

**TRANSIT TIME AND PRICE OPTIMIZATION
FOR INCREASING POTENTIAL CUSTOMER BASE
IN INTERNATIONAL EXPRESS BUSINESS**

**M.Sc. Thesis by
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Department : Industrial Engineering

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**ULUSLARARASI HIZLI KARGO İŞİNDE
POTANSİYEL MÜŞTERİ TABANINI BÜYÜTMEK İÇİN
TRANSİT SÜRE VE FİYAT OPTİMİZASYONU**

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FOREWORD

International Express is one of the most promising markets to grow in the coming years. In this thesis, Industrial Engineering point of view is utilized for clarifying the fundamentals of this business area.

I am grateful to my advisor Prof. Dr. M. Nahit Serarslan for his precious support on my work. His guidance led to develop my work in a proper way and his patience sharpened my effort to intensify the research.

During extensive research period, I always felt the unique and affectionate support of my darling Ms. Emine Güneş and my sister Ms. Şirin Beydilli. In this difficult but rewarding part of my life, I owe my work to their companionship.

June, 2010

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TRANSIT TIME AND PRICE OPTIMIZATION FOR INCREASING POTENTIAL CUSTOMER BASE IN INTERNATIONAL EXPRESS BUSINESS

SUMMARY

Air cargo industry is the fastest growing sector in the dynamic freight market. International Express is a narrow market definition belonging to freight business which has particular pricing and transit time. Turkish International Express market stands to be oligopolistic in terms of competition. This thesis aims to optimize transit time and price for increasing potential customer base in International Express business.

Literature review has been conducted for related studies. Related studies include research focusing on pricing, service quality and development of methodologies in especially air cargo transportation. Cost elements and their attributes have been examined through related studies. Several methodologies which have similar steps with this thesis are included in literature overview. Conclusions from related studies have been added to literature review.

Pricing is major study area in marketing. This thesis derives related pricing topics for the research. Additionally, major International Express Service providers, their global revenues, global profits, global number of employees and service capabilities have been mentioned in research. Pricing concept has been illustrated in proper figures which reflect demand and supply dynamics.

Profit maximization is commonly used as a pricing objective. It is also being used in Operations Research as an objective function in problem formulation. Related literature about profit maximization has also been derived for this study. Most of the studies have analogies with this thesis in terms of model formulation for objective function which maximizes the difference between revenue and cost.

The survey has been sent to 6000 customers to seek their response for clarifying the way to achieve thesis aim. 103 respondents have filled the survey form and 34 specific analyses have been conducted in this area.

English and Turkish versions of survey form have also been added in appendices.

ULUSLARASI HIZLI KARGO İŞİNDE POTANSİYEL MÜŞTERİ TABANINI BÜYÜTMEK İÇİN TRANSİT SÜRE VE FİYAT OPTİMİZASYONU

ÖZET

Hava kargo endüstrisi dinamik kargo pazarının en hızlı büyüyen sektörüdür. Fiyat ve transit süre farklılıkları olan Uluslararası Hızlı Kargo, dar pazar tanımının sınırları ile kargo işine dahildir. Türk Uluslararası Hızlı Kargo pazarı rekabet açısından oligopolistik bir yapı göstermektedir. Bu tez çalışması Uluslararası Hızlı Kargo işinde potansiyel müşteri tabanını büyütmek için transit süre ve fiyat optimizasyonunu hedeflemektedir.

Literatür taraması ilgili çalışmalar için gerçekleştirilmiştir. İlgili çalışmalar özellikle hava kargo taşımacılığında fiyatlandırma, hizmet kalitesi ve metodoloji geliştirme üzerine odaklananları içermektedir. Maliyet unsurları ve özellikleri de ilgili çalışmalar üzerinden incelenmiştir. Literatür taraması bu tez çalışması ile benzer metodolojiler içeren pek çok çalışma içermektedir. İlgili çalışmalardan elde edilen sonuçlar literatür taramasına eklenmiştir.

Fiyatlandırma pazarlamanın ana çalışma alanlarından biridir. Bu tez çalışması ilgili fiyatlandırma konularını toplamaktadır. Buna ek olarak, ana Uluslararası Hızlı Kargo firmaları, global gelirleri, global karları, global eleman sayıları ve hizmet yetkinliklerinden çalışma kapsamında bahsedilmiştir. Fiyatlandırma konusu, arz ve talep dinamiklerini yansıtan uygun şekiller ile gösterilmiştir.

Kar maksimizasyonu fiyatlandırma amacı olarak sıklıkla kullanılmaktadır. Aynı zamanda Yöneyim Araştırması'nda problem formülasyonu içinde amaç fonksiyonu olarak da kullanılmaktadır. Kar maksimizasyonu ile ilgili literatür de bu çalışmada toplanmıştır. İlgili çalışmaların çoğunluğu, bu çalışmada gelir ve maliyet arasındaki farkı maksimize eden amaç fonksiyonunu içeren model formülasyonu ile ortak yanlar içermektedir.

Tezin amacına ulaşmak için giden yolu açığa kavuşturmak için 6000 müşterinin cevaplarını arayan anket düzenlenmiştir. 103 cevaplayan formu doldurmuş ve bu alanda 34 adet analiz gerçekleştirilmiştir.

Anket formunun İngilizce ve Türkçe halleri ekler kısmında bulunmaktadır.

1. INTRODUCTION

Optimization based research methodology became very common in Industrial Engineering especially after the World War II when Operations Research arised as a major study area for application. Applied mathematics is in the center of this research area which includes mathematical programming and computer science.

Customer experience is a very popular channel where business leaders and engineers work together in last few decades. Main topic in customer experience stands to be the product and service attributes that customer perceive in real life. One definition of quality also lies between this perception and expectations of customers.

Profit maximization is a specific method in Operations Research which includes maximization formula of profit as an objective function. The basic constraints in profit maximization are capacity, service or product attributes, market circumstances and financial boundaries. Profit maximization is the most common pricing objective in marketing context.

International Express is a specific type of service in freight business. Main modes of transportation in this business are air and road. In order to pick up and deliver in a faster manner, service providers utilize state-of-art technology and procedures. Easier customs clearance facilities are other major advantages to buy international express service for customers. This service is more expensive with respect to other air or road transportation services. Price and transit time are two major attributes which identify this service and clarify its unique market definition.

Application of operations research technique which is profit maximization in a customer experience perspective to optimize transit time and price for increasing potential customer base in international express business has been investigated in this thesis. The methodology can be accepted as a combination of classical Industrial Engineering and Marketing concepts especially in pricing. The survey in this research is a genuine analysis in Turkish International Express market which is identically oligopolistic.

2. LITERATURE OVERVIEW

Air cargo industry is the fastest growing sector in the dynamic freight market. International Express is a narrow market definition belonging to freight business. Wang (2007) indicates that consumers ship their high value, low-volume, light-weight and time sensitive goods by air. Park et al. (2009) distinguish express firms as increasing their share of smaller cargo shipments by guaranteed services, late pick-up, early delivery, dealing with import/export formalities, extensive use of information technology, and comprehensive global network that supports just in time production and supply chain management.

There are several academic studies specializing on air transportation. The most related studies that have been derived in this literature overview have common objectives or methodologies to this thesis which is transit time and price optimization for increasing potential customer base in international express business. Conclusions, results and comments which are summarized in literature overview are precedents of my research area.

2.1 Introduction of related literature

Smith et al. (2007) demonstrate the development, testing and application of statistics to study rates for expedited freight services which claims that these kinds of models enable carriers to identify customers whose revenues are deficient considering services rendered, and terminals where revenues are deficient considering their mix of business.

Park et al. (2009) explore the relative importance of factors that influence the adoption of air express delivery service, and evaluate the competitiveness of air cargo express carriers in the Korean market by incorporating AHP analysis to identify the most influential factors to competitiveness and the most competitive firm according to those factors. Importance and performance analysis is also included to draw managerial implications.

Wang (2007) uses quality function deployment to integrate quality technology and the voice of consumers. Method includes “House of Quality” charts which illustrates the company’s performance in terms of service and offer suggestions for improvement.

Chang and Yeh (2002) present an effective approach for evaluating service quality of domestic passenger airlines by customer surveys. A fuzzy multi-criteria analysis (MA) is used to formulate the evaluation problem. The model is solved by an effective algorithm which incorporates the decision maker’s attitude or preference for customer’s assessments on criteria weights and performance ratings. The evaluation outcome provides airlines with their internal and external competitive advantages, relative to competitors in terms of customer perceived quality levels of service.

Chen et al. (2009) concentrate to show service quality perception gaps between types and employee statuses of business customers. Service quality perception gap is also important for the research area of this thesis as it should be incorporated as part of evaluation in the survey part. Closing the service quality perception gap between what customers expect and what they perceive is critical to delivering service quality. The main reason of importance is the formulation of quality to increase when performance exceeds the expectations. On the other hand quality decreases when performance falls short of expectations.

Chang et al. (2007) evaluate alternative strategies proposed for the development of a national air cargo industry. This empirical study of Taiwan’s air cargo industry integrates experts’ opinions from three stakeholder groups (the government, the academic and the carrier) about the relative importance and achievability of 18 alternative strategies.

Avlonitis and Indounas (2007) explore the pricing objectives that service companies pursue along with the pricing information that they collect in order to price their services. One of the service industries in the research is the airline industry which makes the study important for this thesis.

Pakdil and Aydın (2007) study measures of airline service quality based on a data collected at a Turkish airline using SERVQUAL scores weighted by loadings derived from factor analysis. Analyses demonstrate that responsiveness dimension is the

most important while availability is the last important element of quality. It should be also noted that this study is done mainly in the area of passenger transportation by air. Method analogy and elements used in the analysis are key interest points to be derived for the literature overview.

2.2 Methodology of related literature

Smith et al. (2007) suggest service providers engage in a form of value-based pricing as they set base rates and then negotiate individual customer discounts which reflect the cost of providing service, competitor pressures, and the anticipated value of customer relationship. On the other hand shippers may pick from the array of negotiated alternatives in some instances and cumulate business to quantify for volume discounts. Looking into the carrier perspectives small carriers exploit niches in selected markets offering time-definite services with computerized tracking under simplified pricing structures. In addition, carriers strive to reach different market segments with differentiated service and pricing.

Chang and Yeh (2002) state that airlines' competitive advantages based on price alone are not sustainable. An airline would lead the market if it offers superior quality services relative to its competitors. It is therefore of strategic importance for airlines to understand their relative competitive advantages on service quality. The study addresses the performance evaluation problem of service quality for domestic passenger airlines based on customer surveys. The evaluation outcome would help airlines better understand how the customers view their services relative to their competitors, thus motivating airlines to provide appropriate levels of services. It is stated that the quality of airline service is difficult to describe and measure due to its heterogeneity, intangibility and inseparability. While the definition of service quality and its influential characteristics continue to be important research issues, the understanding of service quality levels relative to competitors is significantly important for airline strategic management.

The study of Smith et al. (2007) includes cost structures of carriers which is one of the most important constraints in tariff optimization. The net freight rate paid by a shipper depends on published rate, the discount negotiated with the customer, and the blend (classification, weight and distance) of shipments while the discount is affected by the relative negotiating power of the two parties (carrier and shipper). Second

finding is the perceived risk associated with contractual arrangements and the extent to which the two parties enjoy a mutually constructive relationship that enables them to work synergistically. Smith et al. (2007) claim that shipper's buying power in negotiating discount from published base rate are the volume of business, ease of handling for the cargo and the degree of risk associated with the service, while positioning the carrier's competitive position on basic rate structure, its available capacity on the routes used by the customer, its cost structure for local operation, line hauls, and the service levels offered.

Smith et al. (2007) show the factors affecting the negotiated discount in an effective model. (See Figure 2.1)

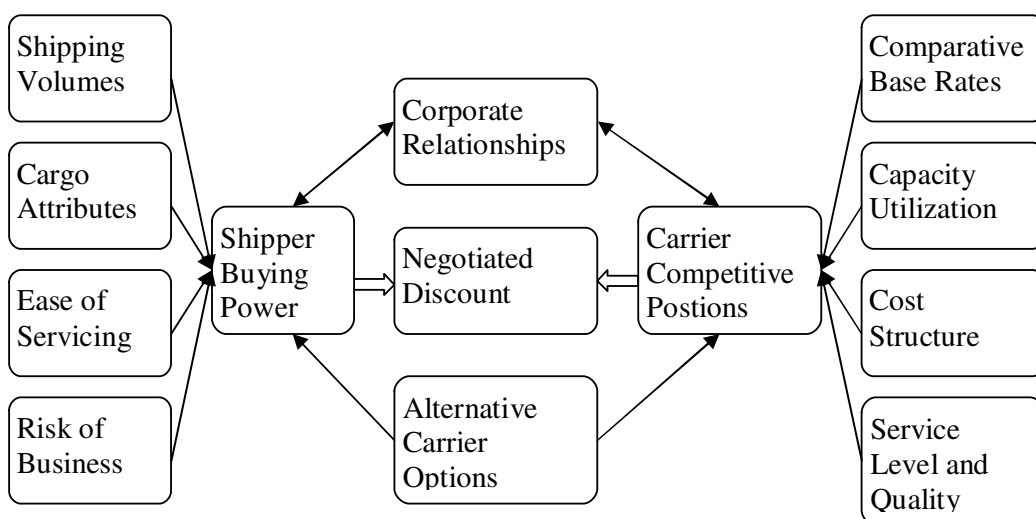


Figure 2.1: Factors affecting the negotiated discount

In construction of the above model, Smith et al. (2007) also reveal that this is a business with mobile resources and ease of entry for competitors which make the revenue obliged to cover the fixed and variable costs of the firm with a reasonable return on investment. Smith et al. (2007) summarize the cost components of a freight carrier as labor for line haul, labor at terminal operations, fuel, tractor investment and maintenance, trailer investment and maintenance, general administration and back office support, including information systems, local delivery expense, customs brokerage and documentation for international shipments. Smith et al. (2007) also summarize the cost components allocated to a customer's shipments for a month in

particular lane as characteristics of cargo (density, fragility, packing), number of shipments, total weight of cargo, distance, local factors affecting costs of terminal operations and vehicle movements at origin and destination points, traffic congestion at origin, destination and along the route, international boundaries (requiring paperwork and causing delays).

Park et al. (2009) carry out their study with survey data which is collected on six core factors which are promptness, accuracy, safety, convenience, economic efficiency and dependability.

Park et al. (2009) describe the hierarchical structure for decision making to find out the relative competitiveness of the firms with respect to mentioned factors. (See Figure 2.2)

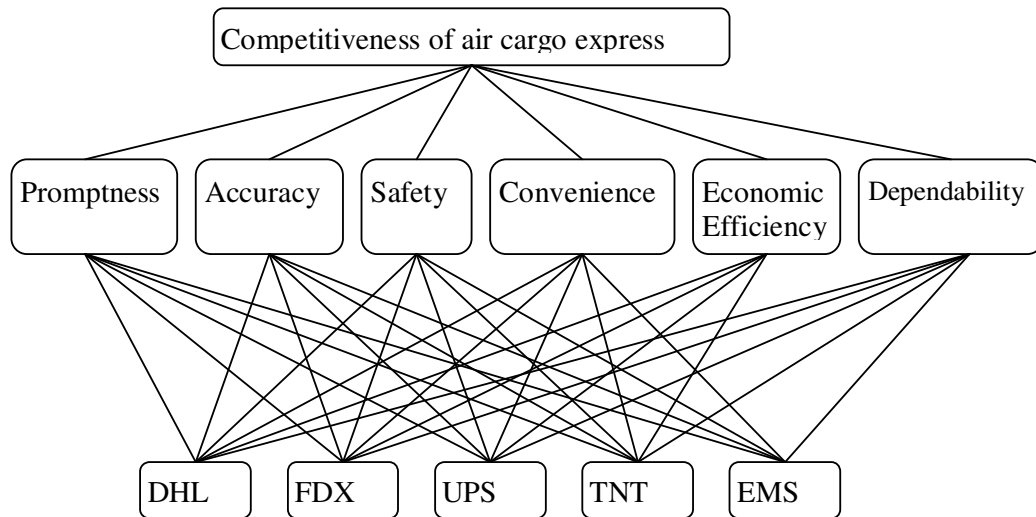


Figure 2.2: The AHP hierarchical structure (Park et al., 2009)

The response of the survey from industry experts is analyzed with AHP and the results show that the two most influential factors to competitiveness are accuracy and promptness. These first two factors are followed by safety, convenience, economic efficiency and dependability. From the perspective of service users, economic efficiency (low price charged by carriers) becomes the most important factor (Park et al., 2009).

