Chapter – II

Review of Literature
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2.1 INTRODUCTION

In the previous chapter captioned "Introduction and design of the study", a brief outline about the importance of postal services, services available with the India Post, Statement of the problem, Methodology, Limitations of the study etc., were dealt with. The basic necessity of any study is to find out the issues considered by the past researchers.

A world bank study (2002) suggests that India Post is particularly well positioned to address the pressures of a changing environment by expanding services into non-traditional areas such as E-Banking, E-governance and E-Commerce and reinventing the services and products it offers. India Post is already a major player in the banking sector through the post office savings bank, involving a huge sum of 44 Billion US Dollars in saving account. India post handles over 110 million money orders in a year¹.

Makhura, M.N and Wasike, W.S.K (2003) made an analysis on “Patterns of access to rural service infrastructure: the case of farming households in Limpopo Province”. In their study, they argued that inadequate infrastructure was a major challenge in the developing countries. In this study, the researchers have applied factor analysis to determine the pattern of access to rural services infrastructure on 158 farming households in the limpopo province. In factor analysis, they have taken into account the Local Government, Hospital, Magistrate office, Post office, Traditional Authority, District Agricultural offices and Extension services. The study concluded that, Categorization of services would motivate the infrastructure. The researchers classify the services applicable to centers into three:

¹ World Bank study 2002. P.65
1. Health, Local government and postal services are mainly in Regional centers.
2. The District Centers provide mainly Agricultural and Judicial Services.
3. Finally local centers provide services of traditional authorities.

Massimo Filippini and Marika Zola (2005) Studied "Economies of scale and cost efficiency in the postal services: empirical evidence from Switzerland". The author has analysed the scale and cost efficiency of the Swiss post using an econometric approach. The study considers a sample of postal offices operating in the Italian speaking part of Switzerland. The paper considers estimation of a Log – Log cost function employing a data set for the year 2001 with information on 47 small local post offices. The empirical evidence indicates the existence of economies of scale. The outcome of the study shows that approximately 50% of the postal offices operate close to the regional standard for efficiency.

Maria Jose Iturralde and Cipriano Quiros (2008) made an "Analysis of efficiency of the European postal sector". The objective of this study was to analyze the productive change that had taken place in the postal sector of the European Union. The researchers have used malmquist index for analyzing the data. Further, the researchers viewed the productivity growth of European postal operators from two angles.

1. The variations in the efficiency level and
2. The technical change

The finding of the study is that, the technical change was responsible for the productivity growth experienced among the group of operators in the sample. The study also brings out the important inefficiencies and high dispersion across the operators.

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Philippe Donder (2006) in his study titled “Access pricing in the postal sector: Theory and simulations”. Produced a theoretical model aimed at assessing the optimal access charges and retail prices in the postal sector. The study took explicitly into account three main characteristics of the postal sector. They are,

a) The ability of the entrants to bypass the incumbent’s delivery network.

b) The imposition on the incumbent, but not on entrants of Universal Service Obligations and

c) The provision of access to both competitors and customers.

The study first develops analytical formulations of the optimal access charges and the incumbent’s end to-end retail price. The study also presents calibrated results illustrating the impact on prices and welfare of the various scenarios\(^5\).

Richard Geddes. R (2005) in his study on “Policy watch: Reform of the U.S Postal service” reviewed the current structure and regulations of the U.S Postal Service. The researcher also discussed the changing size and composition of the U.S mail stream. Many other countries have already undertaken comprehensive postal reform, including both privatization and demonopolization and the researcher also discussed what lessons their experience could provide. The researcher thus made an evaluation of the current reform proposals in the United States\(^6\).

Elliot Vittes.M (1985) in his article titled “Value Trade-offs and Productivity: The Trans politicization of the U.S Postal Service” conclude that the political values in the American public sector are presented through the case of the postal system and its reorganization in 1971. This change (from the post office Department to the United States Postal Service) reflects an attempt to depoliticize and professionalize postal operations. The article suggests that, the results have been the Transpoliticization of the postal system to a corporate model of behaviour and political influence and have led to the limitation of any broadly considered public


role. The corporate model undermines the public nature of the post office, and the connection between the postal service and the public benefits.\footnote{Elliot Vittes. M, “Value Trade-Offs and Productivity : The Transpolitization of the U.S. Postal Service”, mnoGo Search, 1985, p.3.}

