

# IJRTBT | Effect of Raw Material Inventory on Operational Performance in an Emerging Economy: Insight from the Nigerian Manufacturing Sector

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## Abstract

Inventory management in organizations comes with severe challenges, especially in emerging markets. The study examines the effect of the difficulties experienced in raw material management on quality, speed and flexibility, dependability, and cost in the Nigerian Manufacturing sector. This study empirically examines this relationship in a contemporary mixed methodological approach adopting survey and semi-structured interviews. Survey questionnaires were distributed to 703 inventory and supply chain managers in 22 manufacturing firms in Nigeria, while the interview was conducted for 25 managers from 9 manufacturing firms in Nigeria. The crystal-clear finding is that poor inventory management practices negatively affect the quality, speed, and flexibility of operations in Nigerian manufacturing. This contrasts with a second finding that dependability and cost are not statistically significant. We also discovered that difficulties manufacturing firms in emerging markets experience in managing their raw materials arise from government policies, high exchange rates, bureaucracy in importation and port Issues, inflation, infrastructural challenge, logistics and transportation challenges, poor management decisions, regulatory framework, and unstable exchange rate. In conclusion, our study highlights that inefficient raw material management severely affects the manufacturing firm's overall performance.

**Keywords:** *Raw Material; Operational Performance; Inventory Management; Inventory Control Techniques; Emerging Economy*

## Introduction

Inventory management practice in developing countries is inefficient and tend to paralyze operations and ultimately stifle productivity and growth of the organization. Several challenges bedevil developing countries in their efforts to manage inventory; this causes a decrease in productivity (Goonatilake, 1990; Akindipe, 2014). Despite the surfeit of studies on inventory management, much of its progress has been focused on finished goods inventory. Quality management and its human factors play an important role in the implementation if improving the practice of quality and organisation performance (Habtoor & Alharbi, 2020). There is no evidence of studies that have empirically investigated the effect of raw material inventory management on firms' operational performance, especially in Nigerian manufacturing. Therefore, this study will attempt to cover this gap in the literature.

The objective of this study was to empirically investigate how raw material inventory management affects operational performance (i.e., quality, speed, flexibility, dependability, and cost) in firms, with specific reference to manufacturing firms in Nigeria. The study also sought to understand the major cause of inefficient raw material inventory management in an emerging market, challenges firms within these markets are experiencing, and control techniques employed. The rest of the paper is organized below: Section 2 describes the literature review and theoretical Review, Section 3 includes the methodology development, Section 4 contains an analysis and discussion of the result, Section 5 mentions the findings, followed by Section 6 presents the implication conclude.

## **Literature Review**

### ***Inventory Management***

Inventories include products and services, raw materials, work in progress and finished goods considered to be portions of business assets that are ready or will be ready for sale (Ziukov, 2015). An efficient Inventory management system is an asset that enables firms to distinguish themselves. According to Nallusamy, Christina-Mary & Pragna (2018), organisational objectives are met when operating costs are reduced; customers are satisfied, revenue growth increases, and shareholders' value is enhanced. Any firm's profitability heavily depends on its inventory management system (Cheung et al. 2005). An inefficient inventory system makes firms face severe problems such as stock-outs leading to high ordering costs or acquiring excess inventory leading to high holding or carrying costs, low customer satisfaction, pilferages, lost sales, etc. (Muchaendepi et al. 2019; Atnafu & Balda, 2018; Adeyemi & Salami, 2010).

The importance of the first inventory level – raw materials – in manufacturing firms' efficient operation cannot be overemphasized (Akindipe, 2014). The raw materials mainly determine the resultant output's availability, quality, and quantity. Experience over the years shows that there are critical challenges regarding raw material management in manufacturing firms, especially in emerging economies like Nigeria (Dear, 1989; Simon, 1990; Macbeth, 1989; Chikán & Whybark, 1990; Akindipe, 2014) and these challenges have greatly affected operational performance in the firms.