Wang (2007) analyzes the variance between expected service and perceived service received by air cargo forwarders. Using data in quality function deployment (QFD),

service demands of air cargo forwarders is systematically determined with layers of organizational aspects. Moreover, through quality attribute ranking (QAR) methods to assist management in understanding the voice of outside consumer and better prioritize internal operations are developed. Air cargo operation is summarized in three different kinds which are Airmail, Air Express and Airfreight.

Park et al. (2009) continue further analysis on user's perspective. Two most important attributes, namely, moderate price and rate policy belong to economic efficiency factor. Ranking of users is quite different from expert ranking in the AHP analysis while both groups value accuracy highly and the customers would like to see low prices when using express delivery services and the expert panel values promptness highly. The analysis has pointed out DHL as the most competitive carrier in both audience and importance-performance analysis is conducted for each individual carrier. Importance-performance (IPA) evaluation grid is used in the study. (See Figure 2.3)

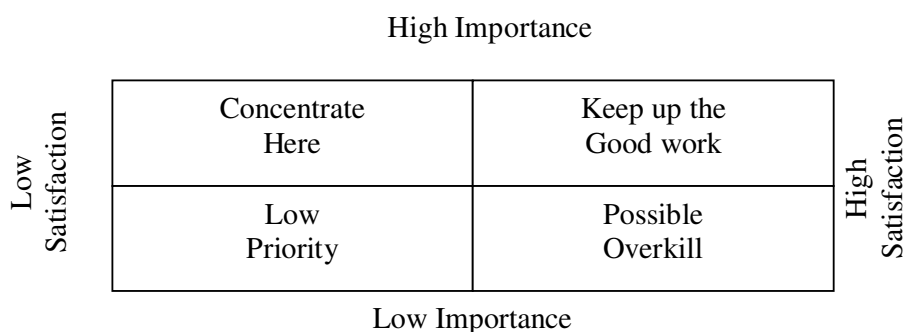


Figure 2.3: IPA evaluation grid (Park et al., 2009)

Pakdil and Aydın (2007) claim that definition of high quality should be clarified before delivering service. The control variables in the questionnaire has been determined as gender, age, nationality, educational, level, job position, marital status, average use of airline services, and purpose of last trip. The questionnaire is including 35 items and airline service quality dimensions consistent with the SERVQUAL dimension. Questions addressing expectations and perceptions were rated using 5-point Likert scale. Perceptions were rated 1 = strongly disagree to 5 = strongly agree and expectations were rated from 1 = unimportant to 5 = very important. The questionnaire is also examined by airline executives and academic staff, which resulted with contributions incorporated. The service quality items

measured are employees, tangibles, responsiveness, reliability and assurance, flight patterns, availability, image, empathy. The results show that service quality expectations and perceptions vary by educational level of consumer. Service quality gaps vary by educational level of consumer, flight frequency and the purpose of the flight. Important results from the study are image and availability to be new dimensions.

Chen et al. (2009) measure overall satisfaction of the line's service on a scale from 1 to 7. Long term relationship proxy is another evaluation which is measured on a scale if the volume shipped by the line increase or decrease. SERVQUAL surveying methodology is used in the research. As a result of the research all of the perceived service quality mean-scores rated by the forwarders for the 22 service items are significantly lower than those rated by the shippers. In addition to this result, the effect of job status on the perceived service quality is consistent among the service items. In the forwarder group, all perceived service quality mean scores relating to reliability, responsiveness and assurance for the subordinates are lower than those for managers.

Chang et al. (2007) design a survey questionnaire to ask the experts to assess the relative importance of six development goals and 18 strategies using a hierarchical pair wise comparison approach and the achievability of these strategies, using the set of self definable linguistic terms. In the questionnaire, 1-9 ratio scale in pair wise comparisons is used as it has been proven to an effective measurement scale for reflecting the qualitative information of a decision problem and for enabling the unknown weights to be approximated. If the ratio value given is five, the corresponding fuzzy assessment can be (4, 5, 6), (3, 5, 7) or (2, 5, 8) if the expert's knowledge of the problem is excellent, good or fair. To facilitate the making of subjective assessments by experts using triangular fuzzy numbers, linguistic terms are used. This is because linguistic terms have been found intuitively easy to use in expressing subjectivity and impression of decision maker's assessments.

Avlonitis and Indounas (2007) state the conventional neoclassical price theory as historically the first one to examine pricing. Under this theory, profit maximization is the reason of existence of any company and relies on finding an equilibrium point that maximizes profit under different market structures like monopoly, oligopoly, monopolistic competition and perfect competition. In addition study point industrial

organization theory that presents a different school of thought, focusing on the relationship between market structure, business behavior and business performance. Within this context, price behavior and pricing objectives is a function of unique characteristics of the market which are consumers' price elasticity, suppliers' bargaining power, product differentiation, market growth, technology, regulation, intensity of competition, market and concentration. However even with this paradigm, profit maximization is considered to be the main pricing objective that triggers price decision making. Avlonitis and Indounas (2007) suggest firms formulating a variety of pricing objectives other than profit maximization such as sales revenue maximization, output maximization, growth maximization and utility maximization. Avlonitis and Indounas (2007) also state that companies need to satisfy their various stakeholders' interests and potential conflicts between customers, shareholders and government which make their pricing behavior to be characterized by a multiplicity of objectives. The research claims that quantitative objectives of pricing are regarded as being more important than qualitative ones with a particular emphasis being placed on profit considerations. Pricing information may be classified into three large categories which are information related to cost, profits, production and sales, information associated with competitors and information related to customers. (Avlonitis and Indounas, 2007)

Smith et al. (2007) summarize the major drivers for the cost components in a relation with cost categories. (See Table 2.1)

Table 2.1: Major drivers for cost components

Cost Category	Cargo Density	No. of shipments	Weight Shipped	Distance of Shipment	Local Factors	Traffic Congestion	International Shipment
Labor line haul			X	X		X	X
Labor terminal	X	X	X		X		
Fuel	X		X	X	X	X	X
Tractor	X		X	X		X	X
Trailer	X		X	X		X	X
General Administration		X			X		X
Local delivery	X	X	X		X	X	
Customs broker							X

Park et al. (2009) use list of factor definitions for their research. (See Table 2.2)

Table 2.2: Factor definition for competitiveness

A. Promptness	
A1 Quick Pick-Up	On-time and quick pick-up from booking point
A2 Quick Delivery	Quick delivery from pick-up point
A3 Network	Quick transportation networking
A4 Quick response	Quick response to request by internet or telephone
B. Accuracy	
B1 On-Time Pick-Up	On-time pick-up as per customer's request
B2 Pick-Up Service Area	Wide pick-up service area
B3 On-time Delivery	On-time delivery as per customer's request
B4 Accurate Delivery	Accurate delivery to address of shipment
C. Safety	
C1 Handling	Handling by cargo characteristics
C2 Compensation	Compensation Policy
C3 Problem Solving	Cargo protection
C4 Information Management	Information management for cargo handling
C5 Facility	New facility
C6 Damage and Loss	Delivery without damage or loss
D. Convenience	
D1 Service Area	Delivery to all areas
D2 Branch	Many branches
D3 Booking	Easy to book by internet and telephone
D4 Tracing	Easy to track and trace by internet and telephone
D5 Schedule	Convenient schedule for pick-up and delivery
E. Economic Efficiency	
E1 Moderate Price	Low price
E2 Variety Rate	Offer many class rates
E3 Reasonable Price	Reasonable price by volume and/or weight
E4 Rate Policy	Offer benefits by track of shippers or forwarders
F. Dependability	
F1 Packing Condition	Maintain packing condition for delivery
F2 Image	Image and reputation of the carrier
F3 Customs Clearance	Seamless customs clearance

Wang (2007) also use list of factor dimensions and service needs attributes for factor analysis. (See Table 2.3)

Table 2.3: Factor dimensions and service needs attributes

Factor Dimensions	Service Needs Attributes
Professionalism	Cargo documents carried on board
	Professional Standards
	Standard operating procedures
	Ability to handle unusual cargo
	Punctual transportation of cargo
	Prompt notification at end of transit
	Flight punctuality
	Polite and friendly cargo handling staff
	Willingness to help solve customer problems
Physical service	Comfortable customer service area
	Clear explanation of service
	Website with multiple enquiry methods
	Clean service area
	Goods transport considerations
	Prompt notification of changes in flight schedule
	Prompt handling of cargo issues
Correctness	Prompt handling of import/export work
	Accurate meeting of customer demands
	Prompt answering of phones
	Prompt EDI transmission

Chang et al. (2007) use list of development goals and their development strategies for analyses in the research. (See Table 2.4)

Table 2.4: Development goals and development strategies

Development Goal	Development Strategy
Promoting airport competitiveness	Enhancing airport capacity Applying competitive airport charges Improving operational efficiency Enhancing airport management system Enhancing airport transit functions
Enhancing integration of transportation and logistics systems	Improving inland transportation and logistics infrastructure Establishing information exchange platform among transportation and logistics system
Expanding air cargo routes	Applying flexible route allocation Lifting carriers' restrictions on the choice of air cargo routes
Improving air cargo management systems	Amplifying air cargo related rules and regulations Strengthening management of hazardous goods Encouraging regional strategic alliance among carriers
Developing air cargo operation center	Expediting the establishment of free trade zones Promoting computerization of air cargo logistics services Fostering internationally qualified professionals
Expediting direct air cargo links between Taiwan and China	Planning facility requirements of direct air cargo services Coordinating technical issues of direct air cargo services, including route planning Reviewing and establishing rules and regulations of direct air cargo services

Avlonitis and Indounas (2007) use list of pricing objectives of the firms. (See Table 2.5)

Table 2.5: Pricing objectives of the firm

1	Profit maximization
2	Achievement of satisfactory profits
3	Sales maximization
4	Achievement of satisfactory sales
5	Market share maximization
6	Achievement of satisfactory market share
7	Market share increase
8	Cost coverage
9	Return on investment (ROI)
10	Return on assets (ROA)
11	Coverage of existing capacity
12	Liquidity maintenance and achievement
13	Price differentiation
14	Service quality leadership
15	Distributors' needs satisfaction
16	Creation of the prestige image for the company
17	Price stability in the market
18	Price wars avoidance
19	Sales stability in the market
20	Market development
21	Discouragement of new competitors entering into the market
22	Price similarity with the competitors
23	Maintenance of the existing customers
24	Customers' needs satisfaction
25	Determination of fair prices for customers
26	Attraction of new customers
27	Long term survival
28	Achievement of social goals

Objectives has been derived from a survey responded by 170 companies in different sectors and information has been collected by adopting various kinds of scales such as binary, ordinal and Likert type (Avlonitis and Indounas, 2007).

2.3 Conclusions and results of related literature

Smith et al. (2007) construct and validate a mathematical model involving major drivers. Model implies that effective tariffs increase at diminishing rates with increases in weight and distance and larger volume shippers receive further discounts. Statistical models can be very useful for reviewing rate structures, discount programs and customer relationship management with determining the

variance between customers' actual revenue versus accumulated expected revenue by the model.

Park et al. (2009) analyze industry experts' responses with pair comparison. The analyses result with factor weights and their rankings with respect to their priorities. (See Table 2.6) Result has been commented by the authors as air cargo delivery was considered by industry experts as service-intensive industry in particular when selecting an international express delivery company, quick delivery and the ability to reach the destination at exact times (punctuality) were considered as priority factors.

Table 2.6: Factor weights and rankings with respect to their priorities

	Promptness	Accuracy	Safety	Convenience	Economic Efficiency	Dependability	Weight (Priority ranking)
Promptness	1.00	0.50	3.25	4.50	2.75	3.67	0.27 (2)
Accuracy	2.00	1.00	3.67	2.00	3.00	5.20	0.32 (1)
Safety	0.31	0.27	1.00	2.00	2.67	6.00	0.17 (3)
Convenience	0.22	0.50	0.50	1.00	1.00	4.00	0.11 (4)
Economic Efficiency	0.36	0.33	0.38	1.00	1.00	2.00	0.09 (5)
Dependability	0.27	0.19	0.17	0.25	0.50	1.00	0.04 (6)

Park et al. (2009) conclude with stating that the contribution is not only to uncover product differentiation strategies by carriers but also to point out the relative weights in price and various service quality aspects.

Wang (2007) states that understanding the relationship between organizational capabilities and service quality variables can assist in understanding where to work on improving customer service quality standards. The analysis shows the factors most important in satisfying outside consumer voice are prompt handling of import/export work, willingness to help solve customer problems, standard operating procedures, flight punctuality, and good transport considerations. Accuracy and efficiency is also found as the key factors in service operations of an air cargo forwarder. Additionally, the factors in greatest need of improvement with regard to quality technology are customer service, cargo loading/unloading management, IT development, training and customer service hotline operations. Another major outcome of the analysis is the customer service; despite air cargo services having the greatest time efficiency for high-price items, difficulties with staff organization and assignment mean the sector cannot fully meet customer demands.

Chang and Yeh (2002) explain that customers' attitude towards a service depends on the strength of their beliefs about various features or attributes associated with the service and the weight of attributes. The criteria used for service quality evaluation are categorized as on-board comfort, airline employees, reliability of service, and convenience of service and handling of abnormal conditions. The research has been concluded with a result showing competitive strengths and weaknesses of four airlines.

Service quality gap between types of business customers is identified as forwarder perceived service quality would be lower than the shippers' perceived service quality when the forwarders know that the line does not do the best to serve them however shippers are usually unable to grasp this situation. Service quality gap among employee statuses is identified as cargo delivery contract is usually made out by a manager of a shipper or of a forwarder with a manager of a liner. After that the subsequent steps in the flow of cargo delivery are charged by employees of low statuses in the organizations. These subordinates of the shippers or of the forwarders will contact the frontline of line service provider. The responsibility of the managers of both shippers and forwarders is only to monitor that their subordinates execute smoothly the jobs to be done. The perceived service quality of managers and their subordinates will be different because their perceptions come from different sources (Chen et al., 2009).

Chang et al. (2007) state that evaluating and categorizing alternative strategies supported by the government and the industry is required to implement a nation's air cargo development policy. Paper presented a survey and optimization based evaluation approach which can help rank and categorize alternative development strategies for enhancing Taiwan's air cargo industry. The approach used in the study generates an optimal overall preference value for all development strategies by integrating subjective opinions of experts in three stakeholder groups with respect to the relative importance and achievability of these strategies.

3. PRICING TERMINOLOGY AND MAJOR INTERNATIONAL EXPRESS SERVICES PROVIDERS

Pricing is a fundamental aspect of financial modeling, and is one of the four Ps of the marketing mix. (Url-1) Pricing is far and away the most powerful profit lever that a company can influence. More sophisticated buyers, distribution channel consolidation, excess supplier industry capacity, worldwide sourcing, supplier base reduction programs, open-book costing and leaner and meaner competitors are the factors that lowers price. Through effectively inspiring good pricing conduct througout anindustry, avoiding price wars, maintaining regular price increases, capturing the full value of innovation, knowing when the time is right and how best to move prices higher, a company can unilaterally contribute to a rise in price and increased profitability of the industry. Price leadership means designing a sound pricing strategy that does not overestimate customer price sensitivity and takes into account the potential that competitors may follow a price move. It also means being clear and consistent in communacating pricing strategy, its rationale and value (Marn et al., 2004).

Microeconomic theory is concerned with the operation of the price mechanism in the allocation of the resources of the economy (Levenson and Solon, 1971).

