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BUSINESS LOGISTICS in Modern Management

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C O N T E N T

Foreword

While Croatian and worldwide economy is rising again, competition is becoming fiercer than ever. It results in managers turning direction of the company towards the additional rationalization while maintaining service and products quality levels, which is most effectively ensured through enhanced logistics activities. Significance of logistics is recognized not only on company level, but equally on national level - while global trade is increasing, percentage of logistics costs in GDP are declining due to more efficient logistics performance. Education for logistics and supply chain is becoming more widespread and innovated as well. All this changes are closely followed and supported by development of the supply chain management and logistics science.

Faculty of economics in Osijek has once more recognized contemporary tendencies by organizing 16th international scientific conference Business Logistics in Modern Management (BLMM2016). Scientist from seven European countries (Germany, United Kingdom, Poland, Bosnia and Hercegovina, Austria, Serbia and Croatia) gave significant contribution with their papers and new researches. After international review process, 17 papers were accepted for presentation at the Conference. Group of 8 selected paper will be published in special issue of journal Ekonomski vjesnik / Econview – Review of Contemporary Business, Entrepreneurship and Economic Issues, while the rest of the papers are published in this Proceedings of the 16th international scientific conference Business Logistics in Modern Management.

In first section of Proceedings papers about contemporary logistics topics are presented. The relationship between port competitiveness and its ecological impact is analyzed in first paper on example of Croatian sea port Ploče. Paper develops a framework that examines ecological impact of logistics activities and port development activities in general in order to evaluate possible competitiveness boost strategies in practical situations when there is ecologically sensitive and environmentally fragile area around the port. Second paper analyzes different types of logistics intermediaries, their classification, functions, the ways they facilitate business operations for international companies in achieving competitive advantages of business entities directly involved in the buying and selling in international trade. In further paper, author from United Kingdom addresses the contemporary challenges of logistics and supply chain education on a case of new programme development in the United Kingdom.

Second section deals with supply challenges, and starting with supply chains in the context of life cycle assessment and sustainability of pork meat in Croatia based on cradle-to-grave approach. Next paper deals with packaging issues in retail supply chains. The supply chain of medication is analyzed in third paper of this section with special emphasize on distribution of medications in the development of the healthcare system in Croatia and role of wholesalers in it.

Finally, Proceedings finishes with section on retail logistics. New points in the formation of retail business units and distribution channels are presented in first paper of this section based on the disharmonies in a quantitative development of retail capacities (sale area) and the economic results achieved in the overall national

economy of the Republic of Croatia. Following paper deals with dynamic pricing as future of retail business by investigating effects of dynamic pricing in retail industry. Last paper analyzes intensifying of competition and dominant position impact of large retailers in relation to manufacturers

Further sustainable development of BLMM2016 Conference is confirmed through guest appearance of our keynote speaker, distinguished professor Alexander Hübner from Catholic University of Eichstätt-Ingolstadt, who will talk about development stages and opportunities to grow of end-to-end retail supply chain management.

Our appreciation goes to all participants of the Conference, to Ministry of Science, Education and Sports of Republic of Croatia, and to Faculty of Economics for its support. And finally we would like to express our sincere gratitude to international review committee, editorial board and to all authors who have contributed to BLMM2016 Conference.

In Osijek, 13 October, 2016.

Davor Dujak

I. CONTEMPORARY LOGISTICS TOPICS

PORT COMPETITIVENESS AND ECOLOGICAL IMPACT OF LOGISTICS ACTIVITIES: A CASE STUDY OF THE PORT OF PLOČE

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Abstract

From the historical perspective the port competitiveness was often strongly determined by the geographical position of the port itself as well as the natural conditions of its surrounding. It is logical if we take into consideration that the port location is static while the port needs to be a connector of the inland and maritime transport routes, and it needs to have favourable maritime conditions in order to effectively serve ships and cargo. From such a perspective, the ecological specificities and biodiversity of the surrounding area can be perceived as a negative development factor that can significantly limit and/or reduce potential for competitiveness development. From the methodology point of view this paper develops a framework that examines ecological impact of logistics activities and port development activities in general in order to evaluate possible competitiveness boost strategies in practical situations when there is ecologically sensitive and environmentally fragile area around the port. Authors are trying to shed some light onto modern approach toward port competitiveness and logistics operations that aims to harmonise and reconcile the requirements of ecological protection with modern port development directions towards competitiveness boost. Such development direction can be founded on the idea that modern technological and social and economic development enables port authorities as well as ports' top management to take into account much wider ecological perspective in order to improve logistics services, attract more cargo as well as future investors in the port infra and superstructure.

Key words: port competitiveness, ecological impact, logistic activities, development directions

This paper has been produced on the basis of the research conducted for the realisation of the project "Technical Assistance to Port of Ploče Authority to Improve Efficiency and Competitiveness on Rail Corridor Vc and the competitiveness of the port of Ploče" in 2015.

1. INTRODUCTION

This paper develops a framework that examines ecological impact of logistics activities and port development activities in general in order to evaluate possible competitiveness boost strategies in practical situations when there is ecologically sensitive and environmentally fragile area around the port. Special attention needs to be payed to harmonize port competitiveness development directions with environmental restrictions while the latter can also be used as a factor that can possibly additionally stimulate port growth. This research was modeled on the case study basis, investigation the complex situation around on of the main Croatian cargo ports – the port of Ploče. The case study analyzes the port system of the port of Ploče in its direct connections with surrounding micro area and indirect connections with national, European as well as global environmental regulation and institutional framework.

The port of Ploče is situated at the Central Adriatic coast line (precisely situated on the eastern coast of the Adriatic Sea on the location of 43˚03 'N and 17˚26' E), approximately 120 km south from the city of Split and 100 km North from Dubrovnik. The ports central-Adriatic location, as well as its position in the south of Croatia leads to an international hinterland, covering the Dalmatic Coast line as well as Bosnia and Herzegovina, Serbia, Montenegro and Hungary. The port of Ploče is of great importance for the national economy as well as for the neighbouring Bosnia and Herzegovina as a result of its specific positioning. The Bosnian border is only 25 km from the port of Ploče and the port can also play a significant role for partners from Serbia and Montenegro, Hungary and other Central European countries.

The port of Ploče is directly connected with its hinterland in Bosnia and Herzegovina through a 24 km railway line and road, further to the north-eastern part of Croatia, and to Central Europe by rail and road. That extends along the route of the C branch (Budapest - Osijek - Sarajevo-Ploče) of the Pan-European Corridor V (Venice - Trieste - Budapest - Uzhgorod - Lviv). Through a 24 km railway line and road, the port is linked with its immediate hinterland of and further to the North-East of Croatia and Central Europe. It is the start/end point of the Corridor Vc (Budapest-Osijek-Sarajevo-Ploče) (Rak et al., 2016).

2. SITUATIONAL ANALYSIS AND BUSINESS POLICY CONTEXT

The EU is highly dependent on seaports for trade with the rest of the world and within its Internal Market: 74% of goods exchanged (imported and exported) with the rest of the world and about 37% of exchanges among EU Member States transit through seaports (Pastori, 2015). According to Pastori (2015) European ports guarantee territorial continuity of the EU by servicing regional and local maritime

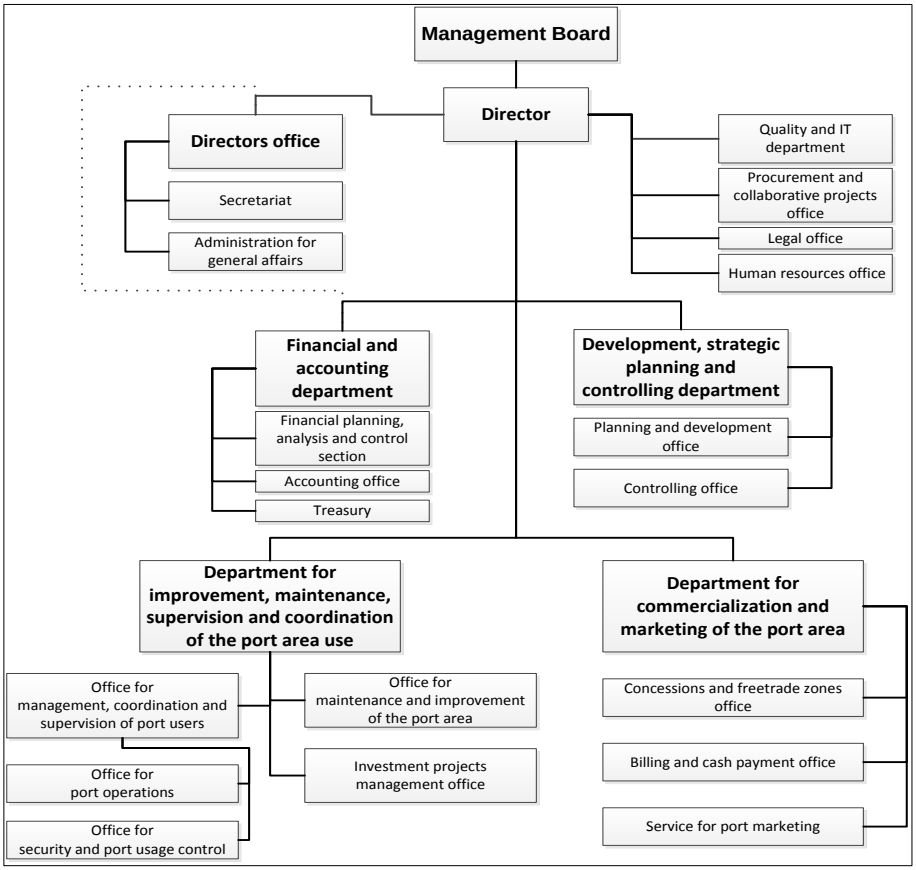
traffic to link peripheral and island areas and they are the nodes from where the multimodal logistic flows of the trans-European network can be organised, using Short Sea Shipping, rail and inland waterways links to minimise road congestion and energy consumption.

From the perspective of local economy the port of Ploče is essential for job creation given its tradition and limited development of neighbouring SMEs not related to port. There is still present a valuable and strong aspiration towards strengthening of local and regional competitiveness improvements and economic growth, but also a high level of concern about environmental issues in development process and especially potential impacts of industrial development. Ploče Port Authority as well as other port community members share a focus of development continuity with the local population and public authorities in order to improve quality of life and boost employment on local job market.

Through years the port of Ploče has become valuable fundament of employment in the local community and probably it will be even increasingly attractive as active investments are finalised and put in operation.

The Ploče Port Authority as a public entity devoted to operation under national public policies, currently employes 35 people (Rak et al., 2016) with the organisational structure illustrated on the following Figure.

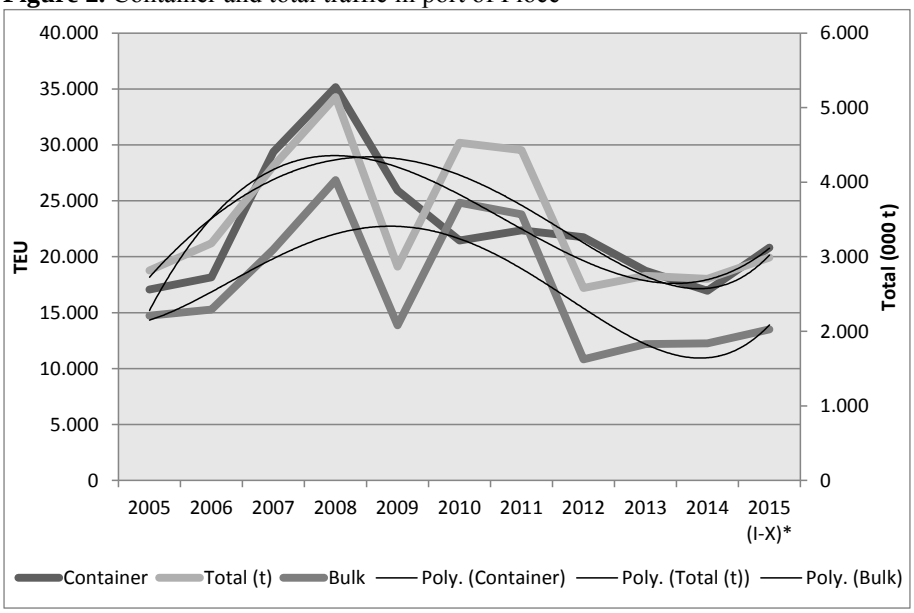
Figure 1. Port of Ploče governance organisational model and structure



Source: Authors based on data from Ploče Port Authority

From the policy perspective and situational analysis it is important to analyse the traffic achievements in port of Ploče based on most significant types of cargo – total traffic, bulk cargo and containers. The graphic representation and polynomic trend lines are shown on the following figure.

Figure 2. Container and total traffic in port of Ploče

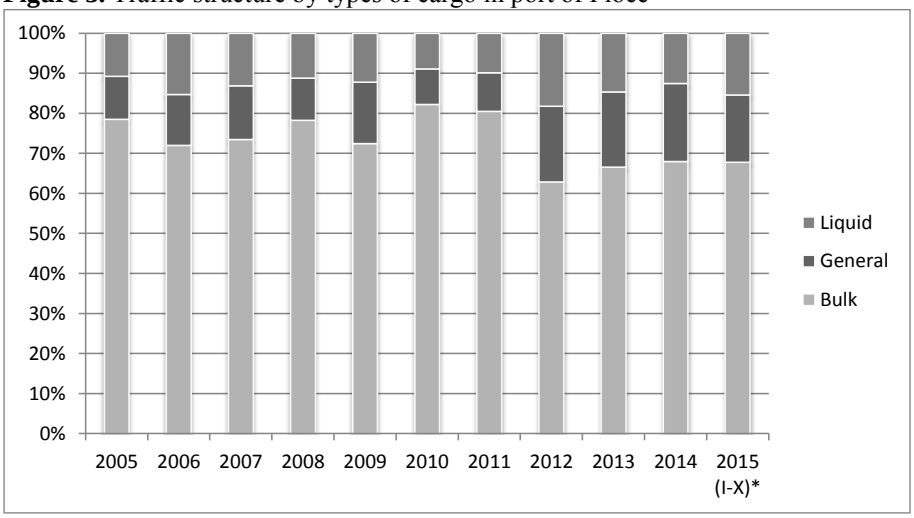


Legend: * Data for 2015 is estimated based on actual traffic achievements for the period I-X/2015
Source: Authors based on data from Ploče Port Authority

It can be seen that the actual movement of the total traffic follows the trend of bulk cargo traffic, obviously as a result of the domination of bulk cargo in the structure of the total cargo. In 2014, realisation of total traffic and traffic of bulk cargo are somewhat below the achievements from a decade earlier – from 2005, with indications of a slow recovery process after the crisis years following 2008 and that have strongly shaken the global traffic flows as well as the realization in the port of Ploče. Level of container traffic in 2014 is almost the same as it was in 2005 but results for Q1-Q3/2015 (17.354 TEU) are showing a sign of recovery in a sense that the final result in 2015 outreached the achievements from 2006 and was close to 2007 container traffic realisation. Polynomic trend lines represented on the figure above are also showing a notice of recovery that is very valuable to further port growth and development in the shade of active investments.

The structure of the traffic by main type groups of the cargo is shown on the following Figure.

Figure 3. Traffic structure by types of cargo in port of Ploče



Legend: * Data for 2015 is estimated based on actual traffic achievements for the period I-X/2015
Source: Authors based on data from Ploče Port Authority

In comparison between 2005 and 2014 it is evident that nowadays there is a bigger share of liquid and general cargo in total cargo volumes with lover share of dry bulk cargo. It is not so much a result of increase of liquid and general cargo (although it is important to emphasise that the general cargo has increased for 75% in the period), as is the reason of decline of bulk cargo (- 4%) as a dominant type of cargo in total cargo volumes. All those transport end economic production aspects are significantly influencing further strategic development directions of the port of Ploče, especially taking into account intensive investment cycle in the port infrastructure in recent years. Based on performed analysis it can be concluded that there is still a plenty of room for further improvements and business growth, but in order to adequately plan the development process multiple environmental aspects that play a significant role in that process need to be considered.

3. ENVIRONMENTAL ANALYSIS AND ECOLOGICAL IMPACT ON PORT DEVELOPMENT

The port of Ploče faces up to its ecological obligations and responsibility in the community. By following feasible environmental standards the port can be devoted to actively promote technological solutions and organisational concepts oriented on the long run sustainable development with the environmental issues included in the top priorities.

It is strategically smart that new technological and organisational approaches are applied targeting "green" orientation in order to help the port live its business life and

develops its competitive strengths in a fruitful symbiosis with the surrounding population, the city and the region.

3.1. The Ramsar Convention and influence on port development directions

It is particularly important to stress out the relationship of the port of Ploče with its local surroundings. The port should recognize the close collaboration with the local environment as a major priority in all of its development directions. All planned investments need to pass thorough environmental impact studies in order to be eligible for continuation and implementation. This is particularly important because the port of Ploče is situated beside the Neretva River Delta which is one of the five Ramsar sites in Croatia, occupying 14% (12.742 Ha of 94.358 Ha) of total Croatian wetlands area included into the List of Wetlands of International Importance (Ramsar List) by the Convention on Wetlands of International Importance, especially as Waterfowl Habitat (Ramsar Convention). It is an international treaty for the conservation and sustainable utilization of wetlands, recognizing the fundamental ecological functions of wetlands and their economic, cultural, scientific, and recreational value that was signed in 1971 and amended in 1982 and 1987 (Ramsar Convention Secretariat, 2013). Ramsar Convention came into force in 1975 (Kellogg Brown & Root, 2010) and since then almost 90% of UN member states from all over the world (including Croatia) have acceded to become Contracting Parties.

The Convention's mission is "the conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world" (Ramsar Convention Secretariat, 2013). The reason for this mission is that wetlands are among the most diverse and productive ecosystems and they provide essential services and supply all fresh water but they continue to be degraded and converted to other uses. One of the main reasons for that from the port infrastructure point of view is that wetlands is relatively shallow and very often situated in lowland areas near the sea that is relatively often suitable for building port infrastructure. So, special attention needs to be paid to preservation in harmonic relationship with port development and especially port growth, especially taking into account port infrastructure.

The Ramsar Convention Secretariat (2013) helped in the modelling the crucial development relationships between wetlands and their business surrounding in a sense of:

- Strengthening economic knowledge and understanding through contribution to better understanding of the economic value and importance of all types of wetlands.
- Advising investors and private companies through sharing knowledge and making recommendations via different sustainable development platforms, as well as work with individual companies on their water and wetland policies.
- Advising governments through providing tailored advice and offering broad support to inter-governmental meetings, to explain the value and importance of wetlands in the context of economic planning and development and to identify opportunities for possible win-win arrangements and partnerships.