### ***Raw Material Inventory***

Manufacturing firms carry raw material inventories at the initial stage to facilitate production. The state of the raw material inventories in terms of efficient management and effective planning determines to a large extent, the activity level, turnover, and profit in any given firm (Akindipe, 2014). Florén et al. (2019) affirmed that how firms manage their raw materials will significantly determine their sustainability and eventually affect how they create value for customers both in the short term and the long time.

In the short term, an efficient supply of raw materials ensures smooth production and sustained volumes that meet customers' demands. Still, the impact is immediate and severe with the interruption of supplies. From a long-term perspective, raw materials' prices affect average costs, marginal costs, and profitability (Aylen & Albertson, 2006). Raw material inventory

management is a complex task beyond procurement or technical issues in manufacturing process development (Florén et al. 2013). It also encompasses employing efficient control policies and techniques, which enhance organizational performance. In the organizational structure there is top of the management which is known as leaders in their own responsibilities (Almatrooshi et al. 2020).

### ***Operational Performance***

Several studies on inventory management and firm performance usually have divergent results (Koumanakos, 2008; Elsayed, 2015; Elsayed & Wahba, 2016). A study shows a significant and positive impact of gross margin on well-finished inventory (Blazenko & Vandezande, 2003). Vastag & Whybark (2005) found no significant relationship between inventory turnover and performance. From the JIT perspective, Fullerton & McWatters (2001) found a positive and significant impact of reducing inventory on firm performance. Some extant literature shows variations in inventory-firm performance based on macroeconomic factors, type of inventory and type of industry (Eroglu & Hofer, 2011; Capkun, Hameri & Weiss 2009; Basu & Wang, 2011). Koliass, Dimelis & Filios (2011) found a negative relationship between inventory turnover and gross margin. A similar study in Malaysia on 82 firms confirmed an insignificant relationship between inventory management and performance (Sahari et al. 2012; Cannon, 2008).

### ***Theoretical Review***

#### ***Resource-Based Theory***

The theory utilized in carrying clarity in investigating how inefficient raw material inventory management affects operational performance is the resource-based theory (RBT). The inventory of a firm holds a vast proportion of its organizational resources. The application of resource-based theory to this study is informed by the need to explain the effect of managing a firm's resources (raw material inventory) on operational performance. RBT is a dominant paradigm in strategic management. It has also gained popularity in adjacent and complementary fields, such as operations management and marketing, and management sub-disciplines such as human resource management and entrepreneurship (Hitt, Xu, & Carnes, 2016). Managing Time, Emotions, and Learning ability are three main factors for any employee's performance at workplace (Krishnamacharyulu et al. 2021).

Holding valuable, rare, inimitable, and non-substitutable resources was necessary but insufficient for firms to achieve a competitive advantage (Sirmon, Hitt, & Ireland, 2007). Those resources also had to be managed effectively by firms to achieve superior performance. Raw material inventory is a vital resource for every manufacturing firm, and effective management of it will be a source of competitive advantage. Firms with poor inventory management systems are prone to operational deficiencies and unsatisfactory performance.