3.1 Allocation By Price

The key feature of market is defined as price which represents the term on which the goods are exchanged. The commodities go to those individuals with the highest willingness to pay. Demand and supply curves can be shown in with price and quantity relationship. (See Figure 3.1)

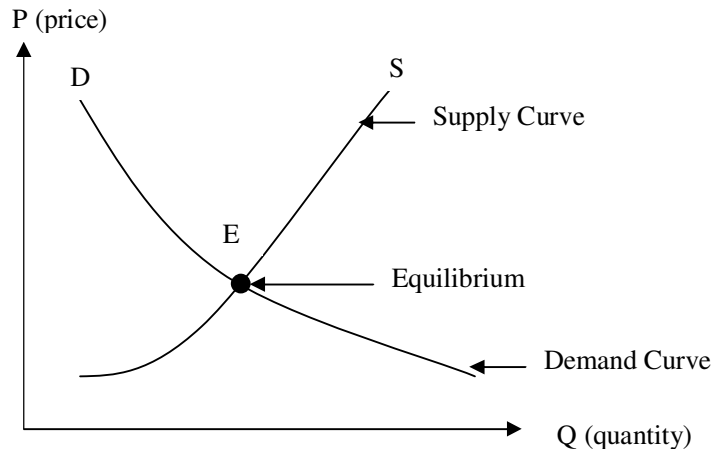


Figure 3.1: Demand and Supply

The coordinates of E are the equilibrium quantity and the equilibrium price which determine the intersection of demand supply curves (Hirshleifer et al., 2005).

3.2 Price Elasticity

Price elasticity of demand is the quantitative measure of consumer behavior that indicates the quantity of demand of a product or service depending on its increase or decrease in price. Price elasticity of demand can be calculated by the percent change in the quantity demanded by the percent change in price. (Url-2)

Price elasticity of demand is determined by the price of the item or service, availability of alternative goods, amount of time being measured, consumer income and whether the item or service is considered to be a necessity or a luxury.

While supply increases as prices rise, demand increases as prices decline. If a small change in price makes a large change in buyer demand, price is said to be elastic, whereas demand is said to be inelastic if price increases have little effect on demand. (Daly, 2002)

$$\text{Price Elasticity} = \frac{\% \text{ Change in Unit sales}}{\% \text{ Change in Price}} \quad (3.1)$$

The price that maximizes revenue and the price that maximizes profit may be far apart. (See Figure 3.2)

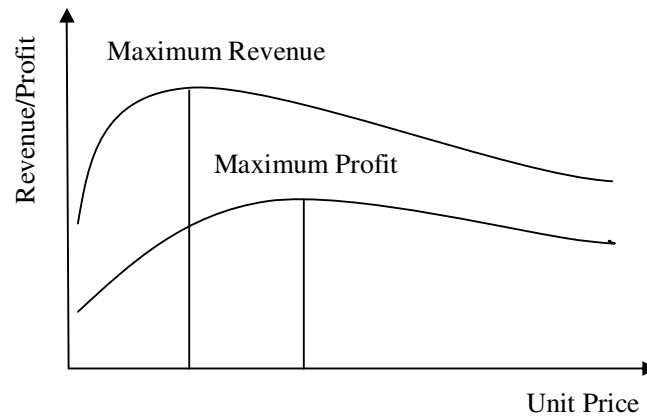


Figure 3.2: The prices that maximize revenue and profit

There are four basic ways of estimating customer demand and price elasticity for a product. They are expert judgement, customer surveys, price experimentation, analysis of historical data. Many strategic considerations come into play in determining price. These include customers, cost, competition, substitutes for the product, legal and ethical constraints. Customer perceptions of value and elasticity for demand are key elements from customer perspective. Cost structure, effect of volume on cost and expected learning curve effects defines cost side. Current competition and potential for future competition are the main attributes of competition on determining price. Features and usefulness of substitutes and pricing of substitutes are elements establishing substitutes aspect on determining price. Price is a signal of value. A buyer's perception of value may be affected by brand name, packaging, previous purchasing experiences and many other factors. Price will be more important in signaling value when a customer has little or no experience with a product category (Daly, 2002).

3.3 Monopoly, Oligopoly and Cartel

Monopoly is a term used by economists to refer to the situation in which there is a single seller of a product (i.e., a good or service) for which there are no close substitutes. The word is derived from the Greek words monos (meaning one) and polein (meaning to sell). (Url-3)

A monopoly exists when an industry contains only a single firm. If a firm can drive out competitors because its costs of production are lower, it enjoys a natural monopoly. Monopoly as compared to perfect competition, leads to higher prices and

lower output. Monopoly can lead to economic inefficiency. A monopolist may divide the market, offering different prices to different classes of buyers or charge different prices in accordance with the quantities purchased. In the extreme a different price might be charged to each consumer for each unit taken, this is called perfect price discrimination. A cartel is a group of firms behaving as a collective monopoly. Each firm in a cartel agrees to produce less than it would under unrestrained competition in order to raise the price (Hirshleifer et al., 2005).

A market for a good where a few major suppliers account for a large majority of sales is called an oligopoly. (Ur1-4) Rather than just supplying quantities to the market, firms more usually compete by quoting prices to consumers. Price competition is more severe than quantity competition. If the products are identical, a firm that quotes a price lower than its competitor's takes away not just part of the market but all of it.

3.4 Responsibility for Pricing

Establishment of pricing policy is a basic responsibility of top management and should be an integral part of corporate strategy. Corporate strategy may allow for local control of pricing as established by corporate guidelines (Daly, 2002).

These things can happen when establishing price:

- a. Overprice: Lose a sale that would have been profitable at a lower price
- b. Underprice: Make an unprofitable sale
- c. Price appropriately: Make a sale and make a profit

Pricing is a multifaceted discipline. Pricing is a mixture of marketing, cost accounting, business strategy, engineering and economics. Besides these disciplines, pricing requires a good working knowledge of the company's products, processes, customers, and competitors. Pricing is best done as a collaboration of people from various parts of business (Daly, 2002).

3.5 Indifference Curves

The term utility was introduced by the British philosopher Jeremy Bentham and evolved to a reflection of rank ordering of preference. Utility is the variable whose relative magnitude indicates the direction of preference. In finding his or her

preferred position, the individual is said to maximize utility. Curves of constant utility are called as indifference curves (Hirshleifer et al., 2005).

In microeconomic theory, an indifference curve is a graph showing different bundles of goods, each measured as to quantity, between which a consumer is indifferent. That is, at each point on the curve, the consumer has no preference for one bundle over another. In other words, they are all equally preferred. One can equivalently refer to each point on the indifference curve as rendering the same level of utility (satisfaction) for the consumer. The main use of indifference curves is in the representation of potentially observable demand patterns for individual consumers over commodity bundles (Böhm and Haller, 1987).

If X and Y are both goods, commodities for which more is preferred to less, then indifference curves drawn on x,y axes have four crucial properties. Figure 3.3 shows a typical view of indifference curves.

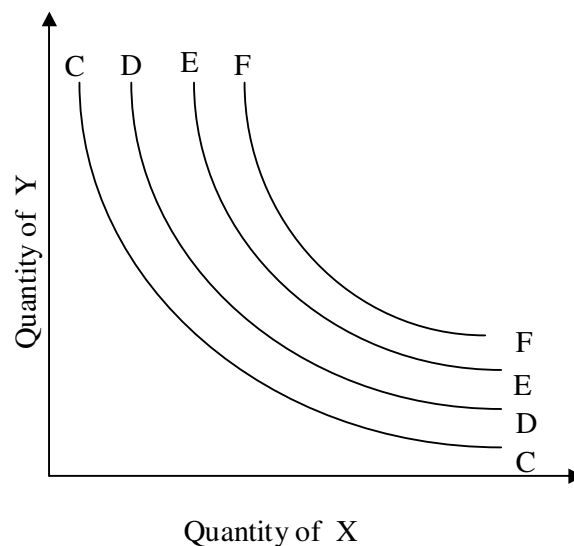


Figure 3.3: Indifference curves

Indifference curves have negative slope. Indifference curves never intersect. Between any two indifference curves another can always be drawn. Indifference curves are convex to the origin.

3.6 Pricing Strategies

Market skimming is a strategy that is frequently used when a company has a new, unique product. New product frequently use sequential skimming, a strategy whereby the initial price is set relatively high but is then progressively reduced as the product matures.

Predation is a strategy whereby a firm sets its price very low in an attempt to discipline a competitor or drive the competitor from the market altogether.

Market penetration is a strategy whereby price is initially set low in hopes of generating buyer demand (and market share) through a low price. If the market is price sensitive (demand is elastic), then the strategy should attract buyers, allowing for increased production volumes and lower unit costs.

A loss leader is a product whose price is set low to attract buyers for the company's other products.

Value pricing refers to a strategy whereby price is set based on the value received by the customer. Value engineering analyzes the value that the customer receives from the various features of the product.

Activity-based costing is a method of assigning the cost of resources to cost objects such as products, product lines, and customers. Activity-based costing has provided a new and more common sense approach to thinking about cost behaviour. It seeks to understand the cause-and-effect relationships between activities and the events that cause those activities to occur. An organization's resources may include time, materials, floor space, equipment, technology and other things of value. The term activity is used to describe the way that an organization expends its resources. Five primary activities are inbound logistics, operations outbound logistics, sales&marketing and service. Four support activities are firm infrastructure, human resource management, technology&development and procurement. Activity-based pricing is a pricing method that uses knowledge about customer demand and knowledge about the costs of a specific selling situation to establish a price that will result in a specific planned profit. Activity-based costing allows the company to project costs corresponding to various sales volumes. Activity-based pricing is

important because it marries volume-sensitive marketing data with volume sensitive cost accounting to provide definitive answers about pricing (Daly, 2002).

A target price is a planned price for a future product. Target prices are usually based on the existing prices for similar products in the market. The target price may be adjusted up for inflation, down for expected productivity gains, or up or down for changes in features or functionality. Target costing has important strategic implications in that it provides management with a greater control over profit by moving profit planning earlier in the product development cycle (Daly, 2002).

3.7 Major International Express Service Providers

International express services by DHL Express includes Same Day, Time Definite, and Day Definite services. Same Day service includes an immediate pick-up of the shipment by a dedicated courier with an emergency delivery within the same day via a dedicated network. Time Definite service is door to door delivery by a certain time (9:00, 10:30, 12:00) on an overnight or next possible business day basis. Day Definite service is reliable door to door delivery within a certain number of days. Economy Select is a day definite product specialized on heavier shipments (>10 kg) that takes 2-3 days longer than their time definite services. DHL offers globalmail business services for worldwide business mail, direct marketing, publications and merchandise which is a cost effective solution available for paper based, non-dutiable items such as envelopes, flats and tubes. Mail services is available for parcels whose customs clearance is included in service. DHL Express has closed 2009 with total revenue of €m 10,312 loss of €m -807 and 99,494 employees. (Url-5)

UPS serves with guaranteed time definite and day definite international express delivery services. The product range consists of Express Critical (Best available flight), Worldwide Express Plus (1-3 business days, delivery typically by 8:30 or 9:00 a.m.), Worldwide Express (1-3 business days, 10:30 a.m or 12:00 noon), Worldwide Saver (1-3 business days, by end of day), Worldwide Expedited (2-5 business days, by end of day). All of these services are door-to-door service with in-house customs clearance. UPS generated \$m 9,699 of revenue and \$m 1,367 of profit from its international package division in 2009. (Url-6)

FEDEX serves international express shipping services. The services is consisted of International Next Flight (delivery within hours between major cities worldwide), International First (delivery in 2 business days as early as 9 a.m.), International Priority (time definite delivery typically up to 3 business days) and International Economy (2-5 business days). All of above services are door-to-door and customs cleared. FEDEX generated \$m 6,978 of revenue from International Priority business line in express segment in 2009. (Url-7)

TNT serves Time Critical (immediate collection with dedicated courier), Time Definite (guaranteed delivery 9:00 a.m., 10:00 a.m., 12:00 noon) , express and economy express (delivery on a within 2-5 working days) delivery services. TNT Express generated €m 5,956 of revenue and €m 193 of operating income. TNT has 78,030 employees in its express division by the end of 2009. (Url-8)

4. SURVEY ANALYSIS

Actual market circumstances and customer perspective is essential to support the academic study in designing methodology for transit time and price optimization for increasing potential customer base in international express business. A survey consisting of 20 questions has been mailed electronically to 6000 companies throughout the country. 103 companies responded the survey which means that response ratio is approximately 1.7 %.

4.1 Survey Design

The survey includes 20 questions which have deterministic approach towards respondents profile and seek to understand customers' perspectives with respect to different profiles. Questions are based on author's professional experience and created originally to generate data for analysis. First 5 questions gather information about sector, position, experience, function and segment of the respondent. Questions 6 to 8 are designed to enquire respondents' service providers, weightbands of shipments and geozones of shipments. A total of those 8 questions are the basis of classification in below analyses.

Questions 9 to 12 investigate the importance, satisfaction levels of price and transit time which answer the problem of optimization objective with actual customer response.

Questions 13 to 20 propose service and price alternatives and try to find customers' perception and acceptance ratio. These questions include economical service enquiries, delivering to branch, electronic invoicing, urban-rural price discrimination, third-party utilization and volume discount proposals. Companies need competent pricing schemes and transit time alternatives in order to gain market share from their rivals. Creating alternatives and applying them to the right cluster of market will help a company to increase its customer base.

4.2 Respondents of the survey by their firm's industry classification

The respondents of the survey are from various industries. Figure 4.1 shows that Textile, confectionary, readywear, carpet, leather, footwear (20%) ; Automotive, tire, automotive supplier industry (14 %); Food industry, agriculture (9%), Construction, building materials, cement (9%) and Metal (8 %) are the big 5 sectors among the respondents. These big 5 sectors correspond to 60 % of all respondents.

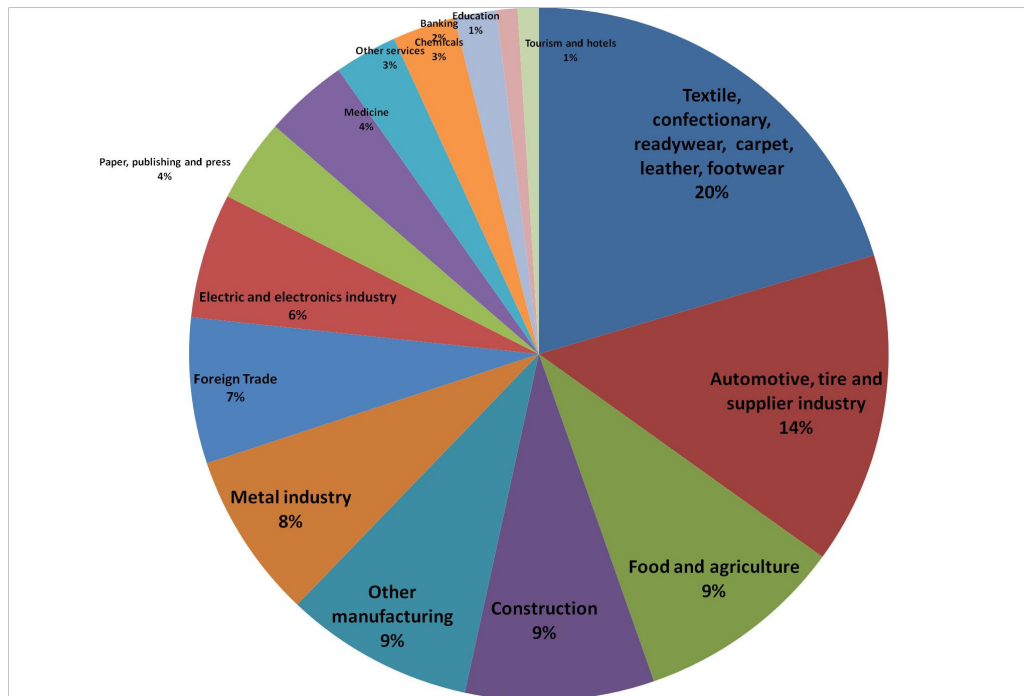


Figure 4.1: Respondents of the survey by their firm's industry classification

4.3 Respondents of the survey by their position in their firms

The survey response is composed of all levels of organization. Figure 4.2 shows that specialist, executive, clerk (37 %) correspond to biggest individual portion. On the other hand managerial level which consists of Firm owner (21%), Middle level manager (21%) and High level manager (18%) accounts for 60 % of all respondents. It can be claimed that the results of the survey should show more managerial point of view rather than user's point of view.

