

Effect of Internal Competencies on the Operational Performance of Manufacturing Firms in Chemical and Allied Industry, Kenya

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ABSTRACT

Internal competencies have emerged as a strategic imperative for manufacturing firms operating in both local and global markets. However, despite increased investments in supply chain systems and organizational capabilities, chemical and allied manufacturing firms continue to experience inefficiencies reflected in delayed deliveries, high operational costs and inconsistent production performance. Therefore, this study examined the relationship between Internal competencies and operational performance of chemical and allied manufacturing firms in Kenya. The study was anchored on the, Resource-Based View theory. The study employed a cross-sectional descriptive research design. The unit of analysis was 94 chemical and allied manufacturing firms while the unit of observation was 282 personnel, comprising of 94 operations managers, 94 supply chain managers and 94 procurement officers. A census technique was adopted and primary data was collected using a structured questionnaire. Piloting of the study was conducted on 28 respondents from 10 chemical and allied non registered firms under KAM in Nairobi County. The validity of the research was ascertained by expert review. Reliability of the instruments was tested using Cronbach's Alpha. Descriptive statistics were used to summarize the key characteristics of data using mean, standard deviation, minimum and maximum. Ordinary least squares regression analysis was used to examine the relationship between variables at a 5% significance level with the aid of Statistical Package for Social Sciences (SPSS) version 31.0. Linearity, multi-collinearity, normality and homoscedasticity tests was performed to check whether ordinary least squares regression assumptions hold. Data was presented using tables and graphs. The findings revealed that internal competencies had a positive and statistically significant effect on operational performance ($\beta=0.627$, $p=0.00<0.05$). The study concluded that internal significantly enhances the operational performance of manufacturing firms in the chemical and allied industry in Kenya. The study therefore recommends that firms should support sector-specific training programs and technology upgrading schemes that raise internal competencies across chemical firms.

Keywords: Internal Competencies, Operational Performance and Chemical and Allied Manufacturing Firms

Background of the Study

The business environment within which manufacturing firms operate has become increasingly volatile due to frequent global disruptions (Vital-Soto & Olivares-Aguila, 2023). Such disruptions have exposed vulnerabilities in supply chains and highlighted the importance of internal competencies in maintaining operational performance. The outbreak of the COVID-19 pandemic in 2020 created unprecedented disruptions across global and local supply chains (Veselovská, 2020). Government imposed lockdowns, movement restrictions, factory shutdowns, labor shortages and border closures significantly affected manufacturing operations worldwide. In Kenya, many manufacturing firms experienced shortages of raw materials, delayed deliveries, increased transportation costs and reduced production capacity. The pandemic disrupted both supply and demand, leading to reduced sales volumes, production delays and increased operational costs (Yu *et al.*, 2022). The Russia Ukraine war caused significant increases in fuel and fertilizer prices, exchange rate pressures and inflation, all of which raised production costs for manufacturing firms (Arndt *et al.*, 2023). Chemical and allied manufacturing firms were particularly affected because many chemical products rely on imported petroleum-based inputs, industrial chemicals and energy-intensive production processes.

Internal competencies refer to the collective capabilities, resources and systems within an organization that enable it to achieve strategic goals and sustain performance in a competitive environment (Fernando & Wulansari, 2021). These competencies include human resource capabilities, technological expertise, leadership effectiveness, innovative capacity and efficient internal processes (Richey et al. 2022). A firm's ability to harness these internal elements plays a critical role in driving operational performance, adaptability and responsiveness to market changes. In the increasingly volatile and competitive environment in which Kenyan manufacturing firms operate, internal competencies serve as a central enabler of operational performance. Without a solid internal foundation, efforts to build agile and responsive supply chains may prove ineffective (Fernando & Wulansari, 2021).

Strong internal competencies such as skilled employees, effective leadership, technological capabilities, efficient processes and organizational knowledge enhance productivity, improve product quality, reduce operational costs, accelerate decision making and enable firms to respond effectively to market changes and disruptions. These capabilities facilitate the efficient utilization of resources, leading to improved operational performance in terms of cost efficiency, quality, delivery reliability and flexibility. Conversely, weak or misaligned internal competencies can negatively affect operational performance by causing inefficiencies, poor resource utilization, delays in decision making, low product quality, increased operational costs and an inability to adapt to changing customer demands or environmental uncertainties. Furthermore, competencies that become outdated or are not continuously developed may create organizational rigidity, limiting innovation and reducing a firm's ability to maintain competitive operational performance in a dynamic business environment.

Several scholars have examined the role of internal competencies in shaping organizational outcomes, consistently highlighting its strategic importance. For instance, Li et al. (2023) argue that a firm's competitive strength lies not merely in its products but in its ability to effectively coordinate and reconfigure internal skills and resources to respond to environmental changes. Similarly, Harifi (2024) finds that human resource capabilities such as training, teamwork and leadership development significantly influence innovation and overall organizational performance, particularly in dynamic and uncertain environments. In addition, Saragih et al. (2020) observe that internal competencies are critical drivers of innovation and quality performance, especially when organizations promote integration and knowledge sharing.

Further, Jafari et al. (2023) demonstrate that supply chain related competencies such as internal integration and information sharing play a significant role in enhancing operational performance and competitive advantage. However, despite these insights, notable knowledge gaps remain. Most of the existing studies have examined internal competencies either as a moderating predictor of performance or in relation to innovation and competitive advantage, with limited focus on its role on operational performance. Specifically, there is insufficient empirical evidence on how internal competencies and operational performance, particularly in developing economies. Moreover, many studies adopt a generalized view of internal competencies without contextualizing it to sector specific dynamics such as those in the chemical and allied manufacturing industry in Kenya. This creates a gap in understanding how internal competencies function within complex and resource constrained supply chains, thereby necessitating further research to explore its effects on operational performance.