***H1a: Raw material inventory management inefficiencies will negatively affect firms' quality.***

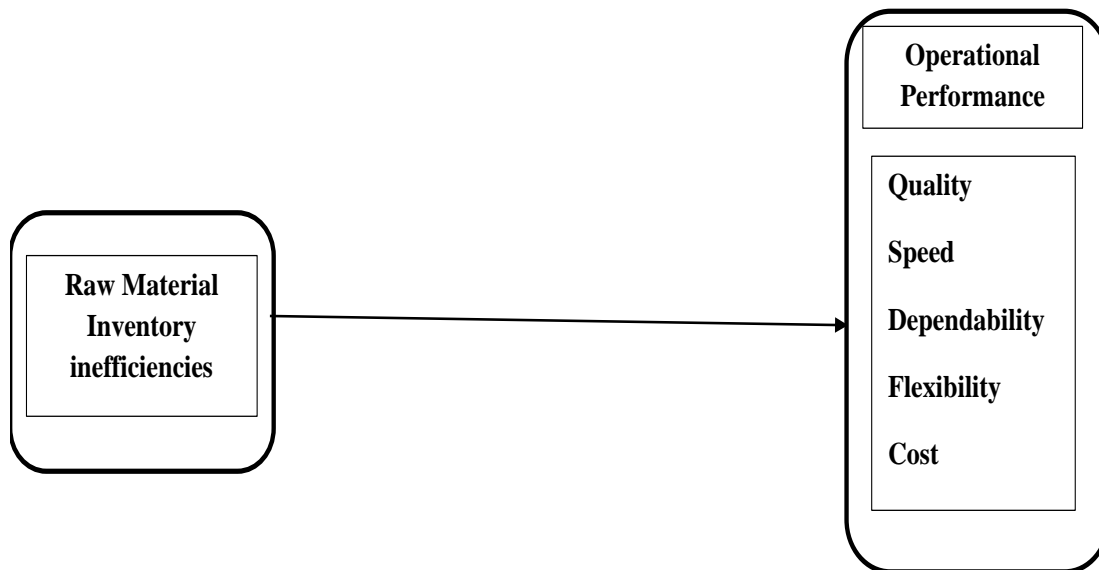
***H1b: Raw material inventory management inefficiencies will negatively affect firms' speed***

***H1c: Raw material inventory management inefficiencies will negatively affect firms' flexibility***

***H1d: Raw material inventory management inefficiencies will negatively affect firms' dependability***

***H1e: Raw material inventory management inefficiencies will negatively affect firms' cost***

*Figure 1: Conceptual Framework*



## Research Methodology

### *Quantitative Analytics*

The measurement parameters concerning emerging markets used for the questionnaire as adapted from the work of Dear (1989), Simon (1990), Macbeth (1989), Chikán & Whybark (1990), Akindipe (2014), and Belekoukias, Garza-Reyes, & Kumar (2014) include overstocking, understocking, management decision, suppliers delay, lack of qualified managing professionals, poor quality infrastructure, poor firm liquidity position; operational performance measures were drawn from with the following variables: quality, flexibility, dependability, cost and speed. The questionnaires were administered amongst respondents drawn from managers and staff working on inventory and supply chain; a reliability test of the survey instrument was organized with 145 respondents; the instrument was considered valid for the study based on a five-point Likert-scale with responses varying from "strongly disagree" to "strongly agree" for the poor inventory management practices. In contrast, the reaction ranged from "very low" to "very high" for the operational performance.

This research collected data from Nigeria's inventory and supply chain managers of twenty-two (22) manufacturing firms. Two research assistants received permission to collect data at these manufacturing firms. Using the intercept approach, the research assistants set out to collect data. They randomly selected 703 respondents and collected data within two months. Of the 703 respondents, 244 (representing a 31.86% answer rate) concurred to finish the survey, then used for the analysis. The final sample was made up of 128 males and 116 females (table 1).

**Table 1: Demographic profile of respondents (n= 244)**

<i>Profile</i>	<i>Measurement</i>	<i>Frequency</i>	<i>Percentage</i>
<i>Sex</i>	Male	128	52.5
	Female	116	47.5
<i>Education Qualification</i>	BSC/HND	214	87.7
	MSC/MBA	29	11.9
	PHD	1	0.4
<i>Nature of Ownership</i>	Local	6	2.5
	Joint	65	26.6
	Foreign	173	70.9
<i>Size of Company</i>	1-9 Employee	1	0.4
	10 – 49	3	1.2
	50 – 249	3	1.2
	250 – Above	237	97.1

A critical piece of information collected for this study was the firms' nature to investigate how their company/corporate cultures drive inventory management policies, whether foreign firms, firms with joint ownership or local firms (as shown in table 1). All respondents are staff and managers in the Nigerian manufacturing sector tasked with managing inventory.

**Qualitative Analysis**

In this aspect of the study, twenty-five (25) inventory management experts from nine (9) organizations represented the following pseudo-codes for confidentiality: MFB, PCON, OFB, CFB, PLAS, TEX, CON, NSB and HYG, were interviewed. The interview was audio-recorded and transcribed into documents. The transcribed interviews were content-coded, line-by-line using the Nvivo 12 PRO Data analytics tool with a comprehensive data codebook consisting of five parents with several sub-nodes, characterising the values included (table 2).

**Table 2: Themes from the semi-structured interview**

<b>Themes</b>	<b>Challenges in Emerging Markets</b>	<b>Control Techniques</b>	<b>Inventory Management Problems</b>	<b>Operational Performance</b>	<b>Strategies for handling inventory challenges</b>

	Bureaucracy in Customs duty	Computerized Inventory Management	Damaged inventory	Down Time and abrupt schedule	Always keep inventory low.
	Government Policies	Economic Order Quantity	Delayed Supply of Raw Materials	Employee Morale	Controlling Inventory with a more efficient method
	High Exchange Earning	Forecasting Technique	Expiration	Firm Reputation	Employing and Training of Skilled Professional
	Importation and corruption Issues	Just in Time Technique	Inaccurate Inventory Records	Incurred Cost	
	Inflation	Manual Labelling	The incompetence of Inventory Personnel	Poor Production performance	Monitor malicious behavior of Suppliers to ensure quality checks.
	Infrastructural Challenge	ABC Classification		Poor Quality	
	Logistics and Transportation Challenges	Reorder Level	Lack of Interest from Senior Management	Poor Sales Performance	Monitor pilferage or Theft
	Poor Management Decision	safety stock method	Overstocking Pilferage and Theft	Profitability Raw Material Wastage	Optimizing inventory supplies
	Regulatory Framework		Poor Storage Facility	Set Targets are not reached.	Regular check-ins with the suppliers to ensure adequate records are kept
	Unstable Exchange Rate		Stockout Suppliers' Malicious behavior	Unsatisfied Customers	

## Result and Discussion

### *Quantitative Study*

Exploratory factor analysis (EFA) was utilized to extract the crucial factors. In this study, the 15 variables for operational performance were loaded on five elements, and the cumulative variance explained by these factors was 0.863. The  $\alpha$  value of each factor group was higher than the suggested threshold of 0.70 (Skipper & Hanna, 2009). Therefore, this result shows that the five factors named in the conceptual model could explain all the measured variables.

An assessment of the measurement model was made before testing the hypothesis. The measurement replica was assessed for goodness-of-fit. Confirmatory factor analysis (CFA) was employed to examine the validity and reliability of the measures. The goodness-of-fit data of the CFA model exhibited an acceptable fit ( $\chi^2/df = 2.724$ , CFI= 0.930, GFI= 0.910, IFI= 0.932, RMSEA= 0.084, P Close 0.000). The path weights were outstanding (t-value > 1.96) and above 0.5). The composite reliabilities (C.R.) for each construct were higher than 0.7. Discriminant validity was evaluated using the Fornell & Larcker (1981) procedure.

**Table 3: Average Variance Extracted**

	<b>IMP</b>	<b>OPDEPEND</b>	<b>OPSPEED</b>	<b>OPQUAL</b>	<b>OPCOST</b>	<b>OPFLEX</b>
<b>IMP</b>	<b>0.52</b>	0.018	0.001	0.018	0.012	0
<b>OPDEPEND</b>	-0.133	<b>0.46</b>	0.005	0.002	0.039	0.027
<b>OPSPEED</b>	-0.036	0.07	<b>0.55</b>	0.002	0.043	0.026
<b>OPQUAL</b>	0.135	0.041	-0.047	<b>0.71</b>	0	0.004
<b>OPCOST</b>	0.012	0.198	0.207	-0.004	<b>0.58</b>	0.099
<b>OPFLEX</b>	-0.048	0.164	0.16	-0.061	0.315	<b>0.37</b>