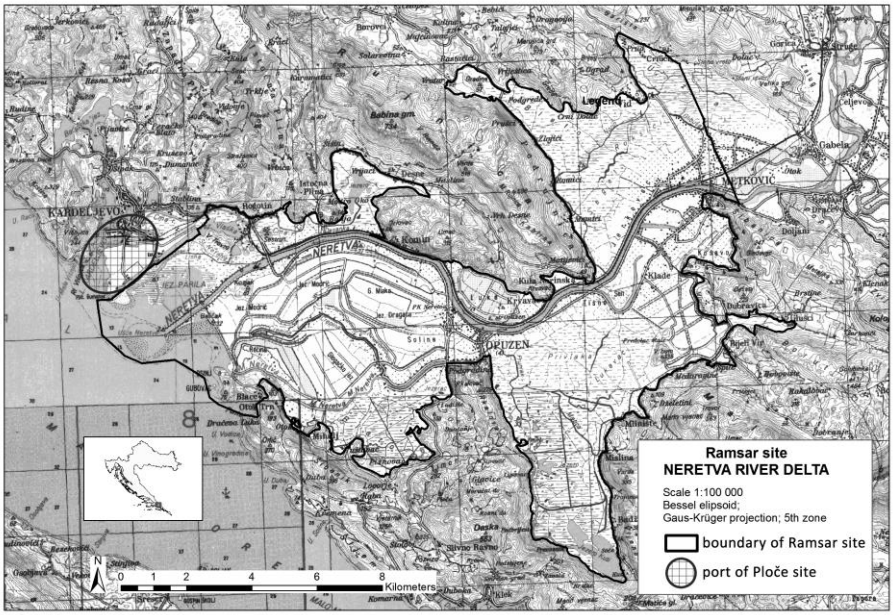
- Stimulating and supporting public-private partnerships through several deep collaborations between the private and public stakeholders and governing bodies that can significantly contribute to the economic vibrancy of respective region.
- Improving regional cooperation between a wide range of public, private as well as NGOs stakeholders through realisation of different activities and projects geared towards the fulfilment of the main goals of the Ramsar Convention.
- Developing and maintaining diverse global network of partners, ranging from formal collaborators on Convention implementation and organizations engaged in sustainable development and biodiversity to prominent private companies and NGOs.

For Neretva River Delta to become one of the Ramsar sites (Ramsar Convention Secretariat, 2013) the following nine main criteria for identifying Wetlands of International Importance are important and the respective site needs to:

1. Contain a representative, rare, or unique example of a natural or near-natural wetland type found within the appropriate biogeographic region;
2. Support vulnerable, endangered, or critically endangered species or threatened ecological communities;
3. Support populations of plant and/or animal species important for maintaining the biological diversity of a particular biogeographic region;
4. Support plant and/or animal species at a critical stage in their life cycles, or provides refuge during adverse conditions;
5. Regularly support 20,000 or more water birds;
6. Regularly support 1% of the individuals in a population of one species or subspecies of water bird;
7. Support a significant proportion of indigenous fish subspecies, species or families, life-history stages, species interactions and/or populations that are representative of wetland benefits and/or values and thereby contributes to global biological diversity;
8. Be important source of food for fishes, spawning ground, nursery and/or migration path on which fish stocks, either within the wetland or elsewhere, depend;
9. Regularly support 1% of the individuals in a population of one species or subspecies of wetland-dependent non-avian animal species.

The strong interrelation between port of Ploče and Neretva River Delta as one of the Ramsar sites is very tight and inseparable as it can be seen on the following figure.

Figure 4. Positioning and interrelation between port of Ploče and Neretva River Delta as the Ramsar site



Source: Authors based on the original map from Ramsar Sites Information Service (2016) [available at: https://rsis.ramsar.org access June 1, 2016]

Such a geographical position of the port of Ploče determines that it must incorporate all the ecological aspects of the Neretva River Delta and respective Ramsar convention into development of its strategic planning and it should take into consideration all the environmental as well as social impacts of its business and logistics operations (Naim, 2006; Vilke et al., 2015; The World Bank, 2007).

The convention has three main pillars that contracting parties should commit to, especially to work towards the wise use of all their wetlands, designate suitable wetlands for the Ramsar List and ensure their effective management and cooperate internationally on transboundary wetlands, shared wetland systems and shared species (Kellogg Brown & Root, 2010). In the light of Ramsar Convention it is very important for the port of Ploče to be focused on green and sustainable development in harmonised cooperation with local community. This ecological aspects represents a significant restricting factor, but it is important to understand it as "restricting", but not "limiting" factor. Restrictions are present and their economic impact have to be calculated and taken into account in business development modelling and planning, but positive aspects of environmentally respective business conduct of the port itself, especially its management and governance system, can significantly overpower negative restrictions. Environmentally friendly business conduct can be perceived as a strong "magnet" for future investors as well as a significant social responsibility multiplicative factor in a sense that it can provide higher level of certainty to all

stakeholders, especially local citizens as well as general public, that port management always take into consideration environmental impact of its business operations.

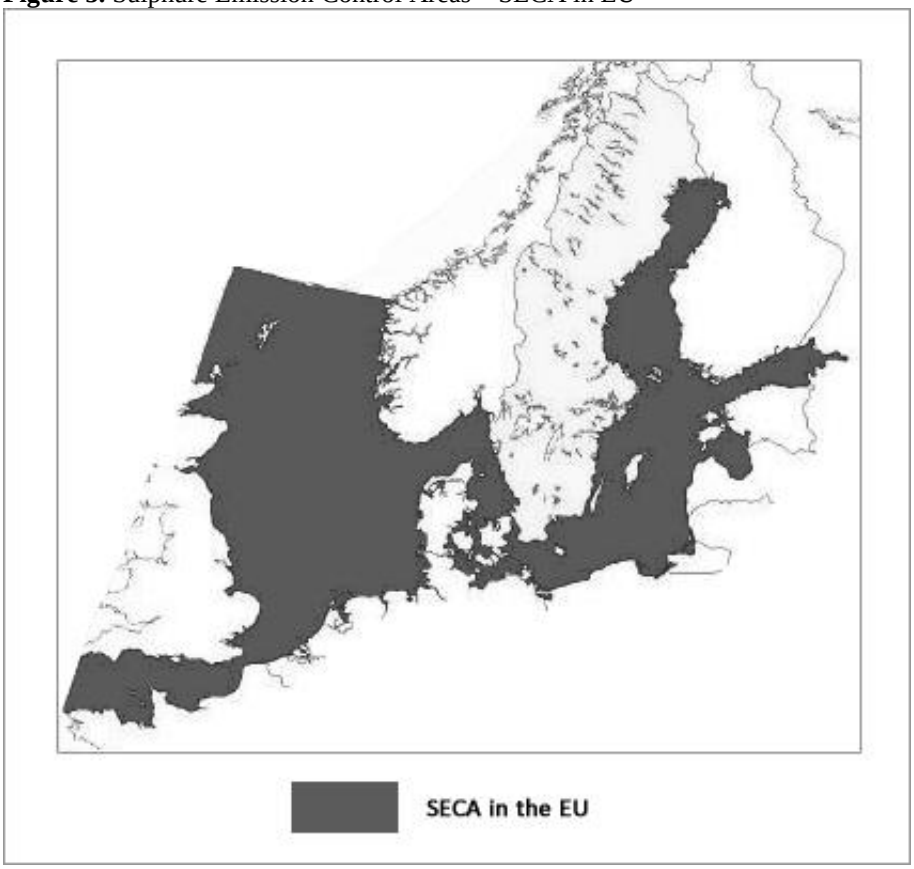
3.2. Port Development in the Framework of Emission Control Areas

Environmental and ecological preservation activities are very prominent also on the international public policy agenda, so it is important for the port to proactively fit in it. This is also one of the dominant themes on the EU policy level as emissions from maritime transport have increasingly affected air quality in the EU, mainly as a result of emissions of air pollutants like sulphur dioxide that can travel long distances. Following the official EU policy point of view, sulphur dioxide emissions cause acid rain and generate fine dust that is dangerous for human health, causing respiratory and cardiovascular diseases reducing life expectancy in the EU by up to two years.

The global idea and concern that emissions from maritime transport increasingly affects air quality is institutionalised through the establishment of the so called Emission Control Areas (ECAs), established under MARPOL Annex VI (Regulations for the Prevention of Air Pollution from Ships) for Sulphur Oxides for the following areas: the Baltic Sea area, the North Sea area, the North American area (covering designated coastal areas off the United States and Canada) and the United States Caribbean Sea area (around Puerto Rico and the United States Virgin Islands) (International Maritime Organization, 1973, 2014).

Such an issue influenced that as of beginning of 2015 EU Member States have to ensure that ships in the Baltic, the North Sea and the English Channel are using fuels with a sulphur content of no more than 0.10% (EU Directive 2012/33/EU). There is established the so called Sulphur Emission Control Area (SECA) and on the following figure it is represented on the EU level. The SECA regulation allows the higher sulphur contents and they are still possible, but only if the appropriate exhaust cleaning systems are in place, so it produce additional costs.

Figure 5. Sulphure Emission Control Areas – SECA in EU



Source: Authors based on Swedish Maritime Administration (2009)

Presently the port of Ploče is not geographically inclusive in the SECA (Swedish Maritime Administration, 2009) but this can be perceived as a significant price competitiveness factor for modern port development. Nevertheless, it is important to stress out that outside the emission control areas, the current limit for sulphur content of fuel oil is 3.50%, falling to 0.50% m/m on and after 1/1/2020, but this date is subject to a review to be completed by 2018, as to the availability of the required fuel oil, and depending on the outcome of the review this date could be deferred to the beginning of 2025 (International Maritime Organization, 2014).

The SECA regulation can be seen as a kind of twist competition factor. The regulation requires the use of low-sulphur ship fuels only for the SECA so it does not apply to the Mediterranean nor Adriatic Sea in the context of port of Ploče. So in non-SECA fuels with a higher share of sulphur content may be used and such fuel is less costly so this present a risk of weakening marine traffic in the SECA and boost the same in non-SECA. Off course, this is not desirable, especially from the macroeconomic perspective, but it can be competitive advantage for the ports

positioned in the non-SECA. Such a competitive advantage (Kesić & Debelić, 2014) can be considered only on the short run because each modern port that wants to be feasible and successful, and especially the port of Ploče, needs to be environmentally friendly on the long run. Beside the mention need for long run "green" orientation, the port of Ploče is devoted to and wants to be environmentally sensitive because it is a part of approach in its surrounding community. General development tendencies should include more orientation to environmental protection issues and energy efficiency as well as sustainable energy orientation.

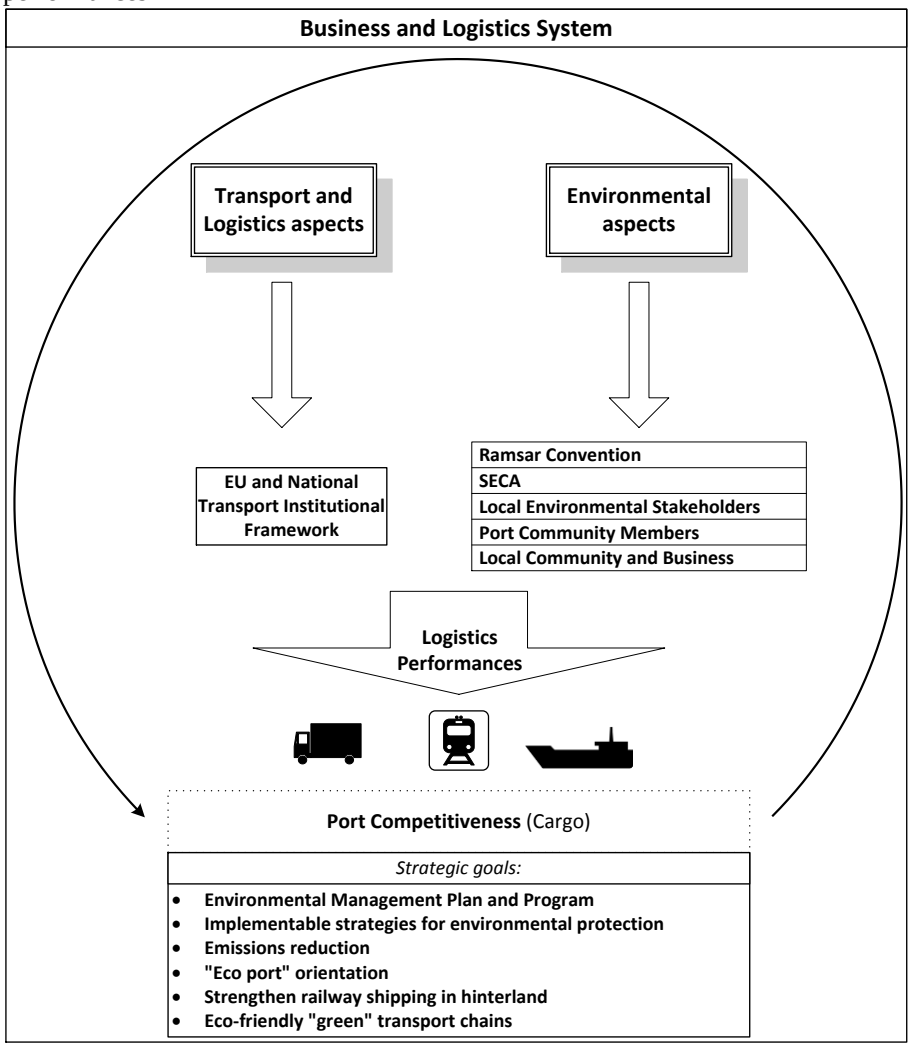
4. ECOLOGICAL IMPACT OF OPERATIONS AND LOGISTICS ACTIVITIES ON PORT COMPETITIVNESS

In order to establish and strengthen the dialog with its surrounding subjects regarding port logistics activities in conjunction with previously elaborated environmental aspects the port should:

- prepare Environmental Management Plan and Program,
- develop and follow environmental protection goals and seek implementable strategies for achievement of those,
- reduce emissions from terminals and industrial plants if feasible,
- be focused on the activities that will make the port being eligible to be so called "eco port" in partnership with its surrounding,
- be focused on and strengthen the railway shipping in the hinterland,
- be prepared to stimulate eco-friendly "green" transport chains.

This approach can be modelled as it is illustrated on the following figure.

Figure 6. Port Competitiveness and environmental aspects of business logistics performances



Source: Authors

Main aims that can be expected to be achieved with such an orientation, that could help the port become trustworthy in a wider ecological sense, are those that will stimulate public acceptance of the port and improve quality of service (Bendeković et al., 2010) as well as attract competitive entrepreneurs and firms as well as better human resources.

Port of Ploče Authority needs to be fully devoted to the principles of sustainable development and long term strategical planning in accordance with the "green development" principle. They should plan to operate and further develop the port system including all terminals and pools in the following years in accordance with

environmentally friendly and ecologically responsible way which thus ensures sustainable growth and long term viability.

The relationship of the port of Ploče with its local surroundings is of special importance for achieve integrated development harmonised with the local community expectations as well as requirements for smart and green competitiveness boost.

Such port positioning requires that the port of Ploče development should be based upon the wise use and effective management of wetlands, recognising international cooperation as a significant instrument to achieve macro goals while in the same time paying attention to the satisfaction of micro ecological and social requirements and proactive dialogue with the local community.

One of the major challenges of the port will be development and maintenance of port services (Boughton, 2003; Barad & Sapir, 2003; Ishfaq, 2012) and operations in/near an urbanised environment, city of Ploče. A special attention and concern for port of Ploče is urban environment due to the potential impact on local way of life that can potentially occur with cargo-related development activities.

The requirement emphasised in this paper is the strategic planning and development approach that is required to minimise potential conflict, and which is multidimensional by nature, so it should consider especially:

- suitability of land use;
- smart and proactive planning of investment activities alongside identification of future freight requirements;
- continuous deliberation and public orientation in dissemination process as It is much more effective to avoid possible conflicts in the first place than to attempt to resolve issues and minimise impacts once they occur.

It is important that the Environmental Management Plan and Program are prepared in a way that can identify the potential environmental impacts during operations, and feasible measures to address these potential impacts. It should be developed as a solid management framework and special "tool" oriented towards prevention.

Community awareness is crucial for engagement opportunities, and community support is needed in order to harmonize development of the port system in conjunction with its surrounding. On the long run it is the only feasible way so port of Ploče should pay special attention to that and should put the common development success goals high on the priority list. This should be performed in order to continue and even intensify the communication and dissemination channels with the community in order to share information regarding port activities and integral business development.

5. DISCUSSION ON LUKA PLOČE WITHIN SMART AND GREEN PORT DEVELOPMENT PHILOSOPHY

Looking from the global perspective in today modern business environment the fundamental and traditional transport function of the port is modified and upgraded so the ports are becoming more and more the centres of trade and logistics (Chow, 1994; Caplice & Sheffi, 1995; Rutner & Langley, 2000) on national and even on international level. In addition to being strategic points in the transportation activities,

they became a modern complex distribution centres (Bendeković & Aržek, 2008). So, the fundamental competitiveness factors in today's modern transport market are added value creation oriented facilities, equipment, and services based on integrated price and quality policies focused on competitiveness boost along the transport route and not only within the port boundaries. The total transport price and quality of service is the one that count for total business success. Port development in a perspective of modern distribution and logistics centres immanently implies parallel and simultaneous development of multimodal transport routes along the transport chains taking into account environmental standards and using ecological diversity and complexity as a development factor to improve its own competitiveness. On the first sight it is contradictory that something that presents a limitation in building and operating new infrastructure as well as superstructure can be seen as development factor. But in modern business logistics such limitation can be transformed into advantage, especially considering the point of view of modern "green" public policies that are often favourable towards infrastructure and transport development that specially cares about ecological aspects. In addition, such "smart and green port development orientation" represents a possible development factor that will attract socially responsible entrepreneurship initiatives and investors in order to fully utilize such a direction towards competitiveness development of the port itself as well as logistics network in its surroundings, especially in the hinterland.

Researches also confirm such a premise that controlled and properly directed sustainable development of the port systems must be based on an integrated strategic orientation and a common policy of all port community members and stakeholders (Debelić et al., 2015). They need to be proactive (Debelić, 2013) in the modern turbulent business environment in terms of modernization and construction of port facilities as well as provision of quality based port and logistics services.

Port of Ploče has a significant and still not fully used potential for developing (widening) its gravitational zone and the markets itself, in accordance with the analysis and by following business development targets and actions analysed in this paper. Fundaments for enhancing the traffic, in a narrow sense, and improving general business achievements, in a broader sense, of port of Ploče are founded on three main development pillars: human resources, infrastructure and organisation. It is evident that physical barriers for further development are present, but they are not crucial. The crucial ones are non-physical barriers that need to be overcome and "soft" managerial and organisational measures that need to be implemented in order to boost business performances of the port of Ploče. In that sense port of Ploče (its position and development opportunities) has great potential for full inclusion into European traffic flows while fulfilling main goals determined by EU transport policies, national policies as well as international environmental standards. An essential prerequisite is, however, improvement of logistic transport chains through parallel green and sustainable orientation of the port to allow the development of the port of Ploče as a hub not only for BiH market, but also for Central and Eastern Europe. There is a significant potential for both – traffic as well as quality of service growth, providing the basis for competitiveness strengthening of all development factors within the port system and port community itself, but also on the entire transport route as an integral part of modern TEN-T network (European Commission, 2015; Raballand et al., 2008).

One of the main sustainable development objectives of the port of Ploče, regarding environmental awareness, should be to harmonise the port development with the surrounding economy bearing in mind ecology and society. The key factor of success is co-operation, not only on commercial basis, but also on general social bassis aiming achievement of medium as well as long term social goals. The development policies should therefore be focused on strengthening the port growth through quantitative as well as qualitative measures seeking job generation and taking into account sustainability requirements and customer orientation on the long run.

6. CONCLUSION

In the modern transport market the essential competitiveness factors are added value creation oriented facilities, equipment, and services based on integrated price and quality policies. Stated factors are focused on competitiveness boost along the transport route and not only within the port boundaries. In order to improve its own competitiveness, port development immanently implies parallel and simultaneous development of multimodal transport routes along the transport chains taking into account environmental standards, ecological diversity as well as complexity.

