. https://doi.org/10.13106/jafeb.2022.vol9.no4.0063
2. Akkermans, H. A., & van Oorschot, K. E. (2018). Relevance assumed: A case study of balanced scorecard development using system dynamics. In M. Kunc (Ed.), *System dynamics* (pp. 107–132). Palgrave Macmillan. https://doi.org/10.1057/978-1-349-95257-1_4
3. Al Tarawneh, E. M., Alqaraleh, M. H., Ali, B. J. A., & Atta, A. A. B. (2023). The impact of the efficiency and effectiveness of electronic accounting information systems on the quality of accounting information. *Information Sciences Letters, 12*(3), 1685–1692. https://doi.org/10.18576/isl/120352
4. Alghaffari, S. (2019). *Organisational effectiveness of Saudi seaports: Critical factors and implications for seaport management* [Doctoral dissertation, University of Tasmania]. https://doi.org/10.25959/100.00031411
5. Ali, I., Sami, S., Senan, N. A. M., Baig, A., & Khan, I. A. (2022). A study on corporate sustainability performance evaluation and management: The sustainability balanced scorecard. *Corporate Governance and Organizational Behavior Review, 6*(2), 150–162. https://doi.org/10.22495/cgobrv6i2p15
6. Alqaraleh, M. H., Almari, M. O. S., Ali, B. J. A., & Oudat, M. S. (2022). The mediating role of organizational culture on the relationship between information technology and internal audit effectiveness. *Corporate Governance and Organizational Behavior Review, 6*(1), 8–18. https://doi.org/10.22495/cgobrv6i1p1
7. Alqaraleh, M. H., Thuneibat, N. S. M., & Nour, A. I. (2020). The factors affecting the adherence of Islamic accounting standards AAOIFI in Jordan. *Journal of Governance and Regulation, 9*(4), 69–75. https://doi.org/10.22495/jgrv9i4art6
8. Ayoub, F. S., Abd Eljalil, S. G., & Elias, W. A. (2021). Strategic performance measurement and balanced scorecard approach in Egyptian travel agencies: A proposed empirical model. *International Journal of Tourism and Hospitality Management, 4*(1), 1–28. https://doi.org/10.21608/ijthm.2021.177907
9. Balaji, M., Dinesh, S. N., Kumar, P. M., & Ram, K. H. (2021). Balanced Scorecard approach in deducing supply chain performance. *Materials Today: Proceedings, 47*(Part 15), 5217–5222. https://doi.org/10.1016/j.matpr.2021.05.541
10. Banabakova, V., & Georgiev, M. (2018). The role of the Balanced Scorecard as a tool of strategic management and control. *IJASOS — International E-journal of Advances in Social Sciences, 4*(10), 84–99. https://doi.org/10.18769/ijasos.417696
11. Bénet, N., Deville, A., & Naro, G. (2019). BSC inside a strategic management control package. *Journal of Applied Accounting Research, 20*(1), 120–132. https://doi.org/10.1108/JAAR-11-2016-0109
12. Braam, G. J., Benders, J., & Heusinkveld, S. (2007). The balanced scorecard in The Netherlands: An analysis of its evolution using print-media indicators. *Journal of Organizational Change Management, 20*(6), 866–879. https://doi.org/10.1108/09534810710831064
13. Burg, M., Gonna, H., Anderson, R. D., Chandra Srinath Patloori, S., Acosta Velez, J. G., Bhaskaran, A., Nair, K., Spears, D., Chauhan, V. S., Ha, A. C. T., Cusimano, R. J., & Nanthakumar, K. (2023). Logistics of safe and stress-free epicardial access in the electrophysiology lab: Creative percutaneous subxiphoid pericardiostomy. *Europace, 25*(Supplement_1), article euad122-721. https://doi.org/10.1093/europace/euad122.721
14. Camilleri, M. A. (2021). Using the balanced scorecard as a performance management tool in higher education. *Management in Education, 35*(1), 10–21. https://doi.org/10.1177/0892020620921412
15. Chami, N. A. (2019). *The roleof inbound logistics function on competitive performance of a manufacturing company in Tanzania a case of TOL gases limited* [Doctoral dissertation, Mzumbe University]. DSpace. http://hdl.handle.net/11192/3687
16. Chung, W., Talluri, S., & Kovács, G. (2018). Investigating the effects of lead-time uncertainties and safety stocks on logistical performance in a border-crossing JIT supply chain. *Computers & Industrial Engineering, 118,* 440–450. https://doi.org/10.1016/j.cie.2018.03.018
17. de Sousa, T. B., Melo, I. C., de Oliveira, P. H., Lourenço, C. M., Guerrini, F. M., & Esposto, K. F. (2020). Balanced scorecard for evaluating the performance of supply chains: A bibliometric study. *Journal of Engineering Research, 8*(1), 294–313. https://doi.org/10.36909/jer.v8i1.4406
18. Delen, D., Dorokhov, O., Dorokhova, L., Dinçer, H., & Yüksel, S. (2020). Balanced scorecard-based analysis of customer expectations for cosmetology services: A hybrid decision modeling approach. *Journal of Management Analytics, 7*(4), 532–563. https://doi.org/10.1080/23270012.2020.1818319
19. Dwivedi, R., Prasad, K., Mandal, N., Singh, S., Vardhan, M., & Pamucar, D. (2021). Performance evaluation of an insurance company using an integrated Balanced Scorecard (BSC) and Best-Worst Method (BWM). *Decision Making: Applications in Management and Engineering, 4*(1), 33–50. https://doi.org/10.31181/dmame2104033d
20. Eisenberg, P. (2018). Increasing board effectiveness with the balanced scorecard — Theoretical assumptions and application in practice. *Discovery Economics, 1*(1), 78–108. https://ssrn.com/abstract=3207803
21. Fernando, Y., & Chukai, C. (2018). Value co-creation, goods and service tax (GST) impacts on sustainable logistic performance. *Research in Transportation Business & Management, 28,* 92–102. https://doi.org/10.1016/j.rtbm.2018.10.001
22. Fernando, Y., Wahyuni-TD, I. S., Zainul Abideen, A., & Mergeresa, F. (2022). Traceability technology, halal logistics brand and logistics performance: Religious beliefs and beyond. *Journal of Islamic Marketing, 14*(4), 1007–1031. https://doi.org/10.1108/JIMA-06-2020-0183