Internal competencies have been measured differently across empirical studies depending on the organizational capabilities under investigation. Hweshure (2022) measured internal competencies using indicators such as employee expertise, managerial capability and operational coordination efficiency in manufacturing firms. Similarly, Harifi (2024) assessed internal competencies through organizational capability dimensions including workforce competence, technological infrastructure and internal management systems. Fernando and Wulansari (2021) measured internal competencies using teamwork competency, communication capability and supply chain integration knowledge, while Machiri et al. (2023) focused on corporate technological capability, innovation systems and technical knowledge as measures of internal competencies. In addition, Tarigan et al. (2021) operationalized internal competencies through competency management practices, internal integration capability and quality management systems. Drawing from these studies, the current study measured internal competencies using employee skills, technological capacity and organizational policies because these

dimensions are critical in enhancing operational coordination, responsiveness, adaptability and decision making within manufacturing firms.

Internal competencies are expected to affect operational performance by strengthening the ability of firms to effectively utilize responsive supply chain practices to achieve superior operational outcomes. Firms with strong internal competencies such as skilled employees, advanced technological capacity and supportive organizational policies are better positioned to coordinate supply chain activities, process information quickly, adapt to market changes and respond efficiently to operational disruptions. According to Teece (2018), dynamic organizational capabilities enhance a firm's ability to reconfigure resources and respond to environmental changes effectively. Tarigan et al. (2021) argue that internal integration and competency management improve the effectiveness of supply chain practices on organizational outcomes. Similarly, Li et al. (2023) established that firms with strong internal competencies are more capable of matching internal resources with external supply chain demands, thereby improving operational resilience and performance.

The increasingly volatile and competitive environment in which Kenyan manufacturing firms operate, internal competencies plays a central role in enhancing operational performance (Harifi, 2024). Without a solid internal foundation ranging from skilled human capital to efficient technological systems efforts to build steady operations may prove ineffective (Fernando & Wulansari, 2021). Therefore, this study examined the effect of internal competencies on operational performance of chemical and allied manufacturing firms in Kenya. The study conceptualized internal competencies with employee skills, technological capacity and organization policies. This conceptualization is strongly supported by the Resource-Based View (RBV) theory since firms achieve sustained competitive advantage by developing and deploying resources and competencies that are valuable, rare, inimitable and well organized (Barney, 1986). In this regard, internal competencies was seen as a foundational pillar that supports other strategic functions such as supply chain management, innovation and customer service.

Operational performance refers to how effectively and efficiently an organization executes its core processes to deliver value to customers and meet its strategic objectives (Jafari et al. 2024). High operational performance enables firms to respond quickly to market needs, reduce waste, improve profitability and maintain competitive advantage (Harifi, 2024; Li et al. 2023, Fernando and Wulansari, 2021 and Richey et al, 2022). In today's fast-paced and highly competitive environment, operational performance has become a central focus for firms seeking to survive and grow, especially in the manufacturing sector where process efficiency and delivery capabilities are crucial.

According to Kazungu (2024), operational performance is influenced by both internal and external organizational factors. Internally, the firm's structure, workforce capability, technology use and decision making processes play a vital role. Externally, factors such as supply chain design, responsiveness to customer needs and integration with suppliers affect how well operations are aligned with market demands. Mbima and Tetteh (2023) argued that operational performance is significantly enhanced when firms invest in supply chain integration, information sharing and coordination with partners, resulting in more agile and cost-effective production systems. Benzidia and Makaoui, (2020) found that supply chain management practices, when supported by effective internal capabilities, had a significant positive impact on both operational and organizational performance.

Similarly, Tarigan et al. (2021) observed that operational performance was highest in firms that combined responsive supply chain strategies with strong internal competencies such as skilled human capital and automated processes. Li et al. (2023) further established that firms with strong internal competencies are better able to align internal resources with external supply chain demands, thereby enhancing operational resilience and firm performance. This study therefore proposes that operational performance can be significantly enhanced by strong internal competencies. Ultimately, improving operational performance is not only essential for firm level profitability but also for national industrial growth and economic development (KNBS, 2025). Operational performance was measured using indicators on market growth, market share and cost efficiency.

Manufacturing firms play an important role in national economic development by contributing significantly to Gross Domestic Product (GDP), employment creation, export earnings and industrial transformation (Mwinuka, 2022; Hweshure, 2022). In Kenya, the manufacturing sector has consistently been recognized as a key pillar for economic growth under development blueprints such as the Kenya Vision 2030 and the The Big Four Agenda, where manufacturing was prioritized to drive industrialization and increase its contribution to GDP (Ngirachu, 2020; GOK, 2007). Manufacturing activities stimulate backward and forward linkages within the economy by supporting agriculture, trade, transport and service sectors (Lizzy, 2024).

Manufacturing is a key driver of Kenya's economic growth, yet recent trends indicate mixed performance that raises significant concerns about the operational performance of manufacturing firms. According to the Kenya National Bureau of Statistics (KNBS, 2025), the manufacturing sector contributed 7.5% to GDP in 2025, with modest growth of 3.1% in the third quarter chemical and allied sub-sector producer prices declined by 8.7%, while production costs rose by 28% (KAM, 2026; KNBS, 2025). Within this sector, the chemical and allied subsector has experienced notable volatility, including a sharp decline of approximately 9.96% in producer prices for pharmaceuticals, medicinal, chemical and botanical products, alongside rising production costs, with chemical products recording price increases of over 30% in recent years. These fluctuations indicate instability in operational performance. Additionally, broader sector reports highlight persistent challenges such as high production costs, supply chain disruptions and increased competition from imports, which have contributed to subdued growth rates of as low as 2.7% in some periods

Regulation of manufacturing firms in Kenya is composed of various bodies to ensure quality, safety, competitiveness and compliance with national standards. The primary government authority responsible for industrial policy, planning and regulatory oversight is the State Department for Industry under the Ministry of Investments, Trade and Industry, which develops industrial policy and oversees sector growth (Secretariat, 2021) and works through various state corporations to implement standards and regulatory functions. Kenya Bureau of Standards (KEBS) is the main standards and quality regulator, established in 1974 to set product and process standards, certify manufactured goods and promote quality assurance across industries (Were, 2016). Complementing KEBS are agencies like the Kenya Industrial Property Institute (KIPI) for industrial intellectual property, Kenya Industrial Research and Development Institute (KIRDI) for applied research and innovation and the Anti Counterfeit Authority which combats counterfeit goods that undermine local manufacturers.

