

## LOGISTICS SERVICE PROVIDERS IN TURKEY: A PANEL DATA ANALYSIS

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**Abstract** — The companies competing in today's business environment are forced to re-engineer their supply chain management in order to meet the increasing needs of the customers. Today's trend for industrial firms is to have a variable cost system by receiving logistics services through outsourcing and focusing on core competencies. This study aims to analyze the logistics service providers sector in Turkey comprehensively and to reveal the sector profile clearly by comparing the data collected in year 2001 and 2007. For this purpose, initially, an empirical research study was carried out to assess the profile of companies operating as logistics service providers and the logistics services already being purchased by real sector and the nature of sector-specific services. The companies to participate in the research were selected so as to form a homogeneous distribution with respect to their turnover, number of employees and geographical locations, therefore aiming to achieve a complete portrait of the Turkish Logistics Providers Sector as a result of the research. The field study involves face-to-face interviews with 71 companies for the year 2001, and 101 companies for the year 2007. The results indicate that although the number of 3<sup>rd</sup> party logistics providers (3PLs) increase in total, when the number of different sectors they are providing services is analyzed, it is found that especially for the top served sectors, the number of logistics service providers is significantly decreased. This can be interpreted as the 3PL companies are focusing on a limited number of different sectors to provide services.

*Keywords* — 3rd party logistics providers, outsourcing, logistics activities, survey, Turkey

### INTRODUCTION

Organizations have been increasingly turning to outsourcing in an attempt to enhance their competitiveness, increase profitability and refocus on their core business. In the academic and practitioner literature, emphasis has shifted from outsourcing parts, components, and hardware subsystems towards the even greater unexploited potentials that intellectual systems offer. The motivations for outsourcing in any industry are driven by an ever-greater organizational pursuit to ensure cost discipline, whilst improving quality of service and delivery capability. However, as the outsourcing has become a popular mechanism for differentiation by contracting out the non-core activities, the differences in the motivations for outsourcing have emerged. This has been ignited by the debate as to what is core and what is non-core function. Outside vendors are regarded as specialists who can provide similar or better level of service at a lower cost than available in-house. However, through outsourcing, firms can also generate various non-financial benefits such as responding to environmental uncertainty in ways that do not increase costs associated with internal bureaucracy. Moreover, they can also focus on building their core competencies, while outsourcing the noncore activities to specialist vendors for both one-off and continual improvements. This is because firms are reported to have limitations as to the depth of specialist knowledge possessed by the suppliers [1].

Fierce competition in today's global markets, the introduction of products with short life cycles and the heightened expectation of customers have forced manufacturing enterprises to invest in and to focus attention on their logistics systems. This, together with improvements in communications and transportation technologies, has resulted in continuous evolution of the management of logistics systems [2].

The new century has shifted the importance of organizational functions and today's trend for industrial firms is to outsource those products and activities, which are not the company's core business. The

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international outsourcing has been referred to as one of the drivers that have made the world “flat” and with increase in international outsourcing, the sourcing debate has moved from what and how to outsource to what and where to outsource [3]. The importance of outsourcing varies among sectors. Outsourcing has grown by 52% for the period 1993–2003 for medium–high-tech sectors while the increase for low-tech sectors is much lower, only 19% [4].

Bendor-Samuel (1998) asserts that outsourcing provides certain power that is not available within an organization’s internal departments [5]. This power can have many dimensions: economies of scale, process expertise, access to capital, access to expensive technology, etc. Another possible benefit is that outsourcing provides companies with greater capacity for flexibility, especially in the purchase of rapidly developing new technologies, fashion goods, or the myriad components of complex systems [6], [7].

Likewise, by outsourcing logistics activities, firms can save on capital investments, and thus reduce financial risks. Investment on logistics assets, such as physical distribution centers or information networks, usually needs large and lump sum costs, which involves financial risks. Furthermore, the 3PL provider can spread the risks by outsourcing to sub-contractors.

