

# The Impact of the logistics outsourcing of activities of Supply chain in Pharmaceutical industry in Karachi

Naveed Hussain Awan<sup>1</sup>  
Email: naveed.86@live.com

Muhammad Shahbaz Khan<sup>2</sup>  
Email: msshahbazus@yahoo.com

## Abstract

*The main focus of the supply chain is the internal and external business integration to maximize the profit and provide better service to ultimate customers. Most of the companies are going towards outsourcing of their major operation for getting competitive advantages in marketplace to achieve global supply chain success. However, the development of logistical infrastructure does not support the supply chain & logistics operations.*

*This study focuses on four issues: (a) does subscription to a logistics service provide cost saving benefits to the company? (b) what are the effects of this subscription on the supply chain from production to the end-user? (c) what are the effects of the subscription on the company's distribution activities and performance, and finally (d) does this subscription provide the organization with a strategic advantage?*

*A list of pharmaceutical companies was drawn from the Pakistan Pharmaceuticals Manufacturers' Association and a closed-ended questionnaire was emailed to responsible officials in the supply chain departments. The gathered data was tested using multiple regression approach. The significance of variables and Principles Components Analysis were used to reduce data redundancy.*

*It was concluded that the impact of logistics outsourcing is to change "cost propositions" into "value propositions". Activities like operations and supply chain are increasingly utilizing logistics outsourcing as an "opportunity" rather than "cost".*

**Key words:** Logistics Outsourcing, Competitive Advantage, Cost Savings, In Time Delivery, Efficient Distribution, Reputation, Strategic Position

<sup>1</sup> Muhammad Naveed Hussain Awan is a graduate of PAF-KIET and presently employed as procurement Executive at Hilton Pharma (Pvt.) Ltd. While Muhammad Shahbaz Khan is assistant professor at College of Humanities Sciences at PAK-KIET

## Introduction

The supply chain is an integration strategy which compels the manufacturing organization to adopt a strategy to achieve sustainable and superior performance. The main focus of the supply chain is the internal and external business integration to maximize the profit and provide better service to ultimate customers.

The Institute of Supply Chain defines Logistic Outsourcing as “a making-or-buying decision from any manufacturing company choosing to purchase any unit or item that initially was manufactured or was a service that was performed in-house” (Monczka, 2005)

Consequent competitive pressures in the recent globalization of business have emphasized on the demand of logistics. Efficient delivery of the products is an important goal and has critical significance in the business process due to increasing time based competition. On the identification of deficiencies in the logistics and supply chain processes, many companies have chosen to outsource these activities and have gained competitive advantage as a result. For emerging demands in logistics operation many logistics companies have been merged to extend their market coverage and enjoy the economies of scale. Key reasons for moving towards outsourcing are getting competitive advantage and achieving greater supply chain success (Schoenherr, 2010). However, any such outsourcing must be done cautiously and companies should avoid outsourcing strategically vital competencies. By outsourcing non-core competencies, firms can better fo-

cus on their key business areas (Prahalad & Hamel, 1990).

## Background:

There is an increase in the use of logistics service outsourcing in the cores business activities like operations and supply chain management. While, traditional activities like transportation have not been outsourced, certain production and flow of goods activities have been outsourced to logistics service providers. Logistics providers have developed capabilities from broader services to customer-specific services and market segmentation capabilities to meet growing demand.

Major parts of supply chain are outsourced by the increasing number of companies. Logistic provider named as 4PLs are acting as a consultant in the design of supply chain and now are the replacement of the shippers. In the ever changing market demand in world globalization and mass customization, logistics is playing a critical role in business operation (Chan, 2011). 50% of the total cost of production is attributable to transportation.

The reason behind choosing Karachi as the geographical area of research is that Karachi is Pakistan's port city and the hub of economic activity. Pakistan is arguably known as one of the developing and emerging countries in South Asia. Business atmosphere in Pakistan mimics & replicates a dynamic economy with the opening of additional funds for the transportation of supplies. At the same time Pakistan is also termed as a high risk country with low transport infrastructure which is striving to meet the needs of the logistics.

