

Impact investigation of the economic crisis to the road freight sector in Thessaloniki, Greece

K. Papoutsis², S. Basbas¹, E. Bouhouras¹ & E. Sdoukopoulos²

¹*Faculty of Rural and Surveying Engineering,
Aristotle University of Thessaloniki, Greece*

²*Centre for Research and Technology Hellas,
Hellenic Institute of Transport, Greece*

Abstract

Within the framework of this paper an attempt is made to investigate the impacts of the economic crisis on the urban road freight transport sector, having as a case study the city of Thessaloniki, the second biggest city in Greece. To this end, a questionnaire-based survey is performed in order to collect relevant data from local carriers and forwarders with respect to the effects of the economic crisis they experienced and the measures they adopted and implemented in order to tackle them. In addition, the paper also includes the findings of a SWOT analysis, which enables the formation of strategies for overcoming the problems that have been identified and exploiting the opportunities raised.

Keywords: road freight, economic crisis.

1 Introduction

Transport is a key enabler of economic and social activity in Europe impacting development and the welfare of populations [1]. Efficient and effective transport systems prove to be a prerequisite in order to facilitate the free flow of people, goods and services, within the European context, thus contributing to productivity in other economic sectors, fostering prosperity and ultimately supporting the foundation upon which national economic strengths rest. The important role of the transport sector has been widely acknowledged and is being considered as a vital part of Europe's sustainable growth strategy accounting for about 3.7% of European GDP and approximately 5.1% of employment in the EU [2].



In 2010, total passenger and goods transport activities in the EU-27 are estimated to have amounted 6424 billion pkm and 3,831 billion tkm respectively. Regarding freight transport, which is being addressed by this paper, road transport in particular accounted for 45.8% (3% higher than 2009) of the total, with maritime transport presenting the second biggest share (36.9%). Following a fall of 2% in 2008 and another 10% drop in 2009, road freight transport activity in the EU is still about 9% below 2007 pre-crisis levels [3] while a 1% decline was also reported in 2011 [4].

City Logistics is both the first and last part of the urban road freight transportation sector. City Logistics is part of the links that create the supply chain and perhaps the most important one. The financial crisis that began in 2008 has impacts on the road freight transportation sector. As a result City Logistics has to face the same impacts. In the first nine months of 2010, the IRU (International Road Union) Road Transport Indices showed that TRACECA (Transport Corridor Europe-Caucasus-Asia) countries were forging ahead with the economic recovery, driven by road transport [5]. In the USA and specifically in the state of California many warehouses that they were constructed to cover the needs of the new port are now empty due to the fact that the number of import containers is declining, although the dramatic growth that occurred between 1996 and 2007 is not entirely wiped out [6]. According to a survey's results for the United Kingdom in 2010, chief executives in logistics were far more upbeat than the overall sample, with 60% being very confident of revenue growth over the next 12 months. The percentage dropped sharply in 2011, with only 36% of logistics CEOs (Chief Executive Officer) feeling very confident [7]. For Europe the economic crisis has cancelled out 6 years of growth in road freight transport [8].

In Greece freight transport mainly depends on the highway network to distribute goods across the country as well as within cities. Trucks carry the majority of freight, handling 97% of the total domestic freight modal share. The road freight sector undertakes 46.3% of the value of [9] exports and 42.9% of the value of imports while representing 7% of the country's GDP [10]. Furthermore, the overall truck fleet size in Greece is rather high ranking 8th in the EU-27, while the number of trucks per capita is one of the largest in the EU-15, second behind Spain [11]. The aforementioned statistics clearly indicate the importance of the road freight sector in Greece thus provide the motivation for this paper, which focuses on urban freight transport systems with the aim to examine the impact that was imposed on the sector as a result of the recent economic downturn. To this end, crisis repercussions and the role of the road freight transport sector in Greece are initially assessed while by having as a case study the city of Thessaloniki, the second biggest city in Greece, the effects of the economic crisis on urban freight transport operations are thoroughly investigated utilizing the findings of a dedicated questionnaire survey targeting local carriers and forwarders. Furthermore, through personal interviews that were conducted with key executives in the road freight sector, the new business environment and the countermeasures they adopted, as a response, are also assessed. Finally, the paper presents the findings of a SWOT analysis, fostering the ground for the

development of targeted strategies with the objective to overcome the problems that were identified and exploit the opportunities that were raised.

2 Road freight in Greece and crisis repercussions

The road freight transport sector in Greece is of utmost importance dominating domestic transport thus playing a crucial role towards Greece becoming a main transit entrance point in South East Europe. Representing a share of 7% of the country's GDP and approximately 7% of employment in 2010, road freight transport systems correlate strongly with productivity and economic prosperity [12].

The Greek road freight transport market is characterized by few large companies located in the Athens' Metropolitan Area and in Thessaloniki, the second biggest city in the country, providing urban freight transport services to different clients presenting a diversity of needs (e.g. supermarkets, retail shops, etc.). The biggest share of road freight transport volumes is carried by private commercial vehicles (95%) while public vehicles represent just a small portion of total freight volumes (5%). The truck fleet size in Greece was estimated around 1.3 million light and heavy commercial vehicles, at the end of 2011, presenting an average growth rate of 2% per year. The majority of commercial vehicles in Greece were found to be over 18 years old, ranking 1st among other European countries concerning the fleet's age (the respective index for EU is 12 years old) [12].

Since 2008, the economic downturn and the resulting economic measures that were foreseen as an integral part of the financing agreement that Greece established with both the European Union and the International Monetary Fund in order to improve its economic situation, led to significant reductions on consumption levels as well as on import and export trade volumes [12].

Regarding the road freight transport sector, the main effects of the economic crisis that were initially documented, can be summarized to the reduction of the total freight transport volumes and consequently to the logistics services provided. More specifically, in 2001 the turnover index for third Party Logistics (3PL) providers and carriers was reduced by 8% while in 2010 by 10.8% and 2009 by 32.2% [12].

Another reason for the problems that the carriers face is the increasing fuel cost, especially the increase of the excise duty for the unleaded gas and diesel exceeded 85% since 2009. As a result 3PL providers and the carriers reduced their operative cost by cutting down the number of employees; overtimes in the logistics centers, the budget for the warehouses and all these in order to offer to their customer's lower tariffs [12].

All the above mentioned problems led the logistics sector of road freight transportation in Greece to be considered by the markets and the bankers as a sector of High Credit Risk [12].

3 The road freight transport system in the center of Thessaloniki

The city of Thessaloniki is the second biggest city in Greece and is located in the Northern part of the country. The population of the Thessaloniki Greater Area (TGA) includes about 912,000 residents and the population of the municipality of Thessaloniki (the biggest Municipality in TGA) includes 322,240 residents [13]. It is estimated that the daily trips made by all transport modes in TGA are in the range between 1.6 million and 1.8 million.

The Organization of Urban Transportation of Thessaloniki (OASTH) is responsible for the public transportation system in the city. With 544 buses, the organisation serves about 167 million passengers per year. There are 79 bus lines connecting all sectors of the Thessaloniki Greater Area [14, 15].

Two research projects were conducted from 2008 to 2011 in the City of Thessaloniki by the Department of Transportation and Hydraulic Engineering, Faculty of Rural and Surveying Engineering, School of Engineering, Aristotle University of Thessaloniki, concerning the following [16]:

1. The parking facilities dedicated for the commercial vehicles. As part of the survey, a questionnaire based survey (40 questionnaires) was conducted in the study area which covers almost 2.5 km² (the hyper centre). The survey addresses the parking needs of the retailers [16].

In the study area, 285 parking places for loading and unloading goods (76 parking places in the northern sector and 209 in the southern sector) were identified. Surveys took place in 155 parking places (145 with time restrictions and 10 with weight restrictions) and 79 questionnaires were submitted to employers of the shops located in a buffer zone of 50 meters from each parking place.

The analysis of the data collected from the survey of the parking places and the questionnaires led to some worth mentioning results. The majority of the parking places (56.68%) can service vehicles up to 7 meters length, while 21.05% of the parking places can service vehicles with length less than 7 meters. The sum of these two categories shows that almost 80% of the parking places can service vehicles with length 7 meters or less.

Another interesting result of the data analysis shows that 84% (240 parking places) are under time restrictions while 16% (45 parking places) are not. Yet, only six of the 240 parking places are located on the northerner sector while the rest are located in the southern sector. It is clear that the northerner sector was expected to show high rate of parking turnover rate for the parking places, taking into consideration that in the northerner sector the enterprises that participated in the survey (40 enterprises) stated that 60% of them require either 10 to 15 deliveries or 20 to 25 deliveries per day. Instead, the data analysis shows that in the northerner sector, parking turnover was recorded only for the 29% of the parking places, while 71% of the parking places are not used at all. In the southerner sector, 39 enterprises fulfilled the questionnaires, stating that 54% of them require either 10 to 15 deliveries or 20 to 25 deliveries per day.

According to the data analysis, 58% of the parking places are occupied by 0 to 3 vehicles during an hour, 38% of the parking places are occupied by 4 to 8 vehicles at the same period and finally 4% of the parking places are occupied by 8 to 12 vehicles. It is clear that in the southerner sector of the study area, the parking places function in a better way than in the northerner sector. However, a further analysis of the data for the southerner sector reveals that the parking turnover rate per hour for the parking places is less or in the best case equal to the illegal parking turnover rate of the vehicles delivering goods next or very close to the same parking places.

2. The needs of the drivers of the commercial vehicles in the same area. The method used is again a questionnaire based survey (194 questionnaires) [17].

During the questionnaire based survey concerning the drivers of the commercial vehicles, almost 200 questionnaires were completed. The analysis of the data collected revealed some of the characteristics of the Urban Road Freight Transportation sector in the city of Thessaloniki [17].

The average number of the crew of the commercial vehicles is one, including the driver. That means that the driver is responsible not only to drive the vehicle, but also to load and unload the goods from and to the vehicle thus increasing the time needed to deliver the goods. The average gross weight of the commercial vehicles is 5.5 tons, while the average payload is 2.3 tons. The commercial vehicle's fleet in the road network of the study area is 'young' (the average age is 10 years). However taking into account that Euro Class 3 engines and Euro Class 5 engines for the commercial vehicles were established in 2000 and 2009 respectively, the environmental impacts from the road freight sector cannot be ignored.

The interviews addressed to the crew of the commercial vehicles took place during their stop in order to load or unload goods. At that time the members of the research team recorded if the vehicles were parked legally (in the specific parking lots for commercial vehicles) or illegally. The analysis of the collected data revealed that 60% of the vehicles were illegally parked, while only 40% were legally parked. It must be mentioned that as legally parked, are considered the vehicles parked outside the limits of the specific parking lots for commercial vehicles but in a buffer zone not exceeded 25 meters. This buffer zone was considered by the research team as a buffer zone, in which the vehicles would be considered as legal by convention.

Another important result exported from the analysis of the collected data is that 55% of the commercial vehicles in the study area, deliver and pick up goods, while 43% of them only deliver goods. Finally only 2% of the vehicles only pick up goods. It is obvious that reverse logistics is not at a desirable level in the city. The 52% of the commercial vehicles are loaded by 60% to 80% of their payload, 21% of the vehicles are fully loaded and 27% are loaded by 0% to 50%. It must be noticed that commercial vehicle traffic is recorded during morning hours, and there are no vehicles during the afternoon. This can be assigned to the fact that since November 2008 goods distribution in the study area is allowed from 09:30 to 12:30. The percentage of vehicles which return to their bases empty of cargo is found to be up to 75%. The 96% of the vehicles tours are scheduled. However

the schedule is decided before by the carriers up to 55% of the cases, the drivers decide the schedule in almost 40% of the cases and the receivers in 3% of the cases. It is clear that the receivers cannot decide about the schedule of the tours, in order to receive their goods. At the same time the deliveries of the goods can be delayed usually up to an hour.

4 SWOT analysis

In order to capture the status of the road freight transport and the city logistics of Thessaloniki Greater Area interviews were taken with staff of two logistics services providers (LSPs) that serve retailers inside TGA and also a supermarket chain. These two LSPs have different economical size and the supermarket services providers are among the largest in Greece. Logisticians and distribution managers of these companies were asked to shape a SWOT analysis (see Table 1) expressing their point of view on the impacts that the economic crisis may have had on their activities between the years 2009 and 2012, the implications of this recession, the opportunities that may occur in the future as a result of the crisis and finally they were asked to outline the threats that may accrue on the activities of each entity in the future.

The logistician of the larger LSP stated that between 2009 and 2011 the company scored the highest level of turnover in 2011. A feature that must be highlighted is that tobacco products' price was increased and a part of the price is transferred to the LSPs. As such, the total turnover regarding tobacco products was raised whereas the turnover for confectionery items reached a 10% decline. This could be analyzed as follows [18]:

- Sudden decline (-25%) due to reduction of consumption (2010).
- Slight halting of overall decline (-5%) due to the lower market competition (2011).
- Stabilization of the rate of decline to -10% due to continuous impact of crisis on overall consumption.

Negative impacts for this type of loss were alleviated by the shutdown of many smaller LSPs that were expelled due to the economic downturn. Cost-effective policies were adopted with rationalization of excessive costs without needing to foster staff layoffs. An example of cost reduction regards the need for commercial vehicles purchase. Purchase cost was reduced due to the lower demand and because of the financially sound company. Joint deliveries were a new efficient business model able to face the new status quo. Reducing inventory levels is another strategy that is attracting attention. The lack of cash flow necessitates the adoption of policies like minimizing the amount of money tied up in inventory [19].

In addition, bank loaning became tougher leading to more expensive borrowing than before the year 2009. Banks were lending in higher interest rates or were unwilling to lend within the context of restrictive policies. In fact, the expensive borrowing was offset by rationalization policies in company's expenses. Moreover, politicians will play crucial role in determining the financial outcome of the activities of an LSP. Goods prices (food, beverages,

tobaccos, etc.) are stipulated by governmental authorities. Private sector is sometimes not flexible to react in political decisions on taxes and VAT. The future of the status of city logistics in TGA and the road freight sector seems a bit nebulous. None of the large LSPs will be led to collapse but also none will be allowed to grow endlessly. This will trigger the risk 'alarms' of the banks and augment the level of loan risk in the light of economic bubbles. Subsequently, in an interview taken with the operations manager of a smaller LSP, it was explained in general how the economic crisis impacted on the operational and economical activities of a smaller LSP who also serves TGA.

Strongest points that could be elicited in a period of economic crisis include the rationalization policies regarding operational costs with focused interventions that do not downgrade the level of service (or at least they keep it at a decent level), better organization of resources (staff, vehicles, infrastructure and cash flow) and rescheduling of fleet routing with respect to urban and interurban distribution. An additional impact given to economic crisis is the rationalization and mitigation of excessive costs that takes place also in the competing companies that balances the competition and does not allow anyone player to enhance (with few exceptions).

Conditions that may worsen the activities of a smaller LSP constitute of narrow borrowing, lack of liquidity that is in line with generally low consumption and reduction in cooperating suppliers (reduction in customer base). LSPs are contingent on their customer base in terms of business planning, i.e. if a large supplier intends to shut all branches in Greece then this has a vital impact on the operations of collaborating logistics providers. Sometimes, in certain periods of economic crises, the fuel cost is rising and such economic conditions act as additional hindrance for the economic viability of small companies.

A small LSP could take advantage of these crises by establishing a professional network that may lead to mergers or acquisition by a larger body. Thus, such business models could deliver sustainable outcomes for both involved companies and for employees as well. On the other hand, further dropping of domestic demand may result in shrinkage of a company's economic activities. Besides this, the viability outlook of a private company depends on the credit constraints that are rendered in the market. The bank attitude towards providing the necessary liquidity is the cornerstone of the market viability. According to the operations manager, within this context, the prospective seems disappointing. It applies mainly to European Commission whether there will be the conducive circumstances for further business development [18].

Supermarket chain is a slightly different case than LSPs. Large supermarket companies act as retail stores, LSPs and suppliers, too. They may own tailored supply facilities and using their own distribution fleet – commercial vehicles – they perform the 'last-mile' distribution supplying their owned supermarket stores in the city [18].

Table 1: SWOT Analysis [18].

LSP		Supermarket Service Provider		Operation Manager of smaller LSP	
<u>Strengths</u>	<u>Weaknesses</u>	<u>Strengths</u>	<u>Weaknesses</u>	<u>Strengths</u>	<u>Weaknesses</u>
During crises, larger LSPs survive and acquire larger parts of the market share due to the ejection of smaller LSPs Cost-efficient operations (larger and fewer deliveries) Investments made by wealth companies are easier due to the general trust to prosperous undertakings and because of general financial devaluation of products, services, etc.	Tough conditions for bank borrowing High capital cost	Cost mitigation tools and policies Increased organization and operations surveillance Distribution fleet rescheduling towards time and fuel savings Rationalization culture adopted by whole market competition	Narrow borrowing Demand reduction and limited customer base Increase in fuel costs (in line with economic downturn) Level of service compromised with available asset	Customers may shift to companies that have the capacity to cover the fluctuating demand Cooperation with competing players for mutual operations	High temporary demand may affect lead time (increase) Reduction of demand
<u>Opportunities</u>	<u>Threats</u>	<u>Opportunities</u>	<u>Threats</u>	<u>Opportunities</u>	<u>Threats</u>
Large LSPs will neither collapse nor grow Lower competition beneficial for financially viable companies	Business plans are prone to volatile political directions and decisions Significant drop of demand in case of long-lasting crisis	Ensure viability through merger or acquisition	Shortening company's activities due to lack of adequate resources	Concerning the supermarket sector, measures towards manipulation of demand could be a key action Opportunity for investments with long-term aiming Conception of new policies that ensure balanced development of scattered units Seamless liquidity for companies that act as subsidiary	Prolongation of economic crisis may halt the outcomes of any sustainable policies

In the case study under consideration, the same beaten track is followed. The company owns a private distribution fleet of lorries but also hires and employs public utility trucks to cover the excessive demand. Between years 2009 and 2012, there were sometimes strikes of public fleet owners that affected companies that rely on public fleet distribution. Hence, there was a shift of interest to other bodies which owned private distribution fleets (like in the under consideration case) and led to temporary bigger market share for the company.

When the demand was reaching higher rates there was lack of fleet availability and sometimes lead time was grown to 48 – 72 hours. During high demand periods, the company's labour costs were raised due to extra needs for staff recruitment and overtime work. However demand levels were periodically fluctuating. It was necessary to channel customer demand by raising it through promotional actions (special offers, etc.). Wealth companies seized the opportunity to make investments to technologies and innovation that enables company to reap the rewards in the long-run. For instance, this supermarket company adopted Switch RF system that optimizes picking process by establishing voice picking for faster and paperless picking. Further investments included the setup of a new routing system to enhance fleet management for efficient distribution and transport operations.

Another good practice could be considered the company's direction towards balanced growth of proprietary branches and warehouses in national concept. This was achieved through economic and operational synergies with rest local branches that do not allow great fluctuations on the economic output. Capturing the crisis trends that customers prefer to make shopping in the local, small city-markets, the company launched a business model that envisaged establishment of such small markets in several densely populated areas in TGA and invested on their growth. Besides this, the company dropped their prices to a decent level pursuing the aim: to sell cheaper but make more sales in order for the turnover to slightly increase. According to the distribution manager of the supermarket chain, this objective was accomplished delivering the desirable outcomes.

The basic threat for all companies is that crisis may be prolonged in Greece. The subsidiary companies that are associated with their wealthier holding ones which are based abroad are luckier because they could have easier access to liquidity than domestic companies.

5 Discussion

The analysis of the available data revealed that the cumulative turnover for the year 2011 was slightly reduced by 2.5% in 1.07 billion euros, due to the decreased demand in basic sector – clients. About 60% of the companies in the logistics sector suffer by a decrease in their sales. Based on the shares in the relative market, the five (5) biggest companies gathered up to 23% of the value of the provided services for the year 2011 in euros. Another significant result of the financial crisis and the measures implemented by the central government is that 60% of the companies of the logistics sector were profitable in a pre-tax level [13].



The results of the SWOT analysis confirm that road freight transport system is affected by the economic crisis, but at the same time opportunities have risen up. The results from the analysis of the existing situation in the center of Thessaloniki can be exploited in conjunction with the results of the SWOT analysis, towards the direction of the rationalization of the road freight sector in the under study area.

Since 2007 the position of Greece in LPI (Logistics Performance Index) ranking of World Bank is dropping. In 2007 Greece was in 29th position with an LPI score of 3.36, in 2009 Greece dropped to 54th position with an LPI score of 2.96 and in 2012 to 69th position with an LPI score of 2.83.

According to statistic data of the Association of Motor Vehicle Importers Representatives in Greece, a great number of small-medium enterprises are experiencing problems due to lack of liquidity, excessive taxation and weakness to raise operating capital, therefore affecting negatively the light commercial vehicle market, which was shrunk by 41.7% compared to 2011. Only 3,707 light commercial vehicles have been registered in 2012 as compared to 2011 while it is apparent that the withdrawal scheme which was in effect stimulated the market and restrained further its downturn. For the first time in 2012, the number of light commercial vehicles which have been registered in December 2012 was higher by 21.0% than the corresponding month of 2011 (450 registrations in 2012, 372 in 2011).

Despite the liberalization of road freight transport (trucks for public use), the market continues to face structural distortions, while the benefits of liberalization are not yet visible. Furthermore, the prolonged recession has led many enterprises either to go bankrupt or struggling to survive, others to a disastrous reduction in turnover, while the continuing presence of foreign carriers in the Greek market, further intensify the distortions. As a result, the market of medium and heavy commercial vehicles faced a dramatic shrinkage of 60.6% in 2012 compared to 2011. In particular, the registrations of medium and heavy commercial vehicles reached 211 units in 2012 against 536 in 2011. In December 2012, the market plummeted by 81.8% compared with the corresponding month of 2011, eloquently capturing the collapse of the market (12 units in 2012 compared to 66 in 2011) [19]. In any case further research on national level at this topic is needed in order to obtain more robust results.

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