As the world becomes more global and the boundaries between countries and cultures disappear, many developing countries, including also Turkey, are turning into attractive centers for international firms because of the geographical locations, low working fees, and high potential for market extensions. However a previous study shows that, in Turkey, outsourcing is still solely based on transportation [8]. As can be seen from this research many Turkish firms understand logistics services as taking the transportation order from the manufacturer and delivering the goods to destination points, without thinking about the warehouse design, the best location of the warehouse or inventory management. Such way of thinking concerns only one side of the subject and reduces the logistics services to a narrow transportation perspective.

This study aims to determine the current situation of outsourcing logistics activities in Turkey, which has a great potential for logistics activities among the surrounding continents because of its geographical location. An empirical research study was carried out to determine the types of logistics activities that are most frequently provided by the 3rd party logistics firms and to reveal the changes in the conjuncture if there are any. A questionnaire was prepared to examine the current situation as well as the future plans of Turkish 3PL firms in terms of logistics activities. Results indicate that most of the firms provide services for more than one industry; apparel, automotive and chemistry industries being the most frequently served. Another perspective of the study highlights the changes in the sector between 2001 and 2007.

## THE FRAMEWORK OF THE STUDY AND RESEARCH METHODOLOGY

This research presented here reveals the results of a subgroup belonging to a large logistics sector survey. The survey includes the four main groups of players operating in the logistics sector. These groups are: Logistics Service Providers, Logistics Service Customers, Logistics Equipment and Hardware Providers, and Information Systems Providers (Figure 1). This study focuses on the first subgroup, logistics service providers survey.

A field study involving face-to-face interviews with the companies operating in the logistics sector as service provider was performed for the research. In the field study, face-to-face interviews were preferred, rather than sending questionnaires by mail. The main reasons for this are the low rates of return for studies performed via mail, the lack of possibility to correct misunderstandings and the loss of the opportunity to obtain information that can only be achieved during an interview.

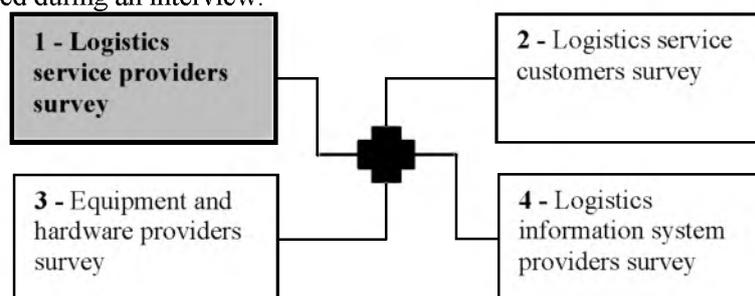


FIGURE 1  
Turkey logistics sector survey

The companies to participate in the research were selected so as to form a homogeneous distribution with respect to their turnover, number of employees and geographical locations.

The questions in the survey can be grouped under two groups, namely, profile related questions and logistics related questions. Profile related questions include industry in which the firm operates, duration of operation, number of employees, existence of a foreign partnership, and sales turnover. Logistics related questions include the cities that the 3PLs have offices and distribution centers, the services they provide, the sectors that the 3PLs provide special services (i.e. rack transportation for apparel sector), warehouse information, and perception about size of the logistics sector.

## RESEARCH FINDINGS

The questionnaire has sections on company profile, logistics services, warehouses, and number of employees (which can be analyzed under company profile). When two different respondent sets from 2001 and 2007 are compared with respect to how long they have been in business, it can be said that there had not been a significant change ( $p=0.975$ ) in the composition (Table 1). Approximately 70% of the firms have survived in the market at least 8 years or more.