Port of Ploče has a significant and still not fully used potential for developing (widening) it’s gravitational zone and the market itself. Three main elements for development and improvement of the traffic, in a narrow sense, and general business achievements, in a broader sense are human resources, infrastructure and organisation. While fulfilling the main goals determined by EU transport policies, national policies as well as international environmental standards, Port of Ploče has great potential for full inclusion into European traffic flows considering its position and competitiveness boost opportunities. Improvements of logistic transport chains, through parallel green and sustainable orientation of the port, are essential prerequisite for development of the port of Ploče as a hub port not only for BiH market, but also for Central and Eastern Europe. There is a significant potential for traffic growth as well as development and improvement of quality of service, providing the basis for competitiveness strengthening of all development factors within the port system and port community itself, but also on the entire transport route as an integral part of modern TEN-T network.

Relationship of the port of Ploče with its local surroundings is of particular importance and needs special attention in order to achieve integrated port development harmonised with the local community expectations as well as requirements for smart and green competitiveness boost. The key factor of success is stakeholders' co-operation, not only on commercial basis, but also on general social basis aiming achievement of medium as well as long term social goals. Port of Ploče should promote technological solutions and organisational concepts focused, in the long run, on sustainable development with the environmental issues included in its top strategical priorities.

Considering previously elaborated port stakeholders cooperation, the scope for the future research can adopt stakeholder analysis on three levels: port itself, transport

route and customers. Also, the social and business effects of the so-called green and smart port development orientation can be further analysed.

7. REFERENCES

Barad, M. & Even Sapir, D. (2003). Flexibility in logistic systems – modelling and performance evaluation. *International Journal of Production Economics*. 85 p. 155 – 170.

Bendeković, J. & Aržek, Z. (2008). *Transport i osiguranje*. Zagreb: Mikrorad.

Bendeković J., Jolić A. & Jolić N. (2010). Upravljanje kvalitetom lučkih usluga, *Ekonomska misao i praksa*, 1 p. 85-104.

Boughton, R.F. (2003). Addressing the escalating cost of road transport. *Logistics and Transport Focus*, 5 (3) p. 36 – 43.

Caplice, C. & Sheffi, Y. (1995). A Review and Evaluation of Logistics Performance Measurement Systems. *The International Journal of Logistics Management*, 6 (1) p. 61-74.

Chow, G., Heaver, T. D. & Henriksson, L. E. (1994). Logistics Performance. *International Journal of Physical Distribution & Logistics Management*, 24 (1) p. 17 – 28.

Debelić, B., Grubišić, N. & Milanović, S. (2015). *The Cost and Non-cost Conditionality of Transport Corridor Logistics Performances as Determinant of Port Competitiveness*, Proceedings of International Scientific Conference: Business Logistics in Modern Management, Faculty of Economics in Osijek.

Debelić, B. (2013). Agency Theory and a Concession Relation in Ports Open to Public Traffic in the Function of Empowerment of Entrepreneurial Initiatives, *Pomorstvo – Scientific Journal of Maritime Research.* 27(1), p. 225-246.

European Commission (2015). Trans-European Transport Network TENTEC [available at: http://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/site/index_en.htm , access September 18, 2015]

EU Directive 2012/33/EU of the European Parliament and of the Council, Official Journal of the European Union L 327 (2012).

Ishfaq, R. (2012). Resilience through flexibility in transportation operations. *International Journal of Logistics Research and Applications*. 15 p. 215 – 229.

Kellogg Brown & Root (2010). *Western Port Ramsar Wetland Ecological Character Description*. Report for Department of Sustainability, Environment, Water, Population and Communities, Canberra.

Kesić, B. & Debelić, B. (2014). Konkurentske mogućnosti i ograničenja razvoja lučkog sustava Republike Hrvatske, Konkurentnost, ekonomski rast i blagostanje, Sveučilište J.J. Strossmayera u Osijeku, Ekonomski fakultet u Osijeku.

International Maritime Organization (1973). *MARPOL* [available at: http://www.imo.org access June 8, 2016]

International Maritime Organization (2014). *Sulphur limits in emission control areas from 1 January 2015*[available at: http://www.imo.org access June 8, 2016]

Naim M. M., Potter, A. T., Mason R. J. & Bateman, N. (2006). The role of transport flexibility in logistics provision. *The International Journal of Logistics Management*. 17 (3) p. 297 – 311.

Pastori, E. (2015). Modal Share of Freight Transport To and From EU Ports, EU DG for Internal Policies, Brussels.

Ploče Port Authority (2015). Data received and interviews performed with Ploče Port Authority during the realisation of the project "Technical Assistance to Port of Ploče Authority to Improve Efficiency and Competitiveness on Rail Corridor Vc and the competitiveness of the port of Ploče"

Raballand G., et al. (2008). *Lessons of Corridor Performance Measurement*, SSATP, Discussion Paper No.7, Regional Integration and Transport – RIT Series.

Rak, L., Debelić, B. & Vilke, S. (2016). Modelling the railway port infrastructure management system: a case study of the Port of Ploče, Pomorstvo – Scientific Journal of Maritime Research. 30, 1., p. 88-94.

Ramsar Convention Secretariat (2013). The Ramsar Convention Manual: a guide to the Convention on Wetlands (Ramsar, Iran, 1971), 6th ed. Ramsar Convention Secretariat, Gland, Switzerland.

Ramsar Sites Information Service (2016) [available at: https://rsis.ramsar.org access June 1, 2016]

Rutner, S. M. & Langley, C. J. (2000). Logistics Value: Definition, Process and Measurement, *The International Journal of Logistics Management*. 11 (2) p. 73 – 82.

Swedish Maritime Administration (2009). *Consequences of the IMO's New Marine Fuel Sulphur Regulations*. Norrköping.

The World Bank (2007). *Port reform toolkit, 2nd Edition*, Modules 1-8.

Vilke, S., Debelić, B. & Maglić, L. (2015). *Road network linking the sea port as a vital transport factor determining its successful hinterland interconnection. Factors determining they primary and secondary role in the case of the port of Ploče*, Proceedings of The 16th Annual General Assembly of the International Association of Maritime Universities, Opatija, 7 – 10 October, 2015., 371 – 375.

THE ROLE OF LOGISTICS SERVICE PROVIDERS IN INTERNATIONAL TRADE

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Abstract

Logistics service providers are an important factor in the business success of companies engaged in trade activities at national and international level. They play an important role in achieving competitive advantages of business entities directly involved in the buying and selling in international trade. The main objective of engaging logistics intermediaries, such as logistics service providers, is to facilitate the operation of companies that deal with the buying and selling at international level in regards to the organization of shipment and / or delivery of goods. As the business processes and business entities in international trade are becoming more complex, it is becoming increasingly difficult to manage all of the activities on one's own. Logistics intermediaries are, on the other hand, qualified to manage certain areas of business operations.

Logistics intermediaries come in different forms and under different names, but they all have the same goal: to provide help to companies in the transportation, storage, shipment and the distribution of goods from the seller to the buyer or the final consumer, of course, for a certain fee. This research revolves around logistics intermediaries in international trade such as international freight forwarders, 3PL, 4PL or LLP. The objective of this paper is to, based on the analysis of the different types of logistics intermediaries, their classification, functions, the ways they facilitate business operations for international companies, indicate the benefits of their engagement and the differences and similarities among them.

Key words: international trade, intermediaries, international freight forwarders, logistics service providers

1. INTRODUCTION

Logistics is one of the most essential parts in companies' operations whether at national or international level. Namely, it is becoming quite difficult to manage all of the activities now that the companies are becoming larger and larger on international scale. On the other hand, intermediaries are qualified to manage specific fields of the business and even though, intermediaries come in different forms and under different names around the globe, they all have the same main objective: to help the companies arrange the transport, warehousing, shipping, distribution of goods and services from the company to the end consumer. The main goal of hiring logistics intermediaries is to facilitate the companies' operations related to the shipment and / or delivery of goods whether nationally and internationally.

The aim of this paper is to analyse the different types of logistics service providers/intermediaries, the manners in which they are classified, their functions, the way in which they facilitate the business operations for international companies and most importantly, their influence the international trade. The goal of the paper is to analyse the most important logistics service providers/intermediaries and to clearly identify their tasks and goals.

In formulating and analysing the research problem, the authors used different combinations of scientific methods such as: the method of analysis and synthesis, the classification and comparative method, the method of induction and deduction and the method of description.

The paper is organized in five chapters. After the *Introduction*, the second chapter titled *The main characteristics of intermediaries in international trade* introduces the concept of intermediaries in international trade and their classification. In the third chapter, *Logistics intermediaries in international trade* focuses on and introduces logistics intermediaries i.e. freight forwarders, third-party logistics, fourth-party logistics and fifth-party logistics service providers whereas the forth chapter provides for the *Differences and similarities between logistics service providers*. In *Conclusion*, the synthesis and explanation of the results of this research are given based on the collected information and data.

2. THE MAIN CHARACTERISTICS OF INTERMEDIARIES IN INTERNATIONAL TRADE

An intermediary is a person or a company that acts as a mediator between different parties with the goal of achieving a certain business deal. Most commonly, intermediaries specialize in one specific field among the various logistics functions. It should be noted that the terms describing this concept have varied during time i.e. these intermediaries were also known as middleman or as facilitators. Facilitators perform a huge number of different tasks and try to improve the overall efficiency of the logistics process.

2.1. The Concept of Intermediaries

Intermediaries are very useful in situations when buyers, sellers, importers and exporters or any other participants who have a need for the international exchange of goods and/or services cannot agree or reach a deal, and things get out of hand. The intermediaries then act as a certain type of link between them. Large companies that are taking part in international business mostly rely on some types of intermediaries. Companies usually start off by doing business on the domestic market and once they reach success and accumulate the needed experience, competence and confidence they decide to spread worldwide. Very few of these companies have the knowledge, expertise and experience to commit to all of the logistics tasks on such a big global scale. This is when intermediaries and facilitators come in help. Intermediaries come in different forms or may be called by different names; they perform similar tasks but in different ways around different countries (Gourdin, 2006, p. 215).

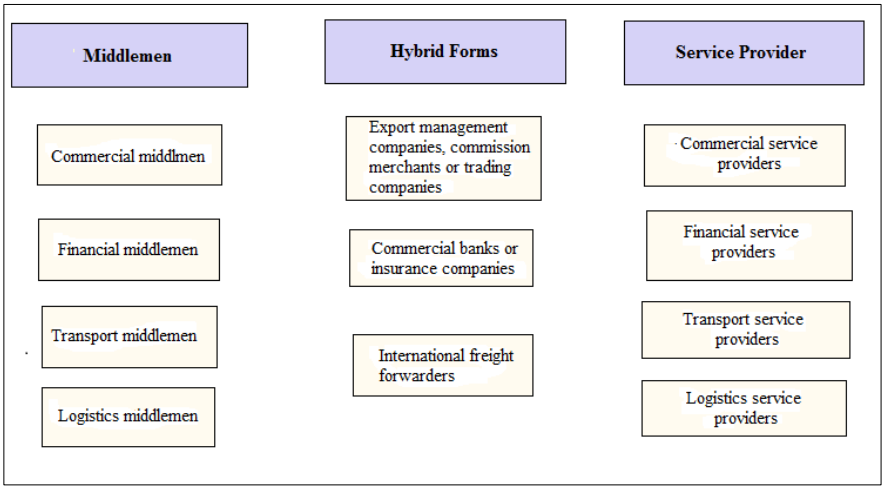
Logistics intermediaries are parties who on behalf of the companies arrange transportation, warehousing, shipping, distribution of goods and services from the producers to the final consumers. Logistics service providers (LSPs) add value to company's products. They have the expertise in performing shipping services whilst minimizing possible risks. LSPs have an important role in the company's supply chain because they dispose of all relevant information. Companies have to have confidence in their level of expertise. Once the terms middlemen and service providers have been introduced we can pass to making a distinction between different intermediaries.

2.2. Classification of Intermediaries

In the world of logistics processes, there are different classifications of logistics intermediaries. Many authors make a distinction between different types and forms of intermediaries (Schramm, 2012, Gourdin, 2006, Bloomberg et al., 2006, Waters, 2003, Hickson et al., 2008, Stefansson, 2006, Jensen, 2010). However, their classifications are almost always very similar and introduce similar roles.

The distinction between intermediaries is very important for the creation of the theoretical framework behind intermediaries. There are different types of intermediaries who have different objectives but one common goal – that of facilitating international trade of goods and services (Schramm, 2012, p. 147) Intermediaries are classified under three forms presented in the following figure.

Figure 1. Three forms of intermediaries



Source: Schramm, 2012, p. 147

According to Schramm (2012, p. 147) "*Middlemen* facilitate market transactions of goods and services as brokers or agents without holding stock or even taking title on them whereas *service providers* actually engage in these market transactions or offer means of handling, transporting, storing and warehousing of physical goods being transacted."

K.N. Gourdin (2006, p. 215-216) introduces similar but still somewhat different forms of intermediaries into the logistics world. According to his classification, the most important intermediaries included in logistics processes are: international freight forwarders, non-vessel common operating carriers, export management companies, export trading companies, export packers and customs brokers.

The most significant intermediaries in international trade, from a logistics point of view, are transport and logistics middlemen and service providers, and international freight forwarders, which Schramm defines as a hybrid form, which represent a very important link in the supply chain.

As their name would suggest, transport middlemen and service providers take care of the physical movement of goods. Transport middlemen are grouped into agents (shipper's agents for shippers, ship agents, shipping agents, IATA cargo agents) and brokers (transport brokers, ship brokers or air freight brokers), whereas, transport service providers, include trucking companies, railways, airlines and shipping companies i.e. those that actually perform the movement/transportation of goods (Schramm 2012, p. 152-153).

Logistics middlemen and service providers, unlike the transport ones, are responsible not just for the spatial movement of goods in time, but also for other related operations as well. According to Schramm (2012, p. 153) this category includes terminal operators (at seaports) and ground handlers (at airports), public or private warehouses as well as export packaging firms are also included here as they are responsible for adequate packaging and the arrangement of goods in containers

before their movement. Third-party logistics providers (3PLs) and fourth-party logistics providers (4PLs) integrate all of the above mentioned services.

On the other hand, we have international freight forwarders as a hybrid form of intermediaries as they do not just provide transport services, but also provide other logistics services, financial intermediation, etc.

3. LOGISTICS INTERMEDIARIES IN INTERNATIONAL TRADE

Intermediaries involved in logistics processes in international trade are an important link in each and every supply chain. This chapter presents the features of international freight forwarders, third-party logistics, fourth-party logistics and new party logistics, the fifth-party logistics.

3.1. International Freight Forwarders

International freight forwarders are one of the most common forms of intermediaries and are a very important link in international trade (Turner & Savitskie, 2008, Ramberg, 1998; Pavlić Skender, Grčić Fabić, 2013). Without a system of international freight forwarding, international trade and international transport could not function optimally. International freight forwarding is very important as it is incorporated in the distribution and exchange of goods thus connecting production and consumption, supply and demand (Zelenika et al., 2000, p. 1).

As they provide a wide range of services, it is rather complex to fully define them. Freight forwarders are an intermediary, organizing goods movements and providing other related services along a chain of transport and logistics operations (Schramm 2012, p. 9-10). They reduce the time and costs for their clients by finding solutions to the biggest complexities in international shipments and combining together many small shipments into a one large shipment. They actually take care of everything; selection of the mode of transport, the route, the payments, international shipping requirements and documentation. International freight forwarders are the most known and common type of logistics intermediary or facilitator. They appear in day-to-day logistics and freight forwarding business and their importance is negligible.

FIATA (International Federation of Freight Forwarders Associations) introduces a number of different functions related to freight forwarders. It defines freight forwarding services as “services of any kind relating to the carriage, consolidation, storage, handling, packing or distribution of the Goods as well as ancillary and advisory services in connection therewith, including but not limited to customs and fiscal matters, declaring the Goods for official purposes, procuring insurance of the Goods and collecting or procuring payment or documents relating to the Goods.” Later on, FIATA has expanded its definition on logistics services: “Freight Forwarding Services also include logistical services with modern information and communication technology in connection with the carriage, handling or storage of the Goods, and de facto total supply chain management. These services can be tailored to

meet the flexible application of the services provided." (FIATA, 2016, FIATA Model Rules for Freight Forwarding Services)

It can be said that freight forwarders are the "architect of transport" (FIATA 2016). They book space on all transport modes; they may own some warehousing and transport assets; they are the custodians of cargo and they collaborate with its customers and carriers, etc. (Baluch, 2006).

It is quite interesting to mention some of the most important freight forwarders on the global scale. The first ten places are held by DHL Supply Chain & Global Forwarding, Kuehne + Nagel, DB Schenker Logistics, Nippon Express, Panalpina, Sinotrans, Expeditors, SDV, DSV and CEVA Logistics (Burnson, 2015).

The main task of the international freight forwarder is to release its client of the efforts and problems of shipping, transportation and delivery of goods in international trade. Many freight forwarders have expanded their volume of services and activities and they turned into logistics operators or integrators. Some of the freight forwarders started with a small volume of business doing a handful of activities, but today they offer complete logistics solutions. According to Schramm (2012, p. 32) ''at least two new fields of activity added value to the traditional freight forwarding: an emerging segment of courier, express and parcel services and contract or third party logistics. The first grew from forwarder's traditional services with a focus on small and standardized shipments. The second seems to be a natural extension to existing transport, handling and warehousing operations of freight forwarders that lead to contract or third party logistics provision." It can be said that they have evolved into third-party logistics providers (3PLs), or even further: into fourth-party logistics providers (4PLs).

3.2. Third-party Logistics

Third-party logistics (3PL) mostly deal with basic logistics activities, and may be of huge help in developing a client's supply chain. In this way, 3PLs are included in the client's business. ''3PL have a growing importance worldwide as they enable the provision of fast pace and varied services to companies from all sectors in order to encourage them to reduce costs, to focus on their core differentiating activities and, consequently, to allow them to achieve higher levels of performance'' (Domingues et al., 2015).

Due to this, 3PLs are today the most often engaged type of intermediary. Third-party logistics service providers coordinate carriers, logistics intermediary firms, and other service suppliers. These service providers play the role of a middleman between the seller and the buyer, render transportation, warehousing services and engage in performing other services such as consolidation and deconsolidation; cross-docking; picking and packing; custom clearance; track and trace information; insurance services; payment services; tendering and contracting carriers; and forwarding services (Stefansson, 2006). 3PLs have similar duties as freight forwarders but are not limited to these.

According to the Terms and Glossary of Supply Chain Management (2008) third-party logistics provider is defined as a "firm which provides multiple logistics services for use by customers. Preferably, these services are integrated or 'bundled'

together by the provider. These firms facilitate the movement of parts and materials from suppliers to manufacturers, and finished products from manufacturers to distributors and retailers. Among the services which they provide are transportation, warehousing, cross-docking, inventory management, packaging, and freight forwarding."

Lieb and Bentz (2003, p. 24) argue that "the use of third-party logistics services is an important option to be considered by large manufacturers as they develop supply chain strategies. 3PL providers offer such companies a broad range of services, not only in the domestic marketplace, but in the international arena as well. The industry continues to evolve, and it is important to both 3PL providers and users of their services that industry dynamics be documented to facilitate the development of corporate supply chain strategy." Tezuka (2011) in his paper propose a conceptual framework for evaluating 3PL utilization in supply chain management, ''in which it is assumed that shippers may enjoy advantages derived from four contributory sources of 3PL specialization: scale, know-how, searching ability, and IT skills'' and ''that shippers may particularly benefit from 3PL when facing uncertain business environments''.

