Empirical Study On Operational Efficiency In Retail Stores In Chandigarh Tricity

** Dr. Himanshu Choudhary*
*** Vandana Sharma*

INTRODUCTION

Retailing has become a global phenomenon today. It has evolved as a hi- tech business with lot of potential for growth for global economies. India has not remained untouched by its rapid development. After liberalization, India has been marching ahead to develop major sectors of the economy such as infrastructure, agriculture, power, automobile, pharmaceuticals, organized retail and so on. Amongst these, organized retail has the potential to add over Rs 2,00,000 crore ($45 billion) business by the year 2010 generating employment for some 2.5 million people in various retail operations and over 10 million additional workforce in retail support activities including contract production & processing, supply chain & logistics, retail real estate development & management etc. (IMAGES India Retail Report 2007). In the competitive globalization, retail is playing a significant role globally in increasing productivity and efficiency across a wide range of consumer goods and services. The impact of this phenomenon can be best studied in countries such as U.S.A., U.K., Mexico, Thailand and now in China and India.

A. T. Kearney Inc. has placed India first on a global retail development index in its report on retail industry, 2005. The country has the highest per capita outlets in the world - 5.5 outlets per 1000 population. The average percentage of the population in India engaged in retailing is 7%, as compared to 20% in the USA. Growing at 9% in value terms and second only to Indonesia's retail value growth, 2006 was a watershed year for retailing in India. The year saw changes in legislation in the form of the opening of single-brand retailing, international retailers entering the country through joint ventures, and domestic players rising to retailing. Major domestic players such as Reliance Group, Aditya Birla Group and Bharti Group have all signaled their intentions to succeed in what is seen as the next big business in India. As the corporates - the Piramals, the Tatas, the Rahejas, ITC, S.Kumar's, RPG Enterprises and mega retailers- Crossroads, Shopper's Stop, and Pantaloons race to revolutionize the retailing sector, retail as an industry in India is coming alive.

Organized retailing in India has a huge scope because of the vast market and the growing consciousness of the consumer about product quality and services. The following factors are responsible for adding kinetic energy to the retailing in India.

- Rapid urbanization.
- Increase in spending power and Increased consumption.
- Rising number of young qualified working professionals.
- Easy availability of loans for anything from furniture to homes.
- Nuclear families.
- Increased exposure to foreign products.
- Increased availability of retail space.
- Exposure through electronic media .
- Brand awareness.
- Improvements in infrastructure.
- Enlarging consumer markets and accelerating the convergence of consumer tastes.
- The internet revolution is making accessibility to national and international products easy.
- With the world economy riding the waves of globalization, the retail sector is bound to take big leaps.
- Population growth.

INDIAN RETAIL: GROWTH PROSPECTS

There has been a phenomenal growth in the Indian retailing over the past couple of years after the Indian economy was liberalized. However, significant development can be observed in Indian retailing only since 2001. India had a huge unorganized retail sector but now she is investing large amounts of money to develop the organized retailing. Organized retailing is thus emerging as a significant contributor to the growth of Indian retail sector. RNCOS' "India Retail Sector Analysis (2006-2007)" report analyses some key opportunities and factors that are very critical to the growth, development and success of retail industry in India.

* *Finance Faculty,* INC Adam Smith Institute of Management, Gurgaon, Haryana. E-mail : himdaisy@gmail.com
** *Marketing Faculty,* ICFAI National College, Gurgaon, Haryana.

• By 2010, Organized retail will form 10% of total retailing.
• From 2006 to 2010, the organized retail sector will show CAGR of around 49.53% per annum in terms of growth.
• Challenges in front of retailers today are cultural and regional differences in India due to large and diversified cultural differences. Presently, hypermarket is emerging as the most favorable format in India.
Another report on www.indiaretailbiz.com briefed some facts of Indian retail as follows:

TABLE1: FACTS OF INDIAN RETAIL

Markets	
Market size (total) 2006	US$ 300 bn/annum
Market size (total) 2015	US$ 637 bn/annum
Market size (modern retail) 2006	US$ 9-12 bn/annum
Market size (modern retail) 2011	US$ 60 bn/annum
Annual rate of growth (modern retail):	35%
Penetration (modern retail) 2006	3 to 4%
Penetration (modern retail) 2010	10%
Number of retail outlets (total):	12 million
New Investment by 2011	US$ 30 bn
Employment	
No. of persons employed (total)	21 mn
No. of new jobs in next two years	2 mn.
Wealth	
No. of dollar designated millionares in India(2006)	100,015
Retail Space	
Typical space per outlet	100 to 500 sq.ft.
Space occupied (modern retail)	35 mn sq.ft.
Operating Malls 2007	114 (35 mn sq.ft.)
New Malls under construction	361 (117 mn sq.ft.)
New space distribution	65% (top 7 cities), 35% (tier II & III cities)
New space distribution (among top 7 cities)	NCR 34%, Mumbai 23%, Rest 43%

Source: Statistics, most of which is in the form of estimates, contained herein above, is based on published research/ news reports on http://www.indiaretailbiz.com/blog/2007/04/11/bharti-plans-3-tier-retail-model/

The analysis of estimates made by different research agencies is that the Indian retail sector is poised for huge growth in the coming years to approximately US$427 billion by 2010 and US$637 billion by 2015. The organized retail is also going to account for 22% of the total retail industry by 2010 from the current 3- 4% (www.tradingmarkets.com, 2008). Therefore, the efficiency of the operations in retailing is of prime concern.
A recent 2008 report on India's organized retail sector predicts that the existing players in this sector such as Bharti, RPG, Pantaloons, Reliance, Birla's and so on are going to witness a multifold growth in the coming 5- 10 years. This dynamic sector will also witness the debut of other major Indian business players such as Mahindra's, Parsavnath, DLF, Hero Honda and Indiabulls. These players are making it happen big in a short span because they are keeping the important factors such as operational efficiency as their prime concern. This is also supported by extremely high concern for customer satisfaction and extravagant experience for the customers while consuming products and services at organized retail stores.

OPERATIONAL EFFICIENCY

India has a highly competitive retail industry; therefore, it is very essential to have know- how of all those factors which will help retailers to sustain in the long run. One of the major factors which will keep the retailers a class apart is knowledge regarding operational efficiency. As Charles Darwin also said "survival of the fittest", similarly operational efficiency of a retailer will enable him to function in his market with minimal inputs and give him maximum output to be the fittest among all. The literature review suggested that there are many factors that affect the operational efficiency of a firm such as labor intensive activity (Bush, Bush, Ortinau and Hair, 1990; Ingene, 1984),competitive conditions (Goldman, 1992), sales volume (Lusch & Serpkenci, 1990), size of firm (Ratchford & Stoops, 1988) and location (Donthu & Yoo, 1998). In the present study, size of the retail store and its location are studies as they play a major role in the operational efficiency (Donthu & Yoo, 1998). Moreover, the association of both with the operational efficiency of a retail store has been tested using appropriate statistical tools.

OBJECTIVES OF THE STUDY

The main objectives of the present study are as follows:
1) To study the operational efficiency of retailers in Chandigarh Tricity.
2) To understand the role & contribution of type of retail formats on operational efficiency.
3) To examine the impact of location of the retail formats on operational efficiency.

HYPOTHESIS OF THE STUDY

H_1: Type of retail store has significant influence on Inventory days.

H_2: Location of retail store has significant influence on Inventory days.

METHODOLOGY

Organized retailing is booming in not only metros but in tier one and tier two cities as well. Therefore, one of the upcoming cities of northern India, Chandigarh and its peripheral cities- Mohali and Panchkula (collectively known as Chandigarh Tricity) were selected for the present study where different types of retail stores are rapidly developing. The present study is based on an empirical analysis for analyzing operational efficiency of retailers in Chandigarh Tricity and its relationship with different retail store formats and the location. The period for study is financial year 2006- 07.A two-pronged approach for data collection was undertaken, primary and secondary data collection. According to the requirement of the study, a questionnaire was designed to study the different retail formats, their sales and inventory in Chandigarh Tricity. The questionnaire had closed- ended and open- ended questions for effective data collection. Secondary data was collected from journals, business magazines and websites.

Efficiency of a retail outlet is said to be high if the inventory on its shelves is kept for a shorter duration i.e. inventory turnover days are less. U.S. retail giant Wal-Mart, which is known for its super-efficient operations and state-of-the-art supply chain management system, keeps inventories at a bare minimum. On an average, inventory on its shelves remains for approximately 45 days. For the present study also, the operational efficiency has been measured in terms of inventory days. The steps involved in calculation of inventory days are as follows:

Step1: The average inventory of retailers was calculated from the minimum and maximum inventory that they keep using the following formula:

$$\textbf{Average inventory} = \frac{\textbf{Minimum Inventory} + \textbf{Maximum Inventor}}{\textbf{2}}$$

Step 2: The Inventory Turnover Ratio (ITR) was calculated from the net sales and average inventory calculated above. The following formula was used to calculate

ITR:

$$\textbf{ITR} = \frac{\textbf{Net Sales}}{\textbf{Average Inventory}}$$

Step3: From the values of ITR calculated above, the average days of keeping inventory by each retailer were calculated as under:

$$\textbf{Average Days of Keeping Inventory} = \frac{\textbf{365 days}}{\textbf{ITR}}$$

Thereafter, the average days of keeping inventory were divided into four groups on the basis of Quartiles (Q1, Q2 and Q3) .Quartiles are values which divide a sample of data into four equal groups comprising of equal numbers of observations.

Quartiles	Average Days of Keeping Inventory
Group 1	17-61
Group 2	61-128
Group 3	128-235
Group 4	235-745

From the two basic retail formats, organized and unorganized; organized retail outlets were selected for the study from Chandigarh Tricity. The retail outlets were categorized into four formats on the basis of their area in Sq. Ft. as follows:

Retail Format	Area in Sq.Ft.
Cash-and-carry stores/ Mom 'n' Pop Stores	Below 500
Convenience stores	500- 1000
Supermarkets	1000-10000
Hypermarkets	Above 10000

The total sample size for the study was 200. The sample size from each city (Location) i.e. Chandigarh, Panchkula and Mohali is as under:

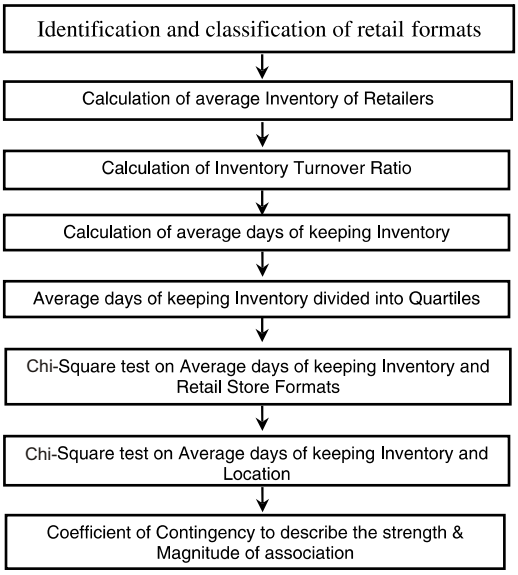
S.No.	City (Location)	Sample size (n)
1	CHANDIGARH	100
2	PANCHKULA	50
3	MOHALI	50

Prominent tests of association between variables are chi-square test, regression and correlation. For the present study, Chi- square test was applied to test H_1 & H_2 hypothesis as this is a very popular test of independence of two categories. Moreover, this test is strongly recommended for variables measured on nominal or ordinal scale. However, chi- square test does not describe the strength or magnitude of the association between the format of retail outlets & operational efficiency and location & operational efficiency, therefore, another technique- coefficient of contingency was applied to test this. It was calculated using the following formula:

$$C=\sqrt{\frac{\chi 2}{N+\chi 2}}$$

where
C = coefficient of contingency
N = Total number of observations

FLOWCHART EXPLAINING THE STEPS IN THE CALCULATIONS



STATISTICAL RESULTS AND ANALYSIS

In the present study, different types of retail formats have been studied for various types of retailers. The different types of retail formats are Cash-and-carry stores/ Mom 'n' Pop Stores, Convenience stores, Supermarkets and Hypermarkets. These stores are classified on the basis of their area in sq. ft. The area of Cash-and-carry stores/ Mom 'n' Pop Stores is below 500 sq. ft., area of convenience stores is 500- 1000 sq. ft., Supermarkets is 1000-10000 sq. ft. and Hypermarkets above 10000 sq. ft. These retail stores have been studied for the following segments in Chandigarh Tricity- FMCG products, food courts, apparels and cosmetics. It was observed that out of 200 retailers in Chandigarh Tricity, 71 are Cash-and-carry stores/ Mom 'n' Pop Stores, 49 are Convenience stores and 80 fall in the category of Supermarkets and Hypermarkets. Since there were only 4 hypermarkets, therefore they have been clubbed with supermarkets for the convenience of calculations. The following table 2 represents the influence of type of retail format on inventory days which have been divided into quartiles.

TABLE 2:INFLUENCE OF TYPE OF RETAIL FORMAT ON INVENTORY DAYS

Inventory Days → / Type of Retail Format ↓	17-61	61-128	128-235	235-745	TOTAL
Cash-and-carry stores/ Mom 'n' Pop Stores	7	23	22	19	**71**
Convenience stores	18	9	15	7	**49**
Supermarkets and Hypermarkets	26	15	13	26	**80**
TOTAL	51	47	50	52	**200**

The calculated value of Chi- Square is 22.46848 which is higher than the table values of Chi- Square at 5% level of significance (12.592) for 6 Degrees of freedom, the alternative hypothesis is accepted at 5% level of significance. It could be concluded that type of retail format has significant influence on operational efficiency (Inventory Days) of retail stores. Therefore, the types of retail format & inventory days are dependent on each other.

The value of coefficient of contingency (C) is equal **to 0.32**. This value indicates that the association between format of retail outlet and operational efficiency is moderate and is not very strong. Therefore, retail format may not influence the operational efficiency of retailers to a great extent.

TABLE3: INFLUENCE OF LOCATION OF RETAIL OUTLET ON INVENTORY DAYS

Inventory Days → / Location ↓	17-61	61-128	128-235	235-745	TOTAL
Chandigarh	28	29	29	14	**100**
Mohali	12	9	10	19	**50**
Panchkula	11	9	11	19	**50**
TOTAL	51	47	50	52	**200**

As the calculated value of chi-square (14.614) is higher than the table value at 5% significance level (12.592) but not at 1% significance level (16.812) for 6 degrees of freedom, the alternative hypothesis is accepted at 5% significance level but not at 1% significance level. It could be concluded that location of retail outlet has significant influence (at $\alpha = 0.05$) on the operational efficiency. The value of coefficient of contingency (C) is equal to 0.261 which is quite low. This indicates that the location and inventory days have low degree of association.

CONCLUSION

From the data analysis, it is observed that there is significant influence of format of retail stores and location on the operational efficiency. However, the degree of association is not very high. This shows that the operational efficiency of the firm is affected by the size of the firm i.e., retail stores will have higher efficiency if they utilize their retail store space rationally. This can be done by having stock keeping units in abundance and in such places where the customers can easily and comfortably access them. The retailers can also make effective use of different styles of gondolas and fixtures in order to give higher visibility to the products kept on them. Also, the location of the retail store must be central to the customers to encourage higher footfall and combat competition. A good location will attract more customer traffic and help the retailers to have higher turnover. This would also mean having enough parking space either in the basement or around the retail store. Thus, the present study analyses that these two factors are of prime importance as they have a good association with the operational efficiency of the retail store.

BIBLIOGRAPHY

A T Kearney (2005) "The 2005 Global Retail Development Index™," [Online Available] http://www.atkearney.com/main.taf?p=5,3,1,108,4 (accessed on January 2006)

Akridge Jay T. (1989) "Measuring Productive Efficiency in Multiple Product Agribusiness Firms: A Dual Approach", *American Journal of Agricultural Economics,* Vol (71)1, February, pp 116-125

Berry Leonard L (2001), "The old pillars of new retailing", *Harvard Business Review*, April, pp 131- 150

Bush, Robert P., Alan J. Bush, David J. Ortinau, and Joseph F. Hair, Jr. (1990). "Developing A Behavior-Based Scale to Assess Retail Salesperson Performance," Journal of Retailing, 66 (Spring): 119-136.

Carlos Pestana Barros (2006) "Efficiency measurement among hypermarkets and supermarkets and the identification of the efficiency drivers: A case study **",** *International Journal of Retail & Distribution Management,* Vol (34) 2, pp 135- 154

Donthu Naveen and Boonghee Yoo (1998) "Retail Productivity Assessment Using Data Envelopment Analysis", Journal of Retailing, Vol (74)1, pp. 96

Goldman, Arieh. (1992). "Evaluating the Performance of the Japanese Distribution System," Journal of Retailing, 68 (Spring), 11-39.

Ingene, Charles A. (1984). "Productivity and Functional Shifting in Spatial Retailing: Private and Social Perspectives," Journal of Retailing, 60 (Fall): 15-36.

John Dawson (2000), "Retailing at century end: some challenges for management and research", *The International Review of Retail, Distribution and Consumer Research,* Vol (10) 2, April, pp 119 148

Lusch, Robert F. and Ray R. Serpkenci. (1990). "Personal Differences, Job Tension, Job Outcomes, and Store Performance: A Study of Retail Store Managers," Journal of Marketing, 54 (January): 85-101.

Marinov Maria (2004) "Spatial Dynamics of the Retail Sector in Israel", Ph.D Thesis, Faculty of Architecture and Town Planning, Israel School of Technology, Israel.

Murugananthan G and S. Kaliyamoorthy (2005), "Retail Revolution", *Marketing Mastermind*, June, pp15-21

Ratchford, Brian T. and Glenn T. Stoops. (1988). "A Model and Measurement Approach for Studying Retail Productivity," Journal of Retailing, 64 (Fall): 241-263.

Sudhakar G P (2005), "Retaining in India- What's up", *Indian Journal of Marketing,* June, pp 17& 23

ANNEXURE

Chi square (χ^2) calculation

TABLE 1: INFLUENCE OF TYPE OF RETAIL FORMAT ON INVENTORY DAYS

O	E	(O-E)	(O-E)2	(O-E)2/2
7	18.105	-11.105	123.321025	6.811435
18	12.495	5.505	30.305025	2.425372
26	20.4	5.6	31.36	1.537255
23	16.685	6.315	39.879225	2.390124
9	11.515	-2.515	6.325225	0.549303
15	18.8	-3.8	14.44	0.768085
22	17.75	4.25	18.0625	1.017606
15	12.25	2.75	7.5625	0.617347
13	20	-7	49	2.45
19	18.46	0.54	0.2916	0.015796
7	12.74	-5.74	32.9476	2.586154
26	20.8	5.2	27.04	1.3
		0	0	22.46848

$$\chi^2 = \sum \frac{(O-E)^2}{E}$$

O = the frequencies observed
E = the frequencies expected

Table 2: Influence of location of retail outlet on Inventory days

O	E	(O-E)	(O-E)2	(O-E)2/2
28	26	2	4	0.153846
29	23.5	5.5	30.25	1.287234
29	25	4	16	0.64
14	25.5	-11.5	132.25	5.186275
12	13	-1	1	0.076923
9	11.75	-2.75	7.5625	0.643617
10	12.5	-2.5	6.25	0.5
19	12.75	6.25	39.0625	3.063725
12	13	-1	1	0.076923
9	11.75	-2.75	7.5625	0.643617
11	12.5	-1.5	2.25	0.18
18	12.75	5.25	27.5625	2.161765
		0	274.75	14.61393

(Cont. from page 27)

"Prevention is better than cure". So the consumers should approach the Government- Central and State redressal grievances departments (ISI Bureau, Agmark Department, Civil supplies Department, Weights and Measures Dept., Advertising Standards Council of India, MRTP Commission, Registrars of trademarks, All India Bank Depositors Associations, Food Inspector and consumer cells provided by various departments), vigilance commission and consumer voluntary organizations before filling the case in the consumer redressal forum / commission.

"Work is worship" is a proper proverb for the consumer protection agencies. The Central and State Government consumer redressal grievances departments, consumer protection councils, consumer redressal forums / commissions, consumer welfare fund committee, CWF, Ministry of civil supplies, consumer research centers, consumer voluntary organizations should work collectively and devotedly to attain the objectives of consumerism.

"Union is Strength" is a proper proverb for consumer voluntary organizations. A voluntary activity is an activity in which people contribute their time and energy without compulsion. The people in the voluntary organization should work with a spirit of dedication and fight for a common cause which is in the interest of the entire society. With the same objective, the voluntary organizations should work and render their services to meet specific goals which are important for the consuming society as a whole.

Consumer movement is an example of the proverb *"Calm before storm".* The businessmen should invite consumer welfare from the bottom of the heart by turning over a new leaf.

DIMENSIONS/APPROACHES FOR FURTHER STUDY

In this broad area, there are more approaches/dimensions for further research. They are as follows.

- Consumer Protection In India - A Study of Consumer Awareness.
- Consumer Protection In India - A Study of working of Bureau of Indian Standards (BIS).
- Consumer Protection In India - A study of Weights and Measures Department.
- Consumer Protection In India - A Study of working of Consumer Clubs (CC).
- Consumer Protection In India - A Study of working of Consumer Information Centres (CIC).
- Consumer Protection In India - A Study of Consumer Welfare Fund (CWF).
- Consumer Protection In India - A Study of working of Forward Trading and Forward Market Commission (FMC).
- Consumer Protection In India - A Study of working of National Consumer Cooperatives (NCCF).
- Consumer Protection In India - A Study of Price Management method of Ministry of Consumer Affairs.
- Consumer Protection In India - A Study of Consumer Protection Act, 1986.
- Consumer Protection In India - A Study of Essential Commodities Act, 1955.
- Consumer Protection In India - A Study of working of National Test House (NTH).
- Consumer Protection In Asia - A Study of Statutes in Asian Countries.
- Consumer Protection In Asia - A Study of National VCOs in Asian Countries.
- Consumer Protection - A Study of Consumers International (CI).