TABLE 1

Operating year, status and capital structure, range of employees comparisons			
Questions	Categories	2001	2007
<b>Operating year</b>	0-1 years	1.4%	2.0%
	1-2 years	8.5%	4.0%
	2-4 years	4.2%	9.9%
	4-8 years	15.5%	14.9%
	More than 8 years	70.4%	69.3%
<b>Firm status</b>	International company	38%	48%
	Local company	55%	48%
	Partner with an international company	7%	5%
<b>Capital structure</b>	Single partner	23%	18%
	Multiple partner	72%	80%
	Public company	6%	2%
<b>Range of employee numbers</b>	1-25	14%	28%
	26-50	17%	22%
	51-100	14%	17%
	101-250	15%	15%
	250-500	17%	6%
	More than 501	17%	13%

When the firm status is analyzed it has been found that 55% of the participant companies operating in the Turkish logistics sector have local status, 38% of the participants are international companies and 7% are companies with international partnerships in the year 2001. The fact that the re-engineering process of the Turkish logistics sector has started recently shows that Turkey is an attractive market for foreign companies. The ratio of international companies introduced to the Turkish market via partnerships with a local company, or fully independently, has reached 48% in a short time (see Table 1). Although the ratio of international companies increased to 48% in 2007 the partnership status of the participants indicates no significant difference in the percentage of firms that are international / local / partner between 2001 and 2007 ( $p=0.209$ ). neither the increase in percentage of international companies from 38% to 48% nor the decrease of local companies from 55% to 48% is found statistically significant. Similarly, the change in the percentage of companies that are partner with an international company is insignificant.

Another finding of the research on capital structures of the companies interviewed is that 72% in 2001 and 80% in 2007 have multiple partners. The ratio of single-partner companies is 23% in 2001 and 18% in 2007, whereas the ratio of public logistics companies is 6% in 2001 and 2 % in 2007. When the capital structure of the firms is compared regarding two survey years, there is no statistically significant ( $p=0.881$ ) change in the percentage of firms that are single partner, multiple partner or public company. The majority of the firms are multiple partners (see Table 1), which can be a consequence of high first investment costs of warehouses, distribution centers, and cargo fleet. When the range of employee numbers of the firms are concerned regarding the scale given in Table 1, there has been a significant change in the range of employees of the firms from 2001 to 2007. The percentage of firms which have less than 100 employees is increased from 48% in 2001 to 66% in 2007 ( $p=0.016$ ). It can be concluded that the firms prefer to work with less employees in 2007. While the percentage of firms with 251-500 employees is 18% in 2001, it is found that only 6% of the firms in 2007 belong to this range ( $p=0.014$ ). Meanwhile, the percentages of small scaled firms (with 1-25 and 26-50 employees) have also increased from 2001 to 2007. However, the only statistically significant change is observed for firms with 251-500 employees.

The most frequently provided services in 2001 are international land transportation Truck Load (TL) and Less than Truck Load (LTL), domestic land transportation (TL), warehouse, and distribution to customer warehouse. While no changes is revealed in the rate of provided services in 2007, the Project Transportation where transportation is designed according to customer's needs gains more weight and replaces warehouse in the rank of occurrence (Table 2).

TABLE 2  
The most frequently provided services

Service	2001	2007
International land transportation (TL)	86%	83%
International land transportation (LTL)	77%	67%
Domestic land transportation (TL)	72%	66%
Warehouse	72%	49%
Distribution to customer warehouse	70%	53%
Project Transportation	65%	53%

A further analysis has also been conducted to reveal the changes and as well as their direction in the services provided by the 3PLs. Table 3 shows that the provided services changed significantly from 2001 to 2007. A decrease in all these services is observed which can be interpreted as the 3PLs are now more focusing on providing core services that they are good at rather than providing numerous services to various sectors.

TABLE 3  
Significant changes in the services provided

Service provided	2001	2007	Significance
<i>Distribution to customer warehouse</i>	70%	53%	$p=0.025$
<i>Domestic land transportation (LTL)</i>	70%	44%	$p=0.000$
<i>Ship transportation</i>	58%	40%	$p=0.019$
<i>Air transportation</i>	69%	34%	$p=0.000$
<i>Distribution center</i>	52%	28%	$p=0.001$
<i>Cross docking</i>	51%	26%	$p=0.001$
<i>Reverse logistics</i>	46%	25%	$p=0.003$
<i>Bonded warehouse</i>	65%	38%	$p=0.000$
<i>Warehouse</i>	72%	49%	$p=0.002$
<i>Palletization</i>	59%	33%	$p=0.025$
<i>Shrinking</i>	56%	30%	$p=0.000$
<i>Labeling</i>	56%	33%	$p=0.002$
<i>Packaging</i>	55%	30%	$p=0.001$
<i>Quality control</i>	37%	19%	$p=0.009$
<i>Full export-import operations</i>	58%	36%	$p=0.004$
<i>Customs clearing</i>	59%	42%	$p=0.023$
<i>Operational reporting</i>	62%	37%	$p=0.001$