### *Hypothesis Testing*

The confirmation of the construct measures was dependable and substantial, followed by a hypothesis assessment of the structural model results. This involved evaluating the model's computing potentials and the correlations among constructs (Hair and Lukas, 2014). AMOS maximum-likelihood-estimation was used to estimate the statistical model's parameters (Arbuckle, 2008), relationships between inefficient inventory management practice and operational performance. The general fit of the model was acceptable (thus:  $\chi^2/df = 2.724$ , CFI= 0.930, GFI= 0.910, IFI= 0.932, RMSEA= 0.084, P Close= 0.000). The results show that the hypothesized relationships are supported in the estimated structural model (table 4). The relationship between inefficient inventory management practice on quality was significant at 0.000, the relationship between inefficient inventory management practice on speed was significant at 0.000, the relationship between inefficient inventory management practice on flexibility was significant at 0.000, partly supporting **H<sub>1a</sub>**, **H<sub>1b</sub>**, H<sub>1c</sub> (as shown in table 4). In contrast, the relationship between inefficient inventory management practice on dependability and cost (H<sub>1d</sub> & H<sub>1e</sub>) are insignificant (table 3).

Table 4: Measurement model: CFA for latent variables

CONSTRUCT/SCALE ITEMS	Estimate	T-Value	P
Poor Inventory Management affects Quality		4.733	***
Poor Inventory Management affects Speed	2.709	4.738	***
Poor Inventory Management affects Dependability	0.334	0.522	0.602
Poor Inventory Management affects Flexibility	0.983	3.452	***
Poor Inventory Management affects Cost	0.406	0.998	0.318

<b>POOR INVENTORY MANAGEMENT</b>			
Poor/Inadequate Infrastructure	1.000		
Overstocking	9.589	1.772	0.076
Unskilled Inventory Professionals	1.910	1.308	0.191
<b>OPERATIONAL PERFORMANCE</b>			
<b>QUALITY</b>			
Customer Satisfaction	1.000		
Defect Per Unit	0.344	7.227	***
Scrap Level	0.287	6.001	***
<b>SPEED</b>			
Order Lead Time	1.000		
Cycle Time	0.826	6.765	***
<b>DEPENDABILITY</b>			
The proportion of Products in stock	1.000		
Percentage of orders delivered late	1.248	12.898	***
Schedule Adherence	1.238	13.084	***
<b>FLEXIBILITY</b>			
The time needed to develop new products	1.000		
Machine Changeover time	-0.230	-0.562	0.574
<b>COST</b>			
Efficiency	1.000		
Cost Operation	0.153	0.218	0.827
Labour Productivity	-0.036	-0.209	0.834

Notes: \*\*\* $p < 0.001$ , \*\* $p < 0.01$ , \* $p < 0.05$ .

### Qualitative Study

The respondents fully agreed with this study's result and offered relevant comments based on the interview. Respondents stated unequivocally that inefficient raw material inventory management practices would negatively affect operational performance (table 2). They pointed out that this effect would be seen in the firms' poor production performance. Given the poor



inventory state, the firms' productivity will face severe challenges. In the words of one of the respondents:

*"... Without the use of raw material, it affects. You know inventory generally is like [the] house or engine room of any organisation, e.g., if you do not have a good storage facility, the production aspect will not properly take place..."*

And another noted that:

*"... Without raw material, there will not be produced. So, there is a delay in the discharge [delivery] of the raw material, maybe due to traffic on the way. So, if we are supposed to run seven lines of production concurrently, we end up running three or four lines as we may [not] have [all] the [required] material in the raw material silo. So that may affect our target, and again we cannot produce without raw materials...."*

Furthermore, this leads to the firms facing continual downtime / abrupt schedule, poor customer satisfaction, decreased employee morale and motivation because they are not sufficiently engaged and adequately compensated. Firms also face poor reputation, incurred costs, inferior quality products, poor sales performance, decreased profitability, and raw material wastage. The participants' responses captured these points:

*"... it will be difficult to be able to satisfy customers, and it will equally be difficult to ascertain what our production schedule should be... So, if the inventory is not managed appropriately, it will impact every other stage after inventory...."*

*"...when employee[s] does [do] not work, there is no money, and when there is no product for [sale] in the market, the company is affected too...."*