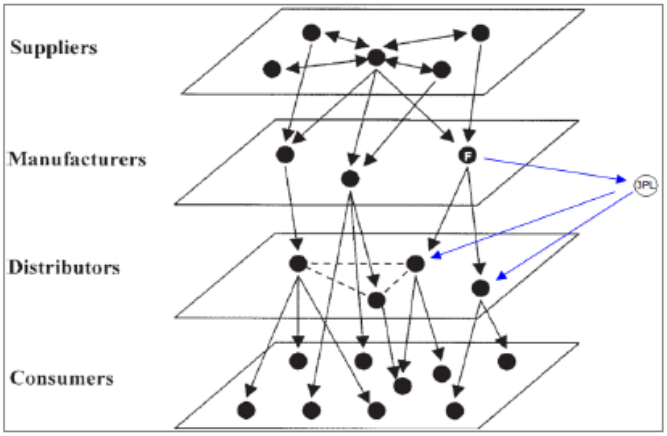
Berglund, van Laarhoven, Sharman and Wandel (1999, p. 59) define 3PLs as "activities carried out by a logistics service provider on behalf of a shipper and consisting of at least the management and execution of transportation and warehousing." The same authors say that other activities such as inventory management, information related activities like tracking and tracing, value added activities, secondary assembly and installation of products may also be included in this list. Therefore, companies tend to use the services of 3PLS because they either lack the necessary knowledge, resources, experience and/or time.

They are of help to small companies, but also to those large. When it comes to smaller companies, they may help set up supply chain relationships and in case of large companies, they may take care of large quantities of goods that are sometimes quite hard to manage. The decision on which third party logistics provider to choose depends on different factors. Some of the factors driving the company's decision are costs, offered services, infrastructure and technology, network, location, former experience by other companies in regard to 3PLs' quality and expertise and the history of their business. Costs may be viewed as the most important factor, but it should not be the only factor. The cost of a certain 3PL may be low and cost-effective, but if the services are not of a good quality or if their technology is not up to date it is not very fortunate to opt for such a provider. It is also important that the logistics service provider has a great network of relationship with other companies /clients as it may serve as a proof of their expertise, knowledge (whether it is general, technological or legal), good communication and trust.

Logistics and freight forwarding are becoming ever more demanding and this is why there is a need for an improvement in services offered by 3PLs to clients. "In order to survive, 3PLs must provide value added services that comprise a significant portion of the customer's total logistics costs. Quality, value-added service is based on consistently providing customers with ever improving solutions to their supply chain needs." (Baluch, 2006, p. 2).

3PLs are in close collaboration with the various links in the supply chain. The following figure shows the relationship network between 3PLs, suppliers, manufacturers, distributors and customers.

Figure 2. Third-party logistics relationships



Source: Camargo et al. 2012, p. 8

Suppliers offer goods and services to manufacturers for further processing. Once the manufacturer produces the goods, they are given to the distributor who distributes the products around the world to different customers. What is the role of third-party logistics provider in this example? Their main role is to receive the goods from manufacturers and organize all activities connected with delivering these goods to distributors. "If the 3PL is well connected in the market, has good and numerous relations with its pairs or is part of LSP associations, probably this company will be able to learn the best practices to improve its own business and, consequently, the role supply chain. The quality of the relationships (the strength of the tie) is important because is not always that a competitor will share its procedures and best practices to other companies" (Camargo et al., 2012, p. 9).
The services offered by 3PLs are constantly evolving and changing to meet new market conditions. The following table provides for a classification of 3PL services.

Table 1. 3PL services and activities

Logistics function	Activities
Transportation	Shipping, forwarding, (de)consolidation, contract delivery, freight bill payment, household goods relocation, load tendering, brokering.
Warehousing	Storage, receiving, assembly, return goods, marking and labelling.
Inventory management	Forecasting, location analysis, network consulting, layout design.
Order processing	Order entry, fulfilment.

Information systems	EDI/VANS, scheduling, artificial intelligence, expert systems.
Packaging	Design, recycling.

Source: Sink et al., 1996, p. 41

In 2003, the top 10 global 3PL suppliers were: Excel Plc, Kuhne & Nagel, Schenker, DHL Danzas, P&O Nedlloyd, TPG&TNT, Panalpina, UPS, Nippon Express and C.H. Robinson Worldwide. As for 2013, ten years later, the first few global 3PL suppliers are presented with their most important logistics characteristics in the following table. These 3PL suppliers are listed according to their profit, i.e. gross logistics revenue from 2013.

Table 2. The Top 10 Global 3PL in 2013

3PL Provider	Million $	Main Logistics Services
DHL Supply Chain & Global Forwarding	31.432	Number one in the efficient co-ordination and movement of freight worldwide.
Kuhne&Nagel	22.587	Strong market position lies in the sea freight, airfreight, contract logistics and overland businesses, with a clear focus on providing IT-based integrated logistics solutions.
DB Schenker Logistics	19.732	Supports industry and trade in the global exchange of goods: in land transport, worldwide air and ocean freight, contract logistics and supply chain management.
Nippon Express	17.317	Serves as your logistics consultant, providing one-stop business solutions that connect people and companies beyond national and regional boundaries, through diverse logistics modes, integrating land, air, and marine transport.
C.H. Robinson Worldwide	12.752	Helps companies simplify their global supply chains. Skilled logistics employees apply a deep knowledge of market conditions and proven processes to solve transportation problems. Integrated technology gathers data from all parts of the supply chain and provides full visibility to orders and costs.
CEVA Logistics	8.517	Providing end-to-end design, implementation and operational capabilities in freight forwarding, contract logistics, transportation management and distribution management.
DSV	8.140	Global supplier of transport and logistics solutions.
Sinotrans	7.738	China's leading domestic logistics company and offers a comprehensive range of fully-integrated services and solutions: integrated services including warehousing, order processing, long-haul

		transportation, local distribution, repacking, labelling, and other value-added services.
Panalpina	7.293	One of the world's leading providers of supply chain solutions. The company combines its core products of air freight, ocean freight, and logistics to deliver globally integrated, tailor-made end-to-end solutions.
SDV (Bollore Group)	7.263	They offer a full range of services and industry expertise. Their solutions match the complete logistics needs of importers and exporters, upstream and downstream of production: organizing transport, customs and regulatory compliance, logistics, industrial projects and supply chain services.

Source: 2013 Top 50 Global & Domestic Third-Party Logistics Providers, 2014

All of them have differences and similarities in their operations. 3PL suppliers are mainly logistics consultants that try to accomplish business and supply chain solutions for their clients. It is necessary to say that the 3PL industry has developed as a result of the ever so demanding need for advanced logistics services.

3.3. Fourth-party Logistics

It may seem that there is not much of a difference between the third-party logistics providers and fourth-party logistics providers. But, many authors say that there are a lot of differences between them (Hickson et al, 2008, p. 10, Norall, 2013). In many cases, it is said that 4PLs are superior to 3PLs. While 3PLs are mainly responsible for the logistics operations and activities, 4PLs are also responsible for the development and maintenance of all of the logistics projects. 4PLs perform the same tasks as 3PLs but in a more strategic way. They are focused on the maintenance, improvement and management of the company's supply chain. "4PLs can be considered as asset-free logistics middlemen offering expertise for the establishment and control of complex logistics systems, including logistics consulting and the organization of information infrastructure, transport, logistics as well as financial services that are needed." (Schramm, 2012, p. 154).

The 4PLs differ from 3PLs in the following ways: "1) 4PL organization is often a separate entity established as a joint venture or long-term contract between a primary client and one or more partners; 2) 4PL organization acts as a single interface between the client and multiple logistics service providers; 3) All aspects (ideally) of the client's supply chain are managed by the 4PL organization; and, 4) It is possible for a major third-party logistics provider to form a 4PL organization within its existing structure" (Supply Chain Management, 2013).

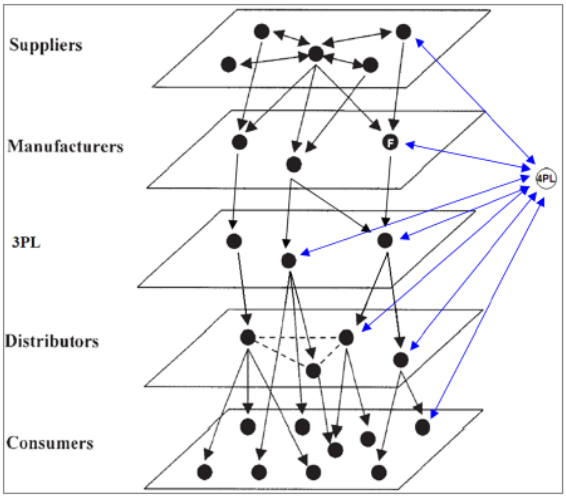
"The 4PL is a strategic activity which involves not only the management of a client's supply chain, but also the development and improvement of their supply chain strategy. 3PL service providers offer far more tactical services." (Hickson et al., 2008, p. 11). For example DHL, a well-known company explains 4PLs and their main

activities in the following way: "A successful 4PL provider is built upon a strong and effective partnership arrangement with customers to deliver value to their business, and encompass a whole range of skills and experience that they deploy to meet the needs. The services are: network analysis and design, consultancy, business planning, change management, project management, control tower and network management services, coordinating a wide supplier base across many modes and geographies, inventory planning and management, inbound, outbound and reverse logistics management." (Fourth Party Logistics, 2016).

Opposed to 3PLs, 4PLs do not own physical assets. They possess extensive technological and knowledge-based assets and manage many other intermediaries that may be involved in the logistics process (Hickson et al., 2008, p. 11).

Fourth party logistics offer much more involvement, which may be a great advantage in comparison to other intermediaries. However, this may also mean that they have much more 'control' over company's business. This may in turn lead to loss of control, disagreement, loss of own expertise in fields performed by 4PLs and as these are usually long-term relationships they are hard to break. The following figure introduces the relationships of fourth party logistics providers with suppliers, manufacturers, 3PLs, distributors and customers.

Figure 2. Fourth-party logistics relationships



Source: Camargo et al. 2012, p. 11

As can be seen, when it comes to 4PLs, and additional layer – the 3PL is added between the manufacturer and distributor layer as its services are used by the 4PLs. The 4PL interacts with all of the layers as it provides and receives outputs from all involved in this network chain. The strongest tie in this network chain is evidently between the 4PL and the focal firm – the manufacturer (Camargo et al., 2012, p. 12) as it is the company that hired it. A company that finds a professional 4PL provider will certainly add value to its outputs regardless of the other actors involved in the

process. 4PL has the overall responsibility over the logistics process and has the ability to change the wrong direction of the company.

When talking about fourth party logistics, it is also important to mention that they are quite often termed as lead logistics provider (LLPs). According to Supply Chain Management (2013) and LLP is "an organization that organizes other third-party logistics partners for outsourcing of logistics functions. An LLP serves as the client's primary supply chain management provider, defining processes and managing the provision and integration of logistics services through its own organization and those of its subcontractors. The term was registered by Accenture as a trademark in 1996 and defined as 'A supply chain integrator that assembles and manages there sources, capabilities, and technology of its own organization with those of complementary service providers to deliver a comprehensive supply chain solution."

According to Schramm (2012, p. 154) "the most advanced 4PLs are: (1) logistics management departments having the ability to offer their in house services to external clients, (2) transport integrators or postal services widening their range of value added services or so called (3) lead logistics providers (LLP's), which are in effect, freight forwarders heavily engaged in dedicated contract logistics backed by heavy usage of modern information processing technology."

3.4. Fifth-party Logistics

New trends in IT and overall international trade brought about a need for more developed service providers which lead to the emergence of the fifth-party logistics providers (5PLs). The 5PLs have not yet evolved so much in comparison to 3PLs and 4PLs, so the information on them is quite limited. Hickson, Wirth and Morales (2008, p. 12) write that the main focus of their work is on technology. They, like 4PLs, do not have physical assets, and are much more focused on technology in the supply chain management, i.e. on the strategic management of the supply chain. Fifth party logistics providers utilize new technology to manage the whole supply chain and logistics network. They organize and plan possible solutions in the logistics processes on behalf of the company by trying to find the appropriate technology. They cooperate with large companies whose networks are much more complex and aim to create an efficient environment. According to the Logistics Glossary (2016) a "fifth party logistic service provider develops and implements, preferably in close consultation with the client, the best possible supply chains or networks. Fifth party logistic is often linked to E-business."

4. DIFFERENCES AND SIMILARITIES BETWEEN LOGISTICS SERVICE PROVIDERS

To summarize and compare the activities (offered services) of all logistics service providers presented above, the following table shows the main differences and similarities between freight forwarders, 3PLs, 4PLs and 5PLs.

Table 3. Differences between freight forwarders, 3PLs, 4PLs and 5PLs

Intermediary	Freight forwarder	3PL	4PL	5PL
Typ of service	Tactical	Tactical	Strategic	Strategic – IT Supply Chain
Basic Idea	Arrange the transport and coordinate the movement of goods, prepare necessary paperwork, arrange storage and insurance	Performs multiple, or all, physical logistics functions on behalf of customer	Performs all supply chain functions for the customer; concerned with the management and improvement of the client's supply chain	Turns customer's supply chain into a function that is completely driven by technology
Resources	Usually owns few physical assets, knowledge and technology assets	May or may not own physical assets; mainly knowledge-based, technology for tracking shipments	Few physical assets, extensive knowledge and technology-based assets	Few physical assets, extensive knowledge and technology-based assets
Potential Benefits	Companies, especially smaller firms, who ship internationally, arrange most cost-efficient route for shipments	Companies who lack internal supply chain resources and knowledge	Companies with complex supply chains	Large companies with highly complex supply chains
Potential Drawbacks	Unknown	Focused more on moving freight than the management and efficiency of the supply chain	Loss of control and relationships with supply chain members, risk in long-term partnerships	Loss of control and relationship with supply chain members, risk in long-term partnerships

Source: Hickson et al. (2008), p. 13.

A clear cut difference between freight forwarders and other parties may be the one given by Shay Scott, director of the Global Supply Chain Institute: “Third- and fourth-party logistics providers are always freight forwarders. But it’s never the other way around” (Burnson, 2011, p. 38).

According to Schramm (2012, p. 154), third party logistics along their general problem-solving activities also have the ability to adapt to the customers’ needs. Third-party logistics providers are, according to Schramm, separated in four subgroups: *standard third party logistics* - who offer highly standardised contracted logistics services, *service developers* – who offer dedicated logistics together with advanced value added services, *customer adapters* – take over their customer’s existing logistics facilities in order to run them as a subcontractor and *customer developers* - who take over their customers’ whole logistics operations. All of them are actually taking many types of logistics activities for their clients.

In order to survive, freight forwarders have to move and adjust their services according to the supply chain management needs. “The small forwarder who has not yet discovered a way to add value to the supply chain will be threatened by the entry

of other competitors into the market. The main difference between a traditional freight forwarder and an advanced logistics service provider is the value added services that they provide." (Baluch, 2006, p. 3) The constant need to reduce the costs and at the same time increase efficiency has forced many freight forwarders to adjust their business activities and introduce new logistics functions and solutions.

Depending on the complexity of the supply chain, each company will decide which type of logistics provider is most suitable. It means the decision will be based on the scope of needed services. In this sense, Papadopoulou (2013, p. 66) suggests steps for the selection the most appropriate logistics provider, and specifically: to identify required services, to search for the type of logistics service provider providing the concerned and supplementary services, to study the role and basic features of each entity, to conduct a cost-benefit analysis, to decide on the most appropriate logistics partner, to evaluate the performance of the partnership, and to continue or break cooperation.

5. CONCLUSION

International companies are becoming more and more aware of the need to improve and adjust their supply chains to meet current market trends. As business processes are becoming more complex, it is becoming increasingly difficult to manage all of the activities on one's own. Therefore, companies tend to engage intermediaries, such as logistics service providers, to facilitate their operations concerning logistics and supply chain management processes (e.g. transportation, storage, shipment and distribution of goods from the seller to the buyer or the final consumer etc.). The basic form of logistics service providers are freight forwarders, which have evolved during time providing more and more logistics services and thus adding value to the final product. These have become third-party logistics or even fourth-party logistics providers. IT development and new trends in international trade lead to the emergence of a newer form of logistics intermediary, the fifth-party logistics providers. However, the differences between these providers are not clear-cut and completely explained in literature and the business world.

Logistics service providers and intermediaries are an important actor in today's business especially when it comes to international trade in which the delivery of goods has to be cost-effective, safe and in time. Logistics service providers are specialized in their field of business and have more experience in performing such tasks, as well as the needed expertise, knowledge and skills that focal companies (clients) do not possess.

By employing intermediaries i.e. by leaving logistical and transportation problems to be dealt by logistics providers, the companies have the chance to focus on their core business activities, save on capital investments, reduce their costs and risks and increase efficiency. Depending on the logistics needs, i.e. the complexity of the supply chain, each company will decide which type of logistics provider is most suitable. Their decision will be based on the scope of needed services i.e. whether it needs just the transportation and/or warehousing of goods (3PL or freight forwarder) or the entire supply chain design (4PL).

Therefore, there is a constant need to follow up on the new developments and trends in international trade and its influence on the development and emergence of new forms of intermediaries and the services they provide. Further research should thus focus on the analysis of the quantity and qualities of logistics services provided by different intermediaries, the cost-benefit analyses of their engagement into one's supply chain and provide guidelines for choosing the optimal service provider.

6. REFERENCES

Baluch, I. (2006). The Changing Role of Freight Forwarders, [available at: www.elleryfreight.co.nz/files/links_sources/baluch_freightorward_role.pdf, access May 3, 2016]

Berglund, M., van Laarhoven P., Sharman, G. & Wandel, S. (1999). Third-Party Logistics: Is There a Future? *The International Journal of Logistics Management*, 10(1), p. 59-70, [available at: http://www.emeraldinsight.com/doi/abs/10.1108/09574099910805932, access June 21, 2016]

Bloomberg, D.J., LeMay, S. & Hanna, J.B. (2006). Logistika, Mate, Zagreb.

Burnson, P. (2011). Freight Forwarding: Choosing the Best, *Logistics Management*, May [available at: http://www.logisticsmgmt.com/ , access May 25, 2016]

Burnson, P. (2015). Top 25 Freight Forwarders: Gaining momentum, *Logistics Management*, [available at: http://www.logisticsmgmt.com/article/top_25_freight_forwarders_gaining_momentum , access June 16, 2016]

Camargo, J.J.B., Sacomano Neto, M. , Ignácio Pires, S.R., da Silva, E.M., Vivaldini, M. & Correa, D.A. (2012). The Role of Logistics Services Providers in the Supply Chain Management: The Social Network Perspective', *2nd Congres Transformare 19-20 mars Paris*, [available at: http://www.transformare.adm.br/anais/Joao-Batista-de-Camargo-Junior-et-al./The-role-of-logistics-services-provider.pdf , access May 3, 2016]

Domingues, M.L., Reis, V. & Macário, R. A. (2015). A Comprehensive Framework for Measuring Performance in a Third-party Logistics Provider, 18th Euro Working Group on Transportation, EWGT 2015, 14-16 July 2015, Delft, The Netherlands, *Transportation Research Procedia*, 10, p. 662 – 672, [available at: http://www.sciencedirect.com/science/article/pii/S2352146515002070, access June 20, 2016]

FIATA (2016) Doc. CL04/06, 2004, [available at: http://www.fiata.com/uploads/media/CL0406_11.pdf, access June 15, 2016]

FIATA Model Rules For Freight Forwarding Services, [available at: http://fiata.com/uploads/media/Model_Rules_07.pdf, access June 14, 2016]

Fourth Party Logistics (4PL) 2016, [available at: http://www.dhl.co.uk/en/logistics/supply_chain_solutions/fourth_party_logistics_4PL.html , access June 18, 2016]

Gourdin, K.N. (2006). *Global Logistics Management – A Competitive Advantage for the 21st Century*, 2nd edition, Blackwell Publishing, Hoboken New Jersey.