Chemical and allied manufacturing firms in Kenya form a critical sub sector within the broader manufacturing industry as classified by the Kenya National Bureau of Statistics and represented by the Kenya Association of Manufacturers under the Chemical & Allied Sector (KNBS, 2024). This sector includes companies involved in the production of industrial chemicals, agrochemicals, fertilizers, paints and coatings, detergents, plastics, pharmaceuticals and specialty chemical formulations (Kenya Association of Manufacturers, 2026). The industry supports key sectors of the economy such as agriculture, construction, manufacturing, water treatment, mining and public health. Major players such as Osho Chemical Industries Ltd and KEL Chemicals Ltd produce crop protection chemicals and fertilizers that are essential for Kenya's agricultural productivity. Firms like Crown Paints Kenya Plc and Kansai Plascon Kenya Ltd supply paints and coatings for the construction industry. The sector plays a strategic role in Kenya's industrialization agenda, particularly under national development frameworks such as the Kenya Vision 2030, which identifies manufacturing as a key pillar for economic growth and job creation (GOK, 2008). Chemical manufacturers contribute significantly to value addition by transforming raw materials into finished or semi finished industrial inputs. Additionally, the sector enhances import substitution by producing goods locally that would otherwise be imported, including detergents, plastics and certain industrial chemicals.

Several major reports have highlighted the operational performance challenges facing Kenya's chemical and allied manufacturing sector. The Kenya Association of Manufacturers (2026) notes that high production costs, energy inefficiencies and logistical bottlenecks are among the most significant constraints affecting manufacturing efficiency across the country. Similarly, the Kenya National Bureau of Statistics (2024) reports that underutilization of production capacity and delays in supply chains are widespread, limiting firms' ability to meet market demand promptly. The Government of Kenya's Vision 2030 (2008) identifies manufacturing

competitiveness and operational performance as critical to achieving industrial growth, emphasizing the need for investment in modern technology, energy solutions and streamlined processes. Sector specific studies, such as those by Macharia, Gathiaka and Ngui (2022) and Ngunzi, Njoka and Kinyua (2023), further point out the role of energy inefficiencies in constraining production, while Otieno and Thogori (2024) report that lean management practices are often inadequately implemented, reducing operational effectiveness.

Although prior research has explored various competencies and how it influences operational performance separately (Nenavani & Jain 2022; Siagian et al. 2021), there remains limited empirical evidence on the effect of internal competencies on operational performance among chemical and allied manufacturing firms in Kenya. This study will fill this gap by investigating how it influences operational performance in Kenya's manufacturing sector.

Research Objective

To examine the effect of internal competencies on the operational performance of manufacturing firms in chemical and allied industry

Research Hypothesis

H₀₁: There is no statistically significant relationship between internal competencies and the operational performance of manufacturing firms in chemical and allied industry

LITERATURE REVIEW

A study by Tarigan et al. (2021) examined the effect of competency management on organizational performance through supply chain integration and quality. The study sought to establish how organizational competencies influence performance outcomes by strengthening supply chain processes and quality management practices. A quantitative research approach employing a survey methodology was adopted and data was collected from organizations to examine the relationships among competency management, supply chain integration, quality and organizational performance. The findings revealed that competency management positively influenced organizational performance, with supply chain integration and quality serving as important mechanisms through which competencies improve organizational outcomes. The findings indicate that organizations with strong competency management systems are better positioned to strengthen supply chain processes and enhance overall performance. However, the study examined competency management within a general organizational context without specifically focusing on manufacturing firms operating under complex production environments. Chemical and allied manufacturing firms operate under unique production processes, stringent regulatory requirements and highly integrated supply chain systems that require specialized internal competencies to sustain operational performance. The current study therefore sought to determine the effect of internal competencies on operational performance among chemical and allied manufacturing firms in Kenya.

In Indonesia, Adoe (2025) examined the role of core competencies in enhancing operational efficiency among Micro, Small and Medium Enterprises (MSMEs). The study focused on how organizational capabilities and internal strengths contribute to improved operational effectiveness. A quantitative research approach employing a survey methodology was adopted and data was collected from MSMEs before being analyzed using statistical techniques to determine the relationship between core competencies and operational efficiency. The findings revealed that core competencies significantly enhanced operational efficiency by improving resource utilization, decision-making, adaptability and process effectiveness. These findings suggest that organizations possessing strong internal competencies are better able to optimize their resources and improve operational processes. However, the study focused on MSMEs, whose organizational structures, resource endowment and operational systems differ substantially from those of large-scale manufacturing firms. Consequently, the findings provide limited evidence on how internal competencies influence operational performance within manufacturing environments characterized by complex production systems and supply

chain operations. The current study therefore examined the effect of internal competencies on operational performance among chemical and allied manufacturing firms in Kenya.

Using statistical analysis techniques, Salman et al. (2020) examined the effect of employee competencies on organizational performance among public and private sector banks. The study sought to determine how employees' knowledge, skills and abilities contribute to improved organizational performance. A quantitative research approach employing a survey methodology was adopted and data was collected from employees working in public and private sector banks. The findings revealed that employee competencies significantly predicted organizational performance by improving productivity, organizational effectiveness and the achievement of organizational objectives.