*"... as I said, there can be losses. Any raw material you buy, there is money you have spent for it. So, suppose you buy [any] raw material that is not used [d]. In that case, that means you have to destroy [it] if you do not get people to buy it as I stated before, and once you destroy [it], there is write off, and all [these] losses would go [to] your profit and loss [account], and it would affect your company['s] expected profit for the year...."*

The respondents also indicated the various inventory management challenges manufacturing firms experience in an emerging market, as can be seen from the above table 2. The respondents were unanimous in their view that firms' inefficiencies in managing inventory (in emerging markets) were caused by apparent environmental challenges, supporting the arguments of Goonatilake (1990). The contextual situations of emerging markets as given by respondents as shown in table 2. Some respondents remarked:

*"...Government regulation is one of the issues; lack of infrastructure is another one. [If the] supplier to my supplier [has] challenges, [it] is an issue too because if they have to import from abroad to produce for me and they are having import problem[s], [it] is an issue too and it will surely affect me...."*

*"...The issue of taxes and the issue of [Customs] delaying our goods unnecessarily to collect bribe and the issue of forex exchange in ordering our raw material from ... abroad."*

*"...Unstable electricity which sometimes [cause] damage to our material, because it needs 100% preservation before it is needed for production."*

## **Conclusion**

The study aimed to investigate the effect of inefficient raw material management on operational performance. It bridges the gap for the call for more research studies on inventory management in developing countries and indicates that inefficient raw material management negatively influences operational performance. The study has augmented the inventory management literature in developing countries by giving practical grounds for research demonstrating that inventory management techniques with efficiency-based objectives should be implemented in developing countries to enable good operational performance. The findings suggest that inefficient raw material management practices negatively affect a firm's operation quality, speed, and flexibility. These results are in cognizance with a previous study carried out on inventory management efficiency and firm performance in 84 firms in Egypt. The insignificant effect of raw material inefficiency on cost and dependability in this study is like previous studies' outcomes.

The qualitative part of the study sought to understand the primary cause of inefficient raw material inventory management in emerging markets, challenges firms within these markets are experiencing, and control techniques employed. And from the interview, we discovered the following as causes of inefficient raw material management in Nigeria (as seen in Table 2)

## **Recommendation**

The study extends the current body of inventory management literature, specifically in a developing country context, by identifying the inefficiencies experienced in managing raw material in manufacturing industries and how it affects operational performance. Our findings suggest that manufacturing organizations' quality, speed, and flexibility in developing countries are negatively affected by inefficient management of the firm's raw material inventory; and the importance of the resource-based theory of a firm's competitive position vis-à-vis emerging markets.

We discovered from both studies (i.e., quantitative, and qualitative) that in developing countries, operational challenges hurt a firm's reputation and competitive position, and these are primarily caused by firms' inability to effectively manage their raw material (i.e., ability to timely procure adequate inventory and convert them to finished products for consumers). From the study, these inefficiencies were primarily attributed to challenges in emerging markets, as stated in table 2 above, which supports findings, which posits that inventory management is due to some constraints in developing countries' contexts across the region faces severe setbacks. The conclusions of this study will help practicing managers understand the complications and challenges surrounding raw material management in emerging markets and the most effective strategy for curbing them. This knowledge will enable them to drive efficient control techniques that will be appropriate based on the form of raw materials they handle.

## **Conflict of Interests**

The authors declare that they have no conflict of interests

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## References

Adeyemi, S.L. & Salami, A.O. (2010). Inventory management: A tool of optimizing resources in a manufacturing industry – a case study of Coca-Cola Bottling Company, Ilorin plant. *Journal of Social Sciences*, 23(2), 135-142.

<https://doi.org/10.5325/transportationj.48.2.0040>

Akindipe, O.S. (2014). The role of raw material management in production operations. *International Journal of Managing Value and Supply Chains*, 5(3), pp 37-44.