Hickson, A., Wirth, B. & Morales, G. (2008). *Supply Chain Intermediaries Study*, University of Manitoba Transport Institute, [available at: https://umanitoba.ca/faculties/management/ti/media/docs/scIntermediariesfinalwithcover(1).pdf, access May 3, 2016]

Jensen, L.M. (2010). Opportunities and constraints for intermediaries in distribution: The challenge of variety, *The IMP Journal*, 4(3), p. 194-219, [available at: www.impjournal.org/getFile.php?id=365, access June 15, 2016]

Lieb, R.C. & Bentz, B.A. (2003) The Use of Third-Party Logistics Services by Large American Manufacturers: The 2003 Survey, *Transportation Journal*, 43(3), p. 24-33, [available at: https://www.jstor.org/stable/20713572?seq=1#page_scan_tab_contents, access June 22, 2016]

Logistics Glossary (2016). Fifth Party Logistic Model (5PL). [available at: http://www.logisticsglossary.com/term/5pl/, access June 14, 2016]

Norall, S. (2013). *3PL vs 4PL: What are these PLs, Anyway? Layers of Logistics Explained*, [available at: http://cerasis.com/2013/08/08/3pl-vs-4pl/, access June 22, 2016]

Pavlić Skender, H. & Grčić Fabić, M (2013). Logistički špediter u fokusu prometnog i gospodarskog sustava, *Pomorski zbornik* 47-48, p. 95-107.

Ramberg, J. (1998) Unification of the Law of International Freight Forwarding, [available at: http://www.unidroit.org/english/publications/review/articles/1998-1-ramberg-e.pdf, access June 14, 2016]

Schramm, H.J. (2012). *Freight Forwarder's Intermediary Role in Multimodal Transport Chains – A Social Network Approach*, Physica – Verlag, Springer Company, Vienna.

Sink, H.L., Langley, C.J. & Gibson, B.J. (1996). Buyer observations of the US Third-party logistics market, *International Journal of Physical Distribution & Logistics Management*, 26(3), p. 38-46, [available at: http://www.emeraldinsight.com/doi/full/10.1108/09600039610115009, access June 16, 2016]

Papadopoulou, E. M. (2013). Logistics Service Providers: Collaboration with IFFs, 3PL, or 4PL Providers? in Folinas, D. (Ed.), *Outsourcing Management for Supply Chain Operations and Logistics Services*, p. 52-77, Business Science Reference, Hershey.

Stefansson, G. (2006). Collaborative logistics management and the role of third-party service providers, *International Journal of Physical Distribution & Logistics Management*, 36(2), p. 76-92, [available at: http://www.emeraldinsight.com/doi/pdfplus/10.1108/09600030610656413, acces June 10, 2016]

Supply Chain Management (2013). Terms and Glossary, [available at: https://cscmp.org/sites/default/files/user_uploads/resources/downloads/glossary-2013.pdf , access June 14, 2016]

Tezuka, K. (2011). Rationale for utilizing 3PL in supply chain management: A shippers' economic perspective, *IATSS Research*, 35, p. 24–29, [available at: http://www.sciencedirect.com/science/article/pii/S0386111211000161, access March 23, 2016]

Turner, W. & Savitskie, K. (2008). Freight Forwarding: Benefits and Implications for Managers, *The Icfai Journal of Supply Chain Management*, V(2), p. 58-67.

Zelenika, R., Pupovac, D. & Rudić, D. (2000). Špediter u funkciji logističkoga operatora, *Pomorski zbornik*, 38(1), p. 143-157, [available at: http://hrcak.srce.hr/file/80167 , access May 3, 2016]

Waters, D. (2003). *Logistics: an Introduction to Supply Chain Management*, Palgrave Macmillan, New York.

2013 Top 50 Global & Domestic Third-Party Logistics Providers, (2014). [available at: http://www.supplychain247.com/article/2013_top_50_global_top_30_domestic_3pls , access June 16 , 2016]

ADDRESSING THE CHALLENGES OF LOGISTICS AND SUPPLY CHAIN EDUCATION: A CASE STUDY OF PROGRAMME DEVELOPMENT IN THE UK

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Abstract

Logistics in the UK is perceived as a sector where qualification levels could improve: the sector is viewed as underperforming in training and education. Representative professional and trade bodies within the sector actively address this challenge. The research derives from the work in a knowledge transfer partnership project between a representative trade body in the sector and the University of Westminster. A principle deliverable from the project has been development of a new Programme in Training and Education tailored to the needs of the sector. New facilitating structures to engage a range of stakeholders have additionally been established. The purpose of this paper is to present an overview of the knowledge exchange process within the project and to present an evaluation of the application of service quality theories in the development of the new service.

The paper focuses on the knowledge exchange elements of the project in developing the programme as a new service for a membership organisation. Participatory observation, project diaries and formal project documentation included reports on knowledge exchange comprise primary data sources.

The paper considers the case of service development in logistics training and education in a representative trade body.

The knowledge exchange contribution to the development of the new service, while significant, highlight the challenges of effective engagement of the service users for membership organisations.

The research is exploratory and covers the development phase for the training and education service in a case study organisation. The normal caveats of single case study research apply.

Further research will initially focus on methodologies for the evaluation of knowledge exchange. The practical implications concern use of knowledge exchange in addressing business engagement in logistics training and education and fostering university-business collaboration.

Key words: Education, service development, knowledge exchange, knowledge transfer partnerships

1. INTRODUCTION

Logistics is a major sector in the UK economy employing 2.2 million people, or one in twelve of the working population. Forecasts to date have been for growth driven by demographic and technological changes, changing patterns of consumption and a recovering economy. However, Logistics is perceived as a poorly qualified sector with a problem in attracting new entrants (UKCES, 2014). The research presented here derives from a two-year project with the case study organisation which focuses on a specialist subsector in the Logistics industry. The wider context of the growth of Urban logistics, the importance of addressing sustainability and the role of global supply chains have shaped an applied approach to the research associated with the project.

The case study concerns a two-year Knowledge Transfer Partnership project aimed at developing and benchmarking a range of new value added services/products for the case study organisation to offer to business members in the logistics sector across the UK. A Knowledge Transfer Partnership (KTP) is a relationship between a company and an academic institution where a project of strategic importance to the company is undertaken by a KTP Associate, typically a young graduate or post graduate. (KTP, 2014). In the United Kingdom, KTPs are an established government funded programme partnering Universities and business, aimed at improving business competitiveness and efficiency, typically through encouraging business growth.

The context of the work draws on management research in Trade Associations in which there is now renewed interest (Rajwani et al., 2015). The initial work of the project utilised theory from Service Quality (Johnston & Kong, 2001; Johnston, 1995) to develop a questionnaire for members of the Trade Association in order to elicit service priorities and desired service characteristics. Subsequent service development focussed on Training and Education, therefore research perspectives in Supply Chain and Logistics education and training additionally inform the research.

This paper presents initial findings from project work with the case study organisation covering business perceptions of challenges and service needs in the logistics sector. As a preliminary paper based on practical results, academic literature is cited in each section to evidence sources used in the course of the project. The role of knowledge exchange within the project is outlined and the use of theoretical perspectives in Service design and development assessed. The objective is to conduct a preliminary assessment of project outcomes from the development phase using theoretical perspectives from service management and to explore the potential for relating efficacy in service provision to the role of Trade Associations as “Institutional Entrepreneurs” as outlined in Rajwani et al. (2015) discussion on use of institutional theory in management research on business association types.

2. BACKGROUND TO THE CASE STUDY IN A UK TRADE ASSOCIATION

2.1. Trade Associations

Boleat (2003) defined TAs as representative bodies for groups of companies with common interests. May et al 1998 point out that membership of trade associations is the most frequently used method for business representation and as such, governments have viewed Trade Associations as a means of improving communication between industry sectors and government and of raising standards and thus competitiveness in these sectors. A principal role of TAs is seen as representation to government, particularly on regulatory issues affecting members, there is a tension here between the pre-emptory interests of self-regulation within an industry sector; Larrain and Prüfer (2015) provide a recent example of research showing benefits of this in differing legal environments.

Business Associations exist in most countries but in the UK, are characterised by voluntary membership. Within the UK, Bennet and Ramsden (2007) identify over 5000 trade and professional associations, of which nearly half contain less than one hundred members. Indeed, echoing complaints dating back to the 1980's in the UK, Macdonald 2001 accepted that from a government view point, too many TAs exist. Recent work in New Zealand (Battisti & Perry, 2014) confirmed that there is no real impetus for TAs to be replaced with fewer sector based associations.

The literature on TAs has explored the tensions between the representative function: "the logic of influence" and other member benefits: "the logic of services". Bennet and Robson (2011) provide a useful analysis of the politics and economics of the UK Trade Associations Services Market. They highlight that Services and how they are bundled provide Associations with their "unique selling point", underlining the importance of Service Design and Service quality for this sector. Bennet's earlier work (Bennet & Ramsden, 2007) showed that many SME companies hold more than one membership of TAs as they in turn, construct their own "bundle" of service requirements.

Tucker (2008) in research on how TA's manage their industry reputations, acknowledges the predominant focus of management literature on the unit of the firm but argues for the importance of research in TA as these "operate as the centralized cooperative component of inter-organisational relationships". More recently, Rajwani et al 2015 argue that management researchers need to give renewed attention to TAs and their impact on companies, industries and societies.

2.2. Case Study Organisation

The Case Study organisation may be characterised as a medium sized TA representing a specialist sub sector in the Logistics industry. At the start of the project, it had recently reviewed overall strategy and identified service provision as an area for development. The UK Trade Association Forum survey in 2010 found that over half of TA's undertook reappraisal of their mission and strategy and over 60% were developing new services. Services provided by TA's are differentiated in a number of ways, for example, individual and collective services and "core" services

as opposed to "affiliate" services. The majority of members of the TA are Small to Medium sized Enterprises, in line with findings that TA membership is dominated by micro and SMEs, further, it is reported that many of these dip in and out of membership, depending on their own perceived needs (Bennet & Ramsden 2007) requiring TAs to continually revisit value propositions to members.

Given that TAs themselves are typically small organisations, TA service provision to members must be of services where the TA can deliver this more efficiently than other forms of organisational associations. TAs are best placed to provide services where:

a) The service is based on a representative function;
b) The services are closely related to the membership of the TA such as annual conferences, themed seminars, exhibitions and statistical schemes. The TA advantage here is in lower marketing cost and ability to secure more relevant speakers and exhibitors;
c) The services are based on the expertise of the secretariat (the direct employees of the TA, including the Chief Executive), which has either been developed with time or it is a natural function of the representative work.

In this case, the core services provided by the TA were:

1. Representation
2. Quasi-commercial financial and advisory services (particularly valuable for small companies)
3. Provision of information, advice and guidance on best practices
4. A gateway for purchasers of the goods or services provided by members (Affiliate Services)

Other types of services focussed on information provision to members, including:

a) Factual information and guidance on relevant legislative, regulatory and related matters;
b) Aggregate statistics of members and other statistics and market information;
c) Information on general policy developments;

The project aimed to develop and implement a range of new value added services for the Association to offer to its members. Overall, the aim was to support the enhancement of the value proposition for current and prospective members. In order to implement new services, internal efficiency in the association was also addressed to ensure capability and capacity for service provision and monitoring.

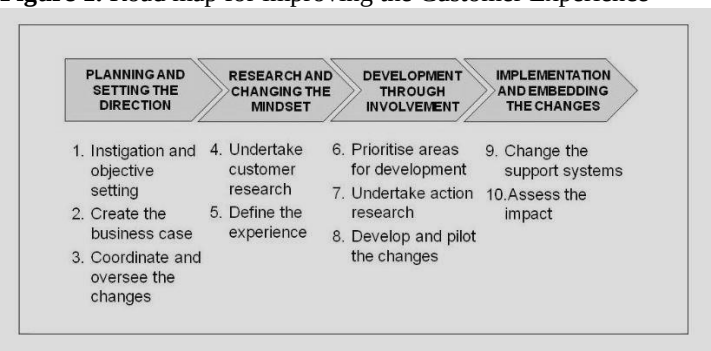
2.2.1. Project Delivery

The first phase of the project covered familiarisation with the case study organisation, business members and the logistics sector in the UK. This phase produced an initial list of areas for potential service development, including training services (principally information for members on providers and courses) and development of national qualifications. However, a wide range of other potential services such as business generation support services, assistance with responding to Invitations to Tender and services to assist members in improving sustainability were also considered.

At this stage, knowledge exchange identified service development theory, stakeholder engagement and management of process change as academic inputs to the project.

Phase 2 covered design and launch of a membership survey with responses collected on line. Using the knowledge gathered through interaction with members and field work in Phase One a detailed questionnaire was developed by the project team. The purpose of the survey was to improve understanding of membership perceptions of both the kinds of services of benefit to them and the service delivery requirements. The overall planning of this phase was underpinned by the ten stage road map (Figure 1) for improving customer experience of services set out by Johnston and Kong (2011).

Figure 1. Road map for improving the Customer Experience



Source: Johnston and Kong 2011 p.17

2.2.2. Methodology: Membership Survey

The development of the questionnaire used the work of Johnston (1995) on service satisfiers and dissatisfiers which showed that a majority of service characteristics can act as both sources of satisfaction and dissatisfaction. Using the findings on predominate determinants, three broader categories for assessing service quality were formulated: Responsiveness, Assurance, and Communication. Questions set, expanded on these so that mapping back to key determinants was supported in data analysis.

Survey development included consultation with stakeholders and pilot testing with senior members of the Association. The survey was launched through the specialist online research website Survey Monkey and was open for a period of ten weeks during which time it was promoted through specialist publications for members, social media, email reminders and a telephone campaign targeted on members in the SME sector to ensure a representative sample across all the categories of membership, based on size of warehouse space managed but also including suppliers into this sector (representing an associated but not full membership category).

The overall response rate of 11 percent was the highest achieved by the Association. Analysis of distribution of responses by category of membership and by

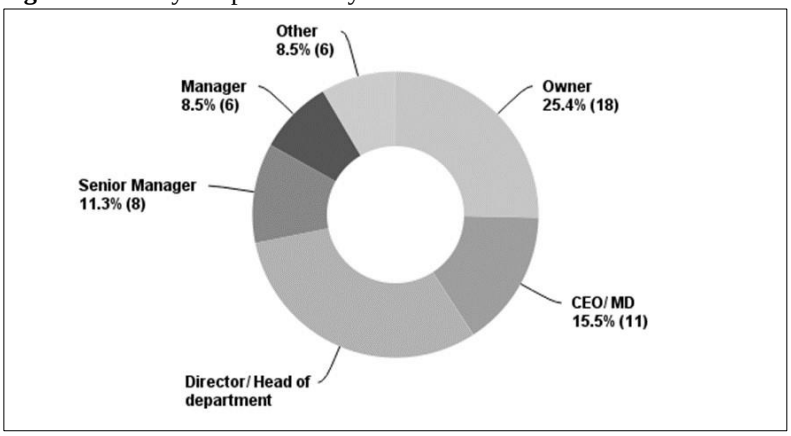
geographical location reflected the actual membership distribution, ensuring the survey results reflect an accurate representation of membership. Survey follow up field work with 15 respondents, selected to reflect all membership categories, was conducted to support the analysis of findings.

It should be noted that for this case study on logistics providers, the definition utilised by the TA concerned specialist provision (warehouse space) as opposed to the broader definitions on Logistics Service providers discussed in the literature. Marasco 2008 provides a discussion on this definition and adopts a broad definition of third party logistics providers as a relationship between buyers or sellers and a logistics service provider in a particular supply chain. In this case study, the definition applies to the organisations holding full membership of the TA, the results of which are presented below. More research is needed to verify findings in the broader logistics service sector.

2.2.2 Summary of Findings for Training and Education

The findings presented here relate to the survey responses subsequently used to gain stakeholder agreement on prioritising new service development in Training and Education. The characteristics of respondents was analysed through their stated job role and differed by company size and type (Figure 2). In the membership category representing SMEs, the majority of respondents were company owners or Chief Executives (40%) with responsibility for oversight of the business. The respondents from larger companies were predominantly directors and heads of departments (46%), whose responsibilities included mainly supply chain related activities but also sales and business development.

Figure 2. Survey Respondents by Job Role



Source: Membership survey 2014

The survey data on perceptions of key challenges showed further differentiation in SME and other members. Smaller members identified increasing competition and investment in technology and ensuring sources of finance. Shortage of skilled staff

and rising energy costs were perceived as challenging particularly by members where the business was experiencing growth.

Results suggest that smallest members were considering, but have issues with, introducing a technology to support logistics operations, while larger members identified successful implementation of an Enterprise Resource Planning system as a challenge.

Cost efficiency was a major issue for the SMEs in membership, as opposed to the larger companies where programmes to control costs exist. Capacity constraints and property availability were also identified as other areas presenting challenges to members.

Table 1. Identification of major challenges in the sector

Challenge	Percentage responding
Need to improve efficiency of operations	47
Shortage of Skilled Staff	41
Increased Competition	40
Improving the visibility of operations through investment in Technology	29
Rising Energy costs	21
Maintaining Robust Risk Management	19
Introducing ERP	12
Ensuring adequate sources of finance	6

Source: Membership survey 2014

The campaign priorities question (Table 2) highlighted membership difficulties in agreeing single overall priorities as in all three cases, over 85% of respondents saw at least potential value in each campaign.

Table 2. Member Campaign Priorities Percentage responses

Campaign	I would value	Of some value	Potentially of value	Limited value	Not relevant
Introduction of more apprenticeship schemes in the logistics industry	43	26	17	6	6
Improving practices in the industry	48	20	20	2	9
Addressing legislative impact in the sector	44	33	11	2	9

Source: Membership survey 2014

This had been anticipated in survey design and were followed by specific questions on firstly, whether the Association should develop nationally accredited qualifications in their logistics specialism and secondly, if the Association should deliver "branded" training, implying Association endorsement of specialist training providers. The responses to these two questions, indicated that members thought these high priorities, in total for both questions, over 85% of respondents thought these were either a priority or a high priority for the Association.

2.2.3 Identifying priorities for development of services

Based on the overall survey results, the project work then evaluated a range of service development opportunities using criteria shown in Table 3. Services related to training and education were initially assessed as high cost and value to the external market but carrying risk of demand uncertainty. However, development of the service was agreed as the survey results on the questions presented demonstrated this was the single area where membership agreement on value was consistent and could arguably be matched the challenges identified across the membership and thus could be developed through involvement of members and other stakeholders as set out in the Road map for improving customer experience.