23. Free, C., & Qu, S. Q. (2011). The use of graphics in promoting management ideas: An analysis of the Balanced Scorecard, 1992–2010. *Journal of Accounting & Organizational Change, 7*(2), 158–189. https://doi.org/10.1108/18325911111139680

24. Gao, H., Chen, H., Feng, J., Qin, X., Wang, X., Liang, S., Zhao, J., & Feng, Q. (2018). Balanced scorecard-based performance evaluation of Chinese county hospitals in underdeveloped areas. *Journal of International Medical Research, 46*(5), 1947–1962. https://doi.org/10.1177/0300060518757606

25. Golpîra, H., Khan, S. A. R., & Safaeipour, S. (2021). A review of logistics internet-of-things: Current trends and scope for future research. *Journal of Industrial Information Integration, 22,* Article 100194. https://doi.org/10.1016/j.jii.2020.100194

26. Graehler, M., Mucci, R. A., & Erhardt, G. D. (2019). *Understanding the recent transit ridership decline in major US cities: Service cuts or emerging modes?* [Paper presentation]. The 98th Annual Meeting of the Transportation Research Board. The Turin School of Regulation (TSR). https://turinschool.eu/files/turinschool/Erhardt_ridesharing.pdf

27. Han, M. M. L. U. T. (2021). Increasing employee motivation and use of ERP system to enhance organizational performance. *AU-GSB e-JOURNAL, 14*(2), 15–26. http://www.assumptionjournal.au.edu/index.php/AU-GSB/article/view/5472

28. Hers, F. (1998). Doe mij even een Balanced Scorecard! *Financieel-Economisch Management, 29,* 18–20.

29. Hristov, I., Chirico, A., & Appolloni, A. (2019). Sustainability value creation, survival, and growth of the company: A critical perspective in the Sustainability Balanced Scorecard (SBSC). *Sustainability, 11*(7), Article 2119. https://doi.org/10.3390/su11072119