The findings demonstrate that competent employees constitute an important strategic resource for enhancing organizational performance. However, the study was conducted within the banking sector, whose service-oriented operations, performance measures and organizational processes differ considerably from those of manufacturing firms. In contrast, chemical and allied manufacturing firms rely heavily on technical competencies, production capabilities and operational expertise to achieve operational efficiency. The current study therefore sought to determine the effect of internal competencies on operational performance among chemical and allied manufacturing firms in Kenya.

A study by Wardhana et al. (2026) examined the role of digital competency in the relationship between operational competence, managerial competence, technical competence and organizational performance. A quantitative research approach employing a survey methodology was adopted and data was collected from 150 respondents before being analyzed using statistical techniques to examine the relationships among operational competence, managerial competence, technical competence, digital competency and organizational performance. The findings revealed that operational, managerial and technical competencies positively influenced organizational performance, while digital competency strengthened the contribution of these competencies towards improving organizational outcomes.

The findings suggest that organizations possessing multiple complementary competencies are more likely to achieve superior organizational performance. However, the study focused on organizational performance across different organizational settings without specifically examining operational performance within manufacturing firms. As a result, the findings provide limited understanding of how internal competencies influence production efficiency, process reliability and operational effectiveness in manufacturing environments such as the chemical and allied industry. The current study therefore examined the effect of internal competencies on operational performance among chemical and allied manufacturing firms in Kenya.

Using statistical analysis techniques, Mikalef et al. (2023) examined the influence of artificial intelligence (AI) competencies on organizational performance from a business to business (B2B) marketing capabilities perspective. The study focused on how AI related skills, knowledge and technological capabilities contribute to improved organizational performance. A quantitative research approach employing a survey methodology was adopted and data was collected from 223 respondents to examine the relationship between AI competencies, marketing capabilities and organizational performance. The findings revealed that AI competencies significantly enhanced organizational performance by improving data-driven decision making, operational efficiency and firms' ability to respond effectively to changing market conditions.

The findings demonstrate that technology-based competencies have become increasingly important in improving organizational competitiveness. However, the study focused specifically on AI related competencies within a B2B marketing context, giving limited attention to broader internal organizational competencies required to support operational performance within manufacturing firms. Consequently, the findings provide limited evidence on how traditional organizational competencies influence production efficiency and operational effectiveness in manufacturing environments. The current study therefore sought to determine the effect of internal competencies on operational performance among chemical and allied manufacturing firms in Kenya.

THEORETICAL REVIEW

Resource-Based View Theory (RBV) expressed as the resource-based view was developed by Penrose (1959) and further refined by Barney (1986). The theory posits that competitive advantage and operational performance is achieved if a firm's resources are valuable, rare, costly to imitate and have no substitute. It argues that an establishment's performance is determined by its capacity to effectively deploy its assets to create value for consumers (Barney, 1986).

RBV argues that firms gain and sustain competitive advantage by possessing and utilizing internal resources that are valuable, rare, inimitable and non-substitutable (VRIN). These resources include tangible and intangible assets such as skilled personnel organizational culture, technology, knowledge and efficient processes. According to RBV, it is not just external market positioning that determines performance, but also how well a firm leverages its unique internal capabilities to deliver superior value.

In relation to this study RBV is particularly relevant in explaining the role of internal competencies the independent variable. The theory suggests that firms with strong internal capabilities such as well trained personnel, advanced production technologies and effective leadership are better positioned to implement strategies like supply chain responsiveness successfully. These competencies serve as strategic assets that enhance a firm's ability to respond to external changes, optimize operations and ultimately improve performance (Davis and DeWitt, 2021). For instance, a firm's ability to shorten lead times, adjust production schedules or share real time information across the supply chain is strongly influenced by the strength of its internal resources.

Furthermore, RBV supports the view that internal competencies are not easily imitated or transferred between firms, making them a source of sustained performance advantage (Lubis, 2022). In the context of Chemical and allied manufacturing firms, which operate in competitive and resource intensive environments, building and nurturing such internal strengths is essential for operational success and strategic agility. Thus, RBV underpins the study's investigation of how internal competencies links operational performance.

The Resource-Based View Theory primarily aligns with the dependent variable of operational performance as the outcome of leveraging valuable resources. In this framework, internal competencies are considered strategic resources. When a firm effectively utilizes these resources, it can achieve superior operational performance, reflected in efficiency, quality, flexibility and overall productivity. Therefore, while internal competencies represents the firm's resources, operational performance is the realized outcome of how well these resources are deployed in creating value, consistent with RBV.

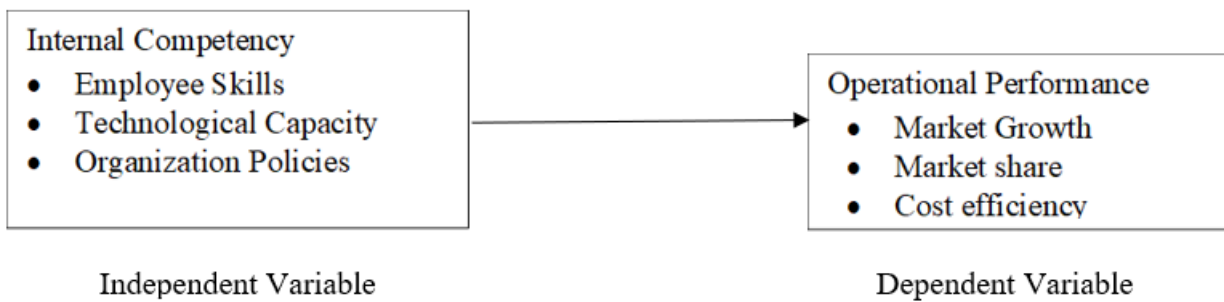
However, the Resource-Based View is not without its limitations. One major criticism is its lack of emphasis on the external environment. RBV tends to assume that internal resources alone determine performance, often overlooking how dynamic market conditions, technological disruptions or supply chain uncertainties can impact firm outcomes (Freeman & Phillips 2021). This inward looking perspective may limit its applicability in highly volatile sectors or emerging markets like Kenya's manufacturing industry, where firms must constantly adapt to external shocks. Additionally, the difficulty in clearly defining and measuring what constitutes a valuable or rare resource can hinder empirical application. It is often challenging to determine which resources meet the VRIN criteria and how they translate into performance outcomes in measurable terms (Miller, 2019).