The services that have not changed significantly are; distribution to final consumption location, international land transportation (LTL and TL), domestic land transportation (TL), project transportation,

container transportation, railroad transportation, intermodal transportation, light assembly/disassembly, vendor managed inventory, collaborative forecasting and collaborative planning, and e-procurement.

*Sectors that 3PLs provide specific services, and the respective specific services:* Considering the sectors on which companies providing sector-specific services focus, it is obvious that the apparel sector predominates. The apparel sector is followed by automotive, food retail, chemistry, and medicine / health sectors, respectively. When we look at the top five sectors that the logistics service providers are providing special services (such as rack transportation for apparel industry of frigorific transportation for food industry), no change has been observed from 2001 to 2007. The only sector facing a considerable change in terms of sector specific services is apparel, in which the number of 3PLs providing special services to this sector is significantly decreased. Parallel to this, the rack transportation services have also decreased significantly from 32% in 2001 to 15% in 2007 ( $p=0.006$ ). *Sectors that the 3PLs are providing regular services:* In 2001, apparel, automotive, chemicals, machinery, computers/electronics sectors are indicated to be the sectors offered services by the great majority of the participants. In 2007, we see that computers/electronics sector is not anymore in the top five list being replaced by the construction materials sector. This result is not surprising considering the construction boom observed in those years between 2001 and 2007. The ranking of the sectors has also changed in 2007 as machinery, construction materials, apparel, automotive and chemicals respectively. When the data is analyzed to find out whether the change in the number of 3PLs is significant or not, it has been found that there is a substantial decrease in apparel, automotive, chemistry and computers/electronics sectors. Although there has been an increase in the percentage of 3PLs for constructing materials sector from 62% in 2001 to 70% in 2007, this increase is not statistically significant (see Table 4). For computers/electronics sector, a statistically significant ( $p=0.003$ ) decrease is found for the percentage of 3PLs providing services to this sector (from 69% in 2001 to 46% in 2007). Similarly apparel and automotive sector has witnessed a significant decrease (see Table 4 for significance values).

TABLE 4  
Top sectors served and significant changes

Top sectors for 2001 and 2007	2001	2007	Significance
<i>Apparel</i>	83.10%	63.35%	$p=0.010$
<i>Automotive</i>	80.28%	60.40%	$p=0.005$
<i>Chemicals</i>	76.06%	56.44%	$p=0.008$
<i>Machinery</i>	71.83%	71.29%	$p=0.938^*$
<i>Computers/electronics</i>	69.01%	46.53%	$p=0.003$
<i>Construction materials</i>	61.97%	70.30%	$p=0.256^*$

In order to calculate the size of the logistics sector and its growth rate during recent years, the participants were asked about their sales turnovers, the rates of change of turnover relative to previous year and turnover expectations for the next year. The reluctance for providing sales turnover information has somewhat decreased from 2001 to 2007; i.e. 66% of the firms reported their sales turnover in 2001, while 88% of the firms report their sales turnover information in 2007. Once the outliers have been discarded, the average of sales turnover for 2001 is 27,665 YTL, and the average of sales turnover for 2007 is 36,125 YTL. However, this difference is not found statistically significant ( $p=0.510$ ). Another question directed to the participants was about their estimates on the size of current Turkish logistics market. The estimates of the participants have risen from 2-4 billion in 2001 to 12-14 billion USD in 2007. The firms are also compared with respect to their strategic behavior. In this section they are asked about whether their vision and mission is determined, their strategy is reviewed regularly, and their strategic goals are documented. In 2007, an additional question on whether all employees are informed about the mission, vision and the strategy of the company or not is asked as well. The answers to these questions are given on a 1-5 scale, depicted in Table 5.