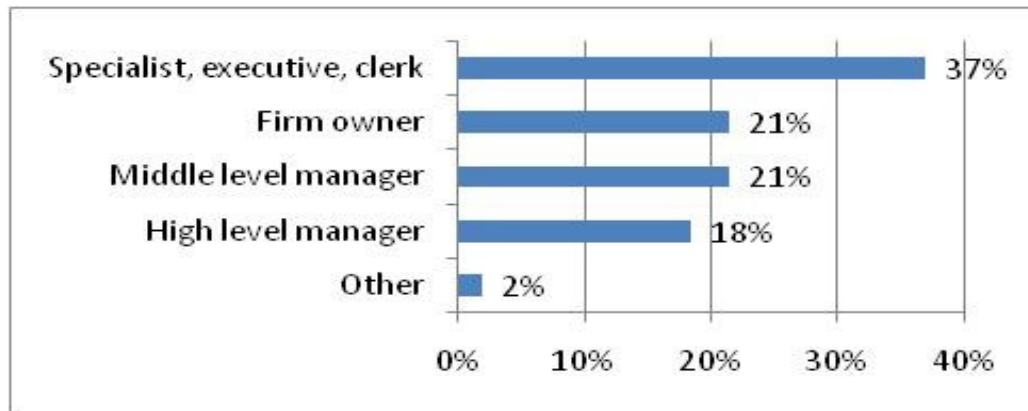


Figure 4.2: Respondents of the survey by their position in their firms

4.4 Respondents of the survey by their total work experience

The survey response is generally composed of relatively more experienced professionals. Figure 4.3 shows that “more than 10 years of work experience” (51 %) and “4 to 10 years of work experience” (42 %) account for 93 % of all respondents. It can be claimed that the results of the survey should show more experienced point of view.

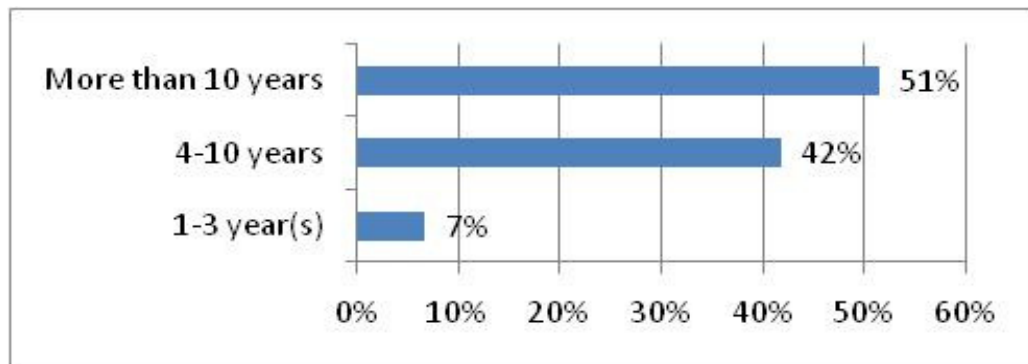


Figure 4.3: Respondents of the survey by their total work experience

4.5 Respondents of the survey by their job function in their firms

Respondents of the survey are from different job functions. Figure 4.4 shows that export and import (50 respondents), General manager or top management (29 respondents) and logistics, supply chain (17 respondents) are the major areas of job functions.

These major areas are quite relevant with the aim of the survey topic. It can be claimed that survey audience is satisfactory to judge on price and transit time attributes of the international express service with its effect on their business.

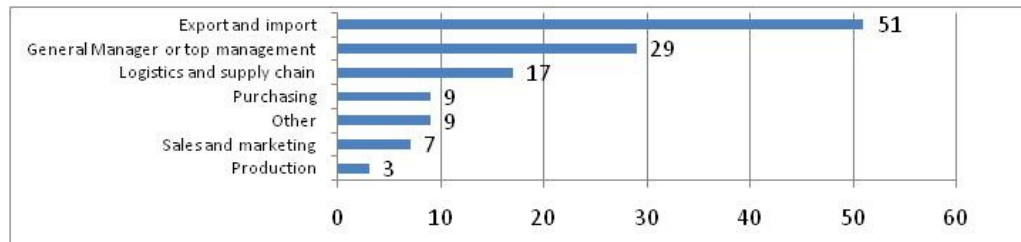


Figure 4.4: Respondents of the survey with their job function in their firms

4.6 Respondents of the survey by their segment

The survey is designed to analyze and understand response of firms with different segments of their international express service usage. Figure 4.5 shows that between 3 and 20 shipments per month (50 %) is the major segment of respondent firms. More than 100 shipments per month (11 %) together with Between 21 and 100 shipments per month (17%) can be classified as superior users of the international express service and most important customer segment for the firms. This segment of customers generates a more considerable part of revenue and should be accepted as an important basis for sales and marketing strategy development.

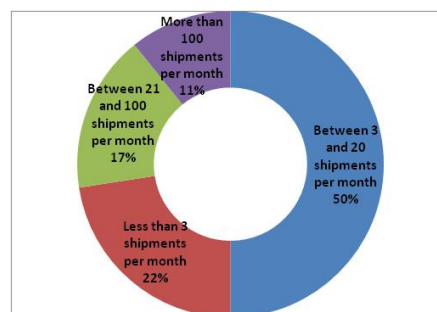


Figure 4.5: Respondents of the survey by their segment

4.7 Respondents of the survey by the number of service providers

The number of international express service providers serving for each firm is a main indicator on decision making and perception of the attributes of the service. Figure 4.6 show that respondents using single service provider (51 %) forms nearly half of the total. Multiple service provider usage (49 %) forms the other half of the total.

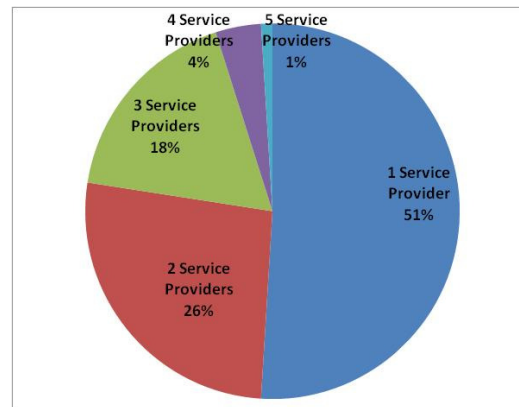


Figure 4.6: Respondents of the survey by the number of service providers

4.8 Respondents of the survey by their express service providers

There are 4 major international express service providers operating in Turkey which are accompanied by relatively small competitors. Figure 4.7 shows that respondents chose DHL (62), TNT (52), UPS (31), FEDEX (15), other competitors like ARAMEX, SKYNET, ASE, and NEX (21) in total. This analysis cannot be accepted as a market share determination however can be seen as the details of the most commonly used international express service providers among respondents.

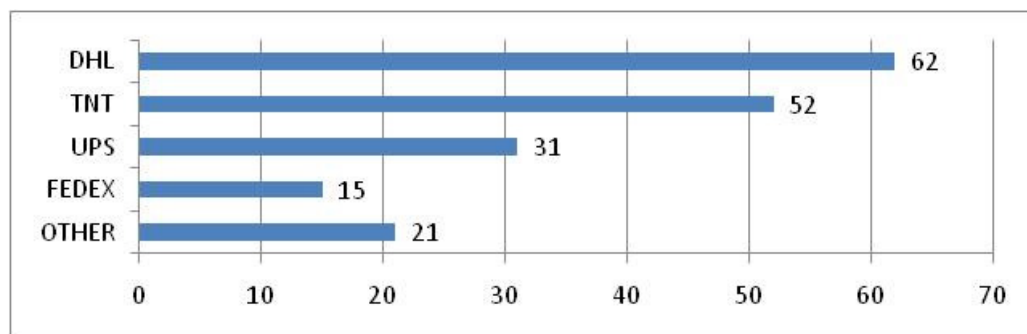


Figure 4.7: Respondents of the survey by their express service providers

4.9 Respondents of the survey by their segment and service providers

Customers' behaviors may change with respect to their segment of international express shipments. Table 4.1 shows the numbers of responses to each service provider with respect to the segment of the respondent's firm. DHL is increasing its popularity among the respondents in correlation with shipments per month. On the other hand TNT, FEDEX and OTHER service providers' popularity decreases while shipments per month increases. UPS can be placed in between of two trends.

Table 4.1: Respondents by their segment and their service providers

Segment	DHL	UPS	TNT	FEDEX	OTHER
Less than 3 shipments per month	10	3	12	2	5
Between 3 and 20 shipments per month	33	13	23	9	10
Between 21 and 100 shipments per month	10	10	13	3	4
More than 100 shipments per month	9	5	4	1	2
Total	62	31	52	15	21

4.10 Respondents of the survey by weight bands of shipments

The weight bands of typical international express shipments is important to identify possible service alternatives, price and transit time component amendments. Figure 4.8 shows that documents (46) are the most commonly chosen shipment type followed very closely by non-document shipments up to 10 kilos. This result clarifies that international express shipment is widely used for light shipments.

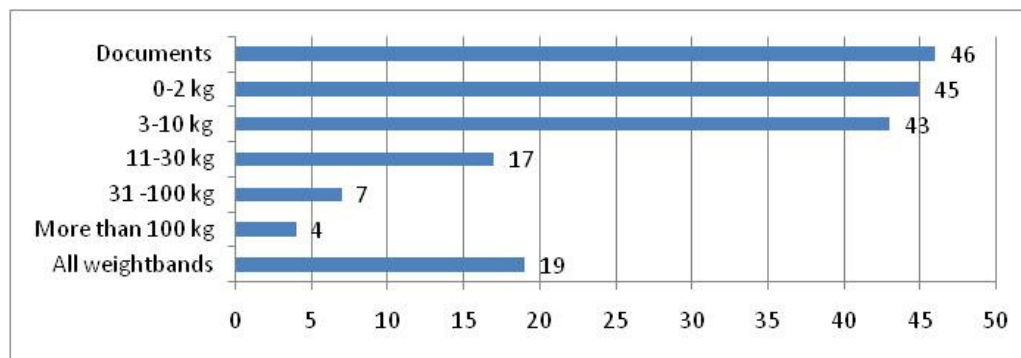


Figure 4.8: Respondents of the survey by weight bands

4.11 Respondents of the survey by geozones of shipments

The geozones of typical international express shipments is important to identify possible service alternatives, price and transit time component amendments. Figure 4.9 shows that Europe (85) is the most common geozone for international express shipments and there is a huge difference between other geozones. Europe stands approximately half of all respondents. This makes European based strategy development very important.

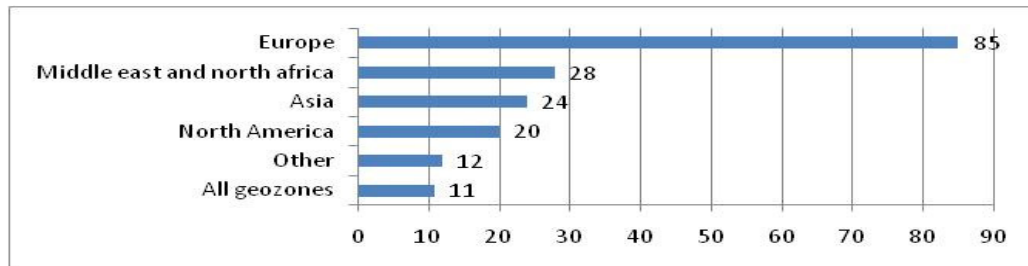


Figure 4.9: Respondents of the survey by geozones

4.12 Importance level of price on decision making

Survey identifies customer perspective and decision making criterias on supplier and service selection. Trying to clarify importance level of price is very important to make precise comments. Figure 4.10 shows that 87 % of all respondents accept price as equally or more important than other factors. In addition 37 % of all respondents perceive price as more or most important factor on decision making process.

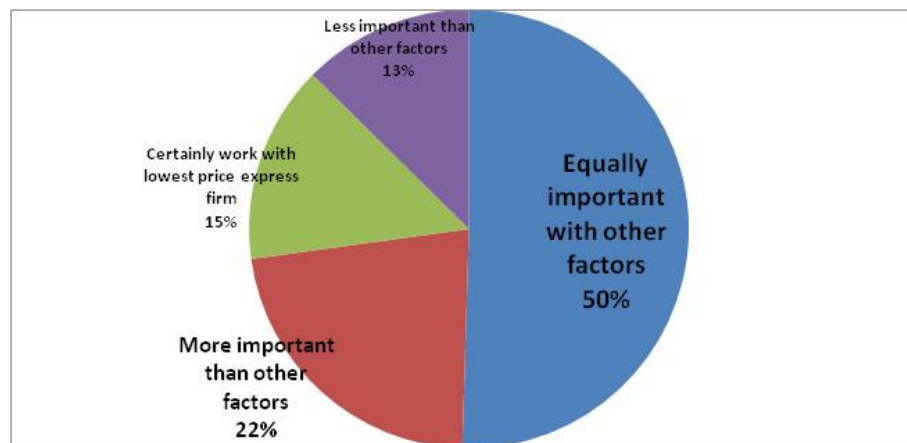


Figure 4.10: Importance level of price on decision making

4.13 Importance level of price on decision making by segment

The segment of customers' international shipments should be determinative on their price perception and supplier selection process. Figure 4.11 shows that more frequent users of this service is more precise and solid in their perception. The highest ratio of accepting price more or most important (45%) is in more than 100 shipments per month segment. On the other hand highest ratio of accepting price less important (18%) is also in this segment. The firms that certainly work with lowest price service provider has biggest ratio (26 %) in less than 3 shipments per month. It is notable that majority of the respondents in all segments do not care price as the single factor for decision making which is important for successful supplier selection process.

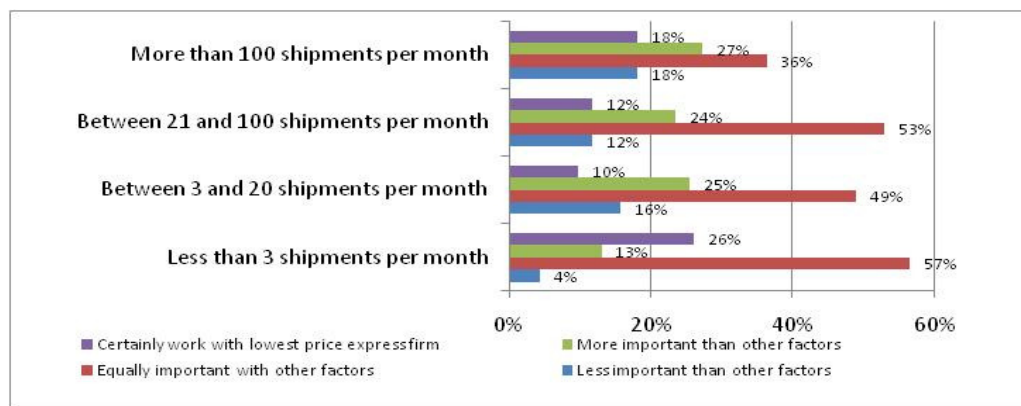


Figure 4.11: Importance level of price

4.14 General Price Satisfaction

Evaluating satisfaction of customers on price of international express service is valuable. Figure 4.12 shows that almost all of the respondents (94%) is satisfied in an average or high level. The customers see this service worths their price which is much more expensive than typical mail or freight services.

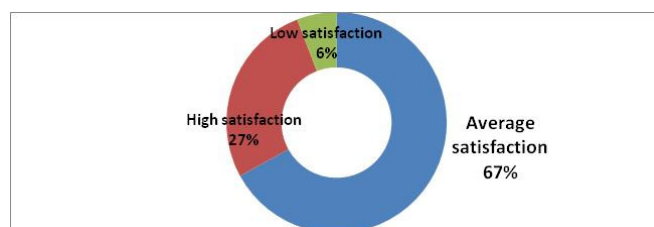


Figure 4.12: General Price satisfaction

4.15 Price satisfaction by international express service provider

It is important to analyze price satisfaction with respect to customers' international express service providers. Figure 4.13 shows that price satisfaction levels are quite similar in all firms with minor differences.