Table 3. Service evaluation criteria employed in Phase 2

1. Service Development Requirements: Cost estimates:
i. Service Standard specification including quality and reliability
ii. Legal requirements compliance
iii. Installation, implementation, user training
iv. Ease of development – costs and time
2. Resourcing
3. Running costs – new process and maintenance
4. External market
a) Benefits to members
b) Price and Sales potential
c) Competition
5. Marketing and promotion

Source: Adapted from Hollins & Hollins (1991), cited in Hollins & Shinkins (2006), p.96

2.3. Discussion of Results relevant to Logistics Training and Education

Development of the service also supported the role of the Trade Association in raising the profile of the industry. The 2015 CBI report had again highlighted the urgency of addressing skills shortages and the need for apprenticeship reform across industries in the UK Clarke 2011 suggest that Trade Associations are of growing importance following fragmentation of trade union and employer organisations (p.106). Clarke compares systems of Vocational Education and Training in different European countries and points out that compared to Germany, France and the Netherlands, the UK has relied on Sector Skills Councils (quasi-governmental bodies) for work on regulation of qualifications. One of the problems for the UK logistics

sector is that the Logistics sector skills council ceased to operate in 2012 and work on logistics vocational education and training was thus fragmented amongst remaining Skills Sector Councils. This has recently been addressed through the formation in 2015 of an employer led Supply Chain and Logistics Trailblazer group to work with the UK Department of Business Innovation and Skills to define standards in the sector (Skills Funding Agency, 2016).

In the academic literature, logistics training and education research features in both general logistics journals and in the field of human resource management. There has been effort to demonstrate organisational benefits of skills development, Gowen and Tallon (2002) using a sample of just over 350 firms found positive correlation between employer training and successful Supply Chain Management practice. Skills requirements in logistics have been given more attention recently, Keller and Ozment (2009) highlight the shift in logistics skills need to address the shift to customer oriented workforces and more recently, Bernon and Mina's (2013) work on executive education supports the need to go beyond competency training to addressing wider managerial development needs. Prajogo and Sohal (2013) again identify the soft skill set (communication and teamwork) as a key competence requirement for SC professionals and also the need for knowledge of technology, especially in relation to supply chain integration. In a recent comprehensive literature review of Human Resource Management issues in SCM, Hohenstein et al. (2014) identify the need for further research in development of "a global mind set" as critical for future training programme development.

Within higher education, research has highlighted challenges in developing the discipline, Lancioni et al. (2001) identified a range of barriers to development of Logistics Higher Education courses in the USA including lack of interest from students and lack of support from the business community. Professionals in both logistics and supply chain management perceive innovation as originating in practice but without engagement, graduate competences may not be adequately addressed as shown in Lutz and Birou's (2013) specialist study of logistics education where they call for closer integration of higher education with Industry to ensure graduates develop industry relevant skills.

Digital courses supporting skills development is of increasing interest, in the UK, significant numbers of accredited courses are delivered on-line. Wu and Huang (2013) address the growth of e learning initiatives.

3. CONCLUSION

The themes presented represent very preliminary work as the project work is not yet complete. Service management theory application has been productive in both providing project structure and in the engagement of business members of the association through the survey and field work but this needs extending through introduction of more fundamental theoretical perspectives on service logic as suggested by Vargo et al (2008). Management research on trade associations has recently featured more prominently in a number of disciplines (business, law and urban studies) and the institutional work of these associations and their impact on

society is under researched. The example case of programme development in logistics training and education demonstrates Esparza et al (2013) claim for trade associations contribution to civic purposes.

It is intended to further extend this preliminary work through first, expanding on Service bundling in Trade Associations and in particular, the use of services in the SME sector where membership of more than one association per year is normal, as is dropping in and out of membership to suit purposes of the SME. Secondly, the importance of new service development to larger members needs consideration, especially how this may help engage these businesses as stakeholders and develop their contribution to trade association activities through analysis of the mutual benefit potential. Finally, the specific challenges of logistics training and education both in the UK and beyond need further elucidation, and a more balanced treatment of the issues of accreditation and qualifications in the sector at all levels will be addressed.

4. REFERENCES

Battisti, M. & Perry, M. (2015). Small enterprise affiliations to business associations and the collective action problem revisited. *Small Business Economics*, 44(3), p. 559-576.

Bennett, R. J. & Ramsden, M. (2007). The Contribution of Business Associations to SMEs Strategy, Bundling or Reassurance? *International Small Business Journal*, 25(1). p. 49-76.

Bennett, R.J. & Robson, P.J. (2011). Exploring the use of trade and professional association services. *Applied Economics*, 43(13), p.1595-1605.

Bernon, M. & Mena, C. (2013). The evolution of customised executive education in supply chain management. *Supply Chain Management: An International Journal*,

18(4), p. 440-453.

Boleat, M. (2003). Managing Trade Associations. London: Trade Association Forum.

CBI. (2015) Inspiring growth CBI/Pearson Education and Skills survey 2015 [available at: http://news.cbi.org.uk/business-issues/education-and-skills/gateway-to-growth-cbi-pearson-education-and-skills-survey-2015/, access June 10, 2016]

Clarke, L. (2011) *Trade? Job? Or Occupation? The Development of Occupational Labour Markets for Bricklaying and Lorry Driving.* In Brockmann, M.; Clarke,L. and Winch,C.(Ed.) *Knowledge, Skills and Competence in the European Labour Market: What's in a Vocational Qualification?*. London: Routledge, pp 102- 119.

Esparza, N., Walker, E. T. & Rossman, G. (2013). Trade associations and the legitimation of entrepreneurial movements: Collective action in the emerging gourmet food truck industry. *Nonprofit and Voluntary Sector Quarterly*, 43(2S), p. 143S-162S.

Gowen Iii, C. R. & Tallon, W. J. (2003). Enhancing supply chain practices through human resource management. *Journal of Management Development*, 22(1), p. 32-44.

Hohenstein, N. O., Feisel, E. & Hartmann, E. (2014). Human resource management issues in supply chain management research: a systematic literature review from 1998 to 2014. *International Journal of Physical Distribution & Logistics Management*, 44(6), p. 434-463.

Hollins, B. & Shinkins, S. (2006). *Managing service operations: Design and implementation*. London: Sage.

Johnston, R. (1995). The determinants of service quality: satisfiers and dissatisfiers. *International journal of service industry management*, 6(5), p. 53-71.

Johnston, R. & Kong, X. (2011). The customer experience: a road-map for improvement. *Managing Service Quality: An International Journal*, 21(1). p. 5-24.

Keller, S. B. & Ozment, J. (2009). Research on personnel issues published in leading logistics journals: what we know and don't know. *The International Journal of Logistics Management*, 20(3), p. 378-407.

Knowledge Transfer Partnerships (KTP) (2014) "What is a knowledge transfer partnership" [available at: http://www.ktponline.org.uk/faqs/ access March 1 2014]

Lancioni, R., Forman, H., & Smith, M. F. (2001). Logistics and supply chain education: Roadblocks and challenges. *International Journal of Physical Distribution & Logistics Management*, 31(10), p. 733-745.

Larrain, M., & Prüfer, J. (2015). Trade associations, lobbying, and endogenous institutions. *Journal of Legal Analysis*, 7(2), p. 467-516.

Lutz, H. & Birou, L. (2013). Logistics education: a look at the current state of the art and science. *Supply Chain Management: An International Journal*, 18(4), p. 455-467.

Macdonald, A. (2001) *The Business of Representation: The modern trade association.* Report to the Trade Association Forum, London [available at: http://www.taforum.org/the-business-of-representation- access May 22, 2016]

Marasco, A. (2008). Third-party logistics: A literature review. *International Journal of production economics*, 113(1), p. 127-147.

May, T., McHugh, J. & Taylor, T. (1998). Business representation in the UK since 1979: the case of trade associations. *Political Studies*, 46(2). p. 260-275.

Prajogo, D. & Sohal, A. (2013). Supply chain professionals: A study of competencies, use of technologies, and future challenges. *International Journal of Operations & Production Management*, 33(11/12), p. 1532-1554.

Rajwani, T., Lawton, T. & Phillips, N. (2015). The "Voice of Industry": Why management researchers should pay more attention to trade associations. *Strategic Organization*, 13(3), p. 224-232.

Skills Funding Agency (2016). Apprenticeship Standards [available at: https://www.gov.uk/government/collections/apprenticeship-standards#logistics-and-supply-chain-standards access June 27, 2016]

Tucker, A. (2008). Trade associations as industry reputation agents: a model of reputational trust. *Business and Politics*, 10(1). p. 1-26.

UK Commission for Employment and Skills (2014). Understanding skills and performance challenges in the logistics sector. Evidence Report 86 [available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/360931/14.10.02._SLMI_Logistics_Evidence_Report.pdf access June 12 2016]

Vargo, S. L., Maglio, P. P. & Akaka, M. A. (2008). On value and value co-creation: A service systems and service logic perspective. *European management journal*, 26(3). p145-152.

von der Gracht, H.A. & Darkow, I. L. (2013). The future role of logistics for global wealth–scenarios and discontinuities until 2025. *Foresight*, 15(5). p. 405-419.

Jim Wu, Y. C. (2007). Contemporary logistics education: an international perspective. *International Journal of Physical Distribution & Logistics Management*, 37(7). p. 504-528.

Wu, Y. C. J. & Huang, S. K. (2013). Making on-line logistics training sustainable through e-learning. *Computers in Human Behaviour*, 29(2), p. 323-328.

II. SUPPLY CHAINS CHALLENGES

SUPPLY CHAINS IN THE CONTEXT OF LIFE CYCLE ASSESSMENT AND SUSTAINABILITY

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Abstract

Production and consumption of many products are subjected to a thorough study of their evident impact on local ecosystems and global warming, with the purpose of reduction their emissions, finding product and process alternatives and/or their total suspension or penalization. The procedure for assessing these impacts through a different length of the supply chains is known as product life cycle assessment (PLCA). PLCA is the basis for the study of environmental damage and the costs of their prevention and compensation. Putting priority on the issue of environmental protection, PLCA and Environment life cycle costs assessment (ELCCA) concepts leave aside problem of development, especially for the less developed areas. Given the fact that the production and consumption of products in a single life cycle must contribute at least declarative social equality of participants in the PLCA, the concept of social life cycle assessment was offered. Starting from the fact that sustainable development involves both generating and maintaining a certain level of material well-being, environmental protection and adequate supplies of natural resources and social equity, the concept of life cycle sustainability assessment (LCSA) was proposed.

The formal supply chains that are created in the product life cycles are still looking for total and partial optimality, mainly through the analysis of economic criteria which may be in conflict with the concept of LCSA.

The paper analyzes LCSA of pork meat in Croatia based on cradle-to-grave approach. Based on data of production, import, export and consumption of pork meat in a given period, and also findings in previous research about emission and functional unit (kg CO2 equivalent/kg pork consumed), a simple PLCA, ELCCA and LCSA were conducted. The imbalance in the supply chain was confirmed showing

questionable sustainability of pork meat life cycle in Croatia. The results can be the basis for future comprehensive LCSA and research of entire meat sector as well as to create a framework for development policy of meat sector in Croatia.

Key words: product life cycle, environmental costs and sustainability assessment, supply chain, pork meat, Croatia

1. INTRODUCTION

A number of research on ecological systems have shown that those systems are degraded due to human activities in production and consumption of various products and services. Such degradation necessitates thorough analyses of products' functionalities as well as processes in which they are produced, the ways of resource usage, and a more detailed investigation of all relevant flows of materials, energy and values created. Based on those requirements, the concept of product life cycle assessment (PLCA) appeared as a system of total assessment of material, energetic and value flows, which includes the whole supply chain – producers, distributors, users, and their indirect and direct effects on ecological systems.

The first and most frequent research in that area was related to energy flows in supply chain of specific categories of energy sources and consumers. It enabled an insight into summarized and/or multiplicative effects on the environment that the production of an individual product can have regarding the waste (primarily greenhouse gases). When the effects of the whole production on the environment were considered, starting from natural resource exploitation to waste disposal into the soil, water and air, it became clear that the product life cycle (so-called „from cradle-to-grave") needs a different approach.

Based on such cognitions, numerous researches have started focused on individual processes and (alternative) products on local levels. During time the research has extended to national and regional, as well as international and cross-sectional relations. It resulted in systematic analyses of partial (cradle-to-gate, gate-to-gate or gate-to-grave) and/or integrated (cradle-to-grave) supply chains of specific categories of products, as well as in large data collection and development of models for estimating whole life cycles of products. Such researches had various purposes and aims and were frequently arbitral regarding assessments of real impacts of production on environment.

That was the reason to propose, improve and update recommendations and rules, as well as methodological framework for conducting such analyses. Based on the experience of a number of previous cases, the SETAC-Society of Environmental Toxicology and Chemistry (1993) has suggested Life-Cycle Assessment Code of Practice.

In the same time, because of inconsistencies in approach, in data and in interpretation of data across different cases, the whole set of standards has been developed (todays ISO 14040 standards and their derivations 14043, 14044), as well as specifications such as GHG Protocol Life Cycle Accounting and Reporting

standard and PAS 2050, based on which LCA for an individual product (or a group of product) or process is conducted.

Physical, material and energetic flows recorded in LCA represented a basis for cost merging and assessment which appears in the environment. Based on that the Life Cycle Costs Assessment (LCCA) or Environment Life Cycle Costs Cssessment (ELCC) concept appeared. This concept raised the question who will, in what amount and on what basis pay the costs incurred in the environment. "An assessment of all costs associated with the life cycle of a product need to be directly covered by any one or more of the actors in the product life cycle (e.g., supplier, manufacturer, user or consumer, or End of Life actor) with complementary inclusion of externalities that are anticipated to be internalized in the decision-relevant future" (Swarr et al., 2011).

Further efforts have been focused on mapping those two concepts and data consolidation with methodologies. How and in what way the production of certain products and services affect the individual parts of the ecosystem (air, water and soil), manifested in the loss of natural resources, reduction of biodiversity, human health and other biocenoza or of man-produced material goods.

Due to the threat of pollution growth and increase global warming, specialized national, regional, transnational and international organizations began (based on the conclusions of several world conferences - Rio, Tokyo, Montreal, Paris) to deal with the LCA. Key results of their efforts in recent decade are systematization of methodologies for environmental impact assessment and construction of the LCA databases of many different products.

Due to some remarks on principles, those two concepts do not reveal the development potentials and social equity (especially in low-income regions). Therefore, the concept of Social Life Cycle Assessment (SLCA) was proposed (UNEP, 2011).

Starting from the request of sustainable development, which integrates the former three concepts, accordingly life cycle sustainability assessment (LCSA) concept was proposed (Swarr et al., 2011). LCSA recognizes all these three concepts (procedures) what can be put as:

$$LCSA = LCA + LCCA + SLCA \qquad (1)$$

"The code of practice is grounded in a conceptual framework for life cycle sustainability assessment (LCSA) of products that uses distinct analyses for each of the three pillars of sustainability, environment, economy, and social equity" (Swarr et al, 2011). This concept is based on the fact that the consumption of common natural resources (air, water and soil) are mostly exploited by economically most developed systems at the expense of less developed due to which the economic development gap between developed and developing is becoming deeper.

Formal supply chains, which are formed among the participants for various products and services (primary and secondary producers, manufactures, producers of final goods, distributors, logistics systems, wholesalers, retailers and end-consumers) are based primarily on the criteria of economic efficiency and profitability of individual participants as well as the whole supply chain.

It is obvious that environmental requirements or requirements for sustainable growth (and development) set new limits to the participants in the chain which must

be fairly distributed. In such a manner, optimal supply chains should be sought in more complex objectives and constraints.

The purpose of this study is to provide a preliminary research of meat production sector in Croatia and assess the acceptable level of development of the domestic supply chain of meat from an environmental (LCA) and sustainability (LCSA) point of view. This objective is part of the overall objectives of project proposal planned for the calls (national and European) which support research for reduce greenhouse gas emissions, provide balanced growth of countries and regions and shorten the life cycle of products.

2. PLCA, LCCA, SLCA, LCSA AND SUPPLY CHAINS

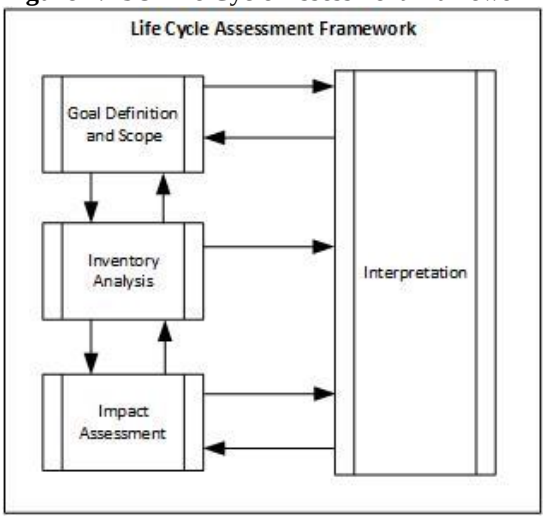
PLCA, LCCA, SLCA and LCSA are timely and data demanding tasks. When it became evident that some industries, i.e. production and consumption of certain types of products irreversibly degrade local and global environment, intensive research on emissions and pollutants upstream and downstream in the supply chain of products began. Research on "environmental footprint" for many processes and products are carried out in different environment and findings that are acquired and publicly available, will be used in this preliminary study.

Key sources of data for this analysis are publicly available database of the Croatian Environment Agency, European Environment Agency (EC-JRC-LCA), Environmental Working Group and US lifecycle inventory database, researches carried out by specialized institutions and faculties.

2.1. Product Life Cycle Assessment

PLCA is the procedure for the collection, analysis, impact assessment and interpretation of results about impact of the production and consumption of different products on the environment. PLCA analysis is a multi-phase process that is carried out with various modifications (WRI, 2011) of the methodological framework established by the ISO 14000 standard. The framework for the implementation of the analysis is shown in Figure 1.

Figure 1. ISO Life Cycle Assessment Framework



Source: ISO (2006)

Objectives of life cycle assessment can be varied and manifold. "The primary goal is to choose the best product, process, or service with the least effect on human health and the environment" (SAIC, 2006). Other objectives include improvement of existing processes and products in terms of environmental impact, comparison of alternative products and processes, cost analysis, penalization of process (product) pollutants, product certification as an environmentally friendly, facility planning on a local and national level, preparation for inter-sectorial analysis and training. Before each analysis it is necessary to determine the scope of the analysis and the participants whose impact on the environment is estimated.

A life cycle inventory analysis (LCI) is „a process of quantifying energy and raw material requirements, atmospheric emissions, waterborne emissions, solid wastes, and other releases for the entire life cycle of a product, process, or activity“ (SAIC, 2006). The data are collected from measurements and processing plants documentation and loaded into the specific databases.

Data collected „can assist an organization in comparing products or processes and considering environmental factors in material selection. In addition, inventory analyses can be used in policy-making, by helping the government develop regulations regarding resource use and environmental emissions“ (SAIC, 2006).

Life cycle interpretation is a „systematic technique to identify, quantify, check, and evaluate information from the results of the LCI and the LCIA, and communicate them effectively. Life cycle interpretation is the last phase of the LCA process“ (SAIC, 2006).

2.2. Life Cycle Cost Assessment

In the product life cycle assessment, the cost assessment that are related to the life cycle of the explored product or group of products can be carried out. Thereby it

is important to separate the costs in the categorization of costs, the costs that are internalized because of environmental requirements and those that are externalized and have to be compensated to external users of environmental resources (through taxes, fees or ad-hoc estimated costs of the incident) when processes are environmentally inadequate. The cost analysis is used to assess the investments required for the elimination of environmental inefficiencies of processes, to explore alternative processes and / or pollutants penalization. Legislation of these costs, whose distribution can vary among participants along with other costs, can significantly affect the competitiveness of certain participants in the supply chain. The key question that must be addressed is a fair distribution of these costs among the participants in the product (service) life cycle.