### Problem Background:

The pharmaceutical industry has shown record growths in the absence of the issuing entity and the unavailability of any such unit. There are some drug quality success stories where millions of people took advantage of getting vital drugs on economically reasonable prices. The industry is not only ready to play a significant role in promoting development in the key areas of healthcare provision but is keen to do so. They require the government to provide an enabling environment and make this technically possible. However, the infrastructure to support such a venture does not exist. Logistical operations are not performed countrywide but are restricted in cities like Karachi, Lahore and Islamabad. This results in increased vulnerabilities and reduced profitability for the companies who are understandably reluctant to become a part of the global supply chain system.

This study tries to identify the role and the involvement of logistics service providers in pharmaceutical operations – in terms of cost effectiveness and efficiency of distribution. The study also seeks to identify the effects of transportation costs into the ordering quantity decision, chance of risk or losing control on operations and reputations due to logistics outsourcing.

The main reason for companies to outsource their logistics function is to reduce the level of inventory excess and vehicles, number of trades and minimize labor costs. People with no knowledge of issues relating to outsourcing are also a problem causing

companies to face many issues related to outsourcing. For this reason, group of expert peoples having extensive experience in logistic might be also helpful.

### Purpose and Objective:

1. To identify role and involvement of logistics service providers in pharmaceutical operations.
2. To identify the effect of freight and transportation costs on ordering decisions.
3. To identify the risks of losing control on operations and reputations due to outsourcing.
4. To assess the perception of efficiency of logistics service providers.
5. To assess whether outsourcing improves distribution of the pharmaceutical in terms of minimizing lead time and sustaining reputation.
6. To evaluate the strategic positioning of the logistics service provider in terms of involvement in the company's operations.

### Scope of Study:

The study will include:

1. Pharmaceutical companies
2. Outbound and Inbound Logistics Service Providers, both domestic and international – who have operations in Karachi

### Literature Review

Most companies are moving towards outsourcing of their major operations for getting competitive advantages in marketplace, and then eventually achieve global supply chain success (Schoenherr, 2010). The In-

stitute of Supply Chain define Logistic Outsourcing as “A making-or-buying decision from any manufacturing company choosing to purchase any unit or item that initially was manufactured, or a service that was performed in-house”(Monczka, 2005).

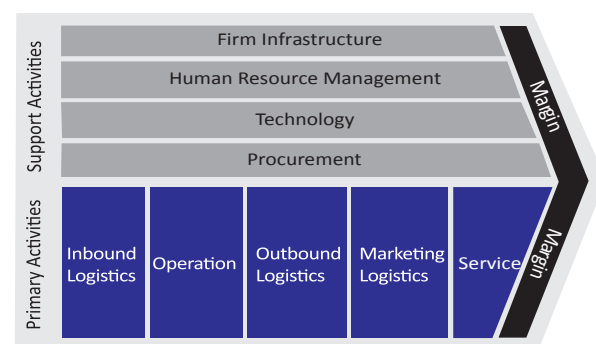
The reason behind any manufacturing company going towards logistics outsourcing is that non-core competencies is not their prime focus while they focus on their other core competencies and major business operations(Gunasekaran & Kobu, 2007). Any manufacturing company should not outsource their products and any service if it is the core competency of the company's operations and has a strategic importance. Whereas, it can outsource non-core competencies in order to pay more attention and focus on their key business areas (Prahalad & Hamel, 1990). The decision of logistics outsourcing is not suggested if the agents of logistic service provider are risk averse, the duration of relationship is long and the chance of risk in cost and quality is high (Balakrishnan, et al., 2008).

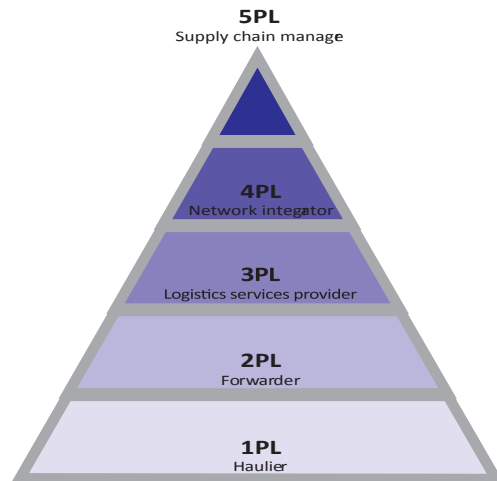
Transaction cost economies (TCE) is one of the earliest theoretical concept for the analysis of logistics outsourcing decisions(Balakrishnan, et al., 2008). The main aspects of the TCE theory are specificity, uncertainty and frequency which are also the main features in purchase decision of any manufacturing organization (Schoenherr, 2010).Another theoretical concept that is used for the analysis of logistic outsourcing decision is the Resource Based View (RBV) of the manufacturing company. The main purpose of RBV is the firm re-