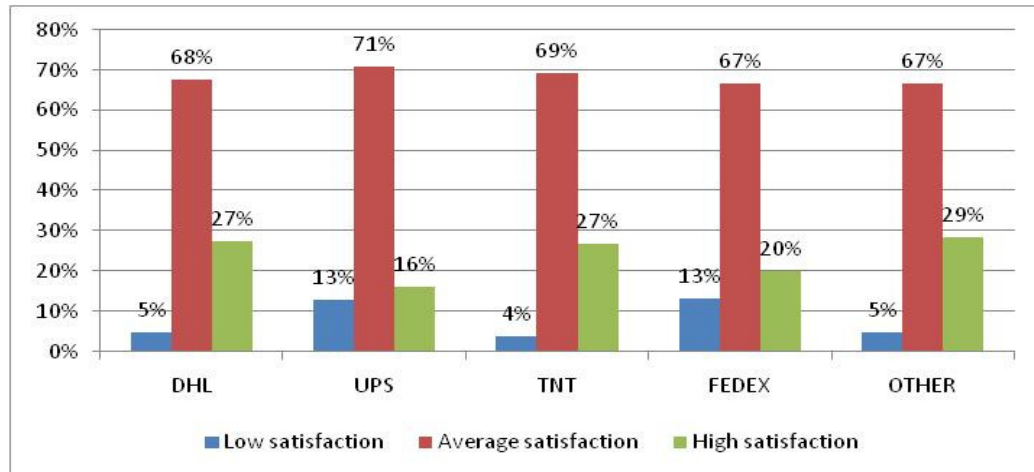


Figure 4.13: Price satisfaction by international express service provider

4.16 Price satisfaction by segment of customers

It is important to analyze price satisfaction with respect to segment of customers' international express shipments per month. Figure 4.14 shows that price satisfaction levels are quite similar in all segments with minor differences.

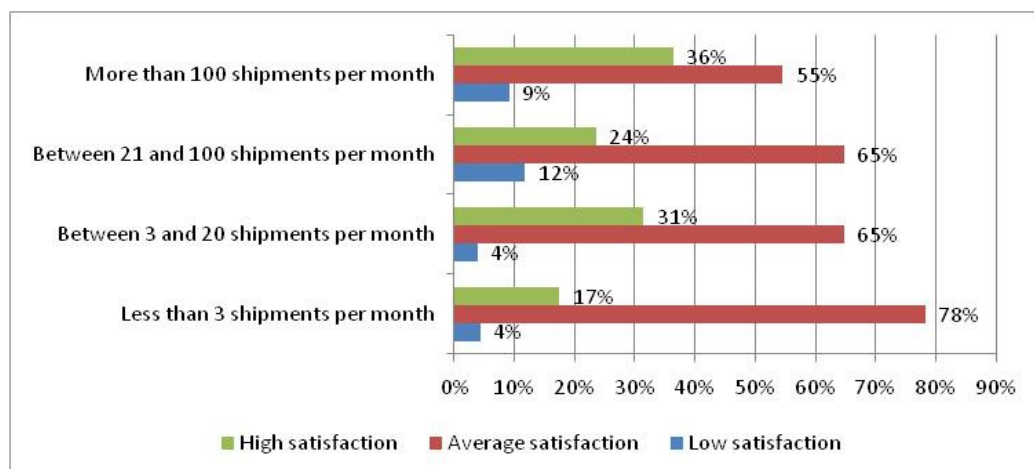


Figure 4.14: Price satisfaction by segment of customers

4.17 Importance level of transit time on decision making

Survey identifies customer perspective and decision making criterias on supplier and service selection. Trying to clarify importance level of transit time is very important to make precise comments. Figure 4.15 shows that 75 % of all respondents accept transit time as equally or more important than other factors. In addition 48 % of all respondents perceive transit time as more or most important factor on decision making process.

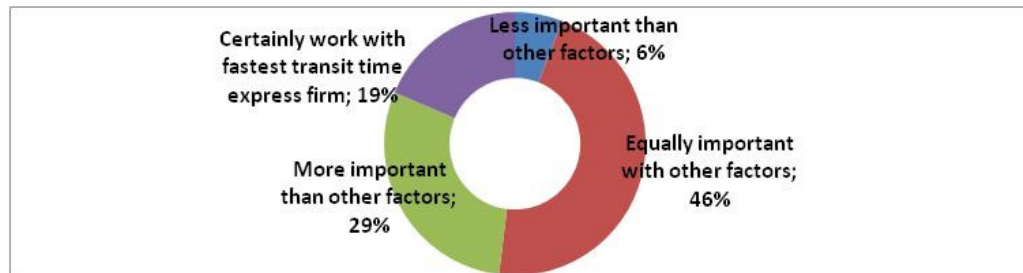


Figure 4.15: Importance level of transit time on decision making

4.18 Importance level of transit time and price on decision making

Price and transit time are the most important factors on decision making for international express supplier selection. The respondents which accept price and transit time more or most important factors are 85 % of all. It is important to analyze those two factors together. Figure 4.16 shows that the respondents which accept price less important factor than other factors, certainly work with fastest transit time international express service provider with a highest percentage (46 %). Price sensitive respondents are also sensitive on transit time with a very considerable percentage (36%).

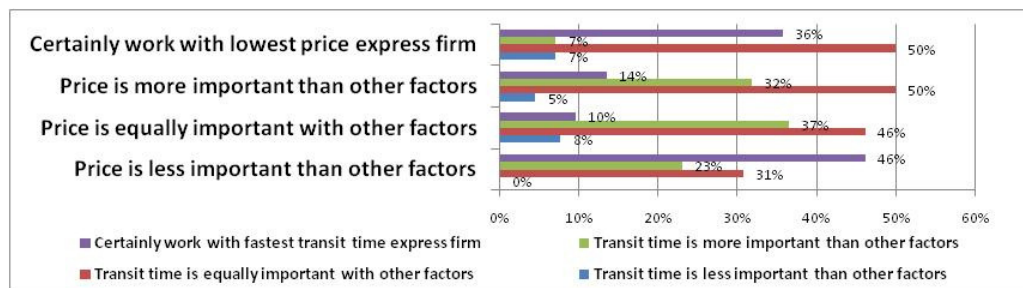


Figure 4.16: Importance level of transit time with respect to importance of price

4.19 General transit time satisfaction

Evaluating satisfaction of customers on transit time of international express service is valuable. Figure 4.17 shows that almost all of the respondents (99%) is satisfied in an average or high level. The customers see this service is satisfactory in terms of transit time which is much faster than typical mail or freight services.

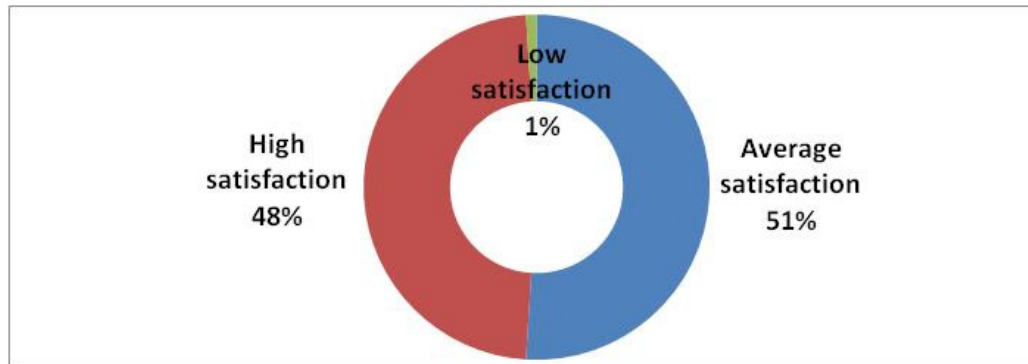


Figure 4.17: General transit time satisfaction

4.20 Satisfactory additional transit time for typical economy service

Service for customers' in search of price and transit time alternatives should be clarified for international express service providers. Figure 4.18 shows that most of the respondents (85%) do not accept more than 3 days as an economical service alternative.

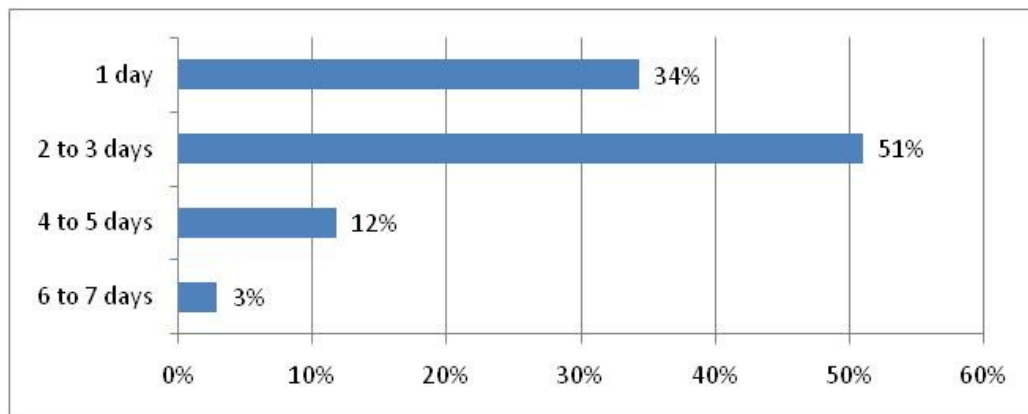


Figure 4.18: Satisfactory additional transit time for typical economy service

4.21 Satisfactory discount on price for typical economy service

Service for customers' in search of price and transit time alternatives should be clarified for international express service providers. Figure 4.19 shows that 50 % of discount on price is satisfactory for the majority of respondents as an economical service alternative

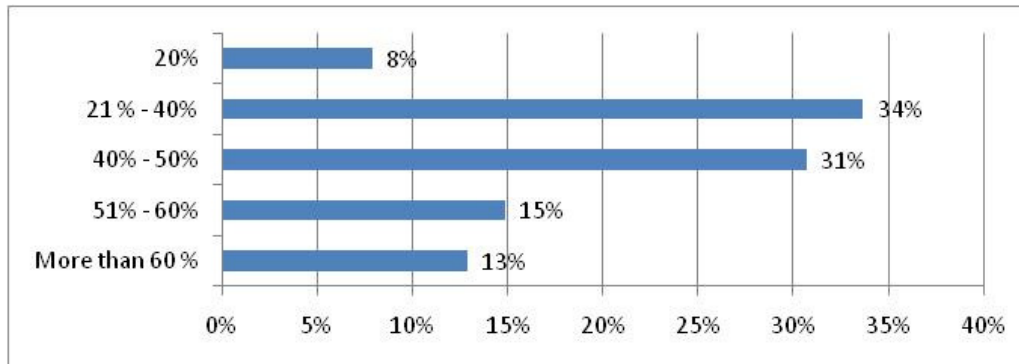


Figure 4.19: Satisfactory discount on price for typical economy service

4.22 Importance of receiving discount for customer deliver to branch

Delivering to branch is offered to the survey respondents as a service alternative for receiving discount. Figure 4.20 shows that 64 % of respondents do not consider delivering to branch as an important service alternative. On the other hand 14 % of respondents consider such an alternative so important that can change service provider.

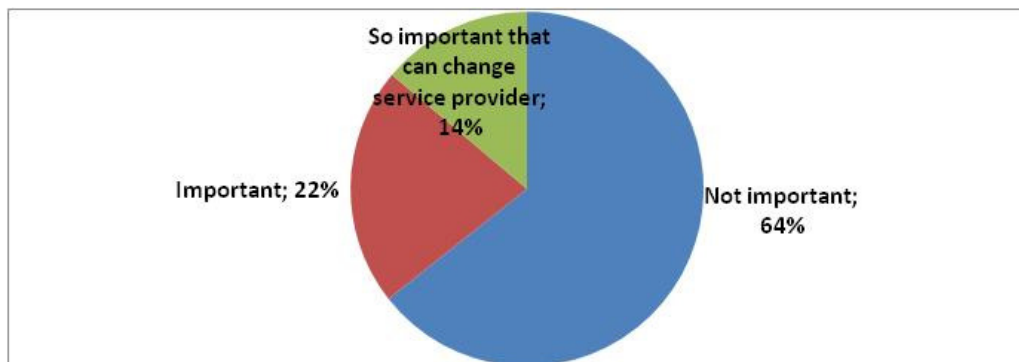


Figure 4.20: Importance of receiving discount for customer deliver to branch

4.23 Importance of receiving discount for accepting electronic invoicing

Electronic invoicing is offered to the survey respondents as a service alternative for receiving discount. Figure 4.21 shows that 68 % of all respondents consider electronic invoicing very important or so important that can change service provider. According to survey results electronic invoicing can be clearly considered as a service alternative for decreasing costs and providing discount alternative. Non-electronic invoicing can also be considered as a surcharge for the remainder part of the customers.

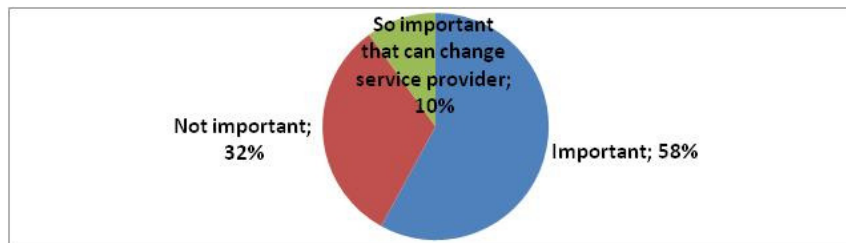


Figure 4.21: Importance of receiving discount for accepting electronic invoicing

4.24 Importance of price discrimination between rural and urban

International express shipments can be classified with respect to rural and urban destination points. Delivery cost difference should be applied in price discrimination methodology. Figure 4.22 shows that 73% of all respondents consider price discrimination between rural and urban shipments very important or so important that can change service provider. According to survey results price discrimination between rural and urban shipments can be clearly considered as a sales and marketing advantage in competition between international express service providers. Out of urban area delivery surcharge can also be considered for pricing strategy.

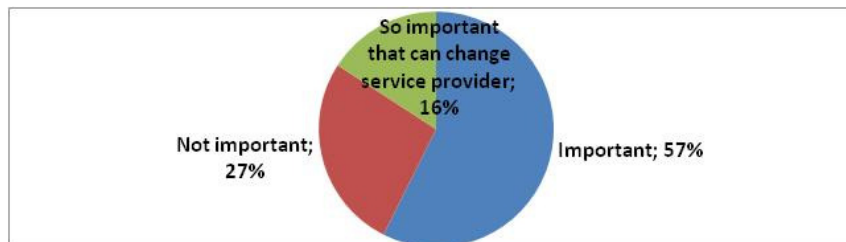


Figure 4.22: Importance of price discrimination between rural and urban

4.25 Response to delivery of economy shipments via third party

Delivery via a cost effective third party operator like postal offices or mail service providers is an economical service alternative for international express service. Figure 4.23 shows that 64 % of respondents certainly do not accept or see this service not important. Majority of customers perceive delivery via original international express service provider a vital part of service.

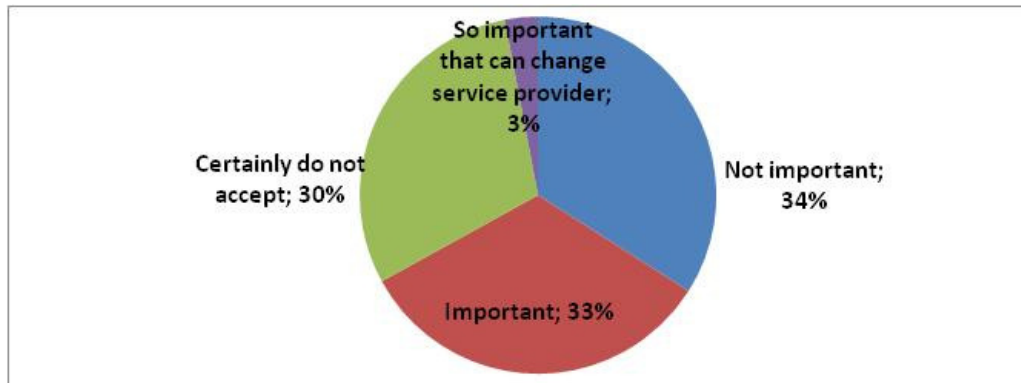


Figure 4.23: Response to delivery of economy shipments via third party

4.26 Importance of variable ratecard which decreases volume

Volume discount on price within a pre-defined time can be considered a pricing strategy to gain competitive advantage. Figure 4.24 shows that 69 % of all respondents consider volume discount important or so important that can change service provider. According to survey results variable ratecard with volume discount can be clearly considered as a sales and marketing advantage in competition between international express service providers.