The assessment of these costs can be performed on the basis of data that must be collected in the field, either on a representative sample or the whole set.

2.3. Social Life Cycle Assessment

Through SLCA one seeks to observe the attitude of participants in the (cradle-to-grave) life cycle to social equality (exploitation, rewards, working conditions, education and training, health care), social engagement and social responsibility of participants in the environment in which they operate (UNEP/SETAC, 2011). Costs related to the requirements for environment protection (preventive costs, environmental taxes, additional disposal costs) that were transferred to the pollutants often resulted in the devaluation of man-made work and requirements to reduce its unit costs. Product life cycle assessment and the assessment of life cycle costs at a given moment represents the state of the production and use of a product in a given area. If it includes all the relevant participants in the life cycle, then it represents the state of the sector and at a given moment, it represents a certain negotiating position in relation to the exploitation (pollution) of the common natural resources. As the production of a product at the local or national level can have a significant impact on the socio-economic growth and development, local (national) systems will try to keep the achieved or planned level of economic development, trying to reduce the real value of the damage caused to the environment. Environmental protection requirements are generally competing demands for economic welfare and it is obvious that a compromise should be sought in the sustainable level of economic growth and development and environmental protection as well. Neglecting development is stated as a criticism of the concept of environmental life cycle assessment, particularly by the less developed regions (UNEP/SETAC, 2011). This is because the problem of depletion of natural resources, the production of greenhouse gases and pollution of soil and water is actualized globally, taking into consideration the current situation in which some local systems reached a maximum depletion of natural resources and environmental pollution, raising their economic welfare at the expense of the less developed systems. Compensations through trading emission rights represent an important but insufficient source of funds for economic growth and development of less developed areas.

2.4. Life Cycle Sustainability Assessment

LCSA is based on the same approach and on the principles of integrated life cycle assessment, life cycle costs, and social life cycle assessment as is symbolically indicated by the expression (1). Sustainable development of an ecosystem (in this case the system is identified with the national environmental system), in which operates a certain socio-economic system, implies such a depletion of resources that future generations can provide at least the same or greater level of welfare in relation to that of a previous generation. Measuring the level of welfare obviously is no longer possible only through the classic (economic) indicators such as GDP per capita. Several models are proposed for sustainability measuring. The most comprehensive is System of Integrated Environmental and Economic Accounting (SEEA) proposed by United Nations, the European Commission, the International Monetary Fund, the Organization for Economic Co-operation and Development and the World Bank (SEEA, 2014).

The second is the modification (correction) of GDP over the Index of Sustainable Economic Welfare (ISEW) (Endres & Radke, 2012):

- private consumption is divided by index of social preference for an equivalent distribution of income,
- value of household production is added,
- values of usefulness of durable goods purchased in previous periods are added and values of newly purchased durable goods are deducted,
- the public (government) expenditure for roads, health, education are added,
- so-called defensive costs of removing the damage and the cost of private treatment are deducted,
- costs of environmental damage in the accounting period are deducted,
- values of decrease in inventories of natural resources are deducted,
- values of the cost of reparations damage from the environment are deducted,
- values of changes of the technical (of man-made) capital are added,
- the difference (positive or negative) of external investment and investment carried out abroad is added.

Eurostat recorded about 140 indicators in 10 fields: Socio-economic development; Climate change and energy; Sustainable transport; Sustainable production and consumption; Conservation and management of natural resources; Public health; Social inclusion; Demographic changes; Global partnership; Good governance.

2.5. Supply chains - requirements for shortening

In the classical approach to the study of supply chains the starting point is the end-customer who's qualitative and quantitative needs are satisfied by some kind of products (goods) and / or services. The term goods indicates the price of good that customer is willing to pay. The functioning of the supply chain in which product or service is made will be based on the criteria of optimality, which generally start from the optimal level of product availability (Chopra & Meindl, 2016). But supply chain

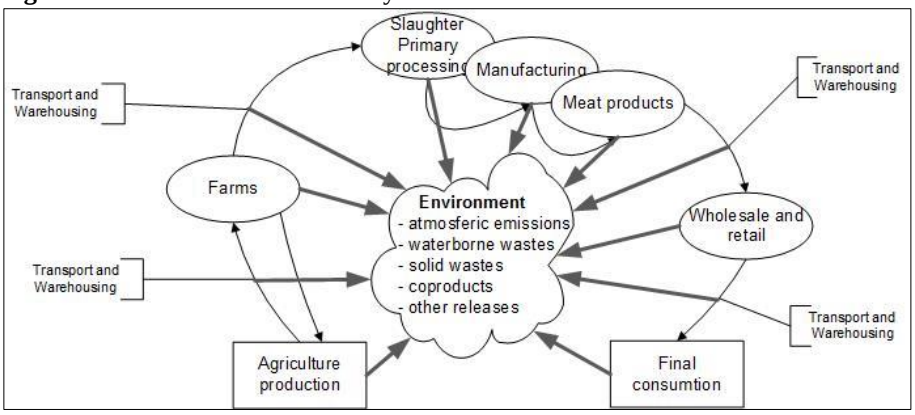
management means to achieve the objectives of economic efficiency, growth, flexibility and stability alongside the whole chain.

Any imbalance in the established supply chain will reflect upstream and downstream in the chain. Maintaining optimal functioning in the contemporary requirements for meeting the needs, new restrictions in the form of external costs that must be internalized are being imposed. PLCAs that are made in the last decade revealed and documented many emissions which resulted in claims for their reduction and / or complete elimination (Milar, 2015; Oliver et al, 2015; Hwang & Rau, 2006). For many products, especially those that do not tolerate high transportation costs, the demand for shortening the life cycle is imposed, both in terms of time of delivery of the product and length of transportation route. In "long" supply chains besides to the direct transportation costs there are a number of warehouses and handling of goods in which different emissions appear. Shortening of supply chain is justified also by the requirements of preserving the quality of the product (as e.g. in many food products often required (SCW, 2013)) and the requirements for sustainable growth and development of local areas (Kebir, 2013). On the other hand, the globalization of business and the requirements for free trade within a formally structured trade agreements, impose the creation of different supply chains (CSCMP, 2015). In the given circumstances, frames for the supply chains design are often determined by socio-political decisions.

3. MEAT LIFE CYCLE ASSESSMENT AND SUPPLY CHAIN IN CROATIA

Contextual framework for meat LCA is shown in Figure 2. It represents the so-called "cradle-to-grave" approach and takes into account all key emissions that occur in the process preceding the production of meat in its processing and consumption. Cradle-to-grave approach is taken because in Croatia there are all of the participants listed in the model.

Figure 2. Contextual for meat life cycle assessment



Source: authors

The intention of this paper is to make a preliminary life cycle assessment as well as LCSA of pork meat production in the Republic of Croatia based on the available data on production, import, export and consumption of pork meat.

Source for emission data for the estimation of total emissions in our case will be taken from Environmental Working Group: Meat Eater's Guide (2011). The data of the production, import, export and consumption of pork in Croatia is taken from Grgić et al. (2015) and Croatian Bureau of Statistics (CBS).

Life cycle costs assessment will be carried out on the basis of CO2 equivalent calculated in PLCA and prices of CO2 equivalent in the European market of emission allowances at eeX (2016) and from Investing.com (2016).

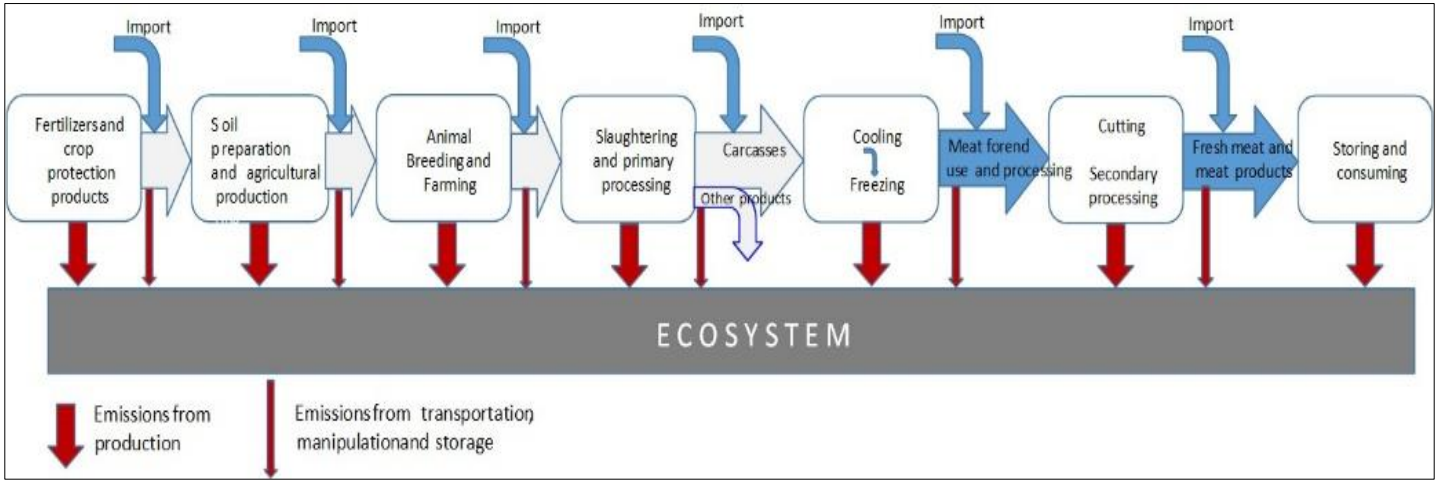
Given the importance that meat production has, particularly for rural areas of Croatia, imbalances in the domestic meat supply chain will be examined. These imbalances caused underutilization of natural resources and production capacities and consequently underdevelopment of rural areas.

The share of pork meat in total meat consumption in Croatia is 35-42%. This consumption is close to the consumption of poultry meat 38-46% (chicken dominantly). The rest of 18 - 23% is beef and about 3% is lamb (CBS, 2015).

The paper did not explored all individual production capacities in the chain (cycle). Emissions are estimated based on data of production, import, export and consumption of pork meat. The starting point for the analysis is shown in Figure 3.

The US pork life cycle with all typical participant shown in Figure 3 according to EWG (2011), gives emission of cca. 12.1 kg of CO2 equivalent per kg of pork. These estimates are made for the conditions and capacities of typical LC participants in the USA (typical practices in agricultural production, the typical diet of pigs to the weight of the usual meat processing, the typical length of transportation routes, and the typical technology solutions of individual participants and modes of consumption). For an accurate assessment of emissions for participants in the chain of Croatia values have to be corrected after a comprehensive analysis of the collected data.

Figure 3. Extended meat supply chain



Source: authors

The pork LCA will be based on data of pork production, export, import and consumption in period from 2007 to 2012 and forecasts for the year 2016. Production of meat in the complete life cycle shown in Figure 1, gives different forms and amounts of outputs that have environmental impact and of which the most important are the so-called greenhouse gases that affect global warming:

- Carbon dioxide (CO2),
- Nitrogen oxides (N2O and NxOy),
- Methane (CH4),
- Fluorinated hydrocarbons (HCFx used as a coolant in refrigerating systems).

Other emissions include waste water from the slurries, slaughterhouses and the meat processing as well as solid wastes that both end up in water streams or in the soil. The emissions that occur in the production of meat come from:

- energy, water, fertilizers, pesticides and other additives in the production of plants for animal feed;
- breeding and raising cattle on farms (heating, cooling, lighting, fermentation digestive processes, irrigation of the slurry);
- fuel consumption in the transport of livestock and crops;
- consumption of electricity, fuel and water in slaughterhouses;
- energy consumption for cooling and freezing of meat;
- use HCFx liquid in stationary and mobile refrigeration systems;
- energy consumption and additional materials for the meat packing and processing in multiple stages including processing and preservation;
- the fuel consumption related to transportation to wholesalers and retailers;
- cooling and manipulation in stores;
- energy use for transportation of meat to the consumer and the consumer's cooling;
- use of energy for the preparation of meat, discarding unused meat before and after cooking and serving.

All emissions of gaseous substances (greenhouse gases) are calculated to the functional unit - amount of emissions per unit weight of product (one kg of meat produced). For comparability impact of certain emissions they are converted to CO2 equivalent, which represents the ratio of the potential for warming (Global Warming Potential) of certain emissions compared to CO2 over a period of 100 years.

Thus, the GWP of certain greenhouse gases are:

- carbon dioxide (CO_2) = 1
- methane (CH_4) = 25 – I.e. Releasing 1 kg of CH_4 into the atmosphere is about equivalent to releasing 25 kg of CO_2
- nitrous oxide (N_2O) = 298 – I.e. Releasing 1 kg of N_2O into the atmosphere is about equivalent to releasing 298 kg of CO2
- Hydrofluorocarbon-23 = 14.800 - Releasing 1 kg of CHF3 into the atmosphere is about equivalent to releasing 14800 kg of CO2 (CCC, 2015).

Based on Meat Eaters Guide (2011) production and consumption of 1 kg of pork meat releases 12.1 kg CO2 eq. This finding will serve in GHG calculation in pork

meat consumption in Croatia[1]. Table 1 presents data of meat production, import, export and consumption of pork meat in Croatia in period 2007-2012 and projection for 2016 (Grgić et al. 2015).

Table 1. Meat Production and Balance in Croatia 2007-2012 and 2016 forecast

	2007	2008	2009	2010	2011	2012	2016
Production							
Slaughtered (000 pigs)	2374	2492	2289	2159	1775	1684	1913
Carcases average weight (kg)	58,48	59,4	69,8	68,35	82,5	75,33	58,02
Net weight of slaughterd (000 t)	138,84	148,04	159,75	147,54	146,46	126,85	111,00
Balance (000 t)							
Domestic meat production (GIP)	133,23	137,12	146,63	136,39	137,70	121,98	104,10
Livestock import	5,64	11,97	14,28	13,05	12,41	10,85	18,42
Livestock export	0,02	1,05	1,16	1,90	3,65	5,98	11,52
Net meat production (000 t)	138,84	148,04	159,75	147,54	146,46	126,85	111,00
Pork import	37,87	54,19	64,50	60,91	63,34	68,82	85,38
Consumption potential	176,71	202,23	224,24	208,45	209,79	195,67	196,38
Pork meat export	2,24	4,79	5,58	5,72	5,65	7,20	8,66
Initial stock	5,63	7,92	6,53	0,87	7,62	4,87	5,11
Final stock	5,83	6,53	0,87	7,62	4,87	5,35	4,88
Domestic consumption	174,27	198,84	224,32	195,98	206,88	188,00	187,95
Per capita consumption	39,33	44,84	50,65	44,36	48,28	43,87	44,01

[1] Emissions of products and processes partly included in meat life cycle are presented in National Inventory Report 2011, Croatian greenhouse gas inventory for period 1990-2009, Ministry of Environmental Protection, Physical Planning and Construction; Croatian Environment Agency, Zagreb, 2011.

Level of self-sufficiency	76,82	68,96	65,37	69,60	66,56	64,88	55,39

Source: Grgić et al. (2015)

3.1. Meat life cycle assessment, costs assessments and sustainability calculation

CO2 emissions in the pork life cycle are calculated based on the data in Table 1. and the assumed amount of CO2 emitted from production of one kg of pork produced in the cradle-to-grave cycle and multiply by coefficient of 12,1 which is calculated in USA pork life cycle. Results are shown in Table 2.

Table 2. CO2 eq. emissions in Croatian pork life cycle

	2007	2008	2009	2010	2011	2012	2016
CO2 Eq emitted in domestic production (000t) (DP)	1.655,70	1.742,05	1.869,21	1.746,46	1.778,93	1.607,78	1.474,55
CO2 Eq emitted for domestic consumption (000t) (DC)	2.108,67	2.405,96	2.714,27	2.371,36	2.503,25	2.274,80	2.274,20
CO2 Eq for DC - CO2 Eq emitted (000 t) in DP	452,96	663,92	845,06	624,90	724,32	667,02	799,64
CO2 emission in full self-sufficiency (000 t)(FSS)	2.744,95	3.488,93	4.152,17	3.407,12	3.760,89	3.506,17	4.105,79
CO2eq price (Eur/t)*	22,50	25,00	16,50	17,00	12,50	7,50	4,50
Savings in CO2 eq not emitted (mil Eur) (SNE)	10,19	16,60	13,94	10,62	9,05	5,00	3,60
CO2 eq costs for full self-sufficiency (mil Eur)	61,76	87,22	68,51	57,92	47,01	26,30	18,48
Average import meat price (000 Eur/kg)	2,10	2,10	2,10	2,11	2,39	2,34	2,56
Average export meat price (Eur/kg)	2,05	2,05	2,05	2,00	2,17	2,37	1,84
Value of meat (import -	74,94	103,98	124,01	117,00	139,01	143,91	202,99

export) (mil Eur)							

Source: calculated by authors

$$CO2\ (eq)\ DP = (domestic\ production + livestock\_import*0{,}25 + livestock\_export*0{,}75 + meat\_import*0{,}05 + average\_stock*0{,}05)*12{,}1$$

The coefficients have the following meanings:

- Coefficient of 0.25 means that 25% of the total CO2eq is generated in the production cycle from slaughter to consumption in Croatia; previously created 75% of CO2eq was emitted abroad;
- The coefficient of 0.75 means that the domestic breeding created 75% of total emissions and rest of 25% will be produced abroad;
- The coefficient of 0.05 is derived from estimates of total emissions from the transport and storage of meat.

CO2eq prices are the prices achieved in the EU CO2 market. Meat prices are average annual prices on imports and exports of meat.

Table 2 shows that emissions from the production of pork are continuously falling since 2009 due to reduced farm breeding and decrease in meat production.

Production and consumption of meat in the cradle-to-grave approach is not a major polluter of the environment (Ekoenerg, 2015) and is not subject to direct penalizing at the national level. Indirect penalization takes place through the price of energy and water consumption at all stages of the life cycle. However, all stages in the life cycle are subjected to regulations based on the specific requirements of the environment (especially for soil and water) and special measures imposed by the conditions of production, processing and consumption.

The value of environmental damage can be seen as a tentative value of the rights (allowances) that can be sold if the right to consume the environment is not consumed. For the purpose of this paper a value of the right for CO2 eq emission is calculated based on differences of possible CO2 eq emission in case of complete domestic production and real production. This difference is multiply with a price of CO2 eq obtained for each year on European CO2 market.

It is obvious that the price continuously decline since 2008 to 2016. This means that in the last eight years, European countries are both, leaving the production which is a major source of emissions and have invested significantly in to the environmental efficiency of the systems used in the different product life cycle. According to Luckow et al. (2016) and Sandbag (2015) it is expected rising prices in the future of emission allowances in USA and EU respectively.

Due to the increasing dependence on imports in the pork life cycle, domestic emissions decreased. However, due to falling prices of emissions rights, "optional income" from the sale of those rights fell too.

Meat supply chain is important (even strategic) sector in the economy of the Republic of Croatia. Although it does not employ a large number of workers, in actual conditions it is important for development of Croatian rural areas as well as adequate use of natural resources. In Croatia, where there is untapped potential in agricultural

land and relatively stable consumption of meat, it is socially necessary to have and maintain a meat supply chain, at least at the level of self-sufficiency.