Despite these limitations, RBV remains a powerful theoretical lens for this study, as it explained why firms with stronger internal competencies are better equipped achieve higher levels of operational performance.

CONCEPTUAL FRAMEWORK

A conceptual framework is a structured and visual representation of the key variables, constructs and factors that influence a given phenomenon (Creswell & Creswell, 2018). In this study, the conceptual framework

illustrated the factors shaping the relationship between internal competencies and operational performance of the Chemical and Allied Manufacturing Firms in Kenya.



Internal competency is proposed as an independent variable in the framework. It encompasses employee skills, technological capacity and organizational policies that support effective organizational operations. Employee skills determine the ability of workers to execute supply chain activities efficiently, while technological capacity facilitates automation, information sharing and decision making processes. Organizational policies provide the guidelines that influence operational effectiveness and resource utilization. Operational performance is the dependent variable and is assessed using market growth, market share and cost efficiency.

METHODOLOGY

The study was conducted among chemical and allied manufacturing firms in Kenya, with a focus on major industrial and manufacturing hubs where these firms are predominantly located. These include Nairobi, Central, Lower Eastern, Coast and Rift regions which host a significant number of chemical, pharmaceutical, fertilizer and industrial chemical manufacturers. The positivism research philosophy suggested by Creswell, (1998) guided this study. The study adopted a cross-sectional descriptive research design. This design was the most appropriate for examining the relationship between internal competencies and operational performance among chemical and allied manufacturing firms in Kenya. According to the Kenya Association of Manufacturers, there are 94 manufacturing firms in this sector and these form the unit of analysis for the study. The respondents were to include 94 operations managers, 94 supply chain Managers and 94 procurement officers. The study adopted a census technique since the target population was relatively small and fully accessible. In this study, data was collected using a structured questionnaire administered to operations managers, supply chain managers and procurement officers in chemical and allied manufacturing firms in Kenya. A total of 28 respondents were selected from 10 non-registered KAM firms in Nairobi County and this is in accordance to Connelly (2016) where he states that a pilot sample representing approximately 10% of the intended sample for the main study was considered adequate. A Cronbach's alpha value of 0.70 or above was generally be considered acceptable, reflecting adequate internal reliability (Kennedy, 2022). Test retest reliability was assessed by administering the questionnaire to a subset of 28 respondents in 10 non registered KAM firms in Nairobi County, Kenya, under similar conditions. Correlation analysis was used to determine the strength and direction of the relationship between the independent and dependent variables. Additionally, simple regression models were employed to explore these relationships more deeply and assess the impact of the independent variables on the dependent variable. Hypothesis testing was performed through multiple regression analysis and F-tests, which had allowed for the comparison of all variables simultaneously and provide insights into their collective influence.

RESULTS AND DISCUSSION

Response Rate

A total of 282 questionnaires were administered to the respondents, of which 276 were duly completed and returned, resulting in a response rate of 97.87%. This response rate was considered highly satisfactory and adequate for statistical analysis and generalization of the study findings. Babbie and Muoton (2011) stated that a study is suitable for analysis and is judged credible if it attains a response rate of 50% or higher. A response

rate of more than 50% is considered adequate, 60% is preferable and 70% or more is considered exceptional (Cooper & Schindler, 2014). Therefore, the achieved response rate of 97.87% enhanced the reliability and credibility of the study results. The high response rate from the respondents was due to the follow-up done by the research assistants and also the use of email-based methods via Microsoft forms for those who were on leaves and unavailable as of the period of data collection. Table 1 presents the results on the response rate.

Table 1: Respondents Response Rate

Response Rate	Frequency	Percentage
Filled Questionnaires	276	97.87%
Non-filled Questionnaires	6	2.13%
Total	282	100%

Source: Primary Data (2026)

Reliability Test of Study Variables

Cronbach's Alpha coefficient was used to compute the research instrument's reliability in relation to each study variable. The results are presented in Table 2.

Table 2: Reliability Test

Variable	Constructs	No. of Items	Cronbach Alpha	Comment
Internal Competencies		18	0.780	Reliable
Operational Performance	Market Growth	6	0.927	Reliable
	Market Share	6	0.931	Reliable
	Cost Efficiency	6	0.752	Reliable

Source: Primary Data (2026)

Results presented in Table 2, all of the study's variables had Cronbach Alpha values more than 0.70. Internal consistency increases with the Cronbach's alpha coefficient's proximity to one, which spans from 0 to 1. An appropriate minimum value was suggested by Cronbach (1951) to be more than 0.60. Literature by Wooldridge (2013) recommended a value of above 0.7. Reliability coefficients below 0.5 are unacceptable; those above 0.8 are good and those greater than 0.9 are considered excellent (Sharma, 2016). As a result, the current study's data was trustworthy. This implies that the study tool can yield reliable findings each and every time it is used. Therefore, the internal consistency of the instrument was deemed enough for additional data analysis to fulfill the goals of the study.

