

# Examining Financial Performance and Supply Chain Process Strategy for a Pharmaceutical Company

Albertus Charles Kotze<sup>1\*</sup>, Peter John Kilbourn<sup>2</sup>

<sup>1\*</sup>Department of Transport and Supply Chain Management, University of Johannesburg, Johannesburg, South Africa, Orcid: 0009-0008-2266-7443

<sup>2</sup>Department, of Transport and Supply Chain Management, University of Johannesburg, Johannesburg, South Africa, Orcid: 0000-0002-7599-0251

## Keywords

Supply chain process  
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## Abstract

Many organisations aim to meet their financial targets by aligning strategies and processes. However, a misalignment between corporate goals and supply chain operations often leads to sub-optimal processes and poor financial performance.

This study examines the link between an organisation's financial performance objectives and the supply chain process strategy that best supports those objectives. Specifically, it focuses on a major pharmaceutical organisation operating in South Africa.

The study utilises a case study approach, employing the Analytic Hierarchy Process method to identify the organisation's preferences regarding financial objectives, and supply chain processes. Financial and decision analysis techniques are applied to analyse primary and secondary data.

The research demonstrates that the case organisation's procurement process plays a pivotal role in supporting operating efficiency and financial objectives for the company. The findings contribute to the existing body of supply chain knowledge by exploring the relationship between corporate financial and supply chain objectives and their mutual impact.

This study highlights the significance of integrating supply chain processes with financial performance objectives and provides insights into selecting the most suitable supply chain process to support an organisation's financial goals.

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<sup>1\*</sup> albert.kotze@gmail.com  
<sup>2</sup>pkilbourn@uj.ac.za

# 1. Introduction

## 1.1. Background

Most corporate business strategies are ultimately expressed and measured in financial terms. It is also quite commonly advocated in supply chain literature that a critical requirement for business organisation success is that their supply chain strategies are aligned with or support their corporate strategies (Stravulaki & Davis, 2010; Durga, Venkata, & Narayana, 2012). Therefore, there should be alignment between the financial objectives and supply chain process strategies of the organisation. However, little research has been done to investigate the relevance of specific supply chain processes to the financial objectives of business organisations (Stravulaki & Davis, 2010; Eslami, Jafari, Achtenhagen, Carlbäck & Wong, 2021).

Strategy alignment from a supply chain perspective is not a new field of study. According to Durga, et al., (2012), when a company's competitive strategy and supply-chain strategy are not aligned, the supply chain may fail to meet customer demands. To resolve this, the company should understand customer needs, develop a competitive strategy to improve its market position, and ensure the supply-chain strategy complements the competitive approach, maximising customer satisfaction. Wu, Jim Wu, Chen & Goh (2014) found that choosing the appropriate corporate environmental strategy in line with a company's supply chain strategy leads to improved firm performance, achieved through increased revenue, reduced costs, or a combination of both. However, there are several reasons why business organisations may not align their supply chain processes including a lack of understanding of how improvements in supply chain management processes can add value to the business (Santos, Mota & Alencar, 2021) especially those related to the financial bottom line of the business (Ellram & Cooper, 2014). Elgazzar (2013) conducted a study focused on enhancing the financial performance of a manufacturing organisation in Egypt through improved supply chain performance and recommended further research on different organisations across various economic sectors and global locations. To that end, this study analysed the link between an organisation's financial performance objectives and the supply chain process strategy that best supports those objectives.

Important indicators to assess an organisation's financial performance encompass the effective deployment of capital, operational efficiency, and asset efficiency (Sondhi, 2003). Operational efficiency is measured by the net profit margin (calculated as operating expenses divided by total revenue), while asset-use efficiency is measured using the asset turnover ratio (total sales divided by total assets) (Pierre, Pascal, Maurizio, Yann & Antonio, 2017). The supply chain of an organisation, encompassing its total operations, plays a direct and indirect role in the efficiency levels of organisations (Fatorachian, & Kazemi, 2020). Therefore, the primary objectives of supply chain management (SCM) include reducing the organisation's overall cost base while simultaneously enhancing customer satisfaction and operational performance (Coyle, Langley, Novack and Gibson, 2016).

A process approach is increasingly followed in managing supply chain activities (Lambert, 2014). According to the Global Supply Chain Forum, supply chain management (SCM) involves integrating key processes across a network of stakeholders and facilities involved in procuring raw materials, transforming them into intermediate and final products, and delivering them through a distribution network (Lambert, 2014; Murphey & Knemeyer, 2018). Establishing a link between an organisation's strategic financial objectives and its supply chain operations allows for aligning supply chain processes and performance with financial performance. This enables supply chain executives to focus on processes that positively contribute to financial objectives and facilitates developing and deploying an appropriate supply chain strategy. By optimising supply chain processes, organisations can achieve increased return on investment (ROI), optimal asset utilisation, improved customer service, and ultimately enhance shareholder value (Elgazzar, Tipi, Hubbard & Leach, 2012; Langley, Novack, Gibson, & Coyle, 2021).

There are various supply chain processes to consider for alignment with the corporate strategy of a business organisation. Simon, SatoloScheidl, and Di Sèrio (2014) identified six conceptual models in the literature related to supply chain management (SCM) that focus on integrating business processes. Each model delineates a set of crucial business processes for a company to handle, and subsequently, the model facilitates their integration with primary key customers and suppliers. Among these models are the supply chain operations reference (SCOR) model and the Global Supply Chain Forum (GSCF) model, both of which offer clear descriptions of the essential supply chain processes (Santos et al., 2021). Stavroulaki and Davis (2010) highlight that the primary supply chain process models do not explicitly explain how they aim to influence a company's supply chain strategy. Additionally, these models lack a connection to the company's competitive strategy.

Two critical supply chain processes identified by the GSCF and the APICS Supply Chain Council (now the Association for Supply Chain Management (ASCM)) through its Supply Chain Operations Reference (SCOR) best practice framework, are the procurement and order fulfilment processes (Lambert, 2014; ASCM, 2023). Procurement connects the organisation with its network of suppliers and enables the efficient and effective provision of the material and/or product supplies needed by the organisation to operate and add value to the supply chain (Langley et al., 2021). Simultaneously, order fulfilment is a key supply chain process by virtue of it being responsible for the generating, filling, delivering and servicing of customer orders (Lambert, 2014; Murphey & Knemeyer, 2018).

This study compared the suitability of both operational efficiency and asset use efficiency as financial objectives for a pharmaceutical company and considered the feasibility of both procurement and order fulfilment as supply chain processes that must be prioritised for the organisation to be profitable and competitive.

## **1.2. Problem Statement**

The financial performance objectives of an organisation play a crucial role in determining and shaping its supply chain process strategies. A top-down approach is necessary to connect supply chain process strategies with the financial performance objectives, wherein the corporate objectives drive the development of supply chain process strategies (Lambert, 2014; Langley et al., 2021). When assessing the financial performance of the organisation, crucial financial performance indicators to consider should address the efficient use of capital, which is determined through operational efficiency, and asset use efficiency (Sondhi, 2003).