30. Illahi, U., & Mir, M. S. (2020). Development of indices for sustainability of transportation systems: A review of state-of-the-art. *Ecological Indicators, 118,* Article 106760. https://doi.org/10.1016/j.ecolind.2020.106760

31. Istiqomah, S., Viana, A. B., Cahyati, A. N., Susanti, S. D., Sutopo, W., & Yuniaristanto. (2021). Application scorecard logistics method for comparative analysis of performance measurement: A case study. In *Proceedings of the 11th Annual International Conference on Industrial Engineering and Operations Management* (pp. 2073–2084). IEOM Society International. http://www.ieomsociety.org/singapore2021/papers/394.pdf

32. Jassem, S., Zakaria, Z., & Azmi, A. C. (2021). Sustainability balanced scorecard architecture and environmental performance outcomes: A systematic review. *International Journal of Productivity and Performance Management, 71*(5), 1728–1760. https://doi.org/10.1108/IJPPM-12-2019-0582

33. Jin, R., Gao, S., Cheshmehzangi, A., & Aboagye-Nimo, E. (2018). A holistic review of off-site construction literature published between 2008 and 2018. *Journal of Cleaner Production, 202,* 1202–1219. https://doi.org/10.1016/j.jclepro.2018.08.195

34. Kaplan, R. S., & Norton, D. P. (1992). The balanced scorecard — Measures that drive performance. *Harvard Business Review Press.* https://hbr.org/1992/01/the-balanced-scorecard-measures-that-drive-performance-2

35. Kaplan, R. S., & Norton, D. P. (1996). *The balanced scorecard.* Harvard Business Review Press.

36. Kaplan, R. S., & Norton, D. P. (1997). *Balanced scorecard: Strategien erfolgreich umsetzen, aus dem Amerikanischen von Horváth.* Schäffer-Poeschel.

37. Koning, J., & Conijn, F. (1997). Balanced scorecard? Nooit van gehoord! *Tijdschrift voor Administrateurs en Controllers, 12*(7–8), 34–38.

38. Konstantinidis, C., Kountios, G., Kourtesi, S., Antoniadis, I., & Kostyuk, A. (2022). Assessing the role of competitiveness estimation as an advisory strategic factor in manufacturing firms: A literature review [Special issue]. *Corporate Governance and Organizational Behavior Review, 6*(4), 349–358. https://doi.org/10.22495/cgobrv6i4sip15

39. Kostyuk, A. (2003). Board practices: An international review. *Corporate Ownership & Control, 1*(1), 102–111. https://doi.org/10.22495/cocv1i1p7

40. Kusrini, E., Novendri, F., & Helia, V. N. (2018). Determining key performance indicators for warehouse performance measurement — A case study in construction materials warehouse. *MATEC Web of Conferences, 154,* Article 01058. https://doi.org/10.1051/matecconf/201815401058

41. Lafkihi, M., Pan, S., & Ballot, E. (2019). Freight transportation service procurement: A literature review and future research opportunities in omnichannel E-commerce. *Transportation Research Part E: Logistics and Transportation Review, 125,* 348–365. https://doi.org/10.1016/j.tre.2019.03.021

42. Lewy, C., & du Mee, L. (1998). The ten commandments of balanced scorecard implementation. *Management Control and Accounting.*

43. Lin, W. C. (2022). Maritime environment assessment and management using through balanced scorecard by using DEMATEL and ANP technique. *International Journal of Environmental Research and Public Health, 19*(5), Article 2873. https://doi.org/10.3390/ijerph19052873

44. Lin, W. C., & Cheng, H. H. (2020). Improving maritime safety through enhancing marine process management: The application of balanced scorecard. *Management Decision, 59*(3), 604–615. https://doi.org/10.1108/MD-08-2019-1044