Production and consumption of meat in the cradle-to-grave approach is minor polluter (in relation to the energy sector, chemical production, transport, thermal energy processes in the industry ...). Sustainable development of the sector is possible in the balanced development of all participants in a way to exploit their capacities and ensure stability of supply and demand. In the analyzed example continuous, slight decrease in meat consumption from 2009 to 2016 is evident, as well as drastic (almost 50%) decline in domestic production of meat. On the other hand, in the same period, there is a continuous increase in pork imports.

The value of the difference between imports and exports, conditionally can be seen as a loss of new value added. The unused own resources on the one hand and low fees that due to environmental protection can be achieved, indicating a disturbed sustainability of the observed supply chain. Imbalances in the meat life cycle, which is a sector of interest to the national economy, can be (must be) dealt with clear measures of economic or agricultural policy (including technology policy and supply chain management policy) and should not be exposed only to the law of supply and demand.

Supply chains created in the meat sector obviously have functioned at the sub optimal level, which means that the balance in the chain is disordered by internal relationships or changes of external conditions that have an impact on the chains. In our case it happened to be on the European market due to the embargo on food exports to Russia what caused a surplus of meat and consequently a drop of pork price.

Meat supply chain began to breakdown at the farm - slaughterhouse relations. The farms are pressed with lower price of output (livestock) on one side and relatively constant or rising input prices on the other side. This makes farms financially inefficient and uncompetitive. This resulted in significantly reduced production, poorly utilized capacities and abandoning of breeding especially on small and medium size farms. In other words, the sustainability of the sector in terms of cradle-to-grave is questionable.

4. CONCLUSION

Life-cycle analysis and collection of data on the production of various products in the cradle-to-grave approach allows detection of important environmental impacts of all participants. Requirements for reducing emissions have become the obligations of human kind. This rise the need for collection of numerous data on polluters - the types and quantities and their impacts on human health, the health of all biocenoza, biodiversity and man-made assets.

Fulfilling environmental requirements is becoming an important criterion of use and applicability of different products. At a time of intense degradation of private and common environmental resources, demand for their preservation becomes prioritized.

Environmental requirements are becoming external costs that must be internalized. In a particular case it results in raising costs of preventing emissions or,

in many cases, direct or indirect penalization of polluters. This requirement is justified in the context of sustainable development and must be complied with.

Preliminary analysis of the pork life cycle in Croatia shows that in this cycle for a given level of production and consumption relatively small amount of emissions are generated. Consequently, penalization (or savings on emissions that can be traded) are also small in relation to the newly created economic value.

In the context of sustainable development it is justified expectation of such systems that production, at least within the limits of self-sufficiency consumption, is favored in relation to environmental requirements.

Supply chain which is created in the conditions of analyzed consumption, production and capacity utilization of individual participants shows its economic misbalance that hurts primarily pigs' breeder i.e. farms. As they are generally located in rural areas of eastern Croatia, it is evident that it will be most reflected in the development of these regions.

Decision-makers in national sectorial policies have budgetary resources, even those derived from emission allowances to direct the equilibrium growth of the sector. They are obliged to intervene in the disturbed relationship in formal supply chains to ensure its' lasting viability.

This research has preliminary character. In future studies a complete meat life cycle assessment as well as life cycle of sustainability assessment should be conducted. Future studies should be based on thorough data analysis and existing sound methodologies for all meat categories that make up the bulk of meat consumption in Croatia. There are numerous studies concerning the state of ecosystems; their use and renewal of natural resources in Croatia (Ekoenerg, 2015; CEA, 2015). In this context, data collected through LCA and SLCA will be useful for creating development and environmental policy related to the interconnected complex production systems.

A particular problem that has to be explored is what benefits for the participants in the chain brings the demand for meat life cycle shortening.

5. REFERENCES

CBS (2015). Croatian Bureau of Statistics [available at: http://www.dzs.hr/ access September 15, 2016)

CCC (2015). Climate Change Connection, CO2 equivalent [available at: http://climatechangeconnection.org/emissions/co2-equivalents/ access September 15, 2016)

CEA - Croatian Environment Agency (2015). MAPPING AND ASSESSMENT OF ECOSYSTEMS AND THEIR SERVICES IN CROATIA, Zagreb.

Chopra, S. & Meindl, P. (2016). Supply Chain Management (Strategy, Planning and Operation), Pearson, Boston.

CSCMP (2015). Are the days of global supply chains numbered? SC Quarterly [available at: http://www.supplychainquarterly.com/news/20150624-are-the-days-of-global-supply-chains-numbered/ access September 2, 2016].

eeX (2016). [available at: https://www.eex.com/en/market-data/environmental-markets/auction-market/european-emission-allowances-auction/european-emission-allowances-auction-download access September 20, 2016].

Ekoenerg (2015). IZVJEŠĆE O INVENTARU STAKLENIČKIH PLINOVA NA PODRUČJU REPUBLIKE HRVATSKE ZA RAZDOBLJE 1990. - 2013. (NIR 2015), Zagreb, naručitelj: Hrvatska agencija za Okoliš i Prirodu, urednik Švedek, I. et al.

Endres, A. & Radke, V. (2012). Economics for Environmental Studies A Strategic Guide to Micro- and Macroeconomics, Springer, Heidelberg.

Environmental Working Group (2011). Meat Eaters Guide: Methodology, LCA

Grgić I., Zrakić, M. & Hadelan, L. (2015). Proizvodno - potrošna bilanca svinjskog mesa u Hrvatskoj, *MESO*, No. 1, Vol. XVII.

Hwang, M.H. & Rau, H. (2006). Development of strategies for shortening supply chain and demand chain, Human Systems Management 25, pp. 255–263.

Investing.com (2016). [available at: http://www.investing.com/commodities/carbon-emissions-historical-data access September 20, 2016].
ISO, (2006). International Organization for Standardization. ISO 14044:2006, Life Cycle Assessment: Requirements and Guidelines. Geneva.

Kebir, L. (2013). Shortening food supply chains: A means for maintaining agriculture close to urban areas? The case of the French metropolitan area of Paris, Food Policy, vol. 41, pp. 85–93.

Luckow, P. et al. (2016). National Carbon Dioxide Price Forecast, Synapse Energy Economics, Massachusetts, [available at: http://www.synapse-energy.com/sites/default/files/2016-Synapse-CO2-Price-Forecast-66-008.pdf access August 29, 2016].

Milar, M. (2015). Global SC Ecosystem, Strategies for Competitive Advantages in a Complex World, Kogan Page.

Oliver, K., Shorten, D. & Engel, H. (2015). Supply Chain Strategy: Back to Basics Eight best practices for managing the supply chain [available at: http://www.strategy-business.com/article/04313?gko=925ed access August 22, 2016].

SAIC (2006) LIFE CYCLE ASSESSMENT: PRINCIPLES AND PRACTICE, National Risk Management Research Laboratory, U.S. Environmental Protection Agency, Ohio.

Sandbag (2015). Getting in touch with reality - Rebasing the EU ETS Phase 4 cap, [available at: sandbag.org.uk/site_media/pdfs/reports/Sandbag_Realiging_EUETS_Ph4_cap.pdf access September 9, 2016].

SCW (2013). Supply Chain World, Shorten the Cycle, [available at: http://www.scw-mag.com/sections/columns/80-shorten-the-cycle access August 29, 2016].

SEEA (2014). System of Environmental-Economic Accounting, Central Framework. United Nations, European Union, FAO, International Monetary Fund, OECD, World Bank, New York. [available at: http://unstats.un.org/unsd/envaccounting/seea.asp access August 22, 2016].

Swarr, T.E., Hunkeler, D., Klöpffer, W., Pesonen, H.L., Ciroth, A., Brent, A.C. & Pagan,R. (2011) Environmental life-cycle costing: a code of practice, International Journal of Life Cycle Assessment 16, pp.389–391.

UNEP (2011). United Nations Environmental Programme (UNEP)/SETAC, CIRAIG, FAQDD, Belgium Federal Public Planning Service Sustainable Development, Guidelines for Social LifeCycle Assessment of Product, Editors: Benoît, C., Mazijn, B. New York.

WRI, Group Authors (2011). Greenhouse Gas Protocol; Product Life Cycle Accounting and Reporting Standard, World Resource Institute (WRI), World Business Council for Sustainable Development (WBCSD).

PACKAGING IN RETAIL SUPPLY CHAINS

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Abstract

Packaging decisions have impact on logistics and sales performance in the consumer packaged goods industry. The packaging decision, i.e. packaging size and case size, is a major transmission belt between the logistical performances of a manufacturer and a retailer. It drives the cost of transportation, warehousing, and safety stock at the manufacturer as well as at the retailer in its warehouses and in the stores. Also, these decisions have effect on the sales of items.

However, the effects of diverse decisions regarding packaging are not clear. Moreover, conflicts of interest can arise between manufacturers and retailers. So, managing the supply chain is not without some extent of ambiguity.

We describe the effects of packaging decisions at a manufacturer of fast moving consumer goods and a retailer within a typical grocery retail scenario. For a specific product range we delve into more details of the trade-offs at a manufacturer and at a retailer. Then, the combined effects of the packaging decision are researched. A numerical example on shelf ready packaging is given.

Key words: packaging, logistics, supply chain management, case study, retail ready packaging

1. INTRODUCTION

A supply chain comprises all activities in the creation of a product. It is characterized by the flow of material from stages of raw material generation via manufacturing, i.e. combining materials, to the ultimate point of consumption of the product. This flow is described also as forward flow as products move in direction to the consumer. The supply chain contains as well the backward flow of parts and products, e.g. for repair or for recycling (E.g., see Wisner et al. 2014, pp. 5-7, Chopra & Meindl 2012, pp. 4-5).

Optimal organization of activities in supply chains is very difficult. This is due to the extent of the supply chain reaching over several firms, the large number of activities linked by the manufacturing process and the diversity of activities involved. Also, these activities are interdependent so that optimization efforts have to consider changes with respect to total supply chain performance. Furthermore, as activities are

spread over several firms, for an individual firm the activities of other firms are not accessible and identifiable. Hence, a prerequisite of optimizing a supply chain is communication between partnering firms of the supply chain so as to make the supply chain transparent for any party.

In this paper we look at the supply chain of fast moving consumer goods (FMCG). We consider the case of a manufacturer of sweets that produces candies. These candies are sold to retailers who will re-sell them to consumers. Hence, we consider only the last two major stages of the supply chain, the manufacturer and the retailer. The manufacturer receives ingredients and combines them to the product, i.e. the candies. The product is put into packaging of different types: Foil or paper to wrap a single candy, bag to carry a pre-specified amount of candies, a carton to carry a number of bags, a pallet to carry stapled cartons. On the retail stage the product itself remains unchanged. It is sold to the consumer by bag, i.e. the bag is the selling unit. The following table provides an overview of types of packaging at different logistics stages.

Table 1. Levels of Packaging in FMCG.

Level of packaging	Function	Sub-Function	Example
Primary Packaging	Establishing the Selling Unit	Separating individual items Collection of individual items	Wrap of candy Bag of candies
Secondary Packaging	Establishing the Logistics Handling Unit	Enabling Order Picking Collection of Selling Units Presentation (Shelf Ready Box)	Shelf Ready Box
Tertiary Packging	Establishing the Logistics Transportation Unit	Mass Transportation	Palletized Cartons

Source: Authors.

It is very common to distinguish between three levels of packaging (See Hellström & Saghir 2006, Dujak et al. 2014). Besides typical protective functions of packaging the levels packaging serve further economic purposes, like enabling efficient handling and transportation by collecting several selling units. See the Report of ECR Europe (2007) for a survey. For example, shelf ready packaging has tremendous effect on the extent of handling in-store (See van Zelst et al. 2009, Villas Boas & Zhao 2005).

2. TRADE-OFFS IN RETAIL SUPPLY CHAINS

In optimizing their business retailers streamline their processes from receiving merchandize from manufacturers to presenting it to the consumers in their retail stores. Especially, grocery retailers adapted developed standardized procedures to restock their outlets and to present merchandize in store. The products are presented

on racks with shelves in order to minimize space required to show a large variety of items.

At the retailer's supply chain, the activities in the warehouse handle transportation units (pallets, cartons) whereas the activities in stores handle selling units. For example, full pallets are transported to their assigned storage or to the picking area where cartons filled with items are collected. Therefore, processes in warehouses are much more efficient regarding cost of activity by selling unit. For example, products are coming in by pallet, i.e. hundreds of units are received at the central warehouse and stocked at the picking area of this item. Therefore, any preparation done at the central warehouse of the retailer or at the manufacturer can reduce the amount of work at the stores by a multiple.

There are several activities to optimize the efficiency of the supply chain. They can be implemented at the manufacturer or the retailer. These are examples of arrangements at the retailer's central warehouse that can reduce cost of activities:

- Arranging the storage and order picking place at warehouse similar to the store
- Order picking of different items and packing their cartons on pallets in the sequence of the aisle layout at stores reduces transportation in stores.

Examples of strategies to be implemented at manufacturers to increase efficiency of the logistics processes:

- Large transport units (number of selling units per carton)
- Labelling of packaging (clear and easily identifiable labelling of cartons to reduce risk of picking errors)
- Shelf-ready packaging (minimize effort in-store to prepare selling units for presentation to the shopper).

Here, we look at shelf-ready packaging (retail-ready packaging), i.e. the carton carrying a number of products, is adjusted such that it helps to reduce activities when preparing the selling units for sale in the retail store. A case study is presented to describe the effects of changing from standard American type of carton to a retail-ready carton.

3. SETTING OF THE CASE

3.1. Croatian Chocolate Producer

In the early twentieth century Kandit ltd. was founded as a sugar factory. During 1920-ties the company started with production of candies and confectionery. After the Second World War Kandit started with chocolate production and in 1960-ties it became one of the biggest chocolate and confectionary producer in former Yugoslavia. During 2011 Kandit became member of Mepas group of companies and started with heavily investing in production facilities. In 2014 a new factory worth more than 20 million EUR was finished and Kandit continued with its production growth. Currently, the company employs more than 300 employees and has continuous growth in sales during last several years.

The economic setting for Kandit changed considerably after Yugoslavia disappeared from the political map and the Republic of Croatia was formed. From 2000 on, the economic development of Croatia restored. It became a member of the World Trade Organization (WTO) and signed the Stabilization and Association Agreement (SAA) with the European Union in 2001. Lately, it joined the European Union on July 1st, 2013. Following the opening of its markets foreign direct investments followed quickly. In the retail markets foreign retailers entered the Croatian market, among them Kaufland, Lidl, dm originating in Germany, and Interspar of Austria.

Consequently, the development of the Croatian retail market adapted to new players. Likewise, in the food market. Domestic retailers, like the Konzum chain, and food processors had new types of competitors penetrating into the Croatian market applying their business models. For example, retailers try to multiply stores according to the strategically set store format.

3.2. Initiation of retail ready boxes project

Due to the changes in the Croatian market and entrance of the big European supermarket chains there are also changes in their demand for different packaging options from their suppliers, i.e. Croatian producers. At the beginning of the year Kandit has been approached by one the biggest Croatian retailers with demand to switch from standard cardboard boxes (so called American type) to retail ready boxes (shelf ready boxes) for the hard boiled and chewy candies. (Figure 1)

Figure 1. Standard type box (left) and sample of shelf-ready box (right).

Source: Kandit, 2016

Obviously, when a customer, here the large retailer, is asking for a change of packaging, the client will check and take a change into consideration. Therefore, in order to be able to satisfy demand of this retailer Kandit started a project of replacing standard boxes which it is currently using for candies in its production by new shelf ready box. In the following the main considerations are the cost of sourcing cartons and the consequences of a replaced carton on the logistics processes and their cost. Thirdly, it is of interest whether there may be effects on the sales performance due to shelf ready cartons. The presentation is guided by these points.

3.3. Cost of Sourcing

In order to compare the cost of cartons the suppliers were asked to hand in new offers for a shelf ready carton. A basis for this is the current volume of cartons required. Table 2 exhibits the yearly volumes, cost per box, and cost of boxes per year regarding three different variants used before starting the project.

Table 2. Current cardboard boxes

Box code	Quantity	Price EUR/pc	Value EUR
Transport box T-111	350.000	0,185	64.750,00
Transport box T-112	30.000	0,230	6.900,00
Transport Box T-113K	120.000	0,150	18.000,00
Total			89.650,00

Source: Kandit, 2016

As it can be seen from Table 2 Kandit is currently using three different boxes (5-layer cardboard) for packaging of hard boiled and chewy candies that are being sold and delivered to this specific and also to other retailers. The three variants of boxes currently in use have different dimensions, different prices for different yearly quantities. The total yearly volume is 500.000 boxes at a cost of EUR 89.650,00.

The different variants of standard carton may carry the same products. Historically three different cartons existed due to demand of retailers.

They are made from same cardboard quality and as the result of this project all three types of boxes should be replaced with one shelf ready box – 114SRPv1 which is made from 3-layer cardboard. Therefore, the complexity of sourcing and storing different boxes for candies would be reduced. Of course, this decision to reduce the number of different cartons is a by-product of the project.

In the course of the project Kandit is also testing another type of box 114SRPv2 which is made from so called KRAFT quality cardboard. It has a higher quality such that it is stronger, i.e. withstands higher loads when stacked on pallets. This is important especially during transport.

Though it is more expensive this cardboard guarantees better logistic performances in transport and on shelves. Consequently, two alternative variants of shelf ready boxes for candies were taken under evaluation. Regarding sourcing costs, the shelf ready variants deviate. Due to the different dimensions and for the second type of test shelf ready box Kandit has received new prices for the boxes (Table 3.).

Table 3. Cost difference – old and new transport box

Box code	Quantity per year	Price EUR/pc	Value EUR
Transport boxes (T-111, T-112, T-1113K	500.000		89.650,00
Transport box T-114SRPv1	500.000	0,169	84.500,00
Price difference (Old boxes-new box)			5.150,00
Transport boxes (T-111, T-112, T-1113K	500.000		89.650,00
Transport box T-114SRPv2	500.000	0,191	95.500,00
Price difference (Old boxes-new box)			-5.850,00

Source: Kandit, 2016

Table 3 compares the total value of purchasing all three types of standard boxes with the two variants of shelf ready boxes. The first variant of shelf ready box accounts for a decrease in sourcing cost of EUR 5.150, the second one for an increase in yearly cost of EUR 5.850 compared to the current situation. Hence, the second variant amounts for increasing sourcing cost and is about EUR 11.000 more expensive than its alternative first variant of shelf-ready box. This holds for the assumption that each customer –not only the asking retailer- will be supplied with a new shelf ready box. Hence, all other retail clients have to be approached by Kandit to convince them for this change they did not ask for before. The sales management needs to bargain with all retail buyers on this change.

Standard cases and shelf ready cases have the same capacity to carry units of selling products.

3.4. Logistic side of the project

The change of boxes will result in a change of internal processes at Kandit as well as a change in processes downstream the supply chain. Besides the cost of the project itself, like development of the new box, financial and time resources needed for this project connected with box replacement, Kandit has to look upon logistic side of the project and that is connected with packing the products in company, putting them on pallets, delivering them to the buyers and finally putting them on shelves in the supermarkets. The effect of changing from three variants of carton to one is not evaluated here. From theory we expect lower average stock of cartons, less warehousing cost and a reduction of cost for reordering activities.

In transportation from manufacturer to the retailers' distribution warehouse there can be logistical consