

Correlational analysis of internal control and inventory management in commercial SMEs of Chimbote

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Abstract: The study aims to determine the relationship between internal control and inventory management in micro and small enterprises (SMEs) of Chimbote. A quantitative approach with a correlational design was adopted, and the sample consisted of 160 SMEs, using structured questionnaires on a Likert scale to collect data. Spearman's Rho coefficient was used to find the levels of association. The results indicated a moderate positive correlation (0.623) between internal control and inventory management, highlighting the importance of dimensions such as the control environment and supervision. However, it was found that only 37.5% of SMEs manage their inventories efficiently, revealing areas for improvement in demand forecasting and inventory policies. In conclusion, strengthening internal control and optimizing inventory management practices are essential strategies for SMEs in Chimbote to optimize their resources, reduce costs, and increase their competitiveness in a globalized and demanding market, thus promoting their sustainability and long-term growth.

Keywords: *Competitiveness, Internal Control, Inventory management, SMEs, Sustainability.*

1. Introduction

In recent years, the effect of globalization in the commercial sector has had a profound influence on Peruvian entrepreneurs, who have had to deal with considerable changes in their businesses to try to compete with major powers in the local and global markets. Many companies face the problem of not having an adequate inventory control system, which leads to poor resource management, directly impacting accounting records, decision-making, and actions taken. Therefore, it is crucial to maintain up-to-date inventory information to provide accurate data for the proper management of resources [1,2].

According to the 2020 Enaho report published by INEI, SMEs constitute the majority of the Peruvian private sector, with 95% of the country's businesses being SMEs in 2020. The presence of SMEs has historically and numerically been significant within the Peruvian business sector, maintaining shares above 91%, which illustrates their importance in the economic expansion of the nation, the creation of family income, and their role as key components in Peru's economy. SMEs were severely affected by the turmoil caused by COVID-19, highlighting the significant effects of the pandemic on businesses, but also illustrating how the economic crisis extended to individuals who depended on SME income [3,4].

Over the years, Peru has experienced great progress in economic development, much of which has been due to the work of micro and small enterprises (SMEs). However, the majority of these institutions, especially those in the commercial sector, lack an internal control system, as the owners do not consider it necessary to implement one, and this negligence leads to inventory control issues [5].

This is due to inadequate purchasing planning, resulting in overstock and, consequently, additional storage costs, making it imperative for these business owners to hire qualified professionals to guide and direct internal control to avoid further issues [6,7].

In the realm of commercial companies, internal controls pose a significant challenge because these organizations are highly vulnerable to theft due to a lack of oversight, which allows employees to get involved in stealing, resulting in increased costs [8,9]. Unfortunately, it is often the employees or even the customers who are responsible for pilferage, which also contributes to rising costs due to the lack of control over inventory goods [10,11].

Commercial companies aim primarily to generate profits, and if a company wishes to increase these profits while sales volume remains constant, it has only three options [12]. These are to increase product prices, reduce costs, or a combination of both [13]. Given today's competitiveness, raising prices is not a practical alternative as it would lead to a loss of customers; therefore, exploring the efficiency of inventory management as a tool to reduce costs associated with a company's inventory is necessary [14]. This approach allows for a balance between cost reduction and maintaining customer satisfaction, optimizing the company's financial results [15,16].

Despite the fact that companies that trade goods or provide services sustain the nation's economy by paying taxes and exporting raw materials, thereby financing the basic resources for the growth of state entities' socio-economic activities that provide services to all Peruvian society, in reality, there are no realistic statistics or any centralized information system that allows us to know the business evolution in the country continuously [17,18].

The current legal framework regarding business formation is based on the political constitution of Peru, and on this basis, business policies have been created that for more than 30 years have favored the continuous formation of monopolies and oligopolies, to the detriment of the development of micro and small enterprises, restricting their development and growth, and worse yet, indirectly fostering their progressive mortality as well as the formation of new businesses [19].