Jeffrey M. Perloff and Michal L. Wachter (1984) in their study on “wage comparability in the U.S Postal Service”. Compared the wages paid in the U.S Postal Service with those paid in the private sector. The authors argued that, the appropriate test of that concept was a comparison of the wages paid to all comparably skilled workers, not only to white male workers in the private sector. By that standard, the authors concluded, from an analysis of CPS data that in 1978 postal workers enjoyed 21% wage advantage. They also point out the low quit rates and Long employment queues in the postal service as evidence confirming that the wage of postal workers was well above that of comparable workers elsewhere. The authors predicted that since the mail transmission market would become increasingly competitive, either the wage advantage of postal workers would decline or postal jobs would continue to shift to the private sector.\footnote{Jeffrey M. Perloff & Michael L. Wachter, “Wage Comparability in the U.S. Postal Service”, mnoGo Search, 1984, p.3.}

Vincenzo Visco Comandini (2007) in his study titled “Servizi Postali” Explains the evolutionary path of the European Postal Industry from an inefficient state – owned monopoly into a highly competitive market, in view of the envisaged market Liberalization by the year 2011. National operators adopt different Strategies towards the increasing competition. France and the UK are willing to maintain Universal Service Obligations and an access regime to their delivery networks. The Netherlands, Germany and Scandinavian countries, instead, favour value-added services, intermediate between ordinary letters and the express courier. While the former base their strategy by maintaining free, Universal and non excludable letter delivery, the later may introduce new change for delivery. The researcher concludes that, the industry faces the so called e-substitution, arising when paper letters are substituted by e-mails.\footnote{Vincenzo Visco Comandini, “Servizi postali”, mnoGo Search, 2007, p.4}
Jonathan F.Bard, Canan Binici and Anura H.Desilva (2008) in their study titled "Staff Scheduling at the United States Postal Service", presented a full-scale model of the tour scheduling problem as it arose in the United States Postal Service and to examine several scenarios aimed at reducing the size of the workforce. The problem is formulated as a pure integer linear program and solved with CPLEX. The researcher presents an integrated model that can be used to find optimal schedules for a homogeneous workforce. The objective is to meet daily staffing requirements at minimum cost without violating labour agreements and government regulations. The main conclusions of the study are that, the problems of realistic size can be solved quickly, and that substantial savings can be achieved by considering loss restrictive polices. While the latter is not surprising, many organizations adopt costly practices, such as providing weekly schedules with the same start times every day for each employee, without fully realizing their implications\textsuperscript{10}.

Satinder N.Gupta and Jatinder N.D.Gupta (2008) in their research entitled "Economies of scale and Economies of scope in the U.S Postal service" reported the empirical investigations conducted to determine whether the operations of the U.S postal service exhibited economies of scale and/or economies of scope. From the published postal data for the period 1961-1980, a trans-log cost function for the postal operations was estimated and used to conclude that the postal operations exhibited diseconomies of scale and economies of scope.

The main findings of the study are:

(a) There is a need to develop and operate theoretically acceptable time-series data relative to postal operations, costs, outputs, and input factors and

(b) There is a need to examine the Postal Reorganization Act to provide a clear and attainable mandate for the U.S postal service\textsuperscript{11}.

Jatinder N.D.Gupta and LeRoy J.Krajewski (2008) in their research survey titled "Operations Research in Postal Services-A Survey" made a broad survey of the application of operations research techniques to analyze and resolve decision

\textsuperscript{10} Jonathan F. Bard, Canan Binici and Anura H. Desilva, "Staff Scheduling at the United States Postal Service", Graduate Program in Operations Research and Industrial Engineering, University of Texas, Austin, TX 78712-1063, USA, 2008, p.4.

\textsuperscript{11} Satinder N. Gupta and Jatinder N.D. Gupta, "Economics of scale and economics of scope in the U.S. Postal Service", mnoGo Search, 2008, p.4.
problems faced by postal managers in various countries. The problem areas considered include: Forecasting, cost and revenue analysis, postal network design, manpower planning and scheduling, maintenance and service characteristic measurement. The researcher concluded with a brief description of the efforts to train postal managers in the use of operations research in their decision-making functions\textsuperscript{12}.

O'Loughlin, Christina & Coenders of Germany (2002) in their article “Application of the European Customer Satisfaction Index to postal services—Structural Equation models versus partial least square” point out that, customer satisfaction and retention are the key issues for Organizations in today’s competitive market place. The article also points out that, much research and revenue have been invested in developing accurate ways of assessing consumer satisfaction at both the macro (National) and micro (organizational) Levels, facilitating comparisons in performance both within and between industries. In this article, the authors have used Partial Least Squares (PLS) to estimate the Customer Satisfaction Indices (CSI) models in preference to Structural Equation Models (SEM) because they do not rely on strict assumptions about the data. This article does not take into consideration more recent advances in SEM, including estimation methods that are robust to non-normality and missing data. In this article, the authors compare both SEM and PLS approach by evaluating perceptions of the Isle of Man post office products and Customer service using a CSI format\textsuperscript{13}.

Crew, Michael A & Kleindorfer, Paul R & Smith, Marc A (1990) in their article entitled “Peak — Load Pricing postal services argued that, “the peak — load pricing problem for postal service was addressed in practice primarily by means of the service differentiation according to class of mail. The authors demonstrated that lower priority mail at peak times helped to ameliorate, but did not eliminate, the peak — load problem. The author’s derived welfare — optimal, service differentiated prices under peak — load conditions for a diverse mail — processing technologies. The authors showed the relationships between this class of problems and the traditional natural

\textsuperscript{12} Jatinder N.D. Gupta and LeRoy J. Krajewski, “Operations Research in Postal Services — A Survey”, Faculty of Management Sciences, College of Administrative Sciences, The Ohio State University, Columbus, Ohio 43210, USA, 2008, p.5.

peak—load literature. The article discussed the implications of the theory for U.K and U.S postal service practice and policy\textsuperscript{14}.

Seung—Hyun Hong and Frank A. Wolak (2008) in their article entitled “Relative prices and Electronic substitution: changes in household—level demand for postal delivery services from 1986 to 2004”, argued that, the extent to which the shift in the aggregate household—level demanded for postal delivery services could be attributed to the appearance of alternative modes of communication versus the concomitant rise in postal prices. The authors found that, both recent postal price increases and the penetration of personal computer technology among US households led to similar reductions in postal expenditure. The authors also found that, a 5\% postal price increase, such as the one introduced in January 2006 reduced revenue collected from US households to $ 215 million and imposed an aggregate welfare loss on US households of $ 333 million\textsuperscript{15}.

Nagabhushan.P, Angadi S.A and Anami B.S (2008) in their research captioned “A soft computing model for mapping incomplete / approximate postal addresses to mail delivery points” point out that, mapping of postal address to a mail delivery point is a very important task that affects the efficiency of postal service. They argue that, this task is very complex in the countries like India, where postal addresses are not structured. Further, most of the times the destination addresses in such countries are incomplete, approximate and erroneous which adds to the complexity of mapping postal address to delivery point. Automation of this aspect of the postal service is a challenge. In this research paper, the researcher presents, a soft computing model to map the postal address to mail delivery point. Firstly machine readable postal address is processed to identify the address components using a novel fuzzy symbolic similarity analysis, and further these labeled components are organized as a symbolic postal address object. This postal address object is further processed using the newly devised fuzzy symbolic methodology for mapping the address to mail delivery point. Symbolic knowledge bases for postal address


\textsuperscript{15} Seung—Hyun Hong and Frank A. Wolak, “ Relative prices and electronic substitutions : Changes in household — level demand for postal delivery services from 1986 to 2004”, Department of Economics, University of Illinois at Urbana-Champaign, II 61820, USA, 2008, p.1.
component labeling and mail delivery point mapping are devised. Fuzzy symbolic
similarity measures are formulated once for address component labeling and the
second time for mapping the entire address to a mail delivery point. In sequel to
similarity computations, which are viewed as fuzzy membership values, an expert
system comprising of \( \alpha \)-cut de-fuzzification is proposed to evaluate the confidence
factors, while inferring the validity of address component labels and mail delivery
points. The system is tested exhaustively and an efficiency of 94\% is obtained in
address component. Identification and about 86\% in mail delivery point mapping,
while working on an Indian postal database of about 500 addresses.\(^\text{16}\)

Ashish G.Parikh, Lawrence J.H.Schulze, Jen-Gwo (Jacob) Chen and
Theodore Cleveland (2007) in their research entitled “Maximum acceptable weight
of asymmetrical lifting and lowering of postal sacks” have taken the asymmetrical
lifting of postal sacks without handles. Type-2 and Type-3 postal sacks (those
typically used by the U.S Postal service) were loaded and unloaded from and to
different carts and conveyor levels. The researcher has used an adjustable table to
simulate the different conveyor levels. -The researchers have chosen twenty
participants (Ten male and Ten female). A modified version of the psychophysical
methodology was used to determine the maximum acceptable weight of lift. A
significant difference was found between the weights lifted across cart heights.
Specifically, the mean load lifted over the 96.5 cm (38.0 in) cart height was 15.337 kg
(33.74 lb) and was significantly greater than the average load lifted across the 20.40
cm (8.0in) and 104.20 cm (41.0 in cart heights). However, this difference is not
practically significantly different (mean difference = 1.44 kg). There was no
significant difference (P>0.05). A significant interaction occurred between cart height
and conveyor height (P<0.05). This interaction indicated that as the vertical distance
between the cart height and the conveyor height increased, the acceptable load
handling capabilities of the participants decreased. The mean MAWL for Type-2
postal sacks (14.5 kg, 31.91 lb) was similar to the mean weight lifted at the
postal distribution center (16.4 kg, 36.0 1g). The mean MAWL for Type-3 sacks
(14.5 kg, 31.9 lbs) was less than half of the mean weight lifted at the postal
distribution center (24.6 kg) (54.1 lb).

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\(^{16}\) Nagabhushan, P, S.A. Angadi and B.S.Anami, “A Soft computing model for mapping incomplete
approximate postal addresses to mail delivery points”, Department of Studies in Computer Science,
University of Mysore, Mysore, India, 2008, p.3.
The results of this study have direct implication regarding the design of postal operations, the types of lifting and lowering tasks that should and should not be performed, as well as more practical weight limitations than are previously employed in these types of operation\textsuperscript{17}.

\textbf{Escribano saez, Alvaro, Gonzalez Gomez, Patricia and Lasheras, Julio (2003)} studied “Economic analysis and Regulation of the postal service in Spain: Strengths and Weaknesses”. The researchers pointed out that, Advanced societies were generating more and more new types of demands: Customers had to decide when, how and where to use, send and receive information and goods fast. This has recently led many countries to deregulate their postal services in order to cope with these new service requirements. The researchers quote one good example of this the high rate of penetration of email or of the national and international couriers who are starting to offer parcel services. In this new scenario, firms that used to work only in the transport industry are now moving into the postal industry. Technological innovation, new logistical organization, email and Internet are fostering the creation of new products and, as a result, the postal industry needs to be restructured. These changes in the industry must come hand-in-hand with appropriate legislation and regulation, together with a set of strategies that postal operators must follow in order to adapt to the new industrial scenario. The first part of this paper outlines the evolution of the structure of the Spanish postal industry and its recent legislation, before analyzing the strategies followed by European operators, including the Spanish operator. Lastly, the paper analyses the Strengths, Weaknesses, Opportunities, Threats of the Spanish postal industry\textsuperscript{18}.

\textbf{Pateiro Rodriguez and Carlos (1993)} made an analysis on “Liberalisation of the Postal Sector in the European Union: Process and Model, Reference to the case of Spain” and pointed out that the last decade had witnessed sweeping changes in the field of communications in the developed world, most of which had been brought about by the new technologies. Postal services had not been an exception. The most

\textsuperscript{17} Ashish G. Parikh, Lawarence J. H. Schulze, Jen-Gwo (Jacob) Chen and Theodore Cleveland, “Maximum acceptable weight of asymmetrical lifting and lowering of postal sacks”, Department of Industrial Engineering, University of Houston, Houston, TX 77204-4812, USA, 2007, p.4.

relevant aspects of the phenomenon served to trigger changes in the field of postal communications, and some even had a bearing on the very core of the traditional setup in the postal services market, characterized until then by a predominance of monopolies, protected to a greater or lesser extent by the member states' own regulations. In a context of real competition, part of the single market process entailed the liberalization of postal services, which began at the start of the Nineties with publication of the Green paper on the Development of the Single market for postal Services (1992). This liberalization process is steadily replacing the traditional concept, more oriented to a monopoly and to the organization of postal services forming part of the Public Administrations' own structure. On account of its major economic and social effects, this issue is the subject of countless studies, conducted from many different perspectives.

In this paper, the researchers focus their interest on two Questions:

a) The Choice between phases of the postal process or the postal business products that will be liberalized.

b) Focuses on the form of Compensation for the supposed financial burden derived from the Universal Service Obligations imposed on postal operators both by European Union regulations and, pursuant to the principle of subsidiary, each Member State's regulations.\(^{19}\)

Chris Nicholson (2008) has made an analysis about the "Access Pricing in competitive postal services". In his analysis he pointed out that, postal services were the latest network industry to be considered for liberalization and privatization. Given the natural monopoly characteristics of the delivery function, one of the most effective ways of introducing competition would be through downstream access to the network. Pricing of access causes particular problems due to the significant averaging of costs as a result of government's desire to maintain universal delivery at a uniform tariff. This paper considers some of the options for access pricing and draws analogies with telecommunication sector.\(^{20}\)


Charles Bravo (2008) in his article titled “United States Postal Service’s environmental strategy of leadership and compliance” pointed out that, the United States postal service was faced with increased regulatory and organizational pressures caused by increasing environmental requirements and a massive reorganization in 1992. Moreover, states and local governments were granted authority to impose fines and penalties on government facilities. The postal service responded to these challenges by implementing a new organization with the environmental function placed in an operations portion of the organization and by placing the environmental responsibility on line management. This article describes the implementation of a strategy of leadership and compliance which was developed by a cross-function team and endorsed by senior management. The strategy focuses on ten target areas including pollution prevention / recycling, Hazardous chemicals, paint spray operations and regulatory outreach21.

Sonia Riyat (2008) in her study entitled “Globalisation of Indian Postal Service” applied SWOT analysis on Indian Postal Services. The main objective of this study was to present a precise scenario of the current working culture of Indian postal departments and to provide a few suggestions to the development of the postal department. Further the researcher pointed out that, today a post office was not limited to transact simple mails only, but it was also a big business icon in the business world. The main suggestions of this study were:

- To increase the productivity of the employees.
- Soft Skill Training to be provided to the employees
- The Postal Service department should adopt an adequate promotional policy.
- Customer-friendly environment should be followed in every counter of the post office.

The main conclusion of this study is that, Indian postal service needs technological, Social, Cultural and economic changes. With a little bit of change, it can create a monopoly in the market22.

Harinder Singh (2005) in his research study titled “Future of India Post-Rural Dimension” pointed out that, India had the largest postal network in the world with 1,55,618 post offices at the end of the financial year i.e. 31.03.2003 including 1,39,081 post offices in the rural areas. At the time of independence, India had only 23,344 post offices, which were largely confined to urban areas and selected villages. During the last 50 years, the number has grown almost seven times; on an average, a post office serves an area of 21.13 sq. km and a population of 6,602 people. The main objective of this study was that, the public confidence in India post remained intact and if we were able to improve the quality of services offered by India post in rural areas then the gap between revenue expenditure and the cost involved would decline substantially. The study concluded that, the ability of India Post to compete in the rural segment would depend on the extent with which new initiatives were pursued with more intensive use of infrastructure. However, innovative restructuring, right sizing along with new initiatives may reduce the extent of financial Loss23.

Saleem (2004) in his study observed the “Postal Savings behaviour in India”. The objective of the study was to find out the determinants of savings by analyzing saving behavior in India over a period of nineteen years ie, from 1980-81 to 1998-99. The methodology adopted was simple and multiple regression models were used. From the analysis, it was found that, a favorable macro-economic environment supported by strong structural reforms including liberalization of financial markets should help domestic savings to increase substantially24.

Sakthi Srinivasan.K and Devi Lakshmi.S conducted a research study on “Post office Savings schemes-An impetus for rural investment.” The objective of the study was to assess the saving habit of individuals and to understand the awareness of people towards post office saving schemes and to bring out the investors perception towards post office for their investment. In this study the sample size was selected as 300. The data was collected purely on random basis. The collected data were tabulated in two formats, viz., simple table and cross table. The data was analyzed by applying simple percentage and chi-Square Test. The study concludes that, Government must create more awareness among the rural and urban people about the

savings schemes and the benefits availed through it as it has not reached the people properly. Good reliable, Government authorised agents should be appointed so that people find it easy to handover the money so that mobilisation of savings could be increased. They suggest that, all the post offices should be computerized and more staff members are to be appointed, and also there must be a change in the infrastructural facilities of post office and the staff should be more hospitable.

2.2 CONCLUSION

The review of previous study is based on service infrastructure, economies of scale and cost efficiency, pricing of postal services, policies, productivity, wage comparability, staff scheduling, operations research and so on. Another research is done with the help of customer satisfaction index. Mapping of postal addresses, methodology of lifting and lowering of postal sacks, economic analysis and regulation of the postal services, liberalisation of postal sector and environmental strategy of leadership are the areas concentrated by the previous researches. Therefore, a study based on the opinion of the postmasters, postmen and women along with the perceptions of the customers of postal services is considered essential in the era of globalisation.