<https://doi.org/10.5121/IJMVSC.2014.5303>

Almatrooshi, M. J. A., Khalifa, G. S., Ameen, A., Hossain, M. S., & Morsy, M. A. (2020). The role of knowledge oriented leadership and knowledge sharing to manage the performance of Ministry of Interior in UAE. *International Journal on Recent Trends in Business and Tourism (IJRTBT)*, 4(2), 9-17.

Arbuckle, J. (2008). *Amos 17.0 user's guide*. SPSS Inc.

Atnafu. D. & Balda, A. (2018). The impact of inventory management practice on firm's competitiveness and organisational performance: Empirical evidence from micro and small enterprises in Ethiopia. *Cogent Business & Management*, 5(1), pp 1503219. <https://doi.org/10.1080/23311975.2018.1503219>

Aylen, J., & Albertson, K. (2006). Markets in ferrous scrap for steelmaking. *Ironmaking & steelmaking*, 33(3), 203-212. <https://doi.org/10.1179/174328106X101538>

Basu, N., & Wang, X. (2011). Evidence on the relation between inventory changes, earnings and firm value. *The International Journal of Business and Finance Research*, 5(3), 1-14.

Belekoukias, I., Garza-Reyes, J. A., & Kumar, V. (2014). The impact of lean methods and tools on the operational performance of manufacturing organisations. *International Journal of production research*, 52(18), 5346-5366. <https://doi.org/10.1080/00207543.2014.903348>

Blazenko, G. W., & Vandezande, K. (2003). Corporate holding of finished goods inventories. *Journal of Economics and Business*, 55(3), 255-266. [https://doi.org/10.1016/S0148-6195\(03\)00023-7](https://doi.org/10.1016/S0148-6195(03)00023-7)

Cannon, A. R. (2008). Inventory improvement and financial performance. *International Journal of Economics Production*, 115(2), 581-593. <https://doi.org/10.1016/j.ijpe.2008.07.006>

Capkun, V., Hameri, A.P. & Weiss, L.A. (2009). On the relationship between inventory and financial performance in manufacturing companies. *International Journal of Operations & Production Management*, 29(8), 789-806.

<https://doi.org/10.1108/01443570910977698>

Cheung, C.F., Wang, W.M. & Kwok, S.K. (2005). Knowledge-based inventory management in production logistics: a multi-agent approach. *Proceedings of the Institution of Mechanical Engineers, Part B: Journal of Engineering Manufacture*, 219(3), 299-307.

<https://doi.org/10.1243%2F095440505X28990>

Chikán, A. & Whybark, D.C. (1990). Cross-national comparison of production—inventory management practices. *Engineering Costs and Production Economics*, 19(1-3), 149-156.

Dear, A. (1989). Improvement in management and control of inventory. *Purchasing & Supply Management Journal*, 1(5), 15-19.

Elsayed, K. (2015). Exploring the relationship between efficiency of inventory management and firm performance: empirical research. *International Journal of Services and Operations Management*, 21(1), 73-86. <https://doi/abs/10.1504/IJSOM.2015.068704>

Elsayed, K., & Wahba, H. (2016). Reexamining the relationship between inventory management and firm performance: An organizational life cycle perspective. *Future Business Journal*, 2(1), 65-80. <https://doi.org/10.1016/j.fbj.2016.05.001>

Eroglu, C., & Hofer, C. (2011). Lean, leaner, too lean? The inventory-performance link was revisited. *Journal of Operations Management*, 29(4), 356-369. <https://doi.org/10.1016/j.jom.2010.05.002>

Florén, H., Frishammar, J., Lee, C., Ericsson, M., & Gustafsson, S. (2013, June). A framework for raw materials management in process industries. In *R&D Management Conference, Manchester, UK, June* (pp. 26-28).

Florén, H., Frishammar, J., Löf, A. & Ericsson, M. (2019). Raw materials management in iron and steelmaking firms. *Mineral Economics*, 32(1), 39-47. <https://doi.org/10.1007/s13563-018-0158-7>

Fornell, C. & Larcker, D.F. (1981). Structural Equation Models with Unobservable Variables and Measurement Error: Algebra and Statistics. *Journal of Marketing Research*, 18(3), 382-388. <https://doi.org/10.2307/3150980>

Fullerton, R.R., & McWatters, C.S. (2001). The production performance benefits from JIT implementation. *Journal of operations management*, 19(1), 81-96. [https://doi.org/10.1016/S0272-6963\(00\)00051-6](https://doi.org/10.1016/S0272-6963(00)00051-6)

Goonatilake, L. (1990). Inventory management in the manufacturing sector in developing countries. *Engineering Costs and Production Economics*, 19(1-3), 19-24.

Habtoor, N., & Alharbi, A. A. (2020). Importance of human factors to organizational performance. *International Journal of Management and Human Science (IJMHS)*, 4(1), 11-22.

Hair Jr, J.F. & Lukas, B. (2014). *Marketing Research*. McGraw-Hill Education Australia.

Hitt, M.A., Xu, K., & Carnes, C.M. (2016). Resource based theory in operations management research. *Journal of Operations Management*, 41, 77-94. <https://doi.org/10.1016/j.jom.2015.11.002>

Kolias, G.D., Dimelis, S.P., & Filios, V.P. (2011). An empirical analysis of inventory turnover behaviour in Greek retail sector: 2000–2005. *International Journal of Production Economics*, 133(1), 143-153. <https://doi.org/10.1016/j.ijpe.2010.04.026>

Koumanakos, D.P. (2008). The Effect of Inventory Management on Firm Performance. *International Journal of Productivity and Performance Management*, 57(5), 355-369. <https://doi.org/10.1108/17410400810881827>

Krishanamacharyulu, M., Rajyalakshmi, N. C., Isaac, O., Harish, K. S., Iqbal, M. I., & Srivastava, K. (2021). Study on Effect of Meditation on Individual's Performance at Workplace. *International Journal of Management (IJM)*, 12(1), 379-389. <https://doi.org/10.34218/IJM.12.1.2021.033>

Macbeth, D. (1989). Not purchasing but supply chain management. Purchasing & supply management. *Journal of the Institute of Purchasing & Supply*, 1(9), 11-20. <https://doi.org/10.1016/j.ijpe.2010.04.026>

Muchaendepi, W., Mbohwa, C., Hamandishe, T. & Kanyepe, J. (2019). Inventory management and performance of SMEs in the manufacturing sector of Harare. *Procedia Manufacturing*, 33, 454-461. <https://doi.org/10.1016/j.promfg.2019.04.056>

Nallusamy, S., Christina-Mary, P.P. & Pragna, B.D. (2018). Development of inventory model for health care system in multi-speciality hospitals using ARENA. *Indian Journal of Public Health Research and Development*, 9(2), pp 276-282. <https://doi.org/10.5958/0976-5506.2018.00133.X>

Sahari, S., Tinggi, M., & Kadri, N. (2012). Inventory management in Malaysian construction firms: impact on performance. *SIU Journal of Management*, 2(1), 59-72.

Simon, M. (1990). Fast and effective stock management, purchasing & supply management. *Journal of the Institute of Purchasing & Supply Management*, 6(9), pp 3-8.

Sirmon, D.G., Hitt, M.A. & Ireland, R.D. (2007). Managing firm resources in dynamic environments to create value: Looking inside the black box. *Academy of Management Review*, 32(1), 273-292. <https://doi.org/10.5465/amr.2007.23466005>

Skipper, J. B., Hanna, J. B., & Cegielski, C. G. (2009). Supply chain contingency planning and firm adoption: an initial look at differentiating the innovators. *Transportation Journal*, 48(2), 40-62. <https://doi.org/10.5325/transportationj.48.2.0040>

Vastag, G. & Whybark, D. C. (2005). Inventory management: is there a knock-on effect? *International Journal of Production Economics*, 93, 129-138. <https://doi.org/10.1016/j.ijpe.2004.06.011>

Ziukov, S. (2015). A literature review on models of inventory management under uncertainty. *Business Systems & Economics*, 5(1), 26-35. <https://doi.org/10.13165/VSE-15-5-1-03>