No company in the country operates outside the law, and those that do not comply with these regulations are labeled and pursued as illicit or illegal businesses [20,21]. Therefore, we can assert that the current laws have not allowed for a centralized business organization in which specific objectives are defined for each economic activity and its contribution not only to the country's planned economy but also to its progressive and sustained development in the short, medium, and long terms [22,23].

Initially, the formation of micro and small enterprises was governed by the Individual Limited Liability Company Law, Law No. 21621, enacted in September 1976, created to promote economic activities and generate wealth for the economy. As the name suggests, it was aimed at forming companies individually, disregarding the reality of the country, where the population's economies are family-based. Subsequently, in December 1997, the General Corporations Law, Law No. 26887, was enacted to create small, medium, and large enterprises, but once again, in the case of small businesses, it ignored the population's economy, which consists of families with limited financial resources, forming with precarious working capital. Finally, in July 2003, the Law for the Promotion and Formalization of Micro and Small Enterprises, Law No. 28015, was enacted. In our opinion, this law made the same mistake, as it does not take into account that the country's reality shows that the economies are family-based and subsistence, and even worse, it does not fulfill the promotional purposes established by the aforementioned law [24,25].

The Law for the Promotion and Formalization of Micro and Small Enterprises mentions the acronym SME, which aims to increase employment, productivity, and profitability that boosts GDP (Gross Domestic Product), expand the domestic market, exports, and tax revenue. However, the results achieved to date have shown that the necessary resources for their functionality have only allowed most SMEs to obtain temporary profits, which is why there is so much informality and delinquency in meeting their tax obligations among formal businesses [26].

Achieving profitability is the fundamental objective of SME success, therefore, it is necessary to achieve their goals and objectives supported and protected by special promotional legislation [27].

Regarding labor aspects, such as workers' labor conditions, financial conditions like interest rates on loans, and tax conditions like the formalization of informal businesses and compliance with the obligations of formal ones, which do not affect their precarious working capital, will ensure their permanent profitability [28,29].

Recent studies show how online opinions and recommendations impact local consumer behavior, which directly affects the demand for products and services, representing a challenge for SMEs in terms of inventory management and internal control. Therefore, these businesses must strengthen their internal control to quickly adapt to market fluctuations caused by e-WOM, thereby avoiding stock shortages or overstock issues that could affect their profitability and sustainability [30]. Furthermore, efficient inventory management, supported by a solid internal control, ensures product availability and service quality, factors that increase customer satisfaction and loyalty, which are vital aspects for the long-term success of SMEs, helping to attract new consumers through positive recommendations and thus creating a beneficial cycle for businesses in Chimbote [31].

In this context, the present study aims to determine the relationship between internal control and inventory management in SMEs in Chimbote. By analyzing this relationship, it is expected to provide a deep understanding of how effective internal control can positively influence inventory management, enabling SMEs to optimize their resources, improve customer satisfaction, and foster loyalty, thereby contributing to their success and sustainability in an increasingly competitive and digitalized market.

This research seeks to establish guidelines for the inventory area of SMEs in Chimbote to provide reliable information for decision-making, as inventories represent a considerable part of an organization's assets. Therefore, it is essential to manage them properly to improve data reliability and facilitate efficient resource management, optimizing performance in terms of inventories and assets. By identifying the problem of internal control in inventory management, solutions aligned with the study's objectives and variables are formulated, using surveys that can be replicated in future research. Similarly, from an economic perspective, implementing proper internal control will reduce financial risks and allow for measuring the efficiency and effectiveness of results, improving the company's profitability by optimizing internal processes, minimizing unnecessary costs, and maximizing the effective use of available resources. Additionally, from a social perspective, obtaining timely information will enable owners to make better decisions regarding prices and promotions, allowing them to offer quality products at competitive prices, increasing customer satisfaction, improving market competitiveness, and strengthening relationships with consumers.

