

THIRD PARTY LOGISTICS (3PL) MODELS: PERSPECTIVES AND PRACTICES. THE CASE OF THE GREEK PHARMACEUTICAL INDUSTRY

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Abstract

The purpose of the present study is to investigate the probability that Pharmaceutical Companies located in Greece entrust their products' storage and distribution services with Third Party Logistics (3PL) Companies, as well as the criteria on which this entrusting is based. Questionnaires including open and close type questions filled out by 25 of the largest pharmaceutical companies in Greece, starting from September 2007 to April 2008, were used to collect data. Furthermore, the survey uses the model of Logistic Regression so as to examine the usage of Third Party Logistics' services.

The analysis of the results concluded that the possibility of the pharmaceutical companies to have assigned the distribution and storage of their products to an independent 3PL company depends on the following:

- *whether the pharmaceutical companies consider that the entrusting of their storage and distribution services to a 3PL company appears no default*
- *whether they believe that great funds are released due to the entrusting of the products' storage and distribution to 3PL companies, making it difficult - at the same time - to control them in a directly way*
- *whether they use the internet facilities in order to find potential suppliers to cooperate with*

Key Words: outsourcing, inventory management, supply chain, Third Party Logistics (3PL)
Classification, JEL: M10-General

1. Importance of Supply Chain

Logistics have immense importance particularly in chemical and pharmaceutical supply chains. Companies in this industry, have gradually begun focusing on their supply chains, and research on pharmaceutical supply chain management and logistics has gained importance, although it has received little attention in the literature. Pressures are leading many pharmaceutical companies to leverage all elements of their business, including increasingly complex supply chains, for making logistics a competitive advantage. Attention focuses in how to improve service quality while reducing operational costs and optimizing efficiency in inventory management and distribution. Moreover, integrated systems at network supply chain level of temperature-controlled shared warehouses and transportation management services, can increase capabilities and ensure the right product where and when needed, so that to reduce inventory and improve delivery status. Besides, the drugs bill of the national health system, funded by taxpayers, is under increasing pressure in recent years adding the need to afford some of the new and expensive drugs which are now being developed to tackle 'modern diseases' such as cancer. As with any organizations, this area is looking for costs savings through better supply chain management.

2. Special Characteristics of the Pharmaceutical Sector

There is a number of special characteristics of the pharmaceutical sector that affect directly or indirectly the physical flow of drugs throughout the supply chains (Logistics Europe,2006):

- Combination of state intervention and social policy with the pharmaceutical market
- Role of innovation in developing new products and building-up distribution networks to store and move promptly and efficiently to final users (expensive R&D programs)
- Economic imperatives for lower costs without impairing quality: since drugs are for protection of social health and customership is in package form
- Continuing adjustment process: in view of changing business and technology environment and rising demand, living standards, life expectancy, modern illnesses, etc.
- Particular importance of the RL since the health of patients may be put at risk if drugs are not withdrawn expeditiously, with a timely and cost-effective manner
- Global marketplace changes: need for global SCS, strategic alliances, joint ventures, etc.
- Inter-European trend to integration: more complex 'strategy-structure-performance' circuit for value adding and creation of sustainable competitive advantage
- Prediction of rising role of logistics with harmonisation and a gradual shift towards pan-European distribution networks
- Need for excess stock, increased role of 3PL, wholesalers role, etc.
- Efficient technology use: rising role, available technology solutions, NIT, EDI, ERP, etc.
- Outdated Manufacturing: increasing competition, updated equipment in pharmacies, etc.
- Counterfeit products are coped with logistics through promoting innovation
- Parallel trading and black market: faced by RFID technology, product origin, etc.
- Law adequacy: helped by improving capabilities of control system, etc.

3. Outsourcing Logistics in the Pharmaceutical Sector

The historical 'question to make or buy' is frequently asked, in the main scope of promoting firms' adjustment to the new corporation and technology environment (Laios and Moschuris, 1999). The relations among the outsourcing firm, the 3PL service providers and customers are complex to integrate, and NIT are helpful to reduce the risks of outsourcing (Xu et al., 2008). However, the 3PL providers may affirm declining efficiency, insofar as they focus on traditional service offerings such as transportation, and warehousing rather than playing the role as integrator or lead service provider (Zhou et al., 2008).

