

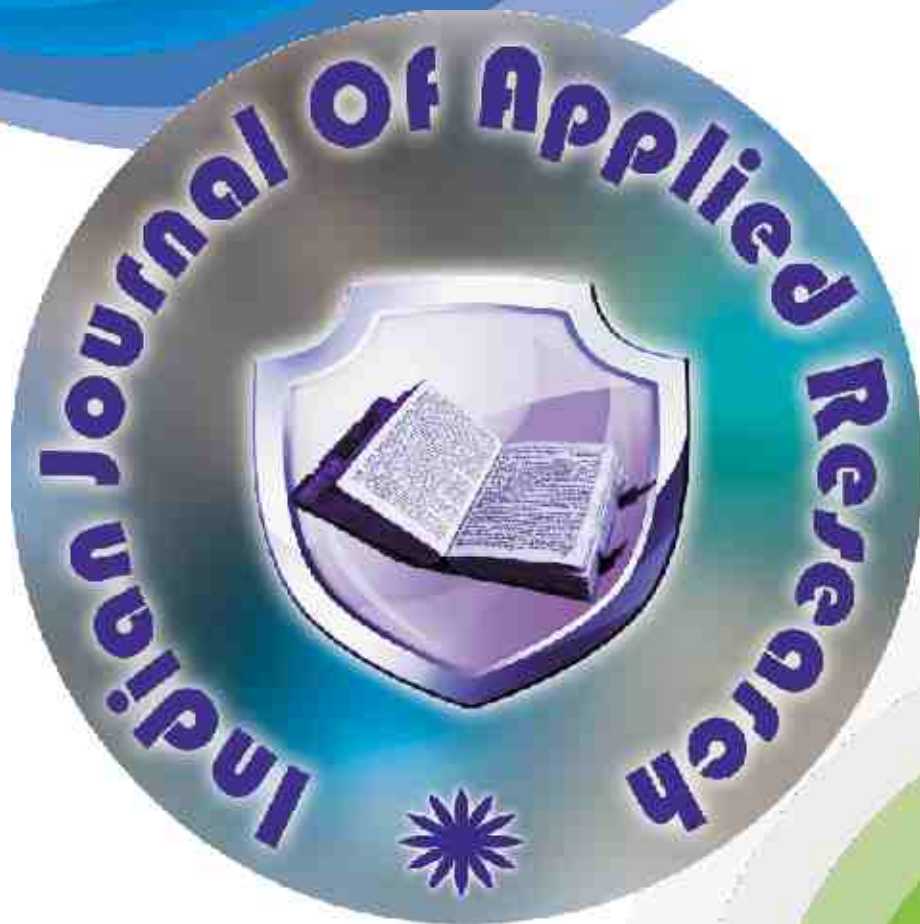
₹ 200

ISSN - 2249-555X

Volume : 1

Issue : 5

February 2012



Journal for All Subjects

www.ijar.in

Listed in International ISSN Directory, Paris.



ISSN - 2249-555X

Indian Journal of Applied Research

Journal for All Subjects

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Inventory Management Strategies And Control Techniques: An Empirical Investigation Of Small Scale Industries

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ABSTRACT

Effectual inventory management is vital for successful operations of any firm. Managers can augment the profitability of business by adopting proper inventory management control devices and competitive strategies. The present study highlights the inventory control techniques and strategies used in 44 small scale units operating in district Udhampur of J&K State. The research framework was examined by empirical analysis of primary data collected. Validity and reliability of the scales in the construct were assessed through BTS and Cronbach-alpha. The results of ranking tables revealed that inventory management assists in cost minimisation, fulfilling customer's requirements & designing effective production scheduling, Economic Order Quantity (EOQ) being the main inventory control technique and Lot sizing the best ordering & inventory management methods used by SSI's.

Keywords : Inventory management and control; Small Scale Industries (SSIs)

Introduction

Inventory management control techniques & strategies involve incessant decision making by managers. Proper inventory management is vital for reducing costs, enhancing product quality and improving competitive ability and operational flexibility (Min et al., 2007). Its proven fact that a manufacturing firm spends, on average, 56 % to cover the direct cost of purchased goods (Handfield, 2002). Further, indirect cost to manage inventory of purchased goods is 30-35 % (Chase et al., 2004) and the total cost of purchased inventory can be quite startling. The various strategies for inventory management identified are attaining proper inventory mix, handle multi stock-room inventories, maintain efficient inventory levels, minimise costs of inventory, order efficiently etc. The firms should therefore adopt proper & efficient inventory control techniques & strategies reducing costs and gaining competitiveness.

Review Of Literature

Inventory management emphasises on reducing waste, inventory reduction and operational flexibility through a pull system. Suri (1998) argued for a persistent reduction of bottlenecks and lead time. Various approaches i.e. theory of constraints & quick response manufacturing were based on flow and lead-time reduction. Other scholars and practitioners conveyed similar messages under different labels such as time-based competition (Stalk, 1988) and lean manufacturing (Womack et al., 1990). Lead time reduction & inventory management literature evoked from initiatives such as JIT/lean production or agility (Naylor et al., 1999), reduction in lot sizes and designing a good product layout. Koufteros et al. (1998) claim inventory management is related to quality improvement efforts, preventive maintenance, dependable suppliers and pull production. Schmenner (2001) demonstrates the relationships between lot sizes, cycle times, bottlenecks, lead times, and process variability (Hopp &

Spearman, 2001). Further, this paper attempts to empirically investigate the inventory control techniques and strategies used by small manufacturing units operating in district Udhampur of J&K State.

Research Methodology

The primary data for the study were collected from 44 functional manufacturing SSIs registered under District Industries Centre (DIC), Udhampur of J&K State sub-divided into ten lines of operation comprising cement (8), pesticide (3), steel (3), battery/lead/alloy (5), menthol (2), guns (2), conduit pipes (2), gates/grills/varnish (5), maize/atta/dal mills (3) and miscellaneous (11). Census method was used to elicit response from owners/managers of the SSIs. Information was collected by administering self developed questionnaire prepared after consulting experts and review of literature which comprised of general information and various statements of inventory management control techniques. Items in the questionnaire were in descriptive form, ranking, dichotomous, open ended and five-point Likert scale. The data collected was further analysed with the help of SPSS (Version 16.00) for purification, checking validity and reliability. Ranking tables were used to elicit meaningful responses from the data.

Analysis And Interpretation

The suitability of raw data for factor analysis obtained from SSI managers was examined through Anti-image, KMO value, Bartlett's Test of Sphericity and (p-value = 0.000), indicating sufficient common variance and correlation matrix. Principal Component Analysis (PSA) with Varimax Rotation brought the construct to the level of 21 statements out of 37 statements originally kept in the domain of inventory management. The KMO value (0.688) and Bartlett Test of Sphericity (451.755) indicates acceptable and significant values. Therefore, the statements resulted into five-factor solution using Kaiser Criteria (i.e. eigen value ≥ 1)

with 68.58% of the total variance explained. The communality for 21 items ranges from 0.56 to 0.89, indicating moderate to high degree of linear association among the variables. The factor loading ranges from 0.517 to 0.888 and the cumulative variance extracted ranges from 17.30 to 68.58 % (Table 1.1).

Table 1.2 avows the benefits derived by SSI managers from proper inventory management. The factors taken into ranking were "Helps in minimising costs", "Meets customer service requirements", "Effective production scheduling" and "Facilitates prudent purchasing". The factor "Helps in minimising costs" dawned with highest rank i.e. one. The factor "Meets customer service requirement" is ranked second by all the firms except dealing in pesticides/insecticides and atta/maize/dal mills. "Effective production scheduling" is accorded rank three and "Facilitates prudent purchasing" as rank four by all the managers of SSI's. It's evident from the mean ranks accorded that benefits derived by SSIs managers form inventory management in descending orders is cost minimization, fulfilling customers' requirements, designing effective production scheduling and least in prudent & timely materials purchasing.