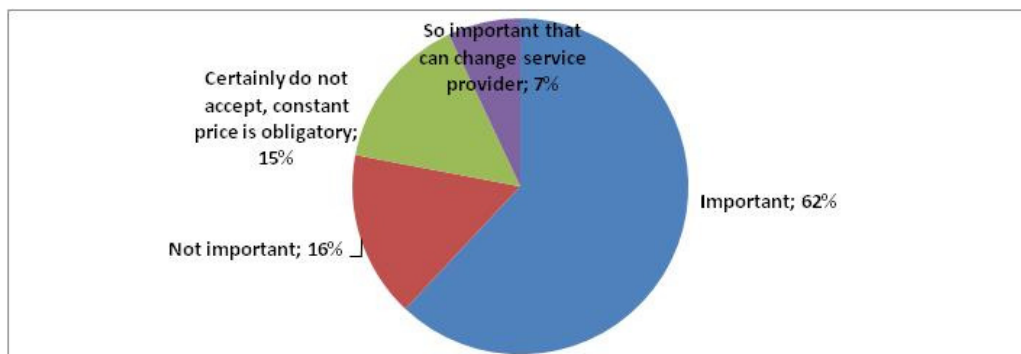


Figure 4.24: Importance of variable ratecard with increase of volume

4.27 Satisfactory additional transit time for a discount level of 20 %

Price elasticity of customers with transit time variance is an area that should be clarified for providing and pricing service alternatives by international express service providers. Figure 4.25 shows that respondents are very time sensitive. 47% of all respondents do not accept additional transit time or accept only late delivery hours for a discount level of 20%. 38% of all respondents accept only 1 day of additional transit time for a discount level of 20 %.

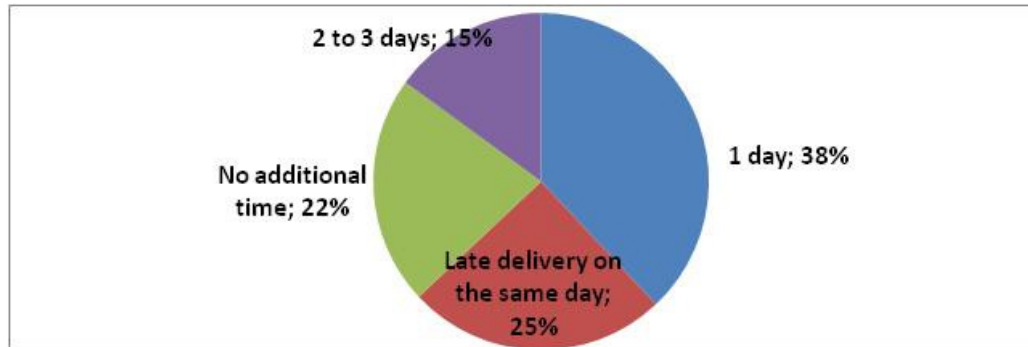


Figure 4.25: Satisfactory additional transit time for a discount level of 20 %

4.28 Economy Service discount level and additional transit time

Discount level and additional transit time expectation of customers define most important components of this service. Figure 4.26 shows that discount levels between 20 % and 40 % is sufficient to offer additional transit time of 1 to 3 days.

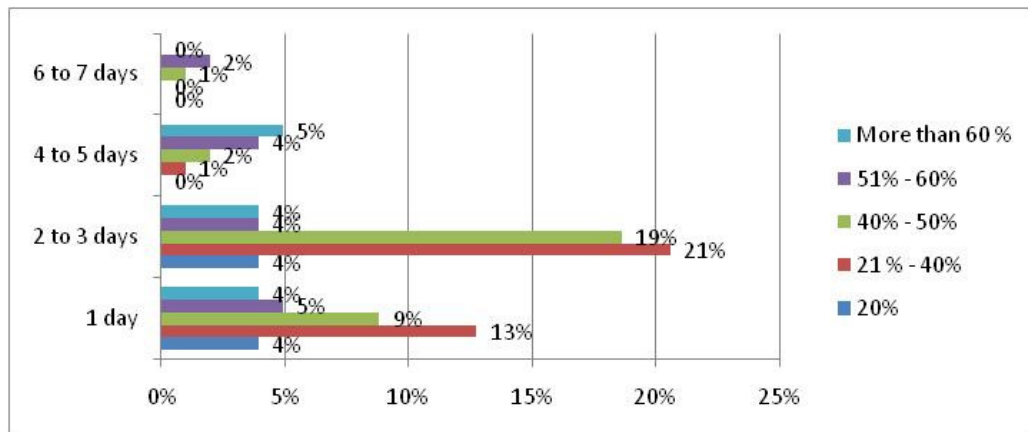


Figure 4.26: Economy Service discount level and additional transit time

4.29 Linear Regression for additional transit time

Regression analysis is conducted to show estimated discount level for additional transit time. “More than 60 %” option is accepted as 80 % for the analysis. Mean of additional transit time and discount are calculated for each option and multiplied with their correspondent percentage of response.

Table 4.2: Mean of additional transit time and discount with their correspondent percentage

Mean Of Additional Transit Day	Mean Of Discount				
	% 20	% 30	% 45	% 55	%80
1.0	50%	37%	29%	33%	31%
2.5	50%	60%	61%	27%	31%
4.5	0%	3%	6%	27%	38%
6.5	0%	0%	3%	13%	0%
Multiplied Sum	1.75	2	2.32	3.07	2.81

Multiplied Sum for discount levels are shown in Table 4.2 above.

Creating a linear regression formula is an essential part to show the relationship mathematically. Sample formula is shown in Equation 4.1 below. Dependent variable is y which is additional transit time. Independent variable is x_1 which is discount percentage with respect to international express price.

$$y = \beta_0 + \beta_1 x_1 \quad (4.1)$$

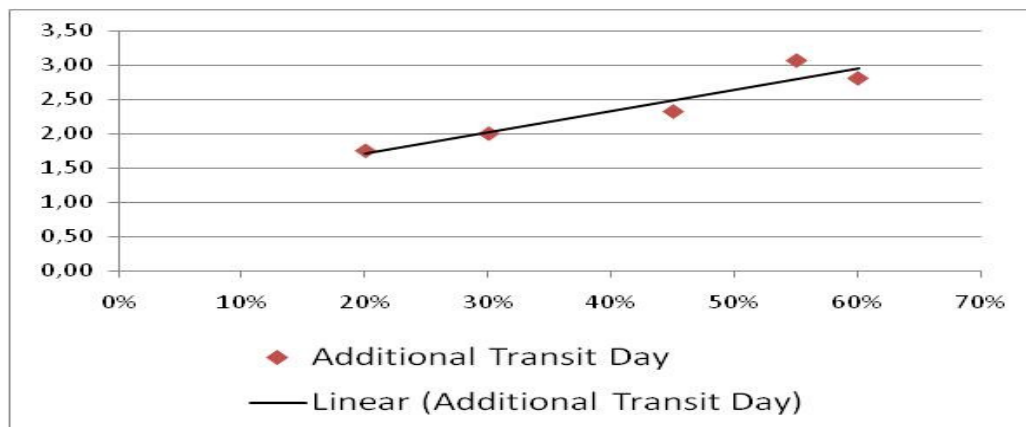


Figure 4.27: Linear regression for additional transit day

Figure 4.27 shows linear regression of additional transit day with respect to discount made from international express price. The linear regressin formula is shown below Equation 4.2.

$$\text{AdditionalTransitDay} = 1.1 + 3.086 \times \text{Discount}(\%) \quad (4.2)$$

4.30 Price importance with respect to work experience

Importance perception of price changes with respect to work experience of the respondent. Figure 4.28 shows that total percentage of regarding price equally or more important increases (43%, 72%, 77%) in direct relationship with work experience. On the other hand, “certainly working with lowest price firm” decreases (29%, 14%, 13%) with work experience as a sign of professional decision making.

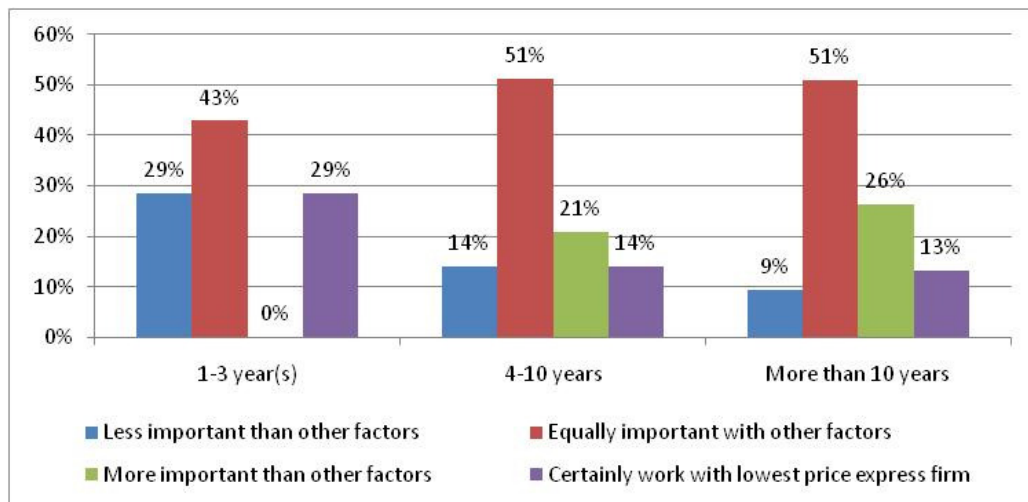


Figure 4.28: Price importance with respect to work experience

4.31 Price importance with respect to position

Importance perception of price changes with respect to position of the respondent. Figure 4.29 shows that “certainly working with lowest price firm” has highest percentage in firm owners (32%) and lowest percentage in high level managers.

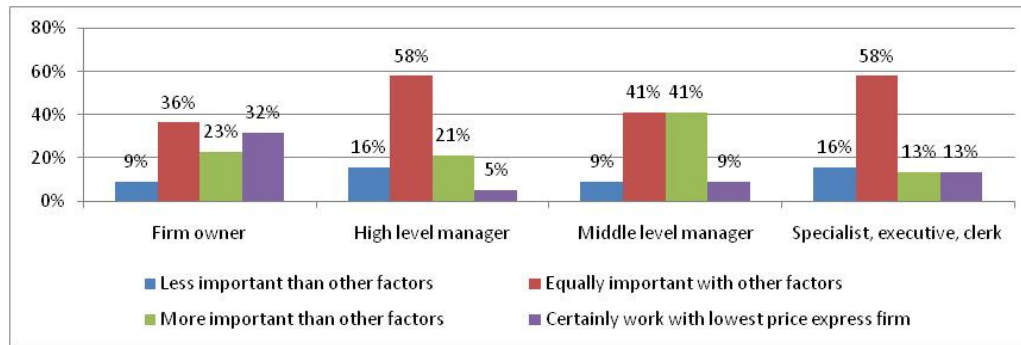


Figure 4.29: Price importance with respect to position

4.32 Transit time importance with respect to work experience

Importance perception of transit time changes with respect to work experience of the respondent. Figure 4.30 shows that total percentage of regarding transit time equally or more important increases after 3 years of work experience.

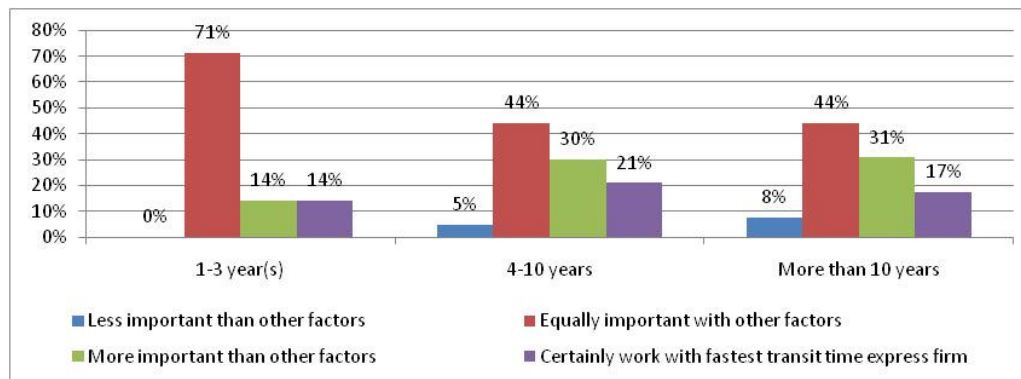


Figure 4.30: Transit time importance with respect to work experience

4.33 Transit time importance with respect to position

Importance perception of price changes with respect to position of the respondent. Figure 4.31 shows that least transit time sensitive respondents are firm owners. Firm owners perceive transit time less important than other factors with 14%. Most transit time sensitive respondents are middle level managers. 27 % of all middle level managers certainly work with fastest transit time express firm.

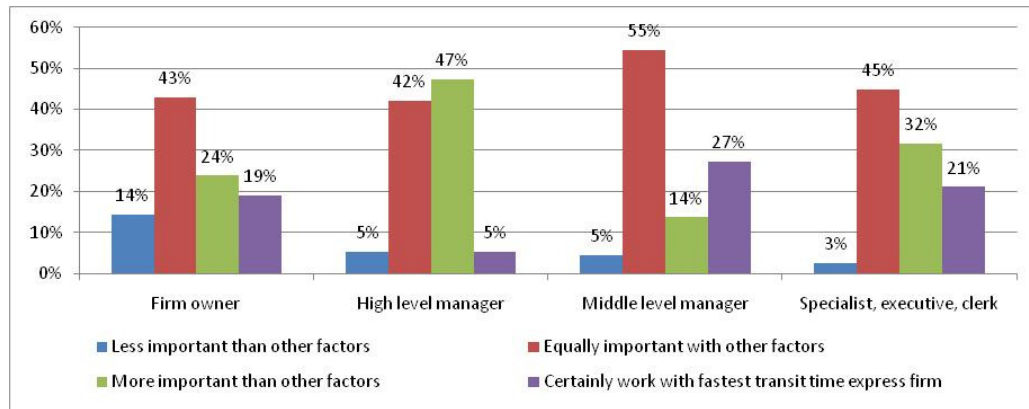


Figure 4.31: Transit time importance with respect to position

4.34 Price importance with respect to weightbands of shipments

Importance perception for price changes with respect to shipment weightbands of the customer. Figure 4.32 shows that the customers that ship heavier shipments perceive price more important. Sum of the customers that see price more important and the customers that use lowest price firm increase in direct relationship with the weight bands (28%, 31%, 37%, 53%). Some weightbands which do not have enough number of respondents are not included.

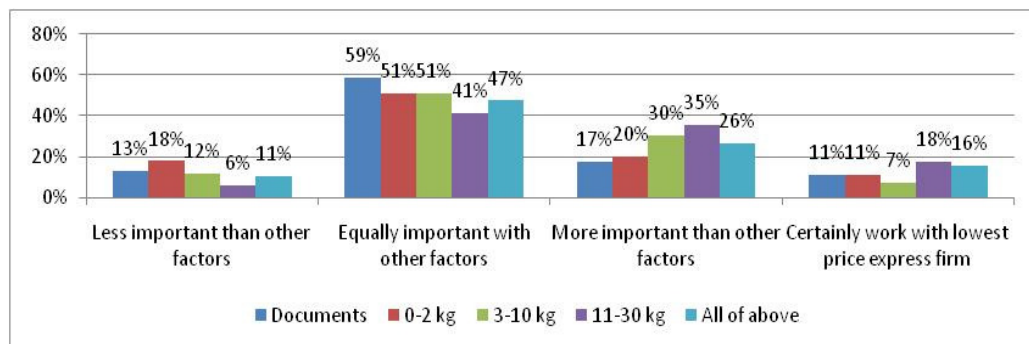


Figure 4.32: Price importance with respect to weightbands of shipments

4.35 Price importance with respect to geozones of shipments

Importance perception for price changes with respect to shipment geozones of the customer. Figure 4.33 shows that the customers that ship intercontinental shipments perceive price more important. “Middle east and north africa” option has highest percentage in perceiving price more or most important (33%, 21%).