Operational Performance

The dependent variable for this study was operational performance of chemical and allied manufacturing firms in Kenya. Operational performance was conceptualized in terms of the extent to which firms achieve superior outcomes in market growth, market share and cost efficiency. These dimensions reflect the ability of firms to effectively utilize their resources, respond to market demands and maintain competitive operations within the manufacturing sector. Respondents were asked to indicate the extent to which they agreed or disagreed with selected statements relating to operational performance using a five-point Likert scale ranging from 1=Strongly Disagree to 5=Strongly Agree. Table 3 presents the descriptive statistics for the individual operational performance indicators as well as the composite operational performance variable, measured using a five-point Likert scale. To determine whether the mean scores differed significantly from the reference value, a one-sample t-test was conducted. The results provided insights into the magnitude and direction of respondents' perceptions regarding each performance indicator and the overall operational performance construct, highlighting variations across the different dimensions assessed.

Table 1: Descriptive Statistics on Operational Performance Indicators

	N	Mean	Std. Deviation	Skewness	Kurtosis
Market Growth	276	3.9478	0.6310	-1.8567	6.6453
Market Share	276	3.9933	0.7846	-1.41083	3.3327
Cost Efficiency	276	4.0326	0.8302	-1.621	3.9327
Average	276	3.99123	0.7486	-1.62951	4.6369

N=Number of Respondents

Primary Data, (2026)

Research findings presented in Table 3 show that operational performance had an aggregate mean of 3.99 and a standard deviation of 0.75, indicating that respondents generally agreed that their firms had achieved a high level of operational performance. Among the individual indicators, cost efficiency recorded the highest mean score ($M = 4.03$, $SD = 0.83$), followed by market share ($M = 3.99$, $SD = 0.78$) and market growth ($M = 3.95$, $SD = 0.63$). The relatively narrow difference between the highest and lowest mean scores suggests that the three dimensions contributed relatively consistently to the overall assessment of operational performance. The findings therefore indicate that the surveyed chemical and allied manufacturing firms were particularly effective in controlling operational costs, while also maintaining favourable market positions and achieving continued market growth.

The relatively low aggregate standard deviation indicates a reasonable consistency in respondents' perceptions of operational performance across the firms. Further, all three indicators recorded negative skewness, with values ranging from -1.86 for market growth to -1.41 for market share, indicating that responses were concentrated towards the higher end of the Likert scale. This confirms that most respondents expressed favourable perceptions regarding their firms' operational performance. The kurtosis values ranged from 3.33 for market share to 6.65 for market growth, indicating relatively peaked distributions, with responses tending to cluster around the respective means. The findings demonstrate that operational performance among the chemical and allied manufacturing firms was generally high, with cost efficiency emerging as the strongest dimension, followed by market share and market growth.

Diagnostic Tests

Prior to estimating the ordinary least squares (OLS) regression models, diagnostic tests were conducted to assess whether the classical linear regression assumptions were satisfied. Specifically, the analysis examined the assumptions of normality of residuals, linearity, homoscedasticity and absence of multicollinearity. These diagnostic procedures were undertaken to ensure that the estimated regression coefficients and statistical inferences were valid and reliable.

Normality of the Study Variables

The Shapiro-Wilk test was conducted to assess the normality of the study variables. The results are presented in Table 4.

Table 4: Shapiro-Wilk Test

Variable	Obs	W	V	z	Prob>z
Operational Performance	276	0.692	60.989	9.610	0.000
Internal Competencies	276	0.864	26.903	7.697	0.000

Source: Primary Data (2026)

The results indicated that Operational Performance ($W = 0.692$, $z = 9.610$, $p < .001$), Internal Competencies ($W = 0.864$, $z = 7.697$, $p < .001$) all significantly deviated from a normal distribution. Consequently, the null hypothesis of normality was rejected for all variables, indicating that the raw data was non-normally distributed.

Since logarithmic transformations are primarily suited to positively skewed data, they were considered inappropriate for this study. Instead, a Box-Cox transformation was selected because it estimates an optimal transformation parameter from the data and can correct moderate positive and negative departures from normality while preserving the continuous nature of the variables (Atkinson et al. 2021). The Box-Cox procedure was employed to identify an appropriate power transformation for each study variable. The results are presented in Table 5.

Table 5: Estimated Box-Cox Transformation Parameters

Variable	λ (Theta)	SE	z	p-value	95% CI
Operational Performance	4.441	0.335	13.27	<0.001	3.785 – 5.097
Internal Competencies	2.843	0.277	10.27	<0.001	2.300 – 3.385

Source: Primary Data (2026)

The estimated transformation parameters (λ) were statistically significant for all variables ($p < .001$), indicating that the optimal transformations differed significantly from the conventional logarithmic transformation ($\lambda = 0$) and from the untransformed scale ($\lambda = 1$). Specifically, the estimated λ values were 4.441 (95% CI: 3.785 - 5.097) for Operational Performance, 2.264 (95% CI: 2.300 – 3.385) for Internal Competencies.

Homoscedasticity

Homoscedasticity is a fundamental assumption of OLS regression, requiring that the variance of the error terms remains constant across all levels of the independent variables. When this assumption is violated, heteroskedasticity occurs, leading to inefficient parameter estimates and biased standard errors, which may result in unreliable hypothesis tests and confidence intervals (Wooldridge, 2016). In this study, homoscedasticity was assessed using the Breusch-Pagan/Cook-Weisberg test for heteroskedasticity. Under this test, the null hypothesis states that the residuals have constant variance (homoscedasticity). A p-value greater than .05 indicates that the assumption of constant variance is satisfied, whereas a p-value less than .05 indicates the presence of heteroskedasticity. Table 7 presents the results of the Breusch-Pagan/Cook-Weisberg tests for the six regression models.