Table 1.3 connotes unit-wise mean ranking of inventory techniques used by small manufacturing firms. The various inventory techniques identified in literature are: "Always Better Control (ABC)", "Economic Order Quantity (EOQ)", "Material Requirement Planning (MRP)" and "Just-in-Time (JIT)". As evident from ranks "Economic Order Quantity (EOQ)" is accorded rank one with mean score 1.91, "Material Requirement Planning (MRP)" as rank second (1.92), "Always

Better Control (ABC)" as rank three (2.4) and "Just-in-time (JIT)" as rank four (3.4) by almost all the SSI managers.

Table 1.4 highlights the ranking of ordering & inventory management methods used by SSI managers. The different methods adopted are "Order releasing", "Lot sizing" and "Order expediting". Lot sizing is accorded rank one by most of the firms with mean score 1.4 to reduce erratic supply of raw materials. Order expediting is accorded rank second followed by order releasing with rank three.

Conclusion And Managerial Implications

The study provides substantive prop up for previous findings in the existing literature and fresh insights about the inventory management control techniques and strategies adopted in small scale industries. Proper inventory management assists in improving asset productivity & inventory turns, targeting customers & positioning products in diverse markets. The study highlights Economic Order Quantity (EOQ) and Lot sizing being the main inventory control technique and ordering & inventory management methods used by SSI's. The managers must be sensitized through periodic training & education programmes in order to better implement the existing and latest inventory control techniques. The findings of the study is limited to small scale industries of district Udhampur of J&K State, so results drawn cannot be generalized for medium or large scale industries functioning in other parts of country having dissimilar business environment.

Table 1.1: Results Showing Factor Loadings and Variance Explained After Scale Purification for Inventory Management

Factor-wise Dimensions	Mean	S.D	FL	Eigen Value	Variance Explained %	Cumulative Variance %	Comm-unity	α
F1	4.17	.482		8.204	17.300	17.300		.8022
Brings potential savings	4.13	.408	.828				.852	
Avoids costly interruptions in operations	4.18	.390	.807				.797	
Facilitates purchase economies	4.22	.522	.711				.742	
Results in effective utilization of human & equipment	4.18	.390	.608				.679	
Inventory is in accordance to the firm size	4.13	.701	.598				.566	
F2	4.18	.391		3.643	15.700	33.000		.8231
Ensures customer confidence	4.27	.450	.386				.844	
Consistent with safety & economic advantage	4.20	.408	.790				.795	
Facilitates cost accounting activities	4.13	.347	.726				.820	
Improves service level	4.13	.347	.563				.735	
F3	3.89	.531		2.923	15.504	48.504		.8293
Price fluctuation	3.90	.520	.888				.897	
Warehousing facilities	3.86	.553	.870				.793	
Inventory catalogue & control	3.90	.520	.744				.761	
F4	4.11	.473		1.646	10.863	59.367		.6273
Reduces storage costs	4.04	.680	.790				.837	
Affects revenue costs	4.15	.370	.734				.831	
Adequate inventories are always there	4.15	.370	.517				.641	
F5	4.19	.425		1.298	9.217	68.584		.6057
Enhances market share	4.20	.461	.873				.791	
Paves for competitive ability	4.18	.390	.718				.654	

Footnotes: KMO Value = .688; Bartlett's Test of Sphericity = 451.76, df = 153, Sig. = .000; Extraction Method Principal Component Analysis; Varimax with Kaiser Normalisation; Rotation converged in 11 iterations; 'FL' stands for Factor Loadings, 'S.D' for Standard Deviation and 'α' for Alpha.

Table 1.2: Unit-wise Ranking of Managers' Perceptions Regarding Benefits Derived from Inventory Management

Units/Benefits	Helps in minimising cost	Meets customer service requirement	Effective production scheduling	Facilitates prudent purchasing
Cement	1 (I)	2.13 (II)	2.88 (III)	4 (IV)
Battery/Lead/Alloy	1.4 (I)	2.6 (II)	3 (III)	3 (IV)
Pesticides/Insecticides	1 (I)	3.3 (III)	2.3 (II)	3.3 (IV)
Conduit pipes	2 (II)	2.5 (II)	2.5 (III)	3 (IV)
Menthol	1 (I)	2 (II)	3.5 (III)	3.5 (IV)
Guns	1.5 (I)	1.5 (II)	3 (III)	4 (IV)
Steel	1.3 (I)	2.3 (II)	2.3 (III)	4 (IV)
Gates/Grills/Varnish/Paint	1 (I)	2.2 (II)	3.2 (III)	3.6 (IV)
Atta/Maize/Dal mills	2 (II)	1.6 (I)	3 (III)	3.3 (IV)
Others (Miscellaneous)	1.63 (I)	2.18 (II)	2.54 (III)	3.63 (IV)
Mean & Rank	1.51 (I)	2.20 (II)	2.78 (III)	3.69 (IV)

Note: Where 1 denotes "highest rank" and 4 denotes "lowest rank"

Table 1.3: Unit-wise Ranking of Inventory Control Techniques Used by SSI's

Units/Techniques	Always Better Control (ABC)	Economic Order Quantity (EOQ)	Material Requirement Planning (MRP)	Just-in-Time (JIT)
Cement	2.3 (III)	1.7 (I)	2.1 (II)	3.7 (IV)
Battery/Lead/Alloy	2.4 (III)	3.4 (IV)	2 (I)	2.2 (II)
Pesticides/Insecticides	2.7 (III)	1.3 (I)	2 (II)	4 (IV)
Conduit pipes	2.5 (III)	1.5 (I)	2 (II)	4 (IV)
Menthol	3 (III)	2 (II)	1 (I)	4 (IV)
Guns	--	--	1 (I)	--
Steel	2.7 (II)	1 (I)	3 (III)	3.3 (IV)
Gates/Grills/Varnish/Paint	2.4 (III)	1.8 (I)	2.2 (II)	3.6 (IV)
Atta/Maize/Dal mills	2 (II)	2.5 (III)	2 (I)	3 (IV)
Others (Miscellaneous)	2.2 (III)	2 (II)	1.9 (I)	3 (IV)
Mean & Rank	2.4 (III)	1.91 (I)	1.92 (II)	3.4 (IV)

Note: Where 1 denotes "highest rank" and 4 denotes "lowest rank"

Table 1.4: Unit-wise Ranking of Ordering & Inventory Management Methods Used by SSI's

Units/Benefits	Order releasing	Lot sizing	Order expediting
Cement	2.42 (III)	1.62 (I)	1.85 (II)
Battery/Lead/Alloy	2 (II)	1.6 (I)	2.4 (III)
Pesticides/Insecticides	2.6 (III)	2 (II)	1.3 (I)
Conduit pipes	3 (III)	1 (I)	2 (II)
Menthol	3 (III)	1 (I)	2 (II)
Guns	1.5 (II)	1.5 (I)	3 (III)
Steel	3 (III)	1 (I)	2 (II)
Gates/Grills/Varnish/Paint	2.8 (III)	1.8 (II)	1.4 (I)
Atta/Maize/Dal mills	2.5 (III)	1.6 (II)	1.5 (I)
Others (Miscellaneous)	2.5 (III)	1.7 (II)	1.5 (I)
Mean & Rank	2.5 (III)	1.4 (I)	1.8 (II)

Note: Where 1 denotes "highest rank" and 3 denotes "lowest rank"

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