TABLE 5  
Strategy related answer options

Answer	Point
Not implemented	1
Planning to implement	2
In preparing stage	3
Partly implemented	4
Fully implemented	5

When the question on whether vision and mission are determined is analyzed, it is seen that in 2001, the firms mentioned that their vision and mission are partially implemented (average: 4.26), while in 2007, they answered as they are at the preparation stage (average: 3.87). There has been found statistically significant difference ( $p=0.043$ ) between these answers. In fact, since the logistics sector market is enlarged in 2007 when compared to 2001, many new players which are at an earlier stage of strategic planning studies entered the market. When the answers to “strategy is reviewed regularly” question is analyzed, it has been found that there is no statistically significant difference between firms that are at the partly implementation stage between 2001 and 2007 (average: 4.26 in 2001 and 4.00 in 2007 respectively,  $p=0.162$ ).

Similarly there has not been found a statistically significant difference for documentation of strategic goals, where firms are both at partly implementation stage (average: 3.91 in 2001, and 3.49 in 2007,  $p=0.063$ ).

## CONCLUSION AND FURTHER SUGGESTIONS

The changing nature of work reflects a major shift in the way work has traditionally been done. To remain competitive and to ensure continued survival amidst such ‘hypercompetitive environment’ firms are attempting to devise new strategies. Research has found that under such circumstances firms disintegrate their business functions and increase outsourcing **Error! Reference source not found.**

The use of outsourcing as a strategic device has been structured on the idea that certain functions such as data handling, customer relations management and information processing are common activities among different industries and thus can be decoupled from their respective value chains. Consequently, firms can focus on their core competencies to develop superior capabilities in order to outcompete other firms in the same industries while externalizing the decoupled or disintegrated functions.

In the literature outsourcing has been identified as one of the most important components of ‘flexible’ firms that can respond quickly to unanticipated threats and opportunities of the market. There are abundant examples in the computer and apparel industries, where industry leaders such as Microsoft, Dell Computers, and Reebok have established the advantages of outsourcing peripheral functions while gaining flexibility and speed through their flatter organizational forms.

The competition in the logistics sector is increasing and causing 3PLs to provide a limited number of services. Similarly, the number of different cities that a single 3PL has offices as well as distribution centers is decreasing dramatically which is also an indicator of more focusing on regional markets rather than providing services for the whole country as well as the European Union. However, since the logistics market is growing in size there are more players in the market, and hence, they have not completed their strategic planning issues yet (or they are at early stages of the strategic planning on the average).

## REFERENCES

- [1] Burdon S., Bhalla A., 2005. Lessons from the Untold Success Story: Outsourcing Engineering and Facilities Management, *European Management Journal*, 23(5), 576–582.
- [2] Bramel J., Simchi-Levi D., 1997. *The logic of logistics*, Springer.
- [3] Kedia B.L., Lahiri S., 2007. International outsourcing of services: A partnership model, *Journal of International Management* 13, 22–37.
- [4] Cadarso M.A., Gomez N., Lopez L.A., Tobarra M.A., 2008. The EU enlargement and the impact of outsourcing on industrial employment in Spain, *Structural Change and Economic Dynamics* 19, 95–108.
- [5] Bendor-Samuel, P., 1998. The brave new world of outsourcing, <http://www.outsourcing-journal.com/issues/may1998/html/everest.html>.
- [6] Carlson, B., 1989. Flexibility and theory of the organization, *International Journal of Industrial Organization*, 7 (1), 189-203.
- [7] Harrison, B.T., 1994. *Lean and mean: the changing landscape of corporate power in the age of flexibility*, Basic Books, New York.
- [8] Ulengin F., Ulengin B., 2003. Impact of Internet on supply chain activities: the case of Turkey, *The International Logistics Congress 2003* 30 June, 1 July 2003.