Table 7: Breusch-Pagan / Cook-Weisberg Test for Heteroskedasticity

Model	Chi2	Df	p	Heteroskedasticity
Model 3: IC -> OP	2.80	1	0.0945	Absent

Source: Primary Data (2026)

The assumption of constant error variance was satisfied for Model 1 ($\chi^2 = 2.80$, $p = 0.0945$) indicating no evidence of heteroskedasticity in these models.

Regression Analysis on Internal Competencies on Operational Performance

The following hypotheses was tested:

H_{01} : There is no statistically significant relationship between internal competencies and the operational performance of manufacturing firms in chemical and allied industry

The results of the model summary, ANOVA and regression coefficients are presented in the subsequent tables.

Table 8: The Goodness of Fit of Model for Internal Competencies and Operational Performance

Model	R	R ²	Adjusted R ²	Std. Error of the Estimate
1 (a)	0.627 ^a	0.394	0.392	0.4536
1 (b)	0.512 ^a	0.262	0.260	0.5101
1 (c)	0.641 ^a	0.411	0.409	0.5041
1 (d)	0.530 ^a	0.281	0.278	0.5942

a. Predictors: (Constant), Internal Competencies

b. Model 1(a) Dependent Variables: Index of operational performance measures, (b) market growth (c): market share, (d) cost efficiency

Source: Primary Data (2026)

The model in Table 8 assesses how internal competencies predict different dimensions of operational performance, including market growth, market share and cost efficiency. The R² value of 0.394 indicates that about 39.4% of the variation in operational performance can be attributed to internal competencies. This means that while internal competencies are important determinants of operational performance, the remaining 60.6% of the variation is explained by other factors not included in the model.

Specifically, market growth has an R² value of 0.262, meaning that 26.2% of the variation in market growth is explained by internal competencies. This indicates that internal competencies have a moderate positive influence on firms' ability to achieve market growth, although a substantial proportion of market growth is influenced by other organizational and environmental factors. For market share, the model reflects the strongest positive effect of internal competencies. The R² value of 0.411 means that 41.1% of the variation in market share is explained by internal competencies, which is the highest among the three operational performance dimensions. This suggests that firms with strong employee skills, adequate technological capacity and supportive organizational policies are better positioned to improve and sustain their market share. In terms of cost efficiency, the model indicates a moderate positive association with internal competencies. The R² value of 0.281 shows that 28.1% of the variation in cost efficiency is explained by internal competencies. This implies that although internal competencies contribute to improved cost efficiency, other operational, technological and market related factors also play a significant role in determining firms' cost efficiency.

The findings suggest that internal competencies have a moderate influence on operational performance and its dimensions, with the greatest explanatory power observed for market share, followed by cost efficiency and market growth. These results underscore the importance of developing employee skills, strengthening technological capacity and implementing supportive organizational policies to enhance operational performance in manufacturing firms within the chemical and allied industry.

Table 92: The Overall Significance of the Model for Internal Competencies and Operational Performance

Model	Sum of Squares	df	Mean Square	F	Sig.
1 (a)	36.617	1	36.617	177.954	0.000 ^b
	56.380	274	0.206		
	92.997	275			
1 (b)	25.361	1	25.361	97.470	0.000
	71.294	274	0.260		
	96.655	275			
1 (c)	48.557	1	48.557	191.089	0.000 ^b
	69.625	274	0.254		
	118.182	275			
1 (d)	37.814	1	37.814	107.117	0.000 ^b
	96.726	274	0.353		
	134.540	275			

a. Predictors: (Constant), Internal Competencies

b. Model 1(a) Dependent Variables: Index of operational performance measures, (b) market growth (c): market share, (d) cost efficiency

Source: Primary Data (2026)

Table 9 presents the Analysis of Variance (ANOVA) results for the regression models examining the effect of internal competencies on operational performance and its dimensions. The ANOVA results indicate that all the regression models are statistically significant, implying that internal competencies significantly predict operational performance, market growth, market share and cost efficiency. For the overall operational performance index, the regression model was statistically significant ($F = 177.954$, $p=0.00<0.05$), indicating that internal competencies significantly explain variations in operational performance. This implies that internal competencies is a good predictor of operational performance.

Regarding market growth, the model was also statistically significant ($F = 97.470$, $p= 0.00<0.05$), suggesting that internal competencies significantly influence market growth. For market share, the ANOVA results revealed the highest level of statistical significance ($F = 191.089$, $p= 0.00<0.05$) among the three operational performance dimensions. Similarly, the model for cost efficiency was statistically significant ($F = 107.117$, $p < 0.001$), demonstrating that internal competencies significantly influence cost efficiency. The ANOVA results confirm that the models are statistically significant and provide sufficient evidence that internal competencies is a good predictor for operational performance and its dimensions. The strongest overall model significance was observed for market share, followed by overall operational performance, cost efficiency and market growth, indicating that internal competencies play a particularly important role in enhancing firms' market competitiveness.

