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# SPECIFYING INVENTORY NEEDS AND STRATEGIES FOR SMOOTH CONDUCT OF BUSINESS OPERATIONS

**Vipul Chalotra***

**Abstract** *Inventory forms the major part of current assets of the business and therefore requires apt strategies for its effective controlling in order to conduct smooth flow of business operations. The paper presents an empirical analysis of inventory control for smooth business operations. The primary data for the study were collected from 44 SSI managers/ owners in Udhampur district of J&K state through census technique. BTS and Cronbach-alpha stood as basis for ensuring validity and reliability of the scales in the construct. The purified data after factor analysis were analysed with the assistance of varied multivariate tools. The results of hierarchal regression model revealed that effective inventory control and management lead to elimination of duplication in ordering, effective inventory control strategies results in reduction of material handling costs, effectual inventory control strategies assists in keeping obsolescence losses to the minimum and effectual inventory control strategies leads to reduction of transportation costs.*

**Keyword:** *Inventory, Control, Management, SSIs (Small Scale Industries*)

## INTRODUCTION

Inventories occupy the most strategic position in the structure of working capital of most business enterprises. It is generally recognised as stock held by business enterprises and is denoted by current assets of the business. The turnover of working capital is largely governed by the turnover of inventory. The inventory only acts as source of profits for the business and its appropriate need is the present need of hour for the modern businesses. The dictionary quotes the meaning of inventory as stock of goods, furniture, and other current assets. So inventory really constitute the stock of goods available with the business at a specific time and which is required to be converted into cash within a year. For a manufacturing concern the meaning of inventory would be rather different as it portrays stock of raw material, stock of work-in-process and stock of finished goods and stores. The term 'inventory' connotes to the accumulation of production of finished goods a concern is offering for sale and the related parts or components that assists in making possible that production. However, as a whole inventory represents accumulation of all tangible items which

(i) are meant to be sold being part of regular business.

(ii) are in work-in-process of converting raw materials into finished goods and making them available for sale.

Further, it is recognised that inventories are resilient assets held for resale, are required for production or for consumption, are must for any business for its survival and smooth functioning. It assists in carrying on business operations such as merchandise, goods produced by the business which are ready for sale. Inventories are basically categorised as follows:

**Finished Goods:** Completely manufactured goods could be sold by the business without any lack out.

**Materials:** These are the items such as raw materials, semi-finished goods, which are utilised in the final finished production.

**Supplies:** Item, that is going to be consumed by the business in its operation activities but will not itself be consumed physically as it is a part of production process. On the other hand, the term inventory means the material having at least one of the following features:

1. marketable,
2. assists in the manufacturing process of business,
3. could be directly used in the manufacturing process of the business, and
4. could be send to outside parties for making marketable productions out of it.

Majority of the Indian companies had reported that inventory magnifies central place in terms of current assets. For example, public limited companies in India had reported that on an average inventories are even more than 60 percent of total current assets of the enterprise and that of Government companies it accounts for about 61 percent. Therefore, a dire need is there to manage, specify, control, predict and sold such inventories resourcefully and successfully in

* Assistant Professor, Dept. of Commerce University of Jammu, Udhampur campus, Jammu & Kashmir, India.
E-mail: vipulchalotra@gmail.com

order to effectively utilize them and to not unduly invest extravagantly in them. So, all the business concerns should rationally manage their inventories otherwise any wrong decision regarding the management of inventories will be endanger its profit sustainability and may fail ruin in the longer run.

## REVIEW OF LITERATURE

The term inventory had occupied an important place in the business and commerce literature and it's of course attaining momentous discussion by authors, academicians, industrialists all around the world (Christopher & Peck, 2004). International supply are becoming helpless due to various factors such as geographic area covered, the transport modes used, political/ border factors and environmental issues (Prater *et al*., 2001). With all this happenings, inventory is generally recognised as one possible tool as it appeals to a risk mitigation approach (Chopra & Sodhi, 2004) and that too in times of supply uncertainties (Lee, 2002). Inventory control is based on two theories as conveyed in the existing literature, one is the traditional inventory control theory which focuses on optimisation of inventory levels and on the other hand there is modern inventory control theory which focuses more on the minimisation of inventory levels. There are these two conflicting theories but out of two there would be optimal inventory held by the business. It is also stated that too much reduction of inventory, as portrayed in the modern theory, could lead to "corporate anorexia" (Radnor & Boaden, 2004). This suggests that there is in fact an optimum level of inventory. Further, it was quoted that 13 percent costs being accorded to inventory costs out of total logistics costs in Europe (Establish Inc/AT Kearney, 2004) and 24 percent costs being accredited to inventory costs in a study conducted USA (European Logistics Association/ Herbert W. Davis & Co., 2005). The present research empirically analyses and investigates inventory needs & strategies for the smooth conduct of business operations of 49 small manufacturing firms operating in district Udhampur of J&K State.