2. Literature Review

2.1. Internal Control

Internal control is a key element in the success of any organization; therefore, it must meet a series of specific characteristics to be effective, reflecting the nature of the organizational structure and adapting to the company's demands and the type of activities to be controlled, as this will allow the controls to be appropriate for the organization's needs and capable of meeting them in the best possible way [32,33]. According to the COSO 2013 Model, the concept of internal control refers to a system designed to provide reasonable assurance that an organization's goals will be achieved. Internal controls encompass a set of related procedures, policies, and practices whose purpose is to help ensure that the entity's activities are carried out effectively and efficiently, that risks are adequately controlled, and that results are achieved in accordance with established objectives [34].

Additionally, internal control is considered a set of processes, procedures, policies, and regulations established and systematically followed by management and other employees of a company, with the aim of ensuring an acceptable level of reliability in financial results and avoiding errors, fraud, and/or abuses, considering that the COSO report from the U.S. is commonly used to achieve better structures that include a plan and a process to establish, document, implement, and maintain specific controls to ensure that the entity's objectives are met [35,36].

In business environments, internal control encompasses the efficient, effective, and profitable use of resources, which should be demonstrated through transparency and honesty, making it viable for an audit, that is, tangible evidence of compliance with such controls. This verification is easy when manual processes are used, such as consecutive folios that allow verification of who authorized and who received certain documents. However, its implementation entails an economic cost that some smaller companies lack, as they do not require control methods, avoiding documents in favor of a notebook entry or memorizing transactions verbally. Nonetheless, the owner must evaluate incoming and outgoing money to determine results [37,38].

Internal control systems are fundamental for administrative efficiency today, as the demand for reliable, solid, transparent, and accurate information increases. These systems ensure that all operations are carried out smoothly, in a structured, interconnected, and monitored manner, which is achieved through the identification and implementation of control procedures to prevent errors and ensure reliability. This is a vital part of accounting that increasingly contributes to business management by providing a truthful, accurate, and uninterrupted flow of information, enabling better decision-making in this ever-changing world [39,40].

According to [41], internal control consists of five interrelated components that are closely related to an entity's administrative processes. These components include the control environment, risk assessment, control activities, information and communication, and monitoring. Moreover, according to [42], internal control is not a linear process, but rather an integral cycle, where each of its components dynamically interacts with the others, in response to changing conditions and the entity's culture, size, and management philosophy. The internal control system may vary for different entities, but each of them will need to have the five components to maintain control over their activities.

2.2. Inventory Management

It is the process of managing and controlling the goods that an organization needs to have available to ensure its efficient operation at a minimal cost, where an inventory refers to the stock of goods kept for use or sale, and its proper management involves implementing policies and guidelines that determine when it is necessary to replenish those goods. This management is essential to maintaining a constant and balanced flow of products between the producer, supplier, and customers. Additionally, proper inventory management not only ensures the efficiency of the production process but also guarantees that the sales department has the necessary resources to meet market demand [43]. In this way, optimal inventory management helps maximize the company's benefits, avoiding both stockouts and overstock, which in turn reduces unnecessary costs [44].

According to [45], inventory management is focused on controlling the receipt, storage, and administration of goods or supplies necessary for production, such as raw materials, complementary materials, work-in-process, and finished products, all of which are fundamental for successfully carrying out the other logistics processes. This control task is performed using different tools, such as storage accounts, product records, and, in some cases, physical inventories that allow for accurate verification of available stock. Therefore, inventory management must be carried out with particular vigilance, as it can directly affect the optimization of production and distribution operations for goods. Inventory monitoring is crucial for the correct and timely processing of orders, as well as for ensuring the constant supply of the necessary inputs and materials for production.

Likewise, it is a quantitative method used to manage products within and outside a company. This technique helps managers determine when and how much to authorize for purchase or production, depending on the type of product and the quantity needed to meet demand [46]. The main objective of inventory management is to provide continuity in production, distribution, and sales, where to achieve this goal, inventory managers must have a thorough understanding of the company's product demand and key business cycles. This allows inventory managers to maximize the use of their resources and store only the necessary levels of products to meet demand. This is usually addressed through various

quantitative methods that involve the use of statistics, predictive modeling, and the ability to monitor and optimize inventory levels [47].