There is a growing international logistics industry trend for expansion of capabilities for handling temperature-sensitive pharmaceuticals, by 3PL developers. Moreover, pharmaceutical wholesalers are widening their service offerings and becoming health providers, supplying the pharmacy not merely with medicines, but with total solutions. Many wholesalers are also developing closer relationships with manufacturers, and offering them logistics services that have traditionally been the domain of 3PLs. With a trend towards greater harmonisation and unity in the EU, there is a gradual shift of European pharmaceutical logistics towards pan-European distribution networks (Addison C. et.al, 2005).

The 3PL providers who remain stick to traditional service offerings may become victims of short-sightedness falling in declining efficiency, insofar as they focus on traditional service such as transportation, and warehousing rather than playing the role as integrator or lead service provider (Malindretos G., 2008).

While outsourcing is a powerful tool to cut costs, improve performance, and refocus on the core business, outsourcing initiatives often fall short of management's expectations. There are three principles for effective implementation of outsourcing: requirements, coordination and communication (Lynch, 2004). More specifically, it has been constructively criticised that outsourcing has to overcome a list of 'seven deadly sins' that underlie most of the failed outsourcing efforts: (1) outsourcing activities that should not be outsourced; (2) selecting the wrong vendor by overblown expectations; (3) writing a poor contract, by blindly banishing projects; (4) overlooking personnel issues; (5) losing control over the outsourced activity; (6) overlooking the hidden costs of outsourcing; and (7) failing to plan an exit strategy, by negligence and end-game myopia (Baitheimy, 2003; Artunian, 2006).

4. The Pharmaceutical Sector in Greece

The 55% of the market share belongs to private companies and the 45% to pharmacies cooperatives (IOBE, 2008). In addition, there are companies called as 'pre-wholesalers', which are local producers that provide logistics services as well for other pharmaceutical companies (figure 1).

The list of the first 25 pharmaceutical companies in Greece, according to their turnover is shown in Table 1. Globally, first is JOHNSON & JOHNSON which doesn't sell drugs in Greece, second is PFIZER (1st in Greece), followed by BAYER, GLAXOSMITHKLINE and NOVARTIS (correspondingly 11th, 3rd and 4th in Greece). In the sixth place is SANOFI-AVENTIS (9th and 10th in Greece – before their merger) and finally HOFFMANN–LA ROCHE and ASTRAZENECA (6th and 8th correspondingly in Greece). In other words, the biggest global players in the pharmaceutical sector are the main players in the Greek market place as well.

