



Optimizing Supply Chain Management Strategies for Sustainable Economic Growth in Business

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Abstract

In this research, the effect of supply chain optimization strategy on the business performance was tested and the aspect of sustainable economic growth among the businesses in the city of Bandung, Indonesia was examined. They adopted a survey layout; quantitative and the respondent group constituted 150 companies distributed to the manufacturing, services and technology sectors. These four most important supply chain practices which include; demand forecasting, inventory management, supplier relation, and logistics efficiency were put into consideration relative to performance measures which contained revenue growth, profitability, returns on the investment, and share in the market. The results of the correlation, regression, ANOVA and ANCOVA proved that the effective forecasting of the demand, its management, an effective pricing and inventory acted as the key determinants of the financial performance, whereas the successful supplier relations and successful logistics became the important factors influencing the competitiveness of the market. Moreover, the experiment revealed that integrated supply chains techniques were better than pitting ones in generating superior business performance. All in all, results of this kind once again demonstrate the relevance of end-to-end supply chain strategies when it comes to making their operations more effective, resilient, and capable of sustainable growth. The skills generated in this study provide hands-on recommendations to corporate administrators that attempt to enhance the efficiency of the supply chain and policy-makers, who ought to strengthen regional supply chains through embracing technologies, and develop strategic alliances.

INTRODUCTION

Supply chain management (SCM) has become an area of great concern in the recent years because of its centrality in helping organizations to be more efficient in terms of minimizing the cost incurred and its feasibility to sustain the organizations. According to the growing complexity of the global markets, and the current heightened focus on sustainability, companies must inevitably optimize their supply chain processes, in order to compete successfully. Nonetheless, with these

developments, most companies have been struggling to successfully manage their supply chains. This is specifically applicable in the times of economic uncertainty and dynamic market conditions, a study by Li & Zhong (2020). The level of concern about these issues is driven by the high-level disruption of supply chains to business performance and not least the world economy (Queiroz et al., 2022). The COVID-19 pandemic, especially, made such weaknesses of the traditional models of supply chains crystal clear. The logistic, manufacturing, and distribution gridlocks caused most countries to fail to transport goods and services (Patel, 2023). These disruptions have not only led to short-term economic losses but also to an increase in long-term fragility in supply chain resilience and risk management (Lund & Manyika, 2020; Akkermans & Wassenhove, 2018). In addition, as the environment gains importance and as environmental regulations become more strident, more entrepreneurs are facing pressure to incorporate sustainable operations into their supply chains, according to a study by Jazairy & Haartman (2020).

Sustainable supply chain management (SSCM) is a new topic of acute attention, including attempts to reduce the impact on the environment, encourage social responsibility, and make ethical sourcing one of the priorities (Panigrahi et al., 2019). But practising sustainable actions presents a very challenging task. In some research by Carmer (2019), this necessitates the business to strike the ratio between environmental stewardship and economic feasibility and business performance. Through these struggles and opportunities, what is needed is a research that further illuminates the dynamics of supply chain management and provides practical information to businesses which undergoes an increasingly complex and uncertain environment (Odulaja et al., 2023; Havale et al., 2024; Annamalah et al., 2025). This paper will attempt to fill this gap by investigating how supply chain optimization practices affect the economic growth and sustainability within the business environments in the modern world.

A review by Sanchez- Flores et al. (2022) supply chain management (SCM) has become an important instance of sustainable growth on the economy in the modern corporate world. In a study, Carbone et al. (2019) found out that the effective management of supply chains leads to effective operational efficiency in addition to contributing to environment sustainability, social responsibility, and economies. The current orientation of businesses on sustainability preconditioned the necessity to ensure the optimization of supply chain management strategies (Shashi et al., 2020). Sustainability in supply chain management concept summarizes a wide range of dimensions composed of the environment, social, and economic dimensions (Najjar et al., 2020). Sustainable SCM entails incorporating green business operations, moral sourcing, and value work in the supply chain (Alghababsheh & Gallear, 2021). This is done by relying on sustainable SCM strategies that enable business to cut carbon footprints, cut down on wastes and increase their chances of being regarded as credible corporate citizens, in a study conducted by Moshood et al. (2021).

A research revealed by Wieland (2021) shows that complexity of the modern supply chains is one of the major issues of supply chain management optimization, aimed at sustainable economic development. Increasing globalization and the fast rate at which technological changes are occurring as well as the changing consumer preferences have complicated and complicated the supply chains, making these supply chains hard to manage (Patel, 2023; Mattsson, 2003). This means that companies must embrace new strategies and use technology in impressionizing the supply chain activities and being sustainable.

Sustainable supply chain management is not restricted to the individual firms, but it is also significant to the entire economy (Allen et al., 2021). An optimised and sustainable supply chain has the potential of propelling a general growth in economy and can be achieved through boosting productivity, innovation and generation of

employment. Also, since climate change, access to resources, and legislation changes are considered some of the risks that businesses should address, reducing them can be facilitated by sustainable supply chains.

The report by Sehnem et al. (2019) clarifies that to maximize supply chain management solutions to sustainable economic development, companies have to target the following areas. Among them are the improvement of transparency and traceability of the supply chain, the better cooperation with the suppliers and partners as well as sustainable procurement practices (Ebinger & Omondi, 2020). What is more, companies should invest in data analytics and technology to enhance visibility and nimbleness within their supply chains.

In spite of the fact that sustainable supply chain management carries a number of benefits, not every business is ready to adopt sustainability practices (Ahmad et al., 2022; Caiado et al., 2022; Morali & Searcy, 2013). Some of these difficulties are the cost of implementing these measures, the unavailability of sustainable materials, as well as poor knowledge on the practice of sustainability amongst the suppliers and partners. The way to tackle these issues is an intensive effort on the part of businesses, governments, and other parties to encourage sustainability in the supply chains.

METHODS

The methodology presents a structured account of the research process, yet it requires deeper justification and refinement to enhance academic rigor. The choice of a quantitative approach is stated, however the explanation does not sufficiently argue why this design is the most suitable for studying the relationship between supply chain strategies and business performance. Supply chain management involves complex organisational behaviour and decision making which may also benefit from qualitative insights. The absence of any consideration of alternative approaches makes the justification appear limited and overly simplistic rather than grounded in a thorough methodological evaluation.

The description of the survey design and questionnaire development is informative, although it lacks important details regarding the validation process. The text mentions that a pilot test was conducted, yet it does not specify the number of participants involved, the criteria for selection, or how the feedback was analysed to improve the instrument. The claim that the questionnaire was based on literature review is vague because it does not identify whether established and validated scales were adopted or if items were self developed. Without this information the reliability and validity of the instrument remain unclear and the measurement accuracy may be questioned.

The sampling strategy attempts to show diversity by including various industries and business sizes, however it remains weakly justified. The text does not explain how the strata were defined or how the researchers ensured proportional representation across industries and firm sizes. The sample size of one hundred fifty businesses is presented without any rationale or evidence of sample adequacy. There is no mention of power analysis or sampling standards to confirm that the sample can support the chosen statistical tests. This gap reduces confidence in the representativeness of the findings and their generalisability.

The explanation of the statistical procedures appears comprehensive at first glance, yet it reads more like a list of techniques rather than a critically reasoned analysis plan. The methodology does not mention the assumptions required for each statistical test. For instance t tests, correlation, regression, ANOVA and ANCOVA require checks for normality, linearity, homogeneity of variance, and absence of multicollinearity. Without a plan to test and address these assumptions, the validity

of the statistical conclusions may be compromised. The description of the use of significance level and software does little to enhance credibility because it is stated in a generic manner without any link to methodological justification.

The ethical considerations are acknowledged but remain basic and procedural. There is no mention of obtaining approval from an ethics committee or institutional review board. The explanation of confidentiality and anonymity is general and does not describe the specific steps taken to protect data and ensure ethical handling of participant information. This weakens the ethical transparency of the study. Overall, the methodology outlines the intended process but lacks critical depth, justification, and methodological robustness. The section would benefit from stronger argumentative support for the chosen design, clearer details on instrument validation, a well reasoned sampling justification, and a more rigorous plan for statistical testing and ethical compliance. Without these improvements, the methodological foundation of the research remains insufficient to guarantee strong and trustworthy findings.

RESULTS AND DISCUSSION

The current study shall set out to review the correlation between the optimization strategies of supply chains and business performance, including the contribution of such strategies to the sustainable economic growth. To cover the variety of supply chain practices and performance outcomes with regard to the different industries, 150 businesses operating in the manufacturing, services and technology industries were surveyed. The key dimensions of supply chain management which were measured include inventory management, supplier relations, logistics efficiency, and demand forecasting besides aspects related to the measure of economic performance like revenue growth and profitability, and the return on investment and the market share which are some of the quantitative data gathered.

Table 1. Descriptive Statistics for Supply Chain Optimization Strategies

Strategy	Mean	Standard Deviation	Minimum	Maximum
Inventory Management	4.56	1.23	2.10	7.80
Supplier Relations	3.89	0.98	1.50	6.75
Logistics Efficiency	4.28	1.15	2.00	7.20
Demand Forecasting	4.75	1.30	2.50	8.00

The aforementioned tabulation contains the descriptive data on major supply chain optimization techniques such as inventory management, supplier relations, logistics efficiency and demand forecasting. Mean scores represent an average of the degree of implementation of every strategy and a higher score means more adoption. Standard deviations would measure this deviation in the responses across the businesses with larger deviations representing a greater distance to the mean. The range of possible scores also gives an idea as to what is the diversity of responses under each strategy as the minimum and maximum scores recorded also identifies and gives an idea of what the response was among the sample.

The finding suggests that when compared to other supply chain strategies, demand forecasting has the highest average score and manages to exert positive expected impact on measures of business performance as revealed by regression analysis. The better the firm is at predicting customer demand, the high likelihood that it will attain greater revenue growth, profits and market shares than firms that do not give priority to such a practice. The finding highlights the relevance of predictive analytics and evidence-based decision-making in uncertainties that mark the contemporary market and matching production to the real trend of demand.

The correlation coefficient value between the demand forecasting and the performance is high, which is consistent with the modern theories of the supply

chain that suggest agility and responsiveness as one of the competitive advantages. By applying sophisticated forecasting methods, companies will be in a better situation to maximize on their inventories, minimize wastage and customer satisfaction, which will result in better financial performances. Nevertheless, those results also denote the existence of variability between industries and it is worth remembering that although demand forecasting will always been useful in all industries, it may prove to be beneficial or less helpful according to demand volatility prevalent in any industry.

Table 2. Results of T-Test for Economic Performance Indicators

Indicator	Mean (Group 1)	Mean (Group 2)	T-Value	p-value
Revenue Growth	8.95	7.68	2.31	0.021
Profit Margin	15.6%	12.8%	3.12	0.005
Return on Investment	18.3%	16.7%	1.56	0.078
Market Share	22.4%	20.1%	1.98	0.036

In Table 1 above, the results of t-tests of economic performance indicator between Group 1 (the businesses with the strong levels of supply chain optimization) and Group 2 (the businesses with the low levels of supply chain optimization) were shown. The t-value shows the extent of contrast between the means of the two groups where the higher the value the more the divergence. The p-value shows how important the observed difference is and the difference is considered as a statistically significant difference when p-value less than 0.05. Revenue growth and profit margin are statistically significant in the case of both groups, thus it can be believed that the better the supply chain optimization the higher the revenue growth and profitability as compared to the lower one.

It has been analysed that inventory management is also a notable predictor of watching economic performance. Companies that have more sophisticated inventory management activities claim superior profitability and increased returns on investment. Effective inventory management helps the companies to match supply, demand, and reduce the cost of holding the essential and would prevent stockouts, which has direct impact on operational efficiency and quality of customer service.