On the other hand, it is considered an essential part of Logistics, related to the proper handling of materials, such as raw materials, work-in-process, or finished products. This is relevant for all types of companies, regardless of whether their main objective is commercial, manufacturing, or services. Proper inventory management can represent the success or failure of the company, depending on its ability to identify, assess, and control the costs associated with executing logistics processes. Therefore, inventory management is an activity that requires an awareness of its importance for any type of organization, as proper management can reduce costs and increase revenues, providing companies with a competitive advantage [48,49].

Finally, managing a company's inventory involves being fully aware of the resources available to meet customer demands and is closely related to the organization's value chain, which must align with the company's strategy and tactics to provide the market with what it truly needs. Therefore, it should be aimed at ensuring the best outcome for customers, guaranteeing the quality of products and services offered to meet their needs [50].

3. Methodology

The study is framed within a quantitative approach, aimed at collecting and analyzing numerical data to rigorously examine the associations between variables and generalize the results in a specific context [51]. Additionally, it is of an applied type due to the consideration and use of previous theories from various investigations to solve the practical problem [52].

It presents a correlational research level and a non-experimental design. The sample consisted of 160 micro and small enterprises (SMEs) in Chimbote. To collect the data, a questionnaire was applied to the legal representative of each participating company, and two structured questionnaires on a Likert scale were used, each consisting of 10 questions that evaluated the variables of internal control and inventory management. The reliability of the instruments was verified through Cronbach's Alpha (0.933 and 0.909, respectively). Finally, the SPSS 27 program was used to apply Spearman's Rho coefficient, allowing the degree of correlation to be verified.

4. Results and Discussion

This section presents the findings from the 160 SMEs in Chimbote and examines the relationships between internal control and inventory management. For this reason, the Rho coefficient was used to assess both the intensity and direction of the relationship.

Table 1.
Degree of correlation between internal control and inventory management.

Criterion	Inventory management		
	Spearman's Rho	df	Sig.
Internal control	0.623	160	0.000

Table 1 reveals a moderate positive correlation between the variables ($Rho = 0.623$), indicating that the stronger the internal control systems, the more efficient the inventory management in the SMEs of Chimbote. The high statistical significance confirms that this relationship is not due to chance, highlighting the importance of internal control in optimizing inventory processes.

Moreover, the finding suggests that companies with better internal control practices tend to maintain more accurate and adequate inventory levels, which in turn reduces losses and optimizes resource use. Implementing this in SMEs could result in a significant competitive advantage, allowing for better adaptation to market demands and greater resilience in the face of economic challenges.

Table 2.
Relationship between internal control dimensions and inventory management in SMEs of Chimbote, 2024.

Criterion	Inventory management		
	Spearman's Rho	df	Sig.
Internal control	0.623	160	0.000
Control environment	0.532	160	0.000
Risk assessment	0.424	160	0.006
Control activities	0.418	160	0.007
Information and communication	0.493	160	0.001
Supervision	0.537	160	0.000

In Table 2, analyzing each dimension of internal control, the control environment shows a moderate positive correlation ($Rho = 0.532$, $p = 0.000$), indicating that a strong and ethical organizational environment is fundamental for efficient inventory management. Supervision also shows a moderate correlation ($Rho = 0.537$, $p = 0.000$), emphasizing the importance of constant supervision to maintain accuracy and control in inventories.

Information and communication have a coefficient of 0.493 ($p = 0.001$), demonstrating that effective communication and an adequate flow of information are crucial for the synchronization and optimal management of inventories. Likewise, risk assessment ($Rho = 0.424$, $p = 0.006$) and control activities ($Rho = 0.418$, $p = 0.007$) also show significant positive correlations, indicating that the identification and mitigation of risks, as well as the implementation of specific control activities, significantly contribute to inventory management efficiency.

Table 3.
Levels of internal control and its dimensions.