Table 3:10 Coefficients for Internal Competencies and Operational Performance

Model	Unstandardized β	Std. Error	Standardized β	t	Sig.
1 (a)	1.355	0.200		6.791	0.000
	0.680	0.051	0.627	13.340	0.000
1 (b)	1.753	0.224		7.816	0.000
	0.566	0.057	0.512	9.873	0.000
1 (c)	0.958	0.222		4.319	0.000
	0.783	0.057	0.641	13.823	0.000
1 (d)	1.354	0.261		5.180	0.000
	0.691	0.067	0.530	10.350	0.000

a. Predictors: (Constant), Internal Competencies.

b. Model 1(a) Dependent Variables: Index of operational performance measures, (b) market growth (c): market share, (d) cost efficiency

Source: Primary Data (2026)

Results presented in Table 9 indicate a statistically significant positive linear relationship between internal competencies and operational performance (regression coefficient = 0.680, $p = 0.000 < 0.05$). The results implied that one unit increase or improvement in internal competencies leads to a significant increase in operational performance by a factor of 0.680. The null hypothesis that there is no statistically significant effect of internal competencies on the operational performance of manufacturing firms in the chemical and allied industry in Kenya is therefore rejected in the current study. Meaning that internal competencies has a significant positive relationship with operational performance in chemical and allied firms in Kenya. Based on results, the regression model for the prediction of operational performance in chemical and allied firms in Kenya is as follows:

$$OP = 1.355 + 0.680IC$$

Where;

OP = The independent variable (Operational Performance)

IC = Internal Competencies

1.355 = *OP*- Intercept (constant). Estimate of the expected value of operational performance when *IC* is Zero. (Constant)

0.680 = An estimate of the expected increase in operational performance in response to a unit increase (improvements) in Internal Competencies (*IC*)

The findings established that internal competencies have a positive and significant effect on operational performance among manufacturing firms in the chemical and allied industry in Kenya. The results showed that improvements in employee skills, technological capacity and organizational policies contribute to enhanced operational performance. Internal competencies were also found to positively influence market growth, market share and cost efficiency, with the strongest effect observed on market share. Therefore, manufacturing firms that invest in developing their internal competencies are more likely to improve their operational performance and sustain a competitive advantage.

The findings are consistent with the Resource-Based View (RBV) Theory (Barney, 1991), which argues that firms achieve sustained competitive advantage by developing valuable, rare, inimitable and non substitutable internal resources. Employee skills, technological capacity and organizational policies represent strategic organizational resources that enable firms to improve efficiency, foster innovation and enhance overall performance. The findings are supported by Tarigan et al. (2021), who established that organizational capabilities and technological competence significantly improve operational performance by strengthening firms' ability to respond to market changes and improve operational efficiency. The findings also concur with Adoe (2025), who reported that firms possessing strong internal competencies, particularly skilled human resources and technological capabilities, achieve superior operational performance because they are better able to adapt to environmental changes and sustain competitive advantage. However, the findings differ from those of Mikalef et al. (2023), who reported a relatively weak relationship between organizational competencies and organizational performance. The variation may be attributed to differences in industry context and technological advancement. Manufacturing firms in Kenya's chemical and allied industry operate in an increasingly dynamic and competitive environment where employee competencies, technological investments and supportive organizational policies have become essential drivers of operational performance. Consequently, the present findings reinforce the argument that developing internal competencies enables firms to achieve superior market growth, increase market share, improve cost efficiency and sustain long-term competitive advantage.

The findings provide empirical support for the Resource-Based View, which argues that valuable, rare, inimitable, and well organized internal resources and capabilities are fundamental sources of sustained competitive advantage and superior organizational performance. The positive and significant relationship confirms that internal competencies constitute strategic organizational resources that enhance operational performance. The findings also reinforce the Dynamic Capabilities Theory, which posits that organizations with strong internal capabilities can effectively integrate, build, and reconfigure resources to respond to changing business environments, thereby achieving superior operational performance. Consequently, the study extends existing literature by providing empirical evidence from Kenya's chemical and allied manufacturing industry that internal competencies are critical drivers of operational performance. The findings imply that managers should prioritize the development and continuous enhancement of internal competencies, including employee skills, technological capabilities, organizational knowledge, leadership, and process management. Investing in staff training, innovation, knowledge sharing, and efficient operational systems can strengthen the firm's capability to execute core activities effectively. Managers should also foster a culture of continuous

improvement and organizational learning to sustain operational excellence and maintain competitiveness in a dynamic manufacturing environment.

Strengthening internal competencies contributes to improved productivity, efficient resource utilization, and cost reduction. Firms with superior competencies are better positioned to minimize operational inefficiencies, improve product quality, and optimize production processes, resulting in higher profitability and sustainable growth. At the industry level, enhanced operational performance improves the competitiveness of Kenya's chemical and allied manufacturing sector, supports industrialization, promotes employment creation, and contributes to national economic development under initiatives such as Kenya's manufacturing agenda. The findings suggest that manufacturing firms should establish structured competency development programmes, including continuous employee training, leadership development, adoption of modern production technologies, and knowledge management systems. Organizations should regularly assess competency gaps and align human resource development initiatives with strategic objectives. Firms should also strengthen internal processes through quality management systems, process standardization, and cross functional collaboration to translate internal competencies into improved operational outcomes.

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The study sought to determine the effect of internal competencies on the operational performance of manufacturing firms in the chemical and allied industry in Kenya. The descriptive findings revealed that the sampled firms possessed relatively high levels of internal competencies, as reflected in employee skills, technological capacity and organizational policies, indicating that they had invested in developing the resources and capabilities necessary to support operational excellence. Correlation analysis established a positive relationship between internal competencies and operational performance, while regression analysis confirmed that internal competencies had a positive and statistically significant effect on operational performance ($\beta=0.627$, $p=0.00<0.05$). These findings imply that firms with competent employees, adequate technological capabilities and supportive organizational policies are better positioned to enhance market growth, increase market share and improve cost efficiency. Consequently, the study rejected the null hypothesis (H_{01}), which stated that there is no statistically significant effect of internal competencies on the operational performance of manufacturing firms in the chemical and allied industry in Kenya.

Conclusion

The study concluded that internal competencies significantly influence the operational performance of manufacturing firms. Employee skills, technological capacity and supportive organizational policies provide firms with the capabilities required to effectively utilize organizational resources and respond to operational challenges. Consequently, firms that continuously invest in developing their internal competencies are more likely to achieve sustained improvements in operational performance.

Recommendation

Firms should support sector-specific training programs and technology upgrading schemes that raise internal competencies across chemical firms.

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