The literature review conducted as part of this study reveals a lack of research linking the financial performance objectives of organisations with their supply chain process strategies. The study used a Gauteng-based university's digital library and search tool to evaluate the accessible literature. The online databases accessed include EBSCO Host, GALE Cengage Learning, African Journal Archive, ISI Web of Knowledge, Cambridge Core and Cambridge Journals, EBSCO Host eBook Collection, Emerald Insight, Springer Link, JSTOR, MarketLine, Oxford University Press, ProQuest, Taylor and Francis Online, and Wiley Online Library.

Furthermore, Pharma X (the case company) has expressed the need for future research on aligning their financial objectives and supply chain process strategy. It is crucial for Pharma X's supply chain process strategy to align with its financial performance objectives, as these objectives are the primary drivers that determine the formulation of appropriate supply chain process strategies. This research would provide valuable insights for Pharma X in making informed decisions regarding its supply chain process strategy. Furthermore, it fills the existing literature gap and provides additional evidence specifically within the South African pharmaceutical industry.

In conclusion, there is a gap in the existing literature regarding the alignment between strategic financial performance objectives and supply chain process strategies. Furthermore, a need was expressed by the case company for a study on the alignment between their financial objectives and supply chain process strategies.

## **1.3. Research objectives**

Building upon the research problem statement outlined in the previous section, the primary research question is formulated as follows: Which supply chain process should Pharma X focus on, to achieve greater alignment between the organisation's financial performance objectives and supply chain processes?

Therefore, the objectives of this study are:

1. To analyse Pharma X's operating efficiency, as measured by net profit margin, and asset use efficiency, as measured by asset turnover, using the DuPont Analysis, to determine which of

these two factors' contributions are more important as a financial performance objective using Analytic Hierarchy Process decision analysis.

2. To determine which of the following two supply chain processes, namely, the procurement process or order fulfilment process, contributes most to improving the financial performance of Pharma X, using AHP decision analysis.

## **2. Literature Review**

This section provides a discussion of the fundamental concepts that have been introduced and utilised in this research. These concepts form the basis upon which the rest of the study is built.

### **2.1. Financial Viability**

Organisations operating in today's global markets face constant change and must effectively manage it to remain competitive and survive (Coyle et al., 2016). The forces of change that significantly impact organisations and their markets include globalisation, technological advancements, organisational consolidation, the power of informed customers, and government policies and regulations. When developing corporate-level strategies to adapt to these changes, executives must consider the long-term direction and competitive position of the organisation. These strategies should involve resource allocation and the development of new capabilities to create a sustainable competitive advantage (Oliver & Parrett, 2018).

While there are various perspectives on why a business organisation exists, it is argued that the most important reason is to be financially viable. Financial viability has two aspects: long-term profitability and short-term solvency and cash flow generation. Profitability is essential for an organisation's sustenance, just as food is essential for the human body. Making a profit allows organisations to grow, develop, and be sustained (Hartley, Firer & Ford, 2011). Selling more products and services while minimising costs increases shareholder value and the organisation's overall value (Kaplan & Norton, 2004). To remain competitive and maximise shareholder value, organisations must leverage market opportunities, overcome market threats, and develop effective and efficient strategies. Strategies aimed at cost reduction, quality improvement, and productivity maximisation play a vital role in outperforming competitors. Effective strategy deployment and trade-off management are critical success factors in this regard (Chan, Tang, Lau & IP, 2002).

### **2.2. Value Analysis**

The DuPont Analysis (DPA) model developed by the DuPont Chemical Company provides a comprehensive framework for evaluating financial performance, which is widely used (Herciu, Ogresan & Belascu, 2010). The DPA model provides insights into financial performance and aids in understanding an organisation's overall financial health (Camerinelli, 2009; Firer, Ross, Westerfield & Jordan, 2012). The DPA focuses on two key aspects: profit margin and asset turnover. Profit margin,

measured by the net profit margin (NPM) ratio, indicates the organisation's profitability after accounting for all costs and expenses. Asset turnover, measured by the asset turnover (ATO) ratio, evaluates the efficiency of using assets to generate sales (Ward & Price, 2011). Organisations can identify strengths and weaknesses by analysing these elements and accordingly direct management efforts (Isberg, 1998).

Key financial performance measures to consider when evaluating the organisation's financial performance include the efficient use of capital, operating efficiency, and asset use efficiency (Sondhi, 2003). Operating efficiency is measured in terms of net profit margin (operating expenses/total revenue), and asset-use efficiency in terms of asset turnover (total sales/total assets) (Pierre, Pascal, Maurizio, Yann & Antonio (2017).

### **2.3. Supply Chain Management**

Supply chain management (SCM) involves integrating and coordinating activities across a network of facilities, suppliers, intermediaries, and customers. It aims to lower costs, increase customer satisfaction, and enhance operational performance (Council of Supply Chain Management Professionals, 2018). SCM impacts an organisation's profitability, liquidity, asset utilisation and efficiency (Johnson & Templar, 2009; Van Weele & Rozemeiger, 2022).

Successful organisations recognise that effective SCM contributes positively to performance. They understand SCM's impact on cost control, quality improvement, responsiveness, and flexibility, leading to a sustainable competitive advantage (Presutti & Mawhinney, 2007). SCM principles focused on supply chain performance measurement play a vital role in achieving customer satisfaction and organisational profitability (Anderson, Britt & Favre, 1997; Wisner, Tan & Leong, 2016).

### **2.4. Strategic disconnect**

There is often a disconnect between strategic objectives and operational capabilities within organisations. Effectively linking corporate strategy, supply chain strategy, and supply chain performance is crucial for achieving competitive advantage and supporting the overall corporate strategy (Harrison & New, 2002; Langley et al., 2022). Shrewd executives understand the importance of SCM in improving competitiveness, controlling costs, and achieving strategic objectives (Presutti & Mawhinney, 2007).

Organisations can focus on specific processes and their impact on financial performance by connecting supply chain processes and strategic financial objectives. Models such as the Economic Value Added (EVA) and Supply Chain Operations Reference (SCOR) models provide frameworks for measuring and managing this connection (Elgazzar et al., 2012).

Elgazzar et al. (2012) revised a model created by Presutti and Mawhinney (2007) and integrated the focus on profitability and operational efficiency from the DuPont Analysis (DPA). Their model, depicted in Figure 1, enables organisations to connect the performance of their supply chain processes

to their strategic financial goals. By utilising the DPA analysis, which emphasises financial reporting, organisations can assess the effectiveness and efficiency of their supply chain operations (Elgazzar et al., 2012). Simultaneously, the SCOR model can be used to identify and describe supply chain process strategies (Elgazzar et al., 2012).

Performance Attributes							
SCOR Level 1 Supply Chain Metrics	Customer Facing			Internal Facing		Economic Value Added	DuPont Analysis
	Reliability	Responsiveness	Flexibility	Cost	Asset Management		
Perfect Order Fulfillment	●					Revenue	Profitability and Efficiency
Order Fulfillment Cycle Time		●					
Upside Supply Chain Flexibility			●			Cost	Profitability
Upside Supply Chain Adaptability			●				
Downside Supply Chain Adaptability			●				
Supply Chain Management Cost				●			
Cost of Goods Sold				●			
Cash-to-Cash Cycle Time					●	Assets	Efficiency
Return on Supply Chain Fixed Assets					●		
Return on Working Capital					●		

**Figure 1: Supply chain metrics linked to financial performance attributes.**

Source: Elgazzar, et al. (2012).

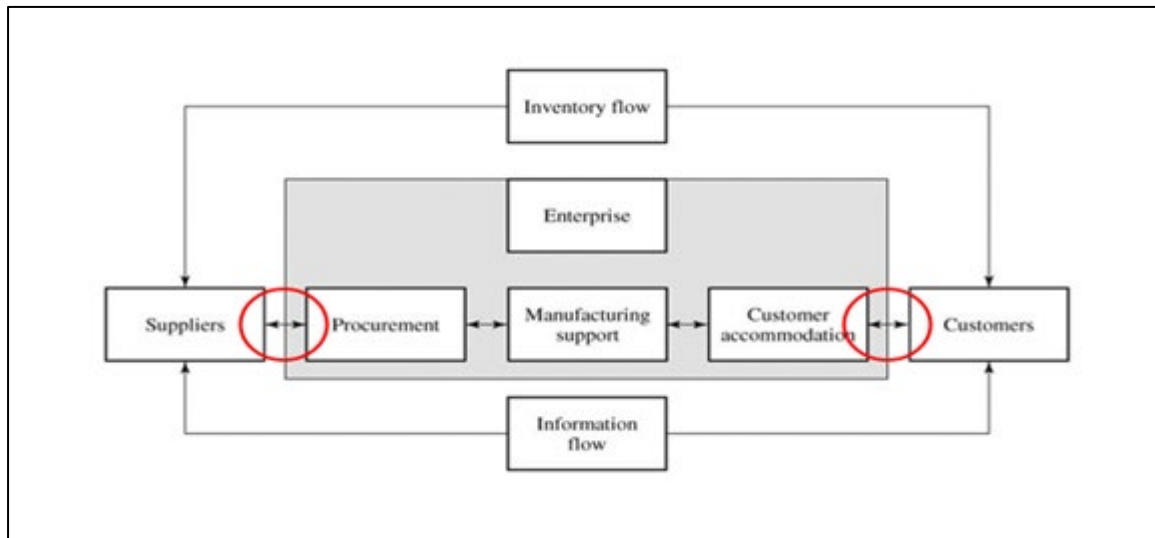
## 2.5. Organisational strategy

A strategy involves defining goals, actions, and resource allocation to achieve an organisation's objectives (Jones & George, 2014). Effective strategy focuses on establishing sustainable competitive advantage and alignment between activities, leading to superior performance (Porter, 1996). Strategic positioning and operational effectiveness contribute to profitable growth, requiring distinctive and focused activities, activity design fit, and effective communication (Porter, 1996).

## 2.6. Supply chain integration

Integrated supply chains involve multiple partners collaborating to create a cohesive, high-performing business model. The integration enables increased market impact, efficiency, ongoing improvement, and competitiveness (Langley et al., 2021). Aligning and integrating operations across the entire supply chain is critical for operational success (Lambert & Enz, 2017). For organisations to achieve effective competition, expanding their network integration by incorporating suppliers and customers is crucial. This necessitates alignment and integration throughout the entire supply chain to ensure ongoing operational success. Figure 2 illustrates the integration points between the organisation's internal operations (shaded area in Figure 2) and its suppliers and customers, along with the associated

information flows. Procurement connects suppliers and the organisation's internal operations, while customer accommodation facilitates the link between customers and the organisation's internal operations (Bowersox et al., 2007).



**Figure 2. Supply chain integration**

Source: Bowersox et al. (2007)

All operational processes within the organisation must be managed and executed well, but certain strategically critical processes must be focused on as they create the differentiation of the organisation's strategy (Kaplan & Norton, 2004). To that end, two processes can be identified as critical from the perspective of supply chain integration based on the work of Bowersox (2007), as illustrated in Figure 2, namely procurement and order fulfilment (also described as customer accommodation).

### 2.7. The procurement process

The procurement process focuses on acquiring products and services from external suppliers. It ensures the continuous flow of materials and goods to support manufacturing or trading activities while maintaining the lowest total cost (Bowersox et al., 2007; Van Weele & Rozemeijer, 2022). Effective procurement involves activities such as procurement planning, purchasing, inventory control, and receiving (Council of Supply Chain Management Professionals, 2018).

### 2.8. Order fulfilment process

The order fulfilment process encompasses activities related to providing customer service and includes order receipt, processing, storage, handling, transportation, and distribution. Effective order fulfilment ensures customer satisfaction, increased sales volumes, reduced costs, and optimal inventory investment (Shapiro et al., 2004; Lambert, 2014; Langley et al., 2021). Integrated logistics processes are required for optimal customer service levels and are crucial in meeting customer expectations (Bowersox et al., 2007; Lambert, 2014; Langley et al., 2021).



## **2.9. Supply chain process performance management**

Performance measurement is vital for understanding how operational tasks contribute to overall organisational objectives (Coyle et al., 2016; Collier & Evans, 2020). The SCOR model provides a best practice framework to measure supply chain performance based on reliability, responsiveness, agility, cost, and asset management capabilities (ASCM, 2023). Aligned performance metrics should be linked to the organisation's corporate strategy and focus on customer requirements, operational processes, balance, and technology for effectiveness (Coyle et al., 2016).

## **2.10. Multi-Criteria Decision Analysis**

Ishizaka and Nemery (2013) argue that decision-making processes, such as ranking, sorting, and selecting choices, have become intricate due to their complexity, often involving multiple criteria. Consequently, the traditional approach of focusing on a single criterion when making decisions, be it in forming long-term business partnerships or addressing environmental and sustainable concerns, is no longer the standard practice. Rather, it is now essential to consider multiple criteria, as rarely will a single option meet all the requirements perfectly. Multi-criteria decision analysis (MCDA) techniques, such as the Analytic Hierarchy Process (AHP), developed by (Saaty, 2008) help organisations make decisions by considering multiple criteria and alternatives. AHP breaks down decisions into a hierarchy of pairwise comparisons and measures consistency to ensure reliable analysis (Saaty, 2008). It has been successfully applied across various industries and institutions (Bodin & Gass, 2003). According to Mu and Pereyra-Rojas (2017), the Analytic Hierarchy Process (AHP) is a decision-making technique that organises choices in a hierarchical manner, illustrating the interrelationships among decision criteria. Additionally, the AHP method enables the incorporation of intangible elements like experiences, preferences, and intuition in a straightforward and well-organised manner (Mu & Pereyra-Rojas, 2017).

## **2.11. The pharmaceutical market**

Globally, the pharmaceutical market value for 2021 was 1,454.66 billion and is expected to increase to \$3201.02 Billion by 2026 at a compound average growth rate of 19.2% (The Business Research Company, 2023), North America is the largest region in the pharmaceuticals market (The Business Research Company, 2023).

The pharmaceutical markets in Africa are experiencing growth across various segments. It is projected that between 2017 and 2030, prescription drugs will grow at a compound annual growth rate of 6.5%, generics at 10%, over-the-counter medicines at 7.1%, and medical devices at 12.1%. This growth is primarily driven by factors such as increasing urbanisation, expanding healthcare capacity, and a supportive business environment (Goldstein Market Intelligence; 2023). Most growth opportunities are concentrated in cities rather than at the national level. A recent study indicates that 30 cities in Africa will house 37% of the continent's consumers, surpassing the combined number of consuming

households in Australia and the Netherlands by 2025. South Africa is the largest pharmaceutical market in Africa, with a market size of &3.9 billion in 2021 (Goldstein Market Intelligence; 2023).

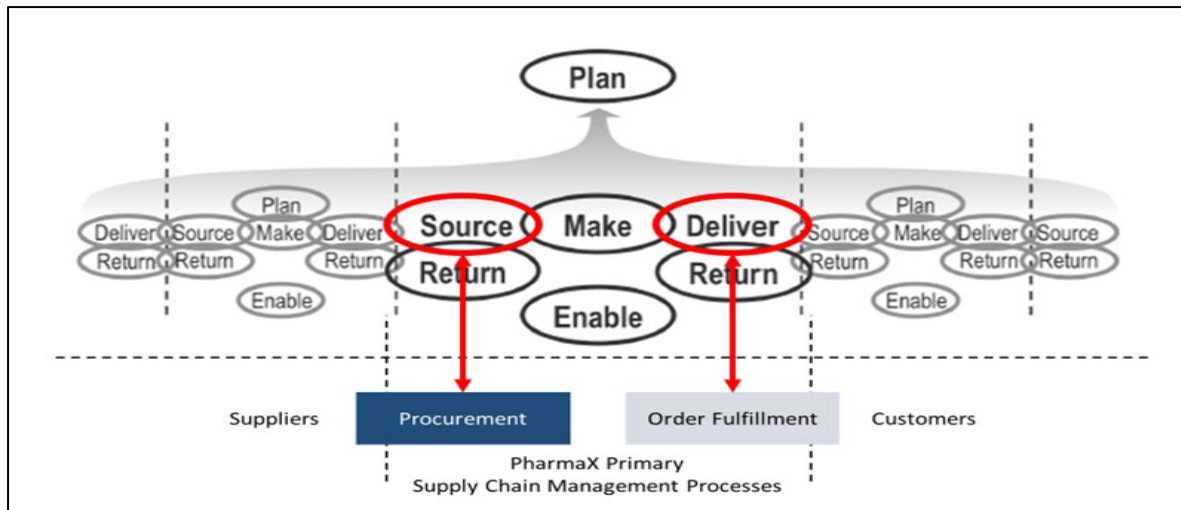
The South African government has played a leading role in stimulating growth by establishing the South African Health Products Regulatory Authority, which aims to accelerate product approvals and ensure high product quality. In 2016, South Africa accounted for 0.6% of the global pharmaceutical market in terms of market value, while the United States accounted for 39.8% (MarketLine, 2017).

Competition within the South African market is strong, with buyers wielding significant purchasing power and suppliers having moderate power. Barriers to entry are high, and the threat of new entrants is moderate. Substitute products, particularly generics and biosimilars, pose a strong threat (MarketLine, 2017).

### **3. The case company**

This study focuses on one of the top five global pharmaceutical organisations operating in South Africa, specialising in generic products. To keep the company's details confidential, the company's name will be reported as Pharma X. The company imports and distributes branded pharmaceutical products manufactured according to the organisation's specifications and standards.

Pharma X's main objective is to ensure broad access to essential medications and healthcare services for patients at affordable prices. They achieve this by offering a diverse range of cutting-edge products in both over-the-counter (OTC) and generic categories. Pharma X emphasises effective customer-focused operations and implements innovative patient management strategies. This allows them to operate across South Africa and other African countries, utilising a supply chain that involves multiple global suppliers for importing a wide variety of branded products. Their comprehensive distribution network serves a broad customer base, including large retail organisations, hospital and healthcare franchises, and privately owned pharmacies. Pharma X follows a make-to-order (MTO) approach, with a primary focus on procurement and order fulfilment, aligning with the SCOR model level 2 supply chain processes of sourcing make-to-order products (sS2) and delivering make-to-order products (sD2) (refer Figure 3) (APICS Supply Chain Council, 2012).



**Figure 3: Pharma X's primary supply chain management processes**  
Source: Adapted from APICS Supply Chain Council (2012)

#### 4. Research Methodology

This study follows a single embedded case study research strategy, which is exploratory in nature. The chosen research methodology for this study is a mixed-method approach, which combines both qualitative and quantitative data collection and analysis. Primary data sources include interviews conducted with Pharma X's executive and supply chain management teams, while secondary data sources involve analysing Pharma X's financial results spanning five years. A cross-sectional time horizon is employed, offering a snapshot of the phenomenon under investigation at a specific point in time. Structured interviews were conducted with Pharma X's executive and supply chain management teams to gather the primary data.

Thirteen participants were selected for the study based on their organisational roles and responsibilities. Seven of the participants were executive management team members, while the remaining six were part of the supply chain management team. The chosen participants were individuals who held significant positions and were actively involved in decision-making within their respective teams. Their extensive experience and knowledge of the organisation and the competitive market were factors considered in their selection for participation in the study.

To collect qualitative data, pairwise questionnaires were used, specifically designed for the AHP analysis technique. These questionnaires focused on obtaining decision preferences, expressed numerically, along with accompanying explanations or justifications for the specific preferences made. This approach allowed for a detailed description of the decisions made and provided contextual information for each preference.

Quantitative data were obtained from the financial statements of the organisation and its competitors. The financial data were analysed using the DPA method of financial statement analysis. Both methods are widely used and recognised as trusted methods of analysis. The DPA method is commonly used in

financial performance analysis, while the AHP method is used as an MCDM technique. These methods provide a structure and framework for analysing Pharma X's data.

#### **4.1. Ethics**

Ethical clearance has been granted by a Gauteng-based university's ethics committee for the study (ethical clearance code: 2018TSCM-033BM), making provision for the control of sensitive organisational information and the anonymity of the case organisation and its participants. The identity of the case organisation and employees associated with the organisation, products of the organisation's market and trade, as well as any other proprietary information associated with the organisation will not be disclosed or made public in this study. The case company has also requested that the organisation's identity not be made public. Hence the organisation has been referred to as Pharma X in the study.

### **5. Results and Findings**

The results are reported in accordance with the study objectives and research design. The first step involves determining Pharma X's financial performance objectives. This is achieved by conducting a DPA analysis of Pharma X's financial statements, followed by an AHP analysis to identify the prioritised and preferred financial performance objectives of the company.

The second step focuses on establishing Pharma X's supply chain process priorities and preferences. Utilising the AHP analysis, the study determines which supply chain processes are prioritised and preferred by Pharma X. The final step of this section presents the results of the analysis, summarising the outcomes of the assessments conducted on Pharma X's financial performance objectives and supply chain process priorities.

#### **5.1 Pharma X's Financial Performance**

The DPA formula enables operating efficiency and asset-use efficiency to be evaluated and measured in the same equation. Secondary financial data was obtained from Pharma X summarised financial statements, Marketline Pharmaceuticals in South Africa report on the pharmaceutical industry (2017) as well as from the annual financial statements and annual reports from competitive companies (competitors 1-5) for the period 2013 to 2017. The authors used the data to calculate operating efficiency and asset-use efficiency ratios for the relevant period.

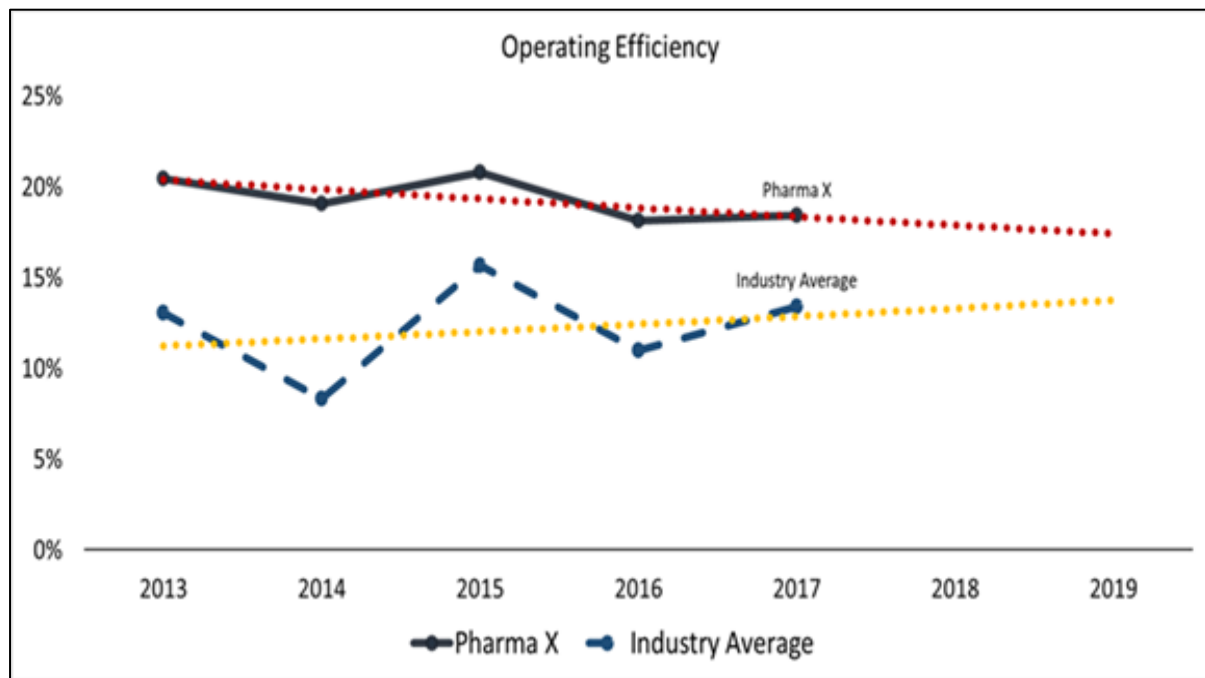
**Operating Efficiency.** The results of a DPA analysis of Pharma X's financial performance in terms of operating efficiency against the leading competitors in the South African market are presented in Table 1. This is followed by Figure 4 which graphically illustrates Pharma X's financial performance in terms of operating efficiency against the industry average within the South African pharmaceutical market. All calculations are made by the authors of this study.

**Table 1: Pharma X's operating efficiency compared to competitors.**

Operating Efficiency	2013	2014	2015	2016	2017
<b>Pharma X.</b>	<b>20.5%</b>	<b>19.0%</b>	<b>20.8%</b>	<b>18.1%</b>	<b>18.4%</b>
Competitor 1.	10.7%	-26.7%	3.8%	3.2%	9.4%
Competitor 2.	0.3%	8.7%	7.5%	4.9%	4.8%
Competitor 3.	18.2%	17.0%	14.4%	12.1%	12.4%
Competitor 4.	17.4%	19.0%	35.5%	13.8%	15.7%
Competitor 5.	11.2%	12.9%	12.3%	13.9%	19.9%
<b>Industry Average.</b>	<b>13.0%</b>	<b>8.3%</b>	<b>15.7%</b>	<b>11.0%</b>	<b>13.4%</b>

Source: Own compilation

**Asset-use efficiency.** DPA analysis of Pharma X's financial performance in terms of asset-use efficiency against the leading competitors in the South African market is presented in Table 2. Figure 5 graphically illustrates Pharma X's financial performance in terms of asset use efficiency against the industry average within the South African pharmaceutical market.



**Figure 4: Pharma X operating efficiency – a comparative analysis**

Source: Own compilation

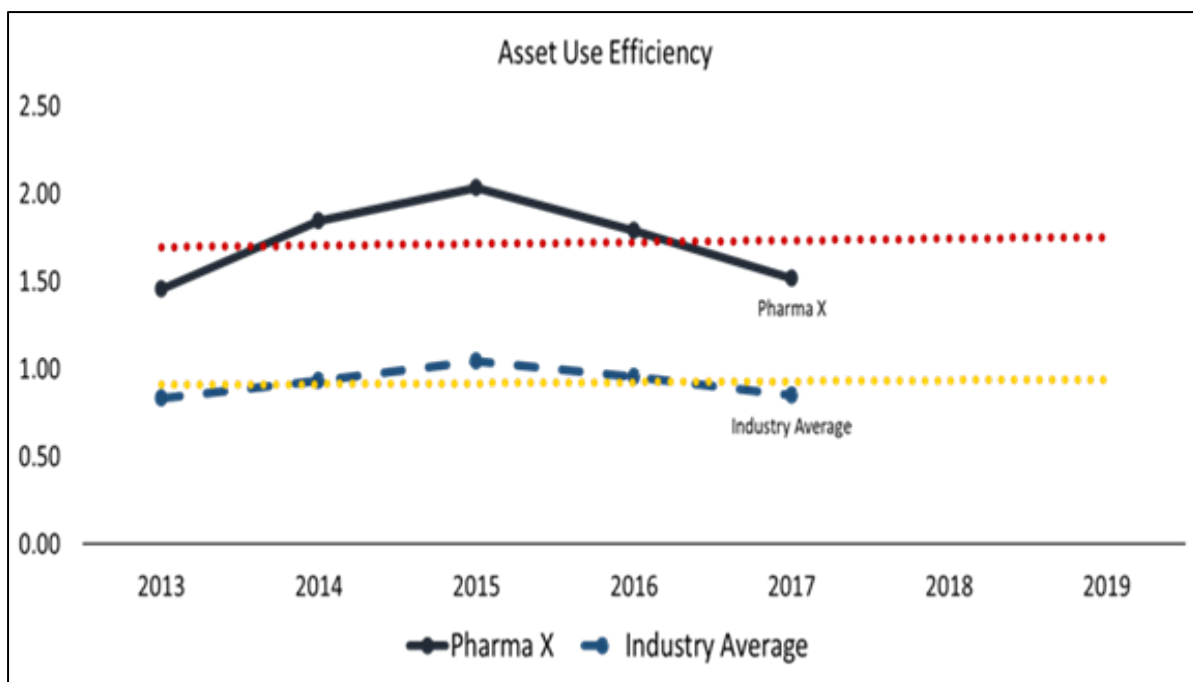
**Table 2: Pharma X's asset use efficiency.**

<b>Asset Use Efficiency</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>
<b>Pharma X.</b>	<b>1.45</b>	<b>1.84</b>	<b>2.03</b>	<b>1.79</b>	<b>1.52</b>
Competitor 1.	0.81	0.89	0.97	0.99	1.07
Competitor 2.	0.63	0.63	0.77	0.68	0.44
Competitor 3.	0.43	0.36	0.41	0.34	0.35
Competitor 4.	0.42	0.43	0.38	0.37	0.37
Competitor 5.	0.35	0.35	0.34	0.32	0.35
<b>Industry Average.</b>	<b>0.83</b>	<b>0.93</b>	<b>1.05</b>	<b>0.95</b>	<b>0.85</b>

Source: Own compilation

The following conclusions can be made from the competitive financial analysis above. Pharma X possesses a clear competitive edge in terms of operating efficiency compared to its competitors. However, there has been a decline in the organisation's operating efficiency, suggesting that there is room for improvement in cost management. Meanwhile, the industry average for operating efficiency is steadily increasing, indicating that Pharma X's competitors are enhancing their operational effectiveness. This situation may negatively impact Pharma X's ability to compete effectively in the market.

While Pharma X enjoys a notable advantage over competitors in terms of asset-use efficiency, this efficiency has been diminishing since 2015. This decline suggests that the management of assets such as inventory, accounts receivables, equipment, property, and cash and cash equivalents could be enhanced for greater productivity. Although the industry average has also experienced a decline, Pharma X's decline has been more significant than the industry average. This presents an opportunity for Pharma X to improve the utilisation of their assets to generate sales, which could have a positive impact on its competitive position in the market.



**Figure 5: Pharma X asset-use efficiency – a comparative analysis**  
 Source: Own compilation

## 5.2. Pharma X's financial performance objective preference

Pharma X's participants were requested to specify their preference between operating efficiency and asset utilisation efficiency as the primary financial performance objectives. and had to indicate their preference on a pairwise questionnaire similar to that in Table 3. An Analytic Hierarchy Process Analysis (AHPA) of individual preference decisions has been concluded, and the calculations and outcomes of the computed results are also provided in Table 3. The group of decision-makers from Pharma X comprises 13 participants, with seven belonging to the executive management team and the remaining six representing the supply chain management team. Out of the 13 participants, 11 expressed a preference for Operating Efficiency over Asset-Use Efficiency, while two participants did not exhibit a specific preference for either option (Refer to Table 4).

**Table 3: Pairwise questionnaire scale**

Your expert judgement:					
Verbal Judgement	Extremely important	Very strongly more important	Strongly more important	Moderately more important	Equally important
Numeric Judgement	9/8	7/6	5/4	3/2	1

Source: Own compilation

**Table 4: Pharma X's participants' individual preference decisions**

Participant	Financial Performance Objective			Team
	OE	AUE	CR	
BCB	0.875	0.125	0.000	EXT
BKB	0.500	0.500	0.000	SCT
CAC	0.833	0.167	0.000	EXT
CNC	0.875	0.125	0.000	EXT
DJD	0.833	0.167	0.000	SCT
ERE	0.900	0.100	0.000	EXT
JRJ	0.833	0.167	0.000	SCT
JTJ	0.900	0.100	0.000	SCT
NMN	0.500	0.500	0.000	SCT
PEP	0.875	0.125	0.000	EXT
SJB	0.875	0.125	0.000	SCT
TST	0.875	0.125	0.000	EXT
YSY	0.833	0.167	0.000	EXT

Source: Own compilation

The individual preference decisions of each participant have been aggregated to determine the overall preference decision of the group. This collective preference is established by calculating the geometric mean of the individual participants' preference decisions. The calculation of the geometric mean is performed using the GEOMEAN function in Microsoft Excel. The geometric mean of the participants indicates a significantly stronger preference of 5/4 towards operating efficiency compared to asset-use efficiency.

According to the results of the AHP analysis, Pharma X exhibits a preference for operating efficiency as the primary financial performance objective for the organisation. The group decision reveals that Pharma X strongly prefers operating efficiency, with a preference of 83.3%, compared to asset-use efficiency, which received a lower group preference of 16.7%. As part of the AHP analysis, the following open questions were asked to the group of decision-makers in support of their specific preference:

- Why does Pharma X prefer Operating Efficiency over Asset-Use Efficiency?
- What actions should Pharma X take to improve Operating Efficiency?

### **5.2.1. Why does Pharma X prefer Operating Efficiency over Asset-Use Efficiency?**

The conclusions noted below show the pattern that the Pharma X group decision-makers prefer operating efficiency over asset-use efficiency for the following reasons:

- Pharma X's core operations revolve around marketing and sales, with production and distribution being outsourced to external service providers. Consequently, Pharma X does not possess a significant asset base in terms of production and distribution infrastructure. The effective management of procurement costs, landed product costs, and marketing and distribution activities



become crucial for ensuring optimal bottom-line performance. Additionally, how products and product categories are managed within their respective markets significantly impacts Pharma X's operating efficiency.

- Participants highlighted that Pharma X operates in a volume-driven environment where sales throughput is a key driver. Efficient management of the entire cycle from procurement to sales and related cost management plays a vital role in achieving the organisation's overall financial goals.
- Some participants stated that operating efficiency is more important in unlocking organisational value than asset-use efficiency. Managing operational costs in procurement and sales activities is deemed more significant than simply improving asset utilisation. Pharma X's focus lies in leveraging operational efficiency and cost optimisation.
- Two major factors affecting operating efficiency identified by participants are government decisions regarding product pricing and the ability to forecast future exchange rates. Exchange rate fluctuations significantly impact Pharma X's operations and financial efficiency, as approximately 95% of the cost of goods sold (COGS) is affected by currency movements.
- Operations efficiency, coupled with sales, drives Pharma X and plays a key role in maximising long-term financial success and overall performance.

### **5.2.2. What actions should Pharma X take to improve Operating Efficiency?**

The conclusions noted below followed a common theme. The group of Pharma X decision-makers proposes the following actions to improve operating efficiency:

- Several participants emphasised the importance of enhanced involvement and alignment between the operational and sales teams to ensure the timely availability of procured products for distribution in the market.
- Participants stressed the need for increased collaboration with suppliers to manage costs and service levels effectively. Since product prices and price increases are regulated by the government, Pharma X must focus on controlling procurement costs, COGS, and increasing sales volumes.
- Managing inventory and associated costs were identified as key factors by some participants. Maintaining an optimal inventory level is essential to serve existing customers and take advantage of competitors' stock shortages.
- Integration of Pharma X's systems was highlighted by some participants to improve reporting. Effective utilisation of data and information plays a central role in enhancing operating efficiency. A greater emphasis on business intelligence and market information utilisation is necessary. Having visibility of this information enables quick response to market demand and customer requirements. Efficient management of all processes, from procurement to sales, is crucial for achieving operational efficiency. Improved system visibility allows for proactive responses to market changes.

- Cost analysis should be conducted for all shipments to assign the most effective and efficient mode of transport. Ocean and air freight are the primary transportation modes for procured products. Factors such as transport lead time, entry points into South Africa, and product urgency influence the choice of transportation mode.
- A few participants suggested that Pharma X should consider engaging multiple service providers, particularly for warehousing and distribution services.
- Improved business processes encompassing resource planning, raw material planning, and production and distribution planning of finished goods are necessary. A cost-benefit analysis should precede all demand and supply requirements and fulfilment needs, both for new and existing products.
- Some participants emphasised the importance of enhancing resource skills through training and education to improve operating efficiency.

### **5.3. Pharma X's Supply Chain Process Preference**

An analysis of the individual preference decisions in terms of the procurement process and order fulfilment process was completed. A summary of the calculated results is provided in Table 5. The group of decision-makers from Pharma X comprises thirteen participants, with seven belonging to the executive management team and the remaining six representing the supply chain management team. Out of the thirteen participants, nine expressed a preference for the procurement process (PP) over the order fulfilment (OF) process. On the other hand, three participants preferred the order fulfilment process over procurement, while one participant did not have a specific preference for either the procurement or order fulfilment process.

The group preference decision is derived by combining the individual preference decisions of each participant. This combined preference is determined through the calculation of the geometric mean using the GEOMEAN function in Microsoft Excel. The geometric mean of the participants indicates a moderately stronger preference of  $3/2$  towards operating efficiency in comparison to asset-use efficiency.

Based on the AHP analysis, the group preference decision of the Pharma X participants indicates that their supply chain process preference is the Procurement Process (75%) over the Order Fulfilment Process (25%).

**Table 5: Pharma X's participants' individual AHP preference decisions**

Supply Chain Process			
PP	OF	CR	Team
0.875	0.125	0.000	EXT
0.125	0.875	0.000	SCT
0.167	0.833	0.000	EXT
0.875	0.125	0.000	EXT
0.875	0.125	0.000	SCT
0.100	0.900	0.000	EXT
0.833	0.167	0.000	SCT
0.833	0.167	0.000	SCT
0.900	0.100	0.000	SCT
0.875	0.125	0.000	EXT
0.875	0.125	0.000	SCT
0.875	0.125	0.000	EXT
0.500	0.500	0.000	EXT

**Source: Own compilation**

The group of decision makers were asked the following open-ended questions as part of the AHP analysis and in support of their specific preference:

1. Why does Pharma X prefer the Procurement Process over the Order Fulfilment Process?
2. What actions should Pharma X take to improve the Procurement Process?

### **5.3.1 Why does Pharma X prefer the Procurement Process over the Order Fulfilment Process?**

The conclusions below reflect the preferences of the group of decision-makers at Pharma X, favouring the procurement process over the order fulfilment process for the following reasons:

- Several participants emphasised that the procurement process is the area where Pharma X can exert the most influence. It allows the organisation to be effective and efficient in terms of operations, supplier collaboration, and cost optimisation.
- Some participants highlighted that Pharma X possesses greater bargaining power and flexibility during the procurement process and related activities. This enables negotiation with suppliers regarding product specifications, service levels, and purchase prices. In contrast, the order fulfilment process provides less leverage and room for price adjustments since the national government regulates prices and price increases.
- Pharma X has more choices when it comes to selecting suppliers and raw materials for formulating and producing the required finished products. However, the organisation is limited to a single service provider for managing the order fulfilment operations. This constraint reduces Pharma X's ability to negotiate lower prices and cost savings with their service provider.

- Procurement has a more significant financial impact on the organisation in terms of potential cost savings and operational effectiveness achieved through supplier relationships.
- Participants noted that the procurement process ensures the availability of products to meet customer demand. It focuses on the timely procurement of the right products from suppliers, using cost-effective and efficient transport modes based on cost analysis and product demand urgency.
- Some participants stated that the procurement process is the initial step in the customer satisfaction process. It facilitates the order fulfillment process, ensuring the availability of the right products at the right time and cost, based on specific market demand.
- Participants recognised that inefficiencies in the procurement process can adversely affect the order fulfilment process, leading to out-of-stock scenarios, potential client losses, and clients switching to other suppliers or substitute products.
- The procurement processes directly impact Pharma X's costs and profitability. The reliability of product suppliers is crucial, particularly since Pharma X specialises in supplying generic medicines. Timely and accurate supply is vital to retain patients' and doctors' trust, as they may shift to alternative products if Pharma X fails to meet their requirements promptly and consistently.

### **5.3.2. What actions should Pharma X take to improve the Procurement Process?**

The following proposed actions to improve the procurement process were noted by the group of Pharma X participants:

- Several participants highlighted the importance of classifying suppliers based on their ability to meet Pharma X's specific requirements and provide value-added services. It is crucial to have a reliable base of suppliers as well as alternative suppliers to ensure flexibility in procurement. This allows Pharma X to switch to alternative suppliers if primary suppliers face supply constraints or disruptions, such as product recalls or manufacturing downtime.
- Participants suggested closer collaboration with primary suppliers and their sub-contractors, along with enhanced visibility into their operations.
- Some participants recommended collaborating with suppliers to improve lead times, increase stock holding, and enhance inventory availability. This includes collaborative planning for events with increased demand, improved communication regarding orders and order status, maintaining visibility of inventory levels, and understanding supplier fulfilment lead times.
- Participants stressed the importance of accurate demand forecasting, incorporating business intelligence and considering supplier capabilities and production restrictions as part of the forecast process.
- Pharma X should focus on improving the planning of procurement activities to ensure the sourcing and procurement of correct raw materials and finished goods are aligned with customer demand

requirements. Procuring all necessary items in the bill of materials and making them available on time for production lead times is essential.

- Some participants emphasised that effective procurement management should encompass timely order placement, selecting the appropriate products and suppliers for each order cycle, and optimising order management within supplier parameters and service level agreements to prevent inventory out-of-stock situations.

## 6. Conclusion

The main findings of the study are reported in accordance with the main objectives of the study. The case study conducted at Pharma X yielded two main findings, which are discussed below.

**1. Financial Performance Objectives:** The decision-makers displayed a strong preference for operating efficiency as the chosen financial performance objective over asset-use efficiency through supply chain process management. Operating efficiency received a group preference of 83.3%, whereas asset-use efficiency received a group preference of 16.7%. This should be seen in the context of the finding that the case study's operating efficiency was calculated to be exceeding that of its direct competitors in this study. However, the study determined that a downward trend was evident in terms of operational efficiency for the case company and that the matter must be addressed for improvement. For the case organisation, the management of supply chain assets such as inventory, accounts receivables, equipment, property, and cash and cash equivalents could be enhanced for greater productivity, therefore efficiency. This finding should also be considered in the context of the case company whose core operations evolve around marketing and sales, with production and distribution being outsourced to external providers, which reduced the asset base required to get products to market. To that end, the effective management of procurement costs, landed product costs, and marketing activities become crucial for ensuring optimal bottom-line performance.

The identification of operational efficiency as a preferred financial performance objective for the case company's supply chain executives supports the work of Pienaar, Vogt, Havenga, Kussing & Nilsson (2017), indicating operating efficiency as an important financial objective linked to operational logistics and supply chain performance. SCM has a significant impact on the financial performance of organisations by means of its impact on both costs and sales, which are both key determinants for operational efficiency and organisational profitability (Langley et al., 2021).

**2. Supply Chain Processes:** The study also revealed a preference amongst the participants for the procurement process over the order fulfilment process as the supply chain process contributes most towards improving the financial performance of Pharma X. The procurement and order fulfilment processes were presented to the decision-makers, and using the AHP method of decision analysis, the group preference was determined. The analysis indicated that the procurement process scored 75% preference, while the order fulfilment process received a group preference of 25%. Hence, the decision-

makers consider the procurement process as the most influential contributor to the organisation's financial performance within the supply chain. This finding is in line with the first main finding placing an emphasis on operating efficiency as a main financial objective, since the procurement function presents many opportunities for cost reductions in an organisation that has outsourced production and distribution.

The result of this study suggests a positive relationship between the efficient and effective management of the procurement process and the ability of organisations to improve their operating efficiencies. This finding supports the view provided by Van Weele and Rozemeijer (2022) that the procurement function offers significant opportunities for cost reductions since most companies spend more than half their turnover on purchased products and services. This finding also supports the work of Wisner, Tan and Leong (2016), who indicate that procurement forms the foundation of supply chain management through its impact on incoming material quality, delivery timing, purchase price, product safety and environmental impact. Furthermore, the finding agrees with the theory that smarter procurement is a very efficient means of improving profits in organisations where the impact is felt in a dualistic way through both cost savings and service improvements (Wisner et al., 2016).

## **7. Managerial implications and recommendations**

Pharma X possesses a notable advantage over its competitors in terms of operating efficiency, despite experiencing a decline in this area. The decline indicates a need for improved cost management within the organisation. Additionally, the industry average for operating efficiency is steadily increasing, suggesting that competitors are improving in this aspect. The dual impact of this scenario may negatively impact Pharma X's ability to compete effectively in the market in the future, and the matter should be addressed. It should, however be noted that supply chain management also has a significant impact on revenue generation (the other critical factor used to determine operating efficiency). Therefore, for optimal performance, supply chain executives should pay attention to the required trade-offs to be considered between cost reduction and revenue generation when decisions are made regarding supply chain process improvements.

Based on the results of the AHP analysis, Pharma X demonstrates a preference for prioritising operating efficiency rather than asset-use efficiency. This result is further explained by the fact that Pharma X has core functions in marketing in sales rather than in production and distribution which are both asset-rich functions. Furthermore, the case organisation operates in a volume-driven industry. To that end, operational efficiency is key to the success of the organisation. The findings of this study provide insight into high-level opportunities for improvement in terms of operating efficiency for the case organisation. These can be summarised as follows:

- To effectively manage procurement costs (including product landed costs)

- To effectively manage sales costs
- To reduce the cash-to-cash cycle of products
- To manage exchange rate risks and costs associated with imported products

The study also revealed some more detailed initiatives that the case organisation can implement to improve operational efficiencies including the improvement of cooperation and alignment between operational and sales teams, increasing collaboration with suppliers, optimising inventory volumes, increasing the integration and use of information systems, implementing total cost analyses when deciding on inbound transportation, considering the use of multiple distribution service providers, improving resource planning, and the enhancement of skills.

Pharma X favours the procurement process as the supply chain process that contributes the most to enhancing operating efficiency. It is therefore recommended that Pharma X focuses on improving the costs and service factors associated with the procurement process. To support this improvement, the implementation of reliability performance measurements based on the SCOR model is suggested. Furthermore, Pharma X could also adopt SCOR's critical operating efficiency performance measurements to ensure that the correct focus is placed when monitoring key activity performances.

From the study, useful practical information was obtained from decision-making participants regarding further improvement initiatives for Pharma X regarding its procurement process. To that end, Pharma X should consider prioritising the following activities within their procurement process:

- Enhancing collaboration with their supplier base.
- Implementing process integration between Pharma X and their suppliers.
- Establishing system integration between Pharma X and their suppliers.
- Improving visibility into the operations and inventory availability of Pharma X's suppliers.

This study demonstrates that when faced with competing objectives, processes, and attributes, the application of multi-criteria decision-making can determine the preferred objective, process, and attribute.

## **8. Final Conclusions, Limitations and Future Research**

This study examined the connection between a case organisation's financial performance goals and the most effective supply chain strategy to achieve those objectives. The objective was to identify the supply chain process that best aligns with the organisation's financial performance goals. The research focused on Pharma X, a major pharmaceutical company operating in South Africa. Financial data was analysed using the DuPont analysis, while the Analytic Hierarchy Process method was employed to determine the organisation's preferences regarding financial objectives and supply chain processes.

The study demonstrated how these methods can be applied to identify the most supportive supply chain process for an organisation's financial goals by utilising financial and decision analysis techniques on

primary and secondary data. The main finding suggests that a dependable supply chain procurement process significantly contributes to Pharma X's operational efficiency and financial objectives. This research also contributes to the existing body of knowledge on supply chain and logistics by exploring the relationship between corporate financial and supply chain objectives and their mutual impact.

This research study's conclusions and results rely on qualitative and quantitative data collected specifically from Pharma X and a group of significant decision-makers within the organisation. It is important to note that these findings cannot be broadly generalised to all organisations or industries.

The study utilised the SCOR model to determine and suggest the most suitable supply chain process activities. The SCOR model and related performance measurements are designed to identify and recommend optimal practices for supply chain processes. This study gave particular attention to the sS2 procurement process and the sD2 order fulfilment process, which are primary processes within the SCOR model. The planning processes associated with these, namely the sP2 plan source and sP4 plan deliver processes, were not the primary focus of the study. The scope of the study was limited to selecting the most appropriate supply chain process for Pharma X when faced with the choice between the sS2 procurement and sD2 order fulfilment processes.

Further research using this study's methods and reference model is recommended. The following are some recommendations to consider but is by no means a complete or exhaustive list:

- The DPA and AHP analysis and SCOR model can be used as a structured framework to identify the most appropriate organisational objectives, the preferred supply chain processes, the preferred supply chain attributes, and the supply chain performance measurements relevant to the corporate strategies of organisations in other industries.
- The results of this study can be compared with those of a similar study conducted on pharmaceutical organisations with insourced production and distribution operations. Such a study should consider more key supply chain processes, including the planning and distribution processes, for a more complete analysis.

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