## HYPOTHESES OF THE STUDY

The study is encompassed with the following hypotheses which are based on the in-depth analysis of existing literature. The main hypotheses formulated in the study are:-

H1: Effective inventory control and management lead to elimination of duplication in ordering.

H2: Effective inventory control strategies result in reduction of material handling costs.

H3: Effectual inventory control strategies assist in keeping obsolescence losses to the minimum.

H4: Effectual inventory control strategies lead to reduction of transportation costs.

**Objective:** To analyse and specify the inventory needs & strategies for smooth conduct of business operations.

## THE RESEARCH FRAMEWORK

The research framework stands at the central place in whole research. The present research conducted was structured in the following way:

### Sampling and Data Collection

The study was conducted in district Udhampur of J&K State on 49 small scale industries registered under District Industries Centre (DIC), Primary data were collected from these industries among which five units were found to be non functional. Out of total 49 industries 44 actually responded representing a successful response rate of 89.79%. Their response was the main basis for drawing meaningful inferences. All the 44 small scale industries were categorised into main ten types of operation namely 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). The miscellaneous circle included M/s Supertech Industry**,** M/s Luxmi Electronics Works**,** Shaj Nath Vanaspati Ltd.**,** M/s Aditiya Cables, Poles and Transformers**,** M/s Unique Carbon Industries**,** M/s B.S Traders**,** M/s Vijay Candles**,** Everest Health Care Products**,** M/s J.K Petro Chemicals, and M/s Ajay Ice Factory**.**

### Sampling Technique Applied

The data from the ultimate respondents i.e. SSI managers were obtained by applying census method.

### The Survey Instrument

The survey instrument connoted as data construction form was constructed known as questionnaire for the present research which was prepared after in depth analysis of the existing literature review and by consulting academicians, experts, businessmen, industrialists, eminent scholars etc. The questionnaire for the present research was composed of general information and 10 statements of inventory management. Statements formulated in the questionnaire were in ranking, open ended and five -point Likert scale, where 1 stands for strongly disagree and 5 for strongly agree.

### Collection of Data

As the nature of data for the study is primary, the same was collected from the respective respondents by approaching

them personally. Three visits to each respondent were set as criterion for gathering response. 44 units responded and five were found to be not functioning. The secondary information were collected from existing review of literature and varied eminent books as well as journals, such as International Journal of Supply Chain Management, International Journal of Logistics Management, Journal of Supply Chain Management, Journal of Academy of Marketing Science etc. Standardised multivariate statistical tools such as mean, standard deviation, regression were used to test hypotheses and to analyze and obtain meaningful inferences.

## Reliability and validity of the instrument

**Reliability:** The study revealed five variable and the and the cronbach's alpha reliability coefficients for all 5 scale items represented alpha value 0.903 was higher than prescribed value of 0.77 as stated by Gordon & Narayanan (1984). This depicts high internal consistency.

**Validity**: All the five items representing the factor represented alpha reliability higher to 0.50 and satisfactory KMO value of 0.894, indicating significant construct validity of the construct (Hair *et al*., 1995).

## DATA ANALYSIS AND INTERPRETATION

The data obtained from the respective respondents i.e. mangers of SSIs were subjected to factor analysis for purification and reduction. Anti-image, KMO value, Bartlett's Test of Sphercity and (p-value = 0.000) stood as basis for examining the data which indicated sufficient common variance and correlation matrix (Dess *et al*., 1997; Field, 2000). The data were further processed with the assistance of R-Mode Principal Component Analysis (PSA) with Varimax Rotation that exhibited 5 statements out of 10 statements initially prepared in the construct of inventory management. The significance and reliability of the data were revealed aptly by the KMO value (0.894) and Bartlett Test of Sphercity (2166.723) which was acceptable and presentable. Therefore, factor loadings divulged conservative criteria which brought factor solution using Kaiser Criteria (i.e. eigen value ≥1) with 36.123% of the total variance explained. The communality for 5 items ranges from 0.715 to 0.958, demonstrating god association among the variables. The factor loadings range from 0.721 to 0.923 and the cumulative variance extracted is 34.123%. All the statements and the factor are flaunted in Table 1. A brief description of factor and its statements emerged are as under:

**Factor (Inventory control):** The five items underlying this factor consisted of "Inventory control eliminates duplication in ordering", "Inventory control provides a check to carelessness & pilferage", "Inventory control reduces material handling costs", "Inventory control keeps down obsolescence losses to the minimum", and "Transportation costs enhances inventory costs". The mean values range from 4.23 to 4.52 representing significant values. The factor loadings fluctuate within .721 to .923. The factor loadings for each statement is: Inventory control eliminates duplication in ordering (.923), Inventory control provides a check to carelessness & pilferage (.901), Inventory control reduces material handling costs (.864), Inventory control keeps down obsolescence losses to the minimum (.834), and Transportation costs enhances inventory costs (.721). The statement "Inventory control eliminates duplication in ordering" emerged with highest factor loadings and the statement. "Transportation costs enhance inventory costs" emerged to be the weakest among all with low factor loading. The communalities varied from .715 - .958 indicating significant values and high degree of linear association among the variables. The communalities for each statement are: Inventory control eliminates duplication in ordering (.868), Inventory control provides a check to carelessness & pilferage (.821), Inventory control reduces material handling costs (.958), Inventory control keeps down obsolescence losses to the minimum (.729), and Transportation costs enhances inventory costs (.715). The statement "Inventory control reduces material handling costs" is enriched with highest communality and the statement "Transportation costs enhance inventory costs" emerged to be the weakest but communalities indicated significant values for the construct. The basic purpose of managers is to specify need & strategies in order to acquire smooth conduct of business operations.

## Regression Analysis

Table 2 shows output from regression analysis to elicit the impact of inventory control on elimination of duplication in ordering. The result of linear regression analysis (Table 2) outlays the positive and appreciable relationship between the predictor (Eliminates duplication in ordering) and the dependent variable i.e. inventory control as contoured by the value of R = .806. In the model 1, R is .806 which indicates 80% association between dependent and independent variable. R-Square for this model is .710 which means that 71% of variation in inventory can be explained from the independent variable. Adjusted R square (.632) indicates that the value of R-square will increase if anytime another independent variable is added to the model. The beta value

**Table 1: Results Showing Factor Loadings and Variance Explained after Scale Purification (Rotated Component Method) for Inventory control (Managers Perceptions)**

| Factor-wise Dimensions | Mean | S.D | F.L | Eigen Value | Variance Explained % | Cumulative Variance % | Comm-unality | α |
|---|---|---|---|---|---|---|---|---|
| **INVENTORY CONTROL** | **4.36** | **.829** | | **14.854** | **34.123** | **34.123** | | **.9035** |
| 1. Inventory control eliminates duplication in ordering | 4.36 | .973 | .923 | | | | .868 | |
| 2. Provides a check to carelessness & pilferage | 4.48 | .895 | .901 | | | | .821 | |
| 3. Inventory control reduces material handling costs | 4.23 | .840 | .864 | | | | .958 | |
| 4. Keeps obsolescence losses to the minimum | 4.25 | .735 | .834 | | | | .729 | |
| 5. Transportation costs enhances inventory costs | 4.52 | .706 | .721 | | | | .715 | |

Footnotes: KMO Value =.894; Bartlett's Test of Sphercity = 2166.723, df = 190, Sig. =.000; Extraction Method Principal Component Analysis; Varimax with Kaiser Normalisation; Rotation converged in 5 iterations; 'FL' stands for Factor Loadings, 'S.D' for Standard Deviation and 'α' for Alpha.

**Table 2: Regression Model Summary**

| Model | R | R2 | AdjustedR2 | Std. Error of Estimate | F value ANOVA | Sig. level | β | t | Sig. level |
|---|---|---|---|---|---|---|---|---|---|
| 1. | .806 | .710 | .632 | .2233 | 40.213 | .000 | .277 | 12.251 | .000 |

a. Predictors: (Constant), Eliminates duplication in ordering
b. Dependent Variable: Inventory control

**Table 3: Regression Model Summary**

| Model | R | $R^2$ | AdjustedR2 | Std. Error of Estimate | F value ANOVA | Sig. level | β | t | Sig. level |
|---|---|---|---|---|---|---|---|---|---|
| 1. | .811 | .716 | .643 | .2877 | 56.231 | .000 | .829 | 10.231 | .001 |

a. Predictors: (Constant), Reduces material handling costs
b. Dependent Variable: Inventory control

**Table 4: Regression Model Summary**

| Model | R | $R^2$ | Adjusted$R^2$ | Std. Error of Estimate | F value ANOVA | Sig. level | β | t | Sig. level |
|---|---|---|---|---|---|---|---|---|---|
| 1. | .912 | .810 | .701 | .5713 | 52.112 | .000 | .913 | 15.634 | .000 |

a. Predictors: (Constant), Keeps obsolescence losses to the minimum

b. Dependent Variable: Inventory control

**Table 5: Regression Model Summary**

| Model | R | $R^2$ | Adjusted$R^2$ | Std. Error of Estimate | F value ANOVA | Sig. level | β | t | Sig. level |
|---|---|---|---|---|---|---|---|---|---|
| 1. | .934 | .816 | .814 | .6123 | 59.132 | .000 | .990 | 14.931 | .000 |

a. Predictors: (Constant), Transportation costs enhances inventory costs

b. Dependent Variable: Inventory control

also signifies the association of independent variable with dependent variable. Change in R square is also found to be significant with F-values significant at 5% confidence level. Thus the hypothesis "Effective inventory control and management leads to elimination of duplication in ordering" is accepted as represented by its significance level $p < .05$.

Table 3 shows output from regression analysis to elicit the impact of inventory control on reduction of material handling costs. The results of regression analysis exhibit the positive and appreciable relationship between the predictor (reduction of material handling costs) and the dependent variable i.e. inventory control as shown by the value of R = .811. In the model 1, R is .811 which indicates 81% association between dependent and independent variable. R-Square for this model is .716 which means that 71% of variation in inventory can be explained from the independent variable. Adjusted R square (.643) indicates that the value of R-square will increase, if anytime another independent variable is added to model. Further beta value signifies good relationship of independent variable with dependent variable. Change in R square is also found to be significant with F-values significant at 5% confidence level. Thus the hypothesis "Effective inventory control strategies results in reduction of material handling costs" is accepted as represented by its significance level $p < .05$.

Table 4 shows output from regression analysis to elicit the impact of inventory control on obsolescence losses to the minimum. The result of linear regression analysis (Table .4) exhibits the positive and appreciable relationship between the predictor (obsolescence losses to the minimum) and the dependent variable i.e. inventory control as shown by the value of R = .912. In the model 1, R is .912 which indicates 91% association between dependent and independent variable. R-Square for this model is .810 which means that 81% of variation in inventory can be explained from the independent variable. Adjusted R square (.701) indicates that the value of R-square will increase, if anytime another independent variable is added to the model. Further beta value signifies good relationship of independent variable with dependent variable. Change in R square is also found to be significant with F-values significant at 5% confidence level. Thus the hypothesis "Effectual inventory control strategies assists in keeping obsolescence losses tot the minimum" is accepted as represented by its significance level $p < .05$.

Table 5 shows output from regression analysis to elicit the impact of inventory control on Transportation costs. The result of linear regression analysis exhibits the positive and appreciable relationship between the predictor (transportation costs) and the dependent variable i.e. inventory control as shown by the value of R = .934. In the model 1, R is .934 which indicates 93% association between dependent and independent variable. R-Square for this model is .816 which means that 81% of variation in inventory can be explained from the independent variable. Adjusted R square (.814) indicates that the R-square will increase, if anytime another independent variable is added to the model. Further beta value signifies good relationship of independent variable with dependent variable. Change in R square is also found to be significant with F-values significant at 5% confidence level. Thus the hypothesis "Effectual inventory control strategies leads to reduction of transportation costs" is accepted as represented by its significance level $p < .05$.

## CONCLUSION

As inventories occupy the most strategic position in business, it is required to be managed strategically as it influences the entire business. The effective management and control of inventories results in meeting demands, targeting customers & positioning products in diverse markets. The study provides new knowledge to the existing literature about inventory control and management. The present study findings supports all the formulated hypotheses and reveals that proper Inventory control leads to elimination of duplication in ordering, effective inventory control strategies results in reduction of material handling costs, Further it was noticed that effectual inventory control strategies assists in keeping obsolescence losses to the minimum and effectual inventory control strategies leads to reduction of transportation costs. The hypotheses were truly supported with the responses gathered from SSI managers/owners so as to draw meaningful results. Managers contacted were told about the research purpose in order to effectuate the originality of the research.

The study is conducted in one area and therefore it is quoted as area specific which cannot be dovetailed in the other areas which are having varied environmental conditions. Future researches can be conducted on the privilege of inventory control strategies from the perspective of wholesalers and retailers for medium & large scale industries.

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