45. Lu, M.-T., Hsu, C.-C., Liou, J. J. H., & Lo, H.-W. (2018). A hybrid MCDM and sustainability-balanced scorecard model to establish sustainable performance evaluation for international airports. *Journal of Air Transport Management, 71,* 9–19. https://doi.org/10.1016/j.jairtraman.2018.05.008

46. Massingham, R., Massingham, P. R., & Dumay, J. (2019). Improving integrated reporting: A new learning and growth perspective for the balanced scorecard. *Journal of Intellectual Capital, 20*(1), 60–82. https://doi.org/10.1108/JIC-06-2018-0095

47. McDougall, N., Wagner, B., & MacBryde, J. (2022). Competitive benefits & incentivisation at internal, supply chain & societal level circular operations in UK agri-food SMEs. *Journal of Business Research, 144,* 1149–1162. https://doi.org/10.1016/j.jbusres.2022.02.060

48. Mio, C., Costantini, A., & Panfilo, S. (2022). Performance measurement tools for sustainable business: A systematic literature review on the sustainability balanced scorecard use. *Corporate Social Responsibility and Environmental Management, 29*(2), 367–384. https://doi.org/10.1002/csr.2206

49. Muda, I., Erlina, Yahya, I., & Nasution, A. A. (2018). Performance audit and balanced scorecard perspective. *International Journal of Civil Engineering and Technology, 9*(5), 1321–1333. https://iaeme.com/MasterAdmin/Journal_uploads/IJCIET/VOLUME_9_ISSUE_5/IJCIET_09_05_146.pdf

50. Nadi, P. A., & Murad, A. (2019). Modelling sustainable urban transport performance in the Jakarta city Region: A GIS approach. *Sustainability, 11*(7), Article 1879. https://doi.org/10.3390/su11071879

51. Neri, A., Cagno, E., Lepri, M., & Trianni, A. (2021). A triple bottom line balanced set of key performance indicators to measure the sustainability performance of industrial supply chains. *Sustainable Production and Consumption, 26,* 648–691. https://doi.org/10.1016/j.spc.2020.12.018

52. Nikitas, A., Michalakopoulou, K., Njoya, E. T., & Karampatzakis, D. (2020). Artificial intelligence, transport and the smart city: Definitions and dimensions of a new mobility era. *Sustainability, 12*(7), Article 2789. https://doi.org/10.3390/su12072789

53. Oliveira, C., Martins, A., Camilleri, M. A., & Jayantilal, S. (2021). Using the balanced scorecard for strategic communication and performance management. In M. A. Camilleri (Ed.), *Strategic corporate communication in the digital age* (pp. 73–88). Emerald Publishing Limited. https://doi.org/10.1108/978-1-80071-264-520211005

54. Oliveira-Dias, D., Maqueira-Marín, J. M., & Moyano-Fuentes, J. (2022). The link between information and digital technologies of industry 4.0 and agile supply chain: Mapping current research and establishing new research avenues. *Computers & Industrial Engineering, 167,* Article 108000. https://doi.org/10.1016/j.cie.2022.108000

55. Olszańska, S., & Prokopiuk, I. (2021). Balanced scorecard as an effective method for process management in a transport company. *Scientific Journal of Silesian University of Technology. Series Transport, 111,* 119–128. https://doi.org/10.20858/sjsutst.2021.111.10

56. Pakurár, M., Haddad, H., Popp, J., Khan, T., & Oláh, J. (2019). Supply chain integration, organizational performance and balanced scorecard: An empirical study of the banking sector in Jordan. *Journal of International Studies, 12*(2), 129–146. https://doi.org/10.14254/2071-8330.2019/12-2/8

57. Perminova, O. M., & Lobanova, G. A. (2018). A logistic approach to establishing balanced scorecard of Russian oil-producing service organizations. *Acta Logistica — International Scientific Journal about Logistics, 5*(1), 1–6. https://doi.org/10.22306/al.v5i1.83

58. Quezada, L. E., Aguilera, D. E., Palominos, P. I., & Oddershede, A. M. (2021). An ANP model to generate performance indicators for manufacturing firms under a balanced scorecard approach. *Engineering Management Journal, 34,* 70–84. https://doi.org/10.1080/10429247.2020.1840877