Variables and dimensions	Deficient		Regular		Efficient		Total	
	fi	%	fi	%	fi	%	fi	%
V: Internal control	0	0.0	76	47.5	84	52.5	160	100.00
D ₁ : control environment	16	10.0	52	32.5	92	57.5	160	100.00
D ₂ : Risk assessment	12	7.5	88	55.0	60	37.5	160	100.00
D ₃ : Control activities	28	17.5	76	47.5	56	35.0	160	100.00
D ₄ : Information and communication	20	12.5	108	67.5	32	20.0	160	100.00
D ₅ : supervision	16	10.0	104	65.0	40	25.0	160	100.00

This table shows that 52.5% of SMEs in Chimbote have efficient internal control, while 47.5% have it at a regular level, with no records of deficiency. Among the dimensions of Internal Control, the control environment is the strongest, with 57.5% efficiency, followed by supervision (25%) and information and communication (20%). In contrast, the dimensions of risk assessment and control activities present lower efficiency levels, with only 37.5% and 35% respectively.

These results indicate that, although SMEs recognize the importance of a robust organizational environment and adequate supervision, there is a need for improvement in risk identification and mitigation, as well as in the implementation of specific control activities. In other words, while most companies maintain generally efficient internal control, it is crucial to strengthen the areas of risk assessment and control activities to optimize inventory management and business performance.

Table 4.
Levels of inventory management and its dimensions.

Variables and dimensions	Deficient		Regular		Efficient		Total	
	fi	%	fi	%	fi	%	fi	%
V: Inventory management	0	0.0	100	62.5	60	37.5	160	100.00
D ₁ : Competitive strategy	16	10.0	64	40.0	80	50.0	160	100.00
D ₂ : Inventory classification	0	0.0	72	45.0	88	55.0	160	100.00
D ₃ : Demand forecasting	12	7.5	112	70.0	36	22.5	160	100.00
D ₄ : Inventory policies	16	10.0	108	67.5	36	22.5	160	100.00

This table shows that 37.5% of SMEs in Chimbote manage their inventories efficiently, while 62.5% do so at a regular level, with no records of deficiency. Among the dimensions of inventory management, inventory classification is the strongest, with 55% efficiency, followed by competitive strategy (50%). In contrast, the dimensions of demand forecasting and inventory policies show lower efficiency levels, with only 22.5% each.

These results indicate that, although SMEs have adequate capabilities in certain areas, they face significant challenges in accurate demand forecasting and in the implementation of effective inventory policies. Therefore, improving these dimensions is essential to optimize inventory management, reduce costs, and increase the competitiveness and sustainability of businesses in the local market.

5. Conclusions

The study conducted on the relationship between Internal Control and Inventory Management in SMEs of Chimbote reveals the crucial importance of implementing robust internal control systems to optimize inventory management. The results show a moderate positive correlation ($Rho = 0.623$) between both variables, indicating that the stronger the internal control systems, the more efficient the inventory management. This significant relationship demonstrates that effective internal control not only improves the accuracy in inventory handling but also reduces losses and optimizes resource use, thereby contributing to the competitiveness and sustainability of businesses.

Furthermore, specific dimensions of internal control, such as the control environment and supervision, proved to be fundamental for efficient inventory management. When these areas are well-developed, they provide a solid organizational environment and constant supervision, which are essential for maintaining adequate inventory levels and minimizing operational costs. On the other hand, dimensions like risk assessment and control activities, while also positive, showed lower efficiency, indicating the need to strengthen these components to further improve inventory management.

Regarding inventory management, only 37.5% of SMEs manage their inventories efficiently, suggesting that there is ample room for improvement. The dimensions of inventory classification and competitive strategy were the most robust, while demand forecasting and inventory policies showed lower efficiency levels, highlighting the need for SMEs to invest in enhancing their capabilities to forecast demand and establish more effective inventory policies, which is essential to avoid stockouts or excess inventory.

Therefore, strengthening internal control and improving inventory management practices are key strategies for SMEs in Chimbote to optimize their resources, reduce costs, and increase their competitiveness in an increasingly demanding and globalized market. The adoption of efficient internal control systems, along with well-planned inventory management, will not only contribute to the

growth and sustainability of these companies but also promote a more organized and resilient business environment in the face of future economic challenges.

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