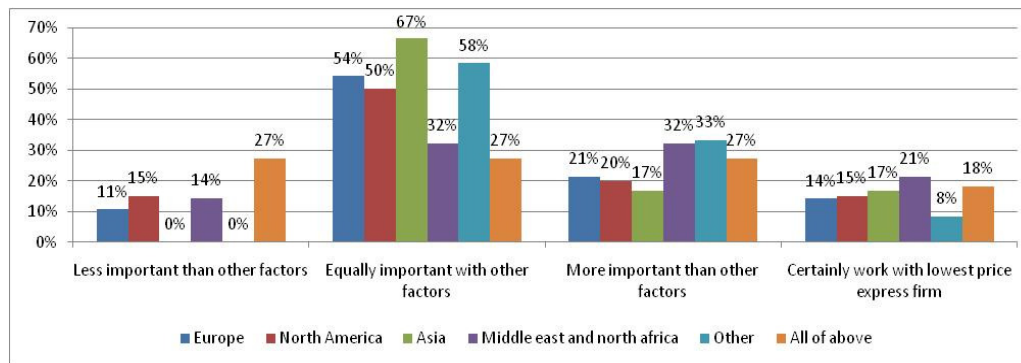


Figure 4.33: Price importance with respect to geozones of shipments

4.36 Transit time importance with respect to weightbands of shipments

Importance perception for transit time changes with respect to shipment weightbands of the customer. Figure 4.34 shows that sum of the customers which see “transit time more important” and the customers which use “fastest transit time firm” increase in “Documents” and “All of above” weight bands (44%, 40%, 41%, 61%). Some weightbands which do not have enough number of respondents are not included.

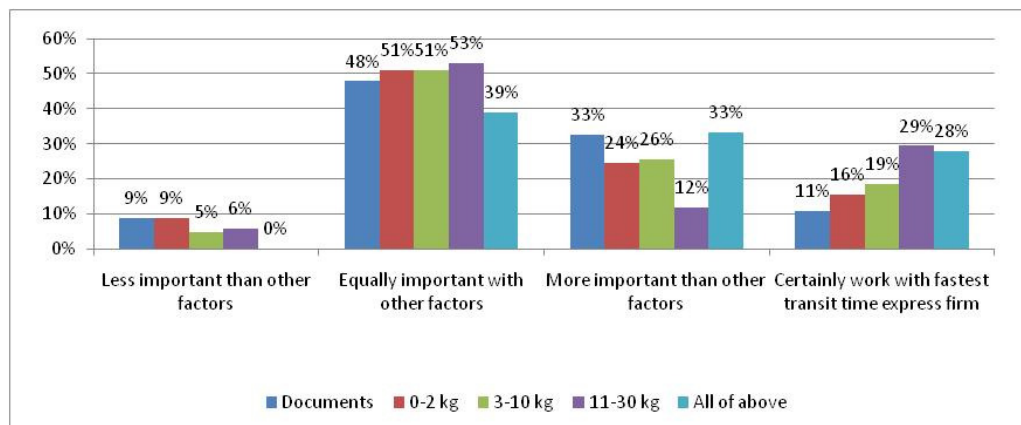


Figure 4.34: Transit time importance with respect to weightbands of shipments

4.37 Survey Results

Survey results show that majority of the respondents do business in 5 sectors which are mainly textile, automotive, food, construction and metal. International express service provider should create more competent price lists in those sectors and provide sector specific service alternatives for those sectors. Customer retention

programs should be utilised for those sectors. 9 % of respondents are serviced by more than one service provider which affects pricing models of competitors. Number of available service provider is included in the model formulation part.

DHL and TNT are more dominant among survey respondents. DHL increases share among respondents from more common users of this service. Competitors should consider their rivals' strategies while building their price schemes.

Respondents use international express service especially for the shipments up to 10 kilograms. Price may be reconsidered to attract demand for heavier shipments. This attribute is included in model formulation. Respondents use internationally express service widely for european trade lanes. Pricing strategies and service alternatives may be reconsidered to attract demand for non-european shipments.

Respondents from the companies which send more number of shipments regard price more important. This attribute is also included in model formulation.

More experienced respondents regard price more important. This attribute is also included in model formulation.

Respondents from the companies which send heavier shipments regard price more important. This attribute is also included in model formulation

A regression analysis is conducted to show the relationship between discount and additional transit time. The result is inherited in the model formulation.

64 % of respondents do not perceive delivering to branch as a competitive service alternative. The service providers should consider their service alternatives regarding this perception.

68 % of respondents accept electronic invoicing as a service component alternative for receiving discount. This acceptance is inherited in model formulation.

73 % of respondents accept urban rural price discrimination. This acceptance is inherited in model formulation.

64 % of respondents do not perceive 3rd party utilisation as a competitive service alternative. The service providers should consider their service alternatives regarding this perception.

69 % of respondents accept variable ratecards with volume discount. The service providers should consider their price alternatives regarding this perception.

Price and transit time are widely accepted as the most influential factors that determine the service provider. 94 % of all respondents are satisfied with price and satisfaction levels are close in different service providers. Furthermore 99 % of all

respondents are satisfied with the transit time provided by service providers. These analytics are directly related with the aim this thesis. According to survey results the competitors in international express business serve satisfactorily in terms of price and transit time optimization. On the other hand a model formulation part is included in this study to provide basis for future studies when there can be harsh competition and more aggressive customer demand.

5. MODEL FORMULATION FOR PROFIT MAXIMIZATION

5.1 Profit maximization related literature

Profit maximization is one of the popular research areas in operations research. Bhattacharjee and Ramesh (2000) study a multi-period profit maximizing model for retail supply chain management with an integration of demand and supply-side mechanisms. A multi-period inventory and pricing model for a single product has been presented.

Shen (2006) studies a profit-maximizing supply chain network design model with demand choice flexibility which gives a company flexibility in determining which customers to serve. Problem formulation, solution algorithm and computational results have been presented. Salvietti and Smith (2008) study a profit-maximizing economic lot scheduling problem with price optimization. Chen and Chen (2007) study profit maximization model for a multi-item distribution channel. Their research formulates four profit maximization models by considering the effects of channel coordination and a joint replenishment program on the supply-side control, taking into account the effect of pricing scheme on demand and revenue increments. Nagurney (2010) studies supply chain network design under profit maximization and oligopolistic competition. Nagurney's model includes supply chain network design problem with oligopolistic firms who are involved in the competitive production, storage and distribution of homogeneous products to multiple demand markets.

Chen and Lan (2001) present a maximal profit flow model for reaching the optimal design of multiple-production-line system undergoing the limitation of obtainable resources. Coelli et al. (2002) measure unused capacity, technical inefficiency and allocative inefficiency to calculate short-run profit gap between actual and maximized profit. Their survey discussions propose an economic capacity measure that involves short-run profit maximization with constant output mix. In relation with this thesis, their research concludes with an empirical illustration of data on airline companies. Liu (2007) develops a computational method involving geometric

programming that gives relationship between profit maximization and returns to scale. Shi and Gershwin (2009) use non-linear programming approach to calculate buffer space and inventory cost which optimize manufacturing processes.

Nagurney (2010) studies on potential manufacturing plants, distribution centers and retail outlets. Author model includes links between manufacturing, shipment and storage. Author models profit as a difference function of revenue and total costs where all firms seek to maximize their own profit that leads a state of equilibrium.

Chen and Chen (2007) focus demand side revenue stimulus with retail price aiming to maximize profit as a methodology. Authors employ a linear price-dependant demand function and propose properly designed rebate to provide channel wide coordination.

Salvietti and Smith (2008) study single machine inventory and set-up cost for price optimization and economic production quantity. Their methodology includes integer programming to find a feasible solution for the objective function which is maximizing profit by formulating demand and price exponentially related.

Shen (2006) focuses on sales price based strategy with delivery costs from production site to distribution centers that covers the decision making to serve the customer. Author's methodology includes minimum cost and maximum revenue based maximization objective function.

Bhattacharjee and Ramesh (2000) claim that retail and supply chain for perishable products should have well planned and efficient decision models in terms of manufacturing and marketing using dynamics of pricing and inventory policies. They incorporate two heuristic procedures to search demand space and determine optimal pricing and ordering policies.

Shi and Gershwin (2009) use a numerical evaluation algorithm rather than simulation.

Chen and Lan (2001) claim that a good designed production line yields efficiency and profit enhancement with decreasing maximum processing time in the bottleneck of the production. They start with assumptions for production stages and develop a step-by-step algorithm which finds optimal production with cost considerations. They also provide proof of optimization.

Liu (2007) start the research by choosing level of inputs for long run profit or chooses output level for short run profit due to market conditions. Author's methodology includes linear and non-linear constraints. Author also provides sensitivity analysis ability in computational method.

5.2 Model formulation

The model that maximizes the profit for an international express service provider is formulated as a fundamental for further studies. The formulation is based on related literature about profit maximization and past professional experience of thesis writer.

The objective function is a combination of price, discount and cost elements. The term "shipment" refers to a customer's item(s) with pick-up from origin and delivery to destination in single consignment note. Trade lane refers to path that is covered during the transportation of a shipment. Istanbul-New York (IST-NYC) is an example of a trade lane used in model formulation. Linehaul refers to transportation of shipment via vehicles in a trade lane. The variables used in the model is listed below. (See Table 5.1)

Table 5.1: Variables of the model formulation for profit maximization

Variable	Explanation
V_{ij}	Volume of shipments for service i on trade lane j
P_{ij}	Base price for one shipment for service i on trade lane j
P_{ijk}	Base price for one shipment for service i on trade lane j for the
D_{ij}	Discount on price for one shipment for service i on trade lane j
D_{ijk}	Discount on price for one shipment for service i on trade lane j for the
C_{ij}	Total cost for one shipment for service i on trade lane j
CSP_{ij}	Number of competitor service providers for service i on trade line j
CL_j	Capacity for trade lane j over specific period of time
LCL_j	Total Linehaul cost on trade lane j
LOL_j	Total Operation cost on trade lane j
CuL_j	Capacity utilization for trade lane j over specific period of time
DC_{ij}	Direct cost allocated for one shipment for service i on trade lane j
LC_j	Unit linehaul cost on trade lane j
OC_{ij}	Unit operation cost for service i on trade lane j
IC_i	Indirect cost allocated for one shipment for service i
AC_i	Administration cost allocated for one shipment for service i
SC_i	Sales cost allocated for one shipment for service i
CC_i	Customer Service cost allocated for one shipment for service i
MC_i	Management cost allocated for one shipment for service i
AO_{ip}	Unit cost of additional option usage of p for service i
WBC	Weightband discount coefficient
EXC	Sender experience discount coefficient
URC	Urban delivery zone discount coefficient
EID, EIS	Electronic Invoicing discount, Electronic Invoicing saving
CSC	Customer segment discount coefficient
ATD	Additional Transit Day

Objective function is denoted as a function of volume, price, discount and cost variables. (See Equation 5.1)

$$\text{Maximize } \sum_{i=1}^n \sum_{j=1}^m V_{ij} (P_{ij} - D_{ij} - C_{ij}) \quad (5.1)$$

Total volume of shipments in all services on trade lane j can not exceed capacity for trade lane j over spesific period of time. (See Equation 5.2)

$$\sum_{i=1}^n V_{ij} \leq CL_j \quad (5.2)$$

Capacity utilization for trade lane j over specific period of time is denoted as total volume of shipments in all services on trade line j divided by capacity for trade lane j over spesific period of time. (See Equation 5.3)

$$CuL_j = \frac{\sum_{i=1}^n V_{ij}}{CL_j} \quad (5.3)$$

Base price for one shipment for service i on trade lane j should be below than the competitors' base rates in order to gain business when there will be no discount available for all competitors. (See equation 5.4)

$$P_{ij} \leq \min P_{ijk} \quad (k : 1, 2, 3, \dots, CSP_{ij}) \quad (5.4)$$

Discounted price for one shipment for service i on trade line j should be below than the competitors' discounted price in order to gain business. (See Equation 5.5)

$$P_{ij} - D_{ij} \leq \min (P_{ijk} - D_{ijk}) \quad (k : 1, 2, 3, \dots, CSP_{ij}) \quad (5.5)$$

Discount increases with an increase of the number of competitor service providers for service i on trade line j and decreases with an increase of capacity utilisation for trade lane j over specific period of time. Discount changes with weightband of shipment, experience of the decision maker, urban delivery zone, electronic invoicing ,segment of the customer and additional transit day. This relationship is

subject to further analysis of a coefficient α that complements the equation. (See Equation 5.6)

$$D_{ij} = \alpha \times WBC \times EXC \times URC \times CSC \frac{CSP_{ij}}{CuL_j} + EID + P_{ij} \frac{ATD - 1.1}{3.086} \quad (5.6)$$

Unit linehaul cost on trade lane j is denoted as total linehaul cost on trade lane j divided by total volume of shipments in all services on trade lane j . (See Equation 5.7)

$$LC_j = \frac{LCL_j}{\sum_{i=1}^n V_{ij}} \quad (5.7)$$

Unit operation cost for service i trade lane j is denoted as total operation cost on trade lane j divided by total volume of shipments in all services on trade lane j . Each service is subject to further analysis of a coefficient that complements the equation. (See Equation 5.8)

$$OC_{ij} = \beta \frac{LOL_j}{\sum_{i=1}^n V_{ij}} \quad (5.8)$$

Direct cost allocated for one shipment for service i on trade lane j is denoted as the sum of unit linehaul cost on trade lane j and unit operation cost for service i on trade lane j . (See Equation 5.9)

$$DC_{ij} = LC_j + OC_{ij} \quad (5.9)$$

Indirect cost allocated for one shipment for service i is denoted as the sum of unit allocated cost for administration, sales, customer service, management and additional optional service usage costs. (See Equation 5.10)

$$IC_i = AC_i + SC_i + CC_i + MC_i + AO_{ip} - EIS \quad (5.10)$$

Total cost allocated for one shipment for service i on trade lane j is denoted as the sum of direct cost allocated for one shipment for service i on trade lane j and indirect cost allocated for one shipment for service i . (See Equation 5.11)

$$C_{ij} = DC_{ij} + IC_i \quad (5.11)$$

6. CONCLUSIONS AND SUGGESTIONS

This research is a genuine analysis in Turkish International Express market which includes literature review, pricing context, survey analysis and a model formulation based on information gathered. This research plays a critical role to be one of the first academic studies that seeks to understand international express market dynamics. It is original in terms of survey design and model formulation for price and transit time optimization. Survey questions are prepared originally by the author which rely on past professional experience.

Literature review has shown that this study covers the gap for analyzing price, transit time and service alternatives in international express business together. Research is positioned uniquely to collaborate pricing, operations research, market study and customer experience altogether.

Thesis aim is transit time and price optimization however market studies in related parts show that international express customers in Turkey are satisfied with performance of their service providers in terms of transit time and price. However customers demand service alternatives from their service providers like electronic invoicing and volume discount schemes. Companies in this business can gain competitive advantages with specializing on innovative pricing and service alternatives. The study shows that it is essential to perform better pricing performance to increase customer base in international express business as survey respondents accept price more or most important factor together with transit time.

Furthermore, linear regression formula is generated to show mathematically the relationship between additional transit time and discount. This formula can be used by international express service providers in product positioning and constructing service alternatives. This formula can also be used by customer service function to satisfy customers which have shipments delivered later than agreed transit time.

Showing that customers are satisfied with transit time and price performance, this study has been enriched with a profit maximization model formulation. The model formulation has analogy with related models included in literature review parts. Objective function and constraint equations are based on both related literature and

author's previous job experience. The model also includes results from survey analysis. Linear regression formula is implemented in model formulation to show a better discount performance.

Application of the profit maximization model can be suggested as an area for future academic studies. Model can be tested with historic and real time data from international express companies. Model should be fine tuned by application to calculate coefficients in constraint equations. The model can be used by international express companies to leverage their overall commercial performance.

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APPENDICES

APPENDIX A.1 : International Express Survey (Turkish Version)

APPENDIX A.2 : International Express Survey (English Version)

APPENDIX A.1 : International Express Survey (Turkish Version)

Anketi Dolduran:	
Firma Ünvanı:	

Soruların yanlarında bulunan kutuları (x) ile işaretleyebilirsiniz .

1. Şirketinizin bulunduğu sektörü işaretleyiniz.

<input type="checkbox"/>	Tekstil , Konfeksiyon, Hazır Giyim, Halı, Deri ve Ayakkabı
<input type="checkbox"/>	Otomotiv, Lastik ve Otomotiv Yan Sanayii
<input type="checkbox"/>	Telekomünikasyon ve Bilişim
<input type="checkbox"/>	Bankacılık, Sigortacılık, Factoring, Leasing ve diğer finansal hizmetler
<input type="checkbox"/>	Dış Ticaret
<input type="checkbox"/>	Eğitim Sektörü ve Üniversiteler
<input type="checkbox"/>	Cam ve Cam Ürünleri
<input type="checkbox"/>	Taşımacılık, Lojistik, Kargo, Kurye
<input type="checkbox"/>	İnşaat, Yapı Malzemeleri ve Çimento
<input type="checkbox"/>	Dayanıklı Tüketim
<input type="checkbox"/>	Hızlı Tüketim
<input type="checkbox"/>	Metal Sanayii
<input type="checkbox"/>	Kimya Sanayii
<input type="checkbox"/>	Elektrik – Elektronik
<input type="checkbox"/>	İlaç, Sağlık ve Hastane Hizmetleri
<input type="checkbox"/>	Gıda ve Tarım
<input type="checkbox"/>	Kağıt, Matbaa, Basın ve Yayıncılık
<input type="checkbox"/>	Turizm ve Otelcilik
<input type="checkbox"/>	Yönetim ve Danışmanlık Hizmetleri
<input type="checkbox"/>	Diğer İmalat Sanayii
<input type="checkbox"/>	Diğer Hizmet Sektörü

2. Organizasyonunuzdaki pozisyonunuzun seviyesini işaretleyiniz.

<input type="checkbox"/>	Firma Sahibi
<input type="checkbox"/>	Üst Düzey Yönetici
<input type="checkbox"/>	Orta Düzey Yönetici
<input type="checkbox"/>	Uzman, Sorumlu, Yetkili
<input type="checkbox"/>	Diğer

3. İş tecrübenizi işaretleyiniz.

<input type="checkbox"/>	1-3 Yıl
<input type="checkbox"/>	4-10 Yıl
<input type="checkbox"/>	10'dan fazla

4. Çalıştığınız departman veya bölümü işaretleyiniz.

<input type="checkbox"/>	Genel Müdürlük ve Üst Yönetim
<input type="checkbox"/>	Satınalma
<input type="checkbox"/>	Satış ve Pazarlama
<input type="checkbox"/>	Lojistik ve Tedarik Zinciri
<input type="checkbox"/>	İhracat ve İthalat
<input type="checkbox"/>	Üretim
<input type="checkbox"/>	Diğer

5. Uluslararası kargo gönderi adedinizi işaretleyiniz.

<input type="checkbox"/>	Ayda 3 adetten az
<input type="checkbox"/>	Ayda 3 - 20 adet arasında
<input type="checkbox"/>	Ayda 20 - 100 adet arasında
<input type="checkbox"/>	Ayda 100 adetten fazla

6. Çalıştığınız uluslararası hızlı kargo firmasını işaretleyiniz (Birden fazla işaretleyebilirsiniz).

<input type="checkbox"/>	DHL
<input type="checkbox"/>	UPS
<input type="checkbox"/>	TNT
<input type="checkbox"/>	FEDEX
<input type="checkbox"/>	Diğer - Belirtiniz:
<input type="checkbox"/>	Diğer - Belirtiniz:

7. Uluslararası kargo gönderilerinizin ağırlık bantlarını işaretleyiniz(Birden fazla işaretleyebilirsiniz)

<input type="checkbox"/>	Doküman
<input type="checkbox"/>	0-2 kg
<input type="checkbox"/>	3-10 kg
<input type="checkbox"/>	11-30 kg
<input type="checkbox"/>	31 -100 kg
<input type="checkbox"/>	100 kg'dan fazla
<input type="checkbox"/>	Hepsi

8. Uluslararası kargo gönderilerinizin bölgelerini işaretleyiniz(Birden fazla işaretleyebilirsiniz).

<input type="checkbox"/>	Avrupa
<input type="checkbox"/>	Kuzey Amerika
<input type="checkbox"/>	Asya
<input type="checkbox"/>	Ortadoğu ve Kuzey Afrika
<input type="checkbox"/>	Diğer
<input type="checkbox"/>	Hepsi

9. Kargo firması seçiminde fiyatın önem derecesini işaretleyiniz.

<input type="checkbox"/>	1	Önemli Değil
<input type="checkbox"/>	2	Diğer faktörlere göre daha az önemli
<input type="checkbox"/>	3	Diğer faktörler ile eşit önem derecesine sahip
<input type="checkbox"/>	4	Diğer faktörlerden daha önemli
<input type="checkbox"/>	5	Kesinlikle en düşük fiyatı sağlayan firma ile çalışıyoruz

10. Seçtiğiniz kargo firmasının size sunduğu fiyatları nasıl değerlendiriyorsunuz.

<input type="checkbox"/>	1	Düşük derecede memnunum
<input type="checkbox"/>	2	Orta derecede memnunum
<input type="checkbox"/>	3	Yüksek derecede memnunum

11. Kargo firması seçiminde gönderi teslimat süresinin ve saatinin önem derecesini belirtiniz.

<input type="checkbox"/>	1	Önemli Değil
<input type="checkbox"/>	2	Diğer faktörlere göre daha az önemli
<input type="checkbox"/>	3	Diğer faktörler ile eşit önem derecesine sahip
<input type="checkbox"/>	4	Diğer faktörlerden daha önemli
<input type="checkbox"/>	5	Kesinlikle en hızlı teslimat süresi sağlayan firma ile çalışıyoruz

12. Seçtiğiniz kargo firmasının size sunduğu teslimat süresini ve saatini nasıl değerlendiriyorsunuz.

<input type="checkbox"/>	1	Düşük derecede memnunun
<input type="checkbox"/>	2	Orta derecede memnunun
<input type="checkbox"/>	3	Yüksek derecede memnunun

13. Ekonomik uluslararası kargo hizmetinin ekspres hizmetinden kaç gün sonra teslim edilmesi sizi tatmin eder ?

<input type="checkbox"/>	1 gün
<input type="checkbox"/>	2-3 gün
<input type="checkbox"/>	4-5 gün
<input type="checkbox"/>	6-7 gün
<input type="checkbox"/>	7 günden fazla

14. Ekonomik uluslararası kargo hizmetinin ekspres hizmetinden ne kadar indirimli olması sizi tatmin eder ?

<input type="checkbox"/>	% 20
<input type="checkbox"/>	% 21 - % 40
<input type="checkbox"/>	% 40 - % 50
<input type="checkbox"/>	% 51 - % 60
<input type="checkbox"/>	% 60' dan fazla

15. Kargo şubesine teslimatı kendiniz yapıp indirim almak sizin için ne kadar önemlidir ?

<input type="checkbox"/>	1	Önemsiz
<input type="checkbox"/>	2	Önemli
<input type="checkbox"/>	3	Firma seçimimi değiştirecek kadar önemli

16. Elektronik faturayı kabul edip indirim almak sizin için ne kadar önemlidir ?

<input type="checkbox"/>	1	Önemsiz
<input type="checkbox"/>	2	Önemli
<input type="checkbox"/>	3	Firma seçimimi değiştirecek kadar önemli

17. Uluslararası kargo gönderileriniz şehiriçi/shehir dışı farklı fiyatlandırılması sizin için ne kadar önemlidir ?

<input type="checkbox"/>	1	Önemsiz
<input type="checkbox"/>	2	Önemli
<input type="checkbox"/>	3	Firma seçimimi değiştirecek kadar önemli

18. Ekonomik gönderileriniz gerekli yerlerde kargo firması tarafından farklı bir firmaya dağıtılması (örneğin ilgili ülkedeki posta operatörü) ve indirim almayı nasıl karşılırsınız ?

<input type="checkbox"/>	1	Kesinlikle kabul etmem
<input type="checkbox"/>	2	Çok önemli değil
<input type="checkbox"/>	3	Önemli
<input type="checkbox"/>	4	Firma seçimimi değiştirecek kadar önemli

19. Gönderi yaptıkça azalan fiyat listesine sahip olmayı nasıl değerlendirirsiniz ?

<input type="checkbox"/>	1	Kesinlikle kabul etmem, sabit fiyat listesi ile çalışırım
<input type="checkbox"/>	2	Çok önemli değil
<input type="checkbox"/>	3	Önemli
<input type="checkbox"/>	4	Firma seçimimi değiştirecek kadar önemli

20. Fiyat listesinde % 20 indirim yapılması şartıyla teslimat süresinde ne kadarlık artışı kabul edersiniz ?

<input type="checkbox"/>	Teslimat süresinde herhangi bir artışı kabul etmem
<input type="checkbox"/>	Aynı günde daha geç saatlerde teslim edilebilir
<input type="checkbox"/>	1 gün
<input type="checkbox"/>	2-3 gün
<input type="checkbox"/>	4 gün ve daha fazla

APPENDIX A.2

International Express Survey (English Version)

Name:	
Firm:	

Please mark (x) in the box next to the your response option for the questions below.

1. Please choose the sector in which your firm operates.

<input type="checkbox"/>	Textile, confectionary, ready wear, carpet, leather, footwear
<input type="checkbox"/>	Automotive, tire and supplier industry
<input type="checkbox"/>	Telecommunication and information technology
<input type="checkbox"/>	Banking, Insurance, Factoring, Leasing and other financial services
<input type="checkbox"/>	Foreign trade
<input type="checkbox"/>	Educational services and universities
<input type="checkbox"/>	Glass and glassware
<input type="checkbox"/>	Transportation, logistics, freight and courier services
<input type="checkbox"/>	Construction, building materials and cement
<input type="checkbox"/>	Durable goods
<input type="checkbox"/>	Consumer Goods
<input type="checkbox"/>	Metal industry
<input type="checkbox"/>	Chemicals and allied products
<input type="checkbox"/>	Electric and electronics industry
<input type="checkbox"/>	Medicine, health institutes and hospitals
<input type="checkbox"/>	Food and agriculture
<input type="checkbox"/>	Paper, publishing and press
<input type="checkbox"/>	Tourism and hotels
<input type="checkbox"/>	Management and consulting services
<input type="checkbox"/>	Other manufacturing and production industries
<input type="checkbox"/>	Other services

2. Please choose your position in your organization.

<input type="checkbox"/>	Firm owner
<input type="checkbox"/>	High level manager
<input type="checkbox"/>	Middle level manager
<input type="checkbox"/>	Specialist, executive, clerk
<input type="checkbox"/>	Other

3. Please choose your work experience.

<input type="checkbox"/>	1-3 year(s)
<input type="checkbox"/>	4-10 years
<input type="checkbox"/>	More than 10 years

4. Please choose the function or department that you work in your organization.

<input type="checkbox"/>	General Manager or top management
<input type="checkbox"/>	Purchasing
<input type="checkbox"/>	Sales and marketing
<input type="checkbox"/>	Logistics and supply chain
<input type="checkbox"/>	Export and import
<input type="checkbox"/>	Production
<input type="checkbox"/>	Other

5. Please the level of your number of shipments.

<input type="checkbox"/>	Less than 3 shipments per month
<input type="checkbox"/>	Between 3 and 20 shipments per month
<input type="checkbox"/>	Between 21 and 100 shipments per month
<input type="checkbox"/>	More than 100 shipments per month

6. Please choose your international express service provider firm. (You may choose more than one options.)

<input type="checkbox"/>	DHL
<input type="checkbox"/>	UPS
<input type="checkbox"/>	TNT
<input type="checkbox"/>	FEDEX
<input type="checkbox"/>	Other - please state:
<input type="checkbox"/>	Other - please state:

7. Please choose the weightbands of your international express shipments. (You may choose more than one options.)

<input type="checkbox"/>	Documents
<input type="checkbox"/>	0-2 kg
<input type="checkbox"/>	3-10 kg
<input type="checkbox"/>	11-30 kg
<input type="checkbox"/>	31 -100 kg
<input type="checkbox"/>	More than 100 kg
<input type="checkbox"/>	All of above

8. Please choose the geozones of your international express shipments. (You may choose more than one options.)

<input type="checkbox"/>	Europe
<input type="checkbox"/>	North America
<input type="checkbox"/>	Asia
<input type="checkbox"/>	Middle east and north africa
<input type="checkbox"/>	Other
<input type="checkbox"/>	All of above

9. Please choose the importance level of price in decision making process for international express firms.

<input type="checkbox"/>	1	Not important
<input type="checkbox"/>	2	Less important than other factors
<input type="checkbox"/>	3	Equally important with other factors
<input type="checkbox"/>	4	More important than other factors
<input type="checkbox"/>	5	Certainly work with lowest price express firm

10. Please choose your satisfaction level with the price provided by your international express firm.

<input type="checkbox"/>	1	Low satisfaction
<input type="checkbox"/>	2	Average satisfaction
<input type="checkbox"/>	3	High satisfaction

11. Please choose the importance level of transit time in decision making process for international express firms.

<input type="checkbox"/>	1	Not important
<input type="checkbox"/>	2	Less important than other factors
<input type="checkbox"/>	3	Equally important with other factors
<input type="checkbox"/>	4	More important than other factors
<input type="checkbox"/>	5	Certainly work with fastest transit time express firm

12. Please choose your satisfaction level with the transit time provided by your international express firm..

<input type="checkbox"/>	1	Low satisfaction
<input type="checkbox"/>	2	Average satisfaction
<input type="checkbox"/>	3	High satisfaction

13. Please choose satisfactory additional transit time for typical economy service with respect t express service ?

<input type="checkbox"/>	1 day
<input type="checkbox"/>	2 to 3 days
<input type="checkbox"/>	4 to 5 days
<input type="checkbox"/>	6 to 7 days
<input type="checkbox"/>	More than 7 days

14. Please choose satisfactory discount level for typical economy service with respect t express service ?

<input type="checkbox"/>	20%
<input type="checkbox"/>	21 % - 40%
<input type="checkbox"/>	40% - 50%
<input type="checkbox"/>	51% - 60%
<input type="checkbox"/>	More than 60 %

15. Please choose the importance of receiving discount for the shipments that you deliver to the branch ?

<input type="checkbox"/>	1	Not important
<input type="checkbox"/>	2	Important
<input type="checkbox"/>	3	So important that can change service provider

16. Please choose the importance of receiving discount for accepting electronic invoicing ?

<input type="checkbox"/>	1	Not important
<input type="checkbox"/>	2	Important
<input type="checkbox"/>	3	So important that can change service provider

17. Please choose the importance of price discrimination between rural and urban shipments ?

<input type="checkbox"/>	1	Not important
<input type="checkbox"/>	2	Important
<input type="checkbox"/>	3	So important that can change service provider

18. Please choose your response for the delivery of your economy shipments via third parties (e.g. postal offices or mail service providers) in destination countries ?

<input type="checkbox"/>	1	Certainly do not accept
<input type="checkbox"/>	2	Not important
<input type="checkbox"/>	3	Important
<input type="checkbox"/>	4	So important that can change service provider

19. Please choose the importance of having variable ratecard which decreases with increase of the number of your shipments ?

<input type="checkbox"/>	1	Certainly do not accept, constant price is obligatory
<input type="checkbox"/>	2	Not important
<input type="checkbox"/>	3	Important
<input type="checkbox"/>	4	So important that can change service provider

20. Please choose satisfactory additional transit time for a discount level of 20 % ?

<input type="checkbox"/>	Certainly do not accept increase on transit time
<input type="checkbox"/>	Same transit day with later delivery hours is acceptable
<input type="checkbox"/>	1 day
<input type="checkbox"/>	2 to 3 days
<input type="checkbox"/>	More than 3 days

CURRICULUM VITAE



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