source based on Value, Rare, Inimitable and non-substitutable(Wenerfelt, 1984). These aspects of value, rare, inimitable and non-substitutable of RBV give any manufacturing company a competitive advantage and also help in making a decision on whether to outsource a particular task or not(Mclvor, 2009). Another theoretical concept that has been used for the logistics outsourcing decision is the Knowledge Based View (KBV) of the manufacturing company(Schoenherr, 2010). Knowledge Based View (KBV) is related to Resource based view which give an incentive for vertical integration and social exchange theory, which recommend the ways when outcome of partnership is high and relative dependence is low (Balakrishnan, et al., 2008).

Michael E Porter in 1985 designed a comprehensive model of value chain based on primary activities consisting of inbound logistics, operations, outbound logistics, marketing logistics and services. Coordinating with some supportive activities consist of firm infrastructure, Human Resource Management, Technology and Procurement. Figure-1.

*Figure 1: Value Chain Model: Michael E Porter. 1985*





With logistic outsourcing, any organization can save their logistic cost by improving internal logistic performance and meeting the requirement of customer (Sohail, et al., 2006). Logistic outsourcing performance in any manufacturing organization act in coordination with supply chain management, strategy as forebear, organizational performance, financial performance and marketing performance respectively (Green & Inman, 2008). Logistics outsourcing offering entrance to cutting-edge technology as well as the utilization of high-powered performance contracts (Novak & Stern, 2008). Logistics outsourcing can also accelerate the flexibility, assist market penetration and increase re-engineering stuff (Lau & Zhang, 2006). Logistics service provider can be the cause for best-in-class and fresh ideas and object creativity (Harland, 2005).

Key challenges and drawbacks in logistics outsourcing have been listed as: Logistics outsourcing can also be a reason of losing a control on outbound logistics activities (Gu-

nasekaran & Kobu, 2007). The factor of failure can also be high due to totally reliance on the performance of logistics service provider (Dabhilkar & Bengtsson, 2008). Other risks are market volatility, incomplete specifications, and lack of ability to measure performance and common risk of performing business internationally (Ellram, et al., 2008).

Authors have suggested ways to overcome logistics outsource drawbacks. (Williamson, 2008) has suggested that a more specific contract can minimize insecurity inherent in the logistics outsourcing relationship, while, (Amaral, et al., 2004) suggests that if an increase in contacts specificity and superior performance control is maintained, then the chance of opportunistic actions or violence is reduced.

### Conceptual Framework

Logistics outsourcing =  $f(\text{cost saving, efficient distribution, reputation, decision-making, strategic position, transit time, timely delivery})$

### Methodology

The study employed Principle Components Analysis and Multiple Linear Regression. To assess the reliability of the study, Cronbach Alpha was employed on the instrument. The questionnaire was kept as simple as possible to avoid comprehension mistakes.

The above mentioned result shows that the Alpha value is 0.857 which is consistently reliable and the result of alpha for 52 items or articles conducting to identify "The Impact of the logistics outsourcing of activities of sup-

ply chain in pharmaceutical industry in Karachi". Table-1

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.857	.807	52

Simple Random Sampling was employed while using the list of members of Pakistan Pharmaceutical Manufacturers' Association Member List as a sampling frame. A sample size of 46 was used.

The pilot testing was done from ten respondents in order to assure the reliability of instrument. After doing the pilot testing certain changes required in order to modify the questionnaire and making it meaningful and useful to assure validity. Question number 3 and 5 were modified and changed into manufacturing outsourcing instead of packaging outsourcing only, the purpose was to making it easily understandable.

The alpha value of the instruments is 0.857, and there is a need to changing the structure of instruments because some of the pharmaceutical companies do outsource their manufacturing along with packaging; however, the formula and expertise are provided by the company itself but produced and manufactured by an external service provider.

The data is collected from 85 pharmaceuticals by sending them the Research Questionnaire through email. Addresses were acquired from Pakistan Pharmaceutical Manufacturers Association.

Mainly are:

- Hilton Pharma (Pvt.)Ltd
- Matrix Pharma (Pvt.)Ltd
- Abbott Pharma
- Hoorra Pharma (Pvt.)Ltd
- Racket and Benckiser
- Barrett Hudson
- Getz Pharma (Pvt.)Ltd
- Sure Bio International
- Searle Pharma
- Sami Pharma (Pvt.)Ltd

The purpose of this research was to get as possible responses but only few responses was obtained.

I got a response of 46 individuals of different Pharmaceutical Companies locating in Karachi after applying convenience sampling technique which is 46% of the total populations through Taro Yamane Sample formula.

The table below shows that the value of multiple correlation matrix was carried out 0.728, and the Adjusted R square indicate that 44% of the variance was predicted from predictor variables. Table-2

Model	R	R Square	Adjusted R Square	Std. Error of Estimate
1	.728	.531	.444	.54488

a. Predictors: (Constant), Transit Time, Cost Saving, Efficient Distribution, Reputation, Decision Making, Strategic Position, Timely Delivery

b. Dependent Variable: Logistics Outsourcing

The table-3 shows the ANOVA table, indicates that the combinations of all the predictor variables extensively and significantly envisage the Logistics outsourcing (dependent



variable), which is 0.000 less than significance value 0.001. Table-3

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.750	7	1.821	6.135	.000
	Residual	11.282	38	.297		
	Total	24.032	45			

a. Predictors: (Constant), Transit Time, Cost Saving, Efficient Distribution, Reputation, Decision Making, Strategic Position, Timely Delivery

b. Dependent Variable: Logistics Outsourcing

Coefficients table-4 has given us the tolerance and significance value of independent variables after computing dependent variable that indicates the standardized beta coefficient and t value results for finding the significance level of hypothesis, which was further elaborated in later part of this study.

The factors extracted after applying Principal axis factor analysis, shows the association of factor with 7 variables and 22 Sub-variables of benefits: Efficient Distribution, Transit time, Reputation, Cost Saving, Timely Delivery, Strategic Position, Decision Making

Table-4

Model		Unstandardized Coefficients		Standardized Coefficients	
		B	Std. Error	Beta	t
1	(Constant)	1.112	.479		2.320
	Efficient Distribution	.817	.199	.526	4.102
	Timely Delivery	-.376	.246	-.318	-1.525
	Cost Saving	.270	.217	.217	1.243
	Strategic Position	-.241	.223	-.203	-1.078
	Decision Making	.255	.190	.257	1.343
	Reputation	-.572	.133	-.602	-4.315
	Transit Time	.447	.168	.444	2.664

a. Dependent Variable: Logistics Outsourcing

Kaiser-Meyer-Olkin (KMO) The determinant measure is .527 i.e. nearly .70 demonstrating that there are adequate items for each factor.

#### KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy	.527
Bartlett's Test of Sphericity	Approx. Chi-Square 939.697
	Df 231
	Sig. .000

Hypothesis	Result
H <sub>1</sub> : Is Logistic Service Provider a Cost Saving solution for the company?	Null Hypothesis is accepted
H <sub>0</sub> : Is Logistic Service Provider not a Cost Saving solution for the company?	
H <sub>2</sub> : Are the Logistic Service Provider effects the Distribution of the company?	Null Hypothesis is rejected
H <sub>0</sub> : Are the Logistic Service Provider not effects the Distribution of the company?	
H <sub>3</sub> : Are the Logistic Service Provider achieved the Strategic position for the company?	Null Hypothesis is accepted
H <sub>0</sub> : Are the Logistic Service Provider hasn't achieved the Strategic position for the company?	

Table-5

Factor	Initial Eigen values		
	Total	% of Variance	Cumulative %
1	5.706	30.480	30.480
2	3.936	17.890	48.370
3	2.459	11.175	59.545
4	1.703	7.739	67.284
5	1.625	7.384	74.668
6	1.048	4.762	79.431
7	.998	4.535	83.955
8	.752	3.417	87.383
9	.645	2.933	90.316
10	.546	2.482	92.798
11	.362	1.647	94.445
12	.280	1.274	95.719
13	.250	1.181	96.901
14	.215	.978	97.879
15	.116	.529	98.408
16	.091	.413	98.821
17	.076	.344	99.165
18	.061	.278	99.444
19	.049	.223	99.667
20	.033	.152	99.819
21	.026	.116	99.935
22	.014	.055	100.000

Rotation Sums of Squared Loading

Factor	Total	% of Variance	Cumulative %
1	5.45	24.780	24.780
2	3.812	17.329	42.109
3	2.577	11.713	53.822

a. Dependent Variable: Logistics Outsourcing

The cumulative percentage of trace and Eigen values have been computed and for all principle axis factoring analysis. Three factors were conserved explaining 53.8% of the total variance as shown in the table given in table-5.

The factors were rotated as follows:

However, the above factors are already computed through Statistical technique of Multiple Linear Regression in order to find out the significance of these variables.

Cost saving is highly Insignificant with a value of 0.221 greater than Significance value 0.05. Efficient Distribution is highly significant with a value of 0.00 lesser than Significance value 0.05. Decision making is highly Insignificant with a value of 0.187 greater than Significance value 0.05. Timely Delivery is highly Insignificant with a value of 0.135 greater than Significance value 0.05.

### Concluding Remarks

After the execution of regression techniques following are the benefits identified from logistics outsourcing:

- Efficient Distribution
- Transit time
- Reputation

It is concluded that the pharmaceutical companies can utilize these benefits in order to improve their level of production as well as maximize the profit but also help in more focusing on major business operation. It is also minimizing the requirement of extra labor and machinery as well the associating cost relating with them.



	Factor		
	1	2	3
Does your company search for any expertise for better Storage Decision?	.836		
Does your company search for Loading/ Unloading Duration & Time from Logistics service provider?	.713		
Does your company search for external service provider for Forecasting on Behalf of Company?	.707		
Does your company Minimizing Percentages of Damages & Shipping Errors from Logistics outsourcing?	.684	.453	
Does your company search for any external expertise for access in Risky Location Decision?	.680		-.380
Does your company search for Minimizing Shipping Errors from Logistics outsourcing?	.600		-.491
Does your company search for any external expertise for better Supply Scheduling Decision?	.582		
Does your company search for any external expertise for better Transportation Decision?	.581	.375	-.301
Does your company search for TIMELY/ APPROPRIATE Respond to Queries?	.575		.521
Does your company search for Reputation?	.559		
Does your company search for TIMELY/ APPROPRIATE Delivery of Shipments?	.539		
Does your company search for INVENTORY ACCURACY?	.493		
Does your company search for MINIMIZING/DECREASING Transportation Cost?		.799	
Does your company search for REASONABLE INFORMATION Cost?		.760	-.319
Does your company search for LOT QUANTITY Cost?		.729	-.383
Does your company search for DECREASING/ MINIMIZING WAREHOUSING Cost?		.709	
Does your company search for INVOLVEMENT IN DECISION MAKING?	.413	.689	
Does your company search for REASONABLE ORDER PROCESSING Cost?	.398	.447	.357
Does your company search for MINIMIZING/ DECREASING ADMINISTRATIVE Cost?		.374	
EXPERTISE/ SPECIALIZATION			
Does your company search for DELIVERY ACCURACY?	.304		.788
Does your company search for PICKING ACCURACY?			.755

After employing regression technique some areas found still problematic in implementation of logistics outsourcing were:

- Cost Saving
- Timely Delivery
- Strategic Position

#### • Decision Making

After computing and analysis these 4 areas emerged as problems for implementing logistics outsourcing. There are some actions and procedures to improving the concept for

future practices which are:

- Doing agreement with logistics service provider
- Integrating with other departments
- Sharing of necessary information
- Sourcing of multiple suppliers for same commodity
- Supplier evaluation on quarterly basis
- Training and upgrading of suppliers

It is concluded in the light of research with respect to the impact of logistics outsourcing in pharmaceutical industry in Karachi, that development of logistics outsourcing is emergent to change “cost pro-

portion” into “value proportion”. Business activities like operation and supply chain increasingly utilizing logistics outsourcing as an “opportunity” rather than “cost center” in pharmaceutical companies of Karachi.

To get an advanced analysis into the theme it is recommended that further research may be carried out focusing the Forth Party Logistics Provider (Under the Theme of Customer for Business Alliance) integrating Third Party logistic service providers (Under the Theme of Customer opting for outsourcing) perspective.

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