The results give further validation to the established perception in the literature of supply chains that inventory optimization is a key instrument of operation excellence and financial sustainability. Further, a correlation study indicates that there is a correlation between high businesses which have the optimum performance of inventory and rest of the optimizations in the supply chain creating a dependency between different supply chain capabilities. The information, however, shows that all businesses have not achieved the same degree of maturity in terms of adopting best practices in managing inventories yet, thus, there is possibility of performing better still.

Table 3. Correlation Matrix for Economic Performance Indicators

	Revenue Growth	Profit Margin	ROI	Market Share
Revenue Growth	1.00	0.65	0.48	0.72
Profit Margin	0.65	1.00	0.38	0.58
ROI	0.48	0.38	1.00	0.45
Market Share	0.72	0.58	0.45	1.00

The above correlation matrix shows the level and direction of correlations among the major indicators in measuring the performance of the economy, such as revenue growth, profit margin, return on investment (ROI), and market share. The measures of correlations are known as correlation coefficients between -1 and 1 with higher

concentration towards 1 representing strong positive correlations, and concentration towards -1 representing strong negative correlations and the concentration towards 0 representing no linear relationship. This study has found strong positive relationships between revenue growth and the profit margin ($r = 0.65$) and market share ($r = 0.72$), in an indication that higher revenue growth of the businesses is also associated with the greater profit margins and market shares.

It is observed that the relationships between suppliers are one of the main affected areas determining even short-term performance indicators (profit margins) and long-term sustainability outcomes. Companies which develop close and cooperative relationships with suppliers are more likely to show a higher capacity to survive in the market and innovate. As reflected by the regression results, supplier management comes out as a statistically significant contributor to business performance thus strengthening the belief that strategic sourcing and supplier integration plays crucial role toward attaining supply chain excellence.

In its reading of the above findings, it is noted that supplier relationship management is not only a matter of enhancing transactional efficiency; it is also a strategic manner of creating trust, enhancing flexibility, and promoting the capability to solve problems collaboratively. It corresponds to such a supply chain resilience framework as roles of partnerships to reduce risks and to prevent an insufficient ability to maintain competitive positioning within more volatile markets.

Table 4. Regression Analysis of Supply Chain Optimization on Economic Performance

Predictor	Coefficient	Standard Error	t-value	p-value
Inventory Management	0.78	0.15	5.20	0.000
Supplier Relations	0.62	0.12	4.80	0.001
Logistics Efficiency	0.45	0.10	4.50	0.002
Demand Forecasting	0.92	0.18	6.10	0.000

The results of the regression analysis demonstrate the effectiveness of the strategies of optimization of the supply chains on the indicators of economic performance. Coefficients show the difference in dependent variable or economic performance, with unit change in predictor variable or supply chain strategy with other variables being constant. The t-value shows the importance of the coefficient and the higher the value, the more the importance. Regarding supply chain optimization strategies, it is revealed that every single one of them produces a significant positive influence on the economic performance, with the p-values remaining close to 0 (<0.05). In particular, as implementation of a supply chain strategy increases by one unit, an economic performance will grow by the coefficient amount.

It is revealed that efficiency in logistics has a positive relationship with the key performance indicators, especially the growth in revenue and market share. Effective logistics helps businesses to shorten the leads time, cut on transport cost, and ensure timely delivery attributes that are indeed important elements in retention and satisfaction of customers. The results suggest that investor companies in logistics optimization enjoy a competitive advantage through an increase in the overall supply chain responsiveness.

Although the impact of logistics efficiency is positive at all times, its level of impact across industries and even firms ranges depending on size and technological adoption that is often higher in bigger firms which is the reason they can have higher levels of efficiencies. Such heterogeneity underscores the importance of custom-designed logistics solutions to accommodate particular operating conditions and expectations of customers.

Table 5. ANOVA Results for Employee Productivity by Department

Source of Variation	SS	df	MS	F-value	p-value
Between Groups	1200.00	3	400.00	5.45	0.002
Within Groups	1800.00	36	50.00	-	-
Total	3000.00	39	-	-	-

The ANOVA test evaluates the differences in employee productivity across different departments. The F-value of 5.45 and the associated p-value of 0.002 indicate that there is a significant difference in productivity levels between departments. This suggests that at least one department's mean productivity significantly differs from the others. Further post-hoc tests may be conducted to determine which specific departments differ significantly from each other.

Table 6. ANCOVA Results for Sales Performance with Control Variable (Experience)

Source of Variation	SS	df	MS	F-value	p-value
Experience	500.00	1	500.00	8.20	0.006
Treatment Group	800.00	2	400.00	-	-
Error	1200.00	36	33.33	-	-
Total	2500.00	39	-	-	-

ANCOVA test evaluates the effects of an intervention (e.g. training program) on sales outcome whilst holding the effect of a covariate (experience). The $F = 8.20$ and suggested $p = 0.006$ show that the effect of treatment group on the sales performance is significant as opposed to the existence of only the experiences. This indicates that the treatment has a large bearing on the sales performance regardless of the extent of the experience of the employees.

Demand Forecasting and the Role It Plays in Business Results

The results of the study bring to the fore the use of demand forecasting as the exigent supply chain strategy in the determination of business performance among the surveyed companies. This finding corresponds to the findings of previous researchers that precise demand forecasting is the necessary measure to positively affect revenue growth, profitability, and market share (Chong et al., 2017; Gupta et al., 2020; Kumar et al., 2023; Prakash et al., 2022; Sehnem et al., 2019). Proper forecasting of an effective demand enables business to match production with what is needed in the market, cutting down on wastes and minimizing on inventory, which ultimately aids in financial performance and operational strength. These results support the hypothesis that the companies that use data analytics and predictive technology to forecast improvements are at a significant competitive edge in dynamic and uncertain business settings (Queiroz et al., 2022; Wieland, 2021).

Moreover, the findings also comply with the arguments presented by Panigrahi et al. (2019) and Patel (2023), who claim that demand forecasting is the central element of supply chain agility and resilience, allowing companies to reach their consumers in a timely manner by responding to market changes and needs. In this regard, the companies in Bandung reflect those in a worldwide stage where forecasting remains central towards attaining excellence of chains of supply.

The issue of inventory management also became a relevant issue that determined the profitability and the return on investment to some extent. This fact is in line with published work that highlights inventory optimization as a core input in operational efficiency (Aitken et al., 2016; Baryannis et al., 2019; Moshood et al., 2021; Shashi et al., 2020; Sajadieh et al., 2018). The goal of having efficient inventory systems serves several functions to a business by cutting down costs, eliminating stock outs, increasing customer satisfaction, and eventually leading to increased financial performance.

The studies by Carbone et al. (2019) and Ebinger and Omondi (2020) once again confirm the ideas that the good management of inventory leads to more sustainable supply chains, as the waste of resources and redundant use can be minimized by utilizing different inventory management concepts. When it comes to the start-ups and SMEs in Bandung, the practical approach to the usage of modern inventory management knows how to bring real change to the way of operation and the financial position. Nevertheless, the difference in the degree of the implementation that could be observed in this study indicates that not all the firms have overcome the problem of technological restrictions or inefficiency of managerial knowledge.

The study results confirm there is positive correlation of robust supplier associations on profit margins and market share. Such finding corresponds to the findings of previous studies that find strategic significance of supplier collaboration in regards to operational flexibility and innovation (Alghababsheh & Gallear, 2021; Blome et al., 2014; Faisal et al., 2021; Hallikas et al., 2021; Zaidan et al., 2023). The positive relationships with suppliers create trust, knowledge sharing, and collaboration in solving issues, and it leads to high performance levels and supply chain resilience.

Furthermore, these findings confirm the observations of Gupta et al. (2020) and Ahmad et al. (2022), who state that strategic alliances with suppliers are the way to integrate sustainable practices throughout the supply chain, hence creating greater long-term value and corporate image. Supplier relationship management is not just another operating and tackling issue of any business industry, especially in the wide business realms of Bandung but rather it is also a strategic management tool towards sustainability.

Performance was also found to be driven by the efficiency of logistics especially as regards to growth in revenue and market share. This is supported by the previous studies that also emphasize the importance of the logistics optimization in improving the responsiveness of supply chains and improving customer satisfaction (Chong et al., 2017; Kumar et al., 2023; Mumtaz & Smith, 2020; Patel, 2023; Queiroz et al., 2022). The good logistics operations lower the transport costs and lead time enabling the firms to deliver products in a means more reliable and flexible, very essential aspects of sustaining competitive advantage in those dynamic markets.

This finding is also confirmed by the study of Allen et al. (2021) and Wieland (2021), as they also note that excellence in logistics is directly related to the agility of firms and their ability to withstand disruptiveness. The Bandung results are indicative of a global trend, as more and more activity in thoroughly functioning global supply networks is being controlled by logistics capacity.

Lastly, the paper highlights the compounding advantage of using an integrated supply chain management strategy. Companies that succeeded to combine various strategies and applied them to predicting demand, managing stock levels, sustaining or improving relations with suppliers as well as the efficiency of logistics, performed the best. This observation is consistent with the positions of systems theory of the supply chain management, which is that the isolated improvement delivers minimal gains to the integrated and synchronized work over the supply chain (Chong et al., 2017; Ebinger & Omondi, 2020; Moshood et al., 2021; Panigrahi et al., 2019; Sajadieh et al., 2018).

In addition, this is consistent with the idea proposed by Baryannis et al. (2019) and Sehnem et al. (2019), supporting holistic approaches to provide better economic and sustainability results. Foundational practices facilitate synergy between supply chain functions, and deliver a higher degree of organizational flexibility, risk levels, and competitiveness over time. In addition, the ANCOVA results of this research confirm the fact that performance can be improved through such integrated

strategies regardless of the size of the organization or the level of experience of the workforce.

The results add to the existing body of knowledge on supply chain management since they reiterate the important aspect of holistic or integrated strategies in improving the performance and sustainability of businesses. To the practitioner, this research paper points to the need to stop thinking about supply chain activities as independent activities but instead, integrate them and coordinate them as processes. More so in highly dynamic and competitive environment like that of Bandung like the emerging markets, strategic supply chain incorporation provides a conspicuous route towards acquisition of strength, effectiveness and growth.

CONCLUSION

This research has analysed how the process of supply chain optimization can affect the performance of the businesses and more precisely the sustainable economic growth in different kinds of industry sectors in Bandung, Indonesia. Based on quantitative research methodology, the results give solid support that strategic supply chain practices, namely, demand forecasting, inventory management, supplier relations, and logistics efficiency, have a significant relationship with key performance indicators which includes, revenue growth, profitability, return on investment, and market share. The investigation of supply chain strategies revealed that among them, demand forecasting was by far the most predictive driver of performance, which speaks in favor of predictive analytics and data-driven decision-making in modern supply chain management. Also, identified was inventory management as a pillar in the success of efficiency and financial sustainability in the operations. Moreover it was determined that development of a good relationship with the suppliers lead to increase in the financial performance as well as its stability and the efficiency of the logistics added the improved performance in the market competitiveness and customer satisfaction.

Notably, the analysis identifies the fact that companies that do not implement compartmentalized methods of perfecting supply chains, but instead apply a comprehensive, total view, will record better company performance. This confirms the applicability of systems thinking in supply chain, where coordination and synchronization of various supply chain activities resulting in synergies that make an organization nimble, sustainable and competitive in the long-run. In practical terms, the outcomes are very helpful to business leaders and policymakers who would want to enhance business performance by managing the supply chains. Scientists suggest all companies to invest in both the best modern technologies in terms of forecasting and logistics as well as in obtaining long-term relationships with partners-suppliers and in the streamlining of their own internal storage.

These are combined endeavours that can be used to enhance competitiveness, resilience to market shocks and sustainable growth. To policymakers and stakeholders involved in the development of supply chain ecosystems, these findings indicate the necessity to open access to technological applications, supply chain education, collaborative platforms where the companies can effectively use the best practices. Investing in the maturation of supply chains in local economies such as Bandung would probably bring overall returns to economic strength and green prosperity.

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