Figure 1 Pharmaceutical Distribution Process in Greece

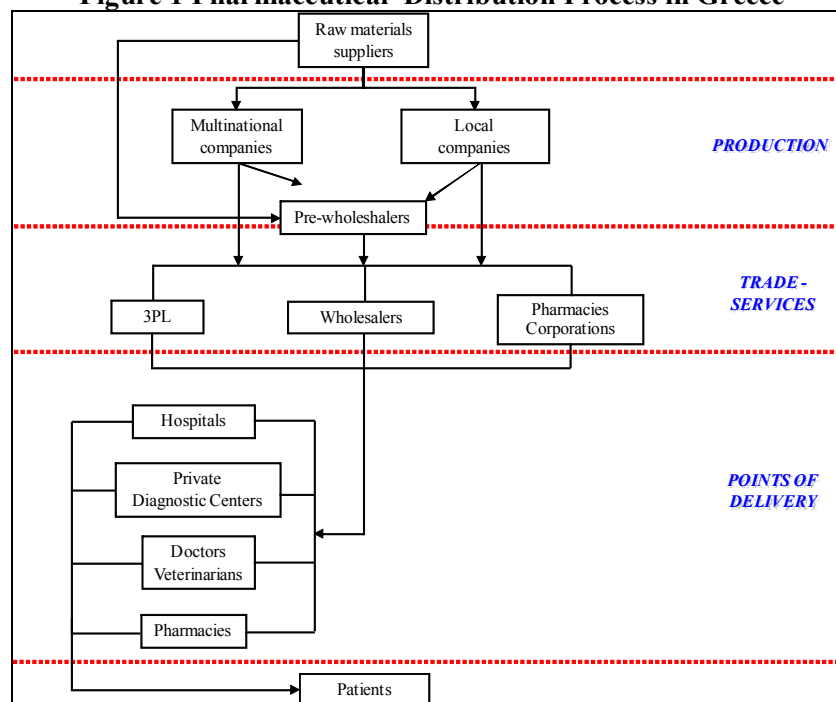


Table 1 List of the first 25 pharmaceutical companies in Greece

a/a	Company	Turnover (€)	Market share
1	PFIZER	400.186	8,5%
2	BOEHRINGER INGELHEIM	329.486	7,0%
3	GLAXOSMITHKLINE (GSK)	267.681	5,7%
4	NOVARTIS	254.869	5,4%
5	VIANEX	249.707	5,3%
6	ROCHE	227.485	4,8%
7	JANSSEN - CILAG	206.073	4,4%
8	ASTRA ZENECA	203.500	4,3%
9	SANOFI-SYNTHELABO	168.202	3,6%
10	AVENTIS	151.892	3,2%
11	BAYER	147.924	3,1%
12	PHARMASERVE LILLY	144.812	3,1%
13	ABBOTT	130.749	2,8%
14	GENESIS	130.486	2,8%
15	BRISTOL MYERS SQUIBB	123.137	2,6%
16	WYETH	100.137	2,1%
17	ΓΕΡΟΛΥΜΑΤΟΣ	100.080	2,1%
18	SCHERING-PLOUGH	92.705	2,0%

a/a	Company	Turnover (€)	Market share
19	ELPEN	74.401	1,6%
20	DEMO	70.373	1,5%
21	FAMAR	67.056	1,4%
22	IΦET	46.217	1,0%
23	CANA	44.314	0,9%
24	BAXTER	43.405	0,9%
25	SERVIER	37.709	0,8%

Source: IOBE

5. Survey Study of the Greek pharmaceutical sector

Based on the discussed research methodology framework, it is conducted here a survey study for the purpose of identifying the extent of logistics penetration in the pharmaceutical companies suppliers of drugs in Greece.

This study has certain advantages and limitations. The sample size is relatively high, as the sample includes twenty five (25) pharmaceutical companies of a total of 102 pharmaceutical companies, representing over 90% of total sector revenues (IOBE, 2008). Ten (10) of the companies included in this study are in the first sixteen (16) places in the global market and fourteen (14) are in the first twenty places in the Greek market. The study was conducted through a questionnaire of 18 questions regarding the following issues: infrastructure and use of outsourcing logistics in relation to strategy and performance, automation and procurement. The information was collected in mid 2006-mid 2007 from the following pharmaceutical companies.

Table 2 List of the pharmaceutical companies included in the survey

a/a	Company
1	ABBOTT LABORATORIES HELLAS ABEE
2	ASTRA ZENECA S.A. HELLAS
3	BAYER ΕΛΛΑΣ ABEE
4	BOEHRINGER INGELHEIM ELLAS
5	BRISTOL-MYERS SQUIBB
6	CANA S.A.
7	CSL BEHRING ΕΛΛΑΣ Μ.Ε.Π.Ε.
8	GALENICA AE
9	GLAXOSMITHKLINE AEBE
10	JANSSEN-CILAG ΦΑΡΜΑΚΕΥΤΙΚΗ AEBE
11	LAVIPHARM ACTIVE SERVICES
12	NOVARTIS (HELLAS) AEBE
13	OMEGA PHARMA HELLAS AE
14	PHARMATHEN S.A. INDUSTRIAL & COMMERCIAL COMPANY
15	ROCHE (HELLAS) AE
16	SANOFI-AVENTIS AEBE
17	SCHERING PLOUGH
18	SERONO HELLAS AE
19	UCB AE
20	BIOSER A.E.
21	GENESIS PHARMA S.A.
22	KORES S.A.
23	MINERVA S.A.
24	GEROLYMATOS
25	PHAMAR

The analysis of the collected data in terms of descriptive statistics is summarized in the following results:

- **The Logistics organization:** 94% of the staff members have expressed in principle the view that an organized Logistics department has to be included in strategic priorities and only 6% of them perceive Logistics solely as a routine function.
- **Logistics Outsourcing (3PL):** Larger proportion (56%) of the interviewed companies have declared that they conduct the warehousing and distribution 'in house', in own (31%) or rented installations (25%). The 44% has subcontracted outsourcing servicing (3PL). However, a number of smaller size companies have adopted 'in house' logistics, while one company of the sample operates as a 'pre-wholesaler', providing logistics services beyond production. It is anyhow noted that most companies that have installed own or rent installations preclude proceeding to 3PL in the foreseeable future.
- **Main advantage of 3PL Warehousing:** The benefits from assignment of the warehousing in third parties are similarly distributed, mainly cheaper warehousing services (38%), capital saving and possibilities of investing in other outlets (31%), focus in 'core processes', etc.
- **Cost of assigning 3PL warehousing services:** The cost of 3PL warehousing is perceived to include the lack of control of the warehousing conditions (38%), which is important in view of the sensitivity of pharmaceutical products, the lack of specialized in pharmaceuticals 3PL companies (25%), the delays in customer service (25%) and the insufficient store management, while 6% had not declared any reservation in outsourcing choice. In effect, none pharmaceutical company considers the 3PL services as high cost (answer to alternative question), but almost all companies perceived defective the quality of services supplied, e.g. delays, bad management, lack of experienced staff, impossibility of any control, etc.
- **Use of 3PL in Distribution:** A noteworthy observation is that the pharmaceutical companies put under consideration the issue of distribution assignment to outsourcing following their decision of warehousing management, assessing it as secondary strategic importance. Any how, the big majority of Greek pharmaceutical companies do not use own fleet in the distribution of their products (71% in the greater Attica area), while all companies make use of agents for the distribution in the provincial country.
- **Assessment of the distribution outsourcing:** The assessed main advantages of outsourcing were the release of capital in transportation means (62%), the possibilities of focusing in 'core processes' (25%) and the cheaper cost of transport services (13%). These advantages overbalance the 'cost' of distribution outsourcing, which is assessed to include the impairment of quality and the impersonal service (57%), the lack of modern transport means for pharmaceutical products (19%), the impossibility of immediate control of the process and the channels of distribution (6%) the damages and returns (6%) and the information leakages (6%), while only the 6% of pharmaceutical companies consider defective the distribution process.
- **Cost and computerization of Logistics:** The cost of orders and of warehousing is significant in the pharmaceutical sector (Pantazis, 2005). The big majority of interviewed companies use ERP program (68%), a small proportion of them uses WMS (13%) and some use combined ERP + WMS (19%). It is inferred that no extensive use has been yet of specialized computer programs for the warehousing management, such as the WMS. Mostly, ERP systems support the movements to and from the store, but do not offer detailed design and following-up as WMSs concerning internal handling process and positions and systems. The computerized support of warehouses, according to staff of the interviewed pharmaceutical companies, contributes chiefly for reduction of faults and for the speed of the warehousing processes (88%).
- **Procurement and orders' processing:** Almost all pharmaceutical companies of the sample (94%) evaluate their suppliers from the time of response to orders and the conformance in quantity and quality. However, just the 6% has developed close and trusting connection with their suppliers, considering unnecessary the evaluation in this area. The communication of the sector's companies and the putting of orders is conducted through Fax (53,8%), via e-mail the 11,8%, via ERP the 11,7% and by telephone the 10,3%, while the 12,4% had not revealed this information. It is shown therefore that the new technologies have not yet reached the Greek pharmaceutical companies, in part possibly as considering past practices as more personal and friendly. Thus, the majority of these companies (62%) make rare use of the internet tools and facilities for searching new suppliers, while 19% do not use it at all and the rest 19% makes exclusive use of internet for this purpose.

A model of the following form of using 3PL services was build-up and tested:

$$3PL = a_0 + a_1 WSD + a_2 DSD + a_3 DSP + a_4 IPS + e_i$$

where:

3PL, for use of 3PL services

WSD, for main feature of use of warehousing 3PL services

DSD, for main negative feature of use of distribution 3PL services
 DSP, for main positive feature of use of distribution 3PL services
 IPS, for using internet facilities in search of suppliers

For the estimation of the depended variable 3PL for a pharmaceutical company the Logistic Regression method was applied with the above independent variables concerning the use of 3PL services. The Lickert scale was used with '1' for the main characteristic of each variable and '0' for its refusal or not answering. The dependent variable also takes the value '1' for use of 3PL services and '0' for not use of 3PL services by a pharmaceutical company. The main regression results are outlined in the following table:

Table 3 Estimated regression results

Variables' Parameters	Estimated Parameter
a_1 for WSD	3,5* (2,759)
a_2 for DSD	-7,254** (4,333)
a_3 for DSP	2,288*** (1,303)
a_4 for IPS	-3,109** (4,055)

symbols ***, **, * for statistical significance at 1%, 5% και 10% respectively

The main quantitative results of this survey research are summarized as follows:

The parameter of the WSD is positive and statistically significant at 10% level, which means that warehousing 3PL services have positive influence in using such services. Moreover, the coefficient of DSD, for main negative feature of use of distribution 3PL services, is negative and statistically significant at 5% level, implying that the pharmaceutical company which considers negative the 3PL services because of impossible exercising of direct control, avoids using them. The positive coefficient of DSP, of use of distribution 3PL services, at 10% level considers positive the 3PL services chiefly because of 'freeing capital'. In addition, the use internet services for procurement by a pharmaceutical company, reduces the probability of using 3PL services.

In brief, these results indicate that the Greek pharmaceutical companies have as main criteria of using 3PL services the warehousing services and the freeing capital, which however reduces exercising direct control and the alternative use of internet services for the procurement. It means dominance of lack of understanding and awareness of the role of 3PL and more broadly the perception of the supply chain strategy, for achieving sustainable competitive advantage. The research of the logistics infrastructure and the education in logistics have substantiated such a situation. Although the supply chain of the pharmaceutical products is critical for the social health, in the majority of the pharmaceutical companies the responsibility of the warehousing and distribution processes remain in the responsibility of the general management. Of course, in consideration of the 'economies of scale' in production and distribution, have pushed a number of pharmaceutical companies and a number of services companies in mergers and collaborations, with main aims the cost reduction and the capital saving.

Comparison of advantages and disadvantages of the 3PL in warehousing and distribution, in the framework of the results of this study, main disadvantage has been considered the loss of direct control (44%) and main advantage the freeing of capital (40% on average) in combination with the basic production functions (average 24%).

6. Main concluding remarks

In this paper has been attempted to erase a series of misconceptions concerning the quality of outsourcing (3PL) through ascending qualitative technical support to induce initiatives for strategy forming at network supply chain level, and mobilization of all available resources. Participative action research based on the triangular integration approach for strategy formulation (at technocratic, corporation and state policy level) can be useful in the case of the Greek pharmaceutical sector. It may help to reveal a series of hindering factors to strategy formulation for acquiring sustainable competitive advantage, such as the relatively high returns and rising drugs demand due to rise in income and aged population. Helpful to this goal is the

identification of a series of special characteristics of the pharmaceutical sector to facilitate the supply chain analysis of this sector. Moreover, useful are assessed the presentation of the distribution network structure and a survey study of the logistics outsourcing conducted in the Greek pharmaceutical sector. Actually, the results of this research have shown a number of developments in the correct direction, but self-complacency deprives the sector from the potential benefits of SCS for attaining sustainable competitive advantage, due to lack of knowledge, understanding and mistrust. Thus, although the pharmaceutical companies which use 3PL in warehousing and distribution have higher market shares, the main criterion has been the capital saving. This, along with the restricted action in the area of pharmacies' cooperatives, is indicative of big possibilities of use of integrated logistics strategy to succeed sustainability of the Greek pharmaceutical sector.

References

1. Addison C., White C. and Cruickshank C. (2005), 'Outsourcing beyond the comfort zone', *Pharmaceutical Technology*.
2. Artunian, Judy (2006). *The Seven Deadly Sins of Outsourcing*, Computerworld, May issue.
3. Baitheimy, Jerome (2003). *The seven deadly sins of outsourcing*, *Academy of Management Executive*. 17 (2): 87-98.
4. IOBE (2008). *Pharmaceutical market in Greece*, Athens.
5. Laios, Lambros, Socrates Moschuris (1999). *An Empirical Investigation of Outsourcing Decisions*, *The Journal of Supply Chain Management*, Winter Issue: 33-41.
6. *Logistics Europe* (April 2006), 'Keep talking the tablets', *European Logistics Association*.
7. Lynch, C. F. (2004). *Logistics Outsourcing: A Management Guide*, CFL Publishing: 42-43.
8. Malindretos George (2008), *Lectures Notes, 'Geography of Transport'*, Harokopio University.
9. Pantazis D. (2005), 'The Impact of Climatic Changes on the Good Distribution Practices of Pharmaceuticals', 9th *Panhellenic Logistics Conference*, Macedonia Pallace Hotel, Salonica, November 25-26
10. Xu, Huan, Zhinuo Liu and Yan Li (2008). *Integrating processes of logistics outsourcing risk management in e-business*, *proceedings of the IEEE/WIC/ACM International Conference 2006*, Computer Society.
11. Zhou, Gengui, Chao Xu and Zhenyu Cao (2008). *Evaluating the Comparative Efficiency of Chinese Third-Party Logistics Providers using data envelopment analysis*, *International Journal of Physical Distribution & Logistics Management*, 38 (4): 262-279.