59. Quezada, L. E., Reinao, E. A., Palominos, P. I., & Oddershede, A. M. (2019). Measuring performance using SWOT analysis and balanced scorecard. *Procedia Manufacturing, 39,* 786–793. https://doi.org/10.1016/j.promfg.2020.01.430

60. Raj, S. K., & Singh, N. K. (2020). Strategizing of fast food industries using a balanced scorecard approach: A case study of McDonald's corporation. *International Journal of Humanities, Arts and Social Sciences, 6*(6), 258–273. https://doi.org/10.20469/ijhss.6.20004-6

61. Sánchez-Márquez, R., Guillem, J. A., Vicens-Salort, E., & Vivas, J. J. (2018). A statistical system management method to tackle data uncertainty when using key performance indicators of the balanced scorecard. *Journal of Manufacturing Systems, 48*(Part A), 166–179. https://doi.org/10.1016/j.jmsy.2018.07.010

62. Saroha, M., Garg, D., & Luthra, S. (2022). Analyzing the circular supply chain management performance measurement framework: The modified balanced scorecard technique. *International Journal of System Assurance Engineering and Management, 13,* 951–960. https://doi.org/10.1007/s13198-021-01482-4

63. Schmidt, C. V. H., Kindermann, B., Behlau, C. F., & Flatten, T. C. (2021). Understanding the effect of market orientation on circular economy practices: The mediating role of closed-loop orientation in German SMEs. *Business Strategy and the Environment, 30*(8), 4171–4187. https://doi.org/10.1002/bse.2863

64. Shao, M., Han, Z., Sun, J., Xiao, C., Zhang, S., & Zhao, Y. (2020). A review of multi-criteria decision-making applications for renewable energy site selection. *Renewable Energy, 157,* 377–403. https://doi.org/10.1016/j.renene.2020.04.137

65. Sithole, L. T., Luke, R., Nabee, S. G. (2020). The impact of measuring driver performance in the bulk fuel supply chain. *Journal of Transport and Supply Chain Management, 15,* Article a583. https://doi.org/10.4102/jtscm.v15i0.583

66. Terziev, V., Georgiev, M., & Andreeva, O. (2020). Balanced Scorecard — Analysis of theoretical and applied solution. In *62nd International Scientific Conference on Economic and Social Development-Lisbon* (pp. 19–20). https://doi.org/10.2139/ssrn.3735895

67. Thuneibat, N. S. M., Ali, B. J., Alqaraleh, M. H., & Thneibat, H. (2022). The mediating role of innovation on the relationship between information technologies and reducing tax evasion. *Information Sciences Letters, 11*(5), 13–23. https://digitalcommons.aaru.edu.jo/cgi/viewcontent.cgi?article=1421&context=isl

68. Toklu, A. T. (2021). The impact of the customs on logistics performance: A research on the Sarp Border Gate. In A. Aliye (Ed.), *Reflections of economic development* (pp. 25–52). İksad Publishing House. https://avesis.erdogan.edu.tr/yayin/0e0e01f7-a92a-48f3-821c-6802029b4201/the-impact-of-the-customs-on-logistics-performance-a-research-on-the-sarp-border-gate

69. Tuan, T. T. (2020). The impact of balanced scorecard on performance: The case of Vietnamese commercial banks. *The Journal of Asian Finance, Economics and Business, 7*(1), 71–79. https://doi.org/10.13106/jafeb.2020.vol7.no1.71

70. Van den Heuvel, H., & Broekman, L. (1998). *Wolf in schaapskleren 2 — Scorecard nader gebalanceerd.* Personeelbeleid.

71. Vosoughi, S., Chalak, M. H., Yarahmadi, R., Abolghasemi, J., Alimohammadi, I., Anbardan, A. N., & Kanrash, F. A. (2021). Prioritization and assessment of safety key performance indicators in an automotive industry. *Sigurnost, 63*(4), 347–361. https://doi.org/10.31306/s.63.4.1

72. Wilkinson, A. (2022). *Human resource management: A very short introduction.* Oxford University Press. https://doi.org/10.1093/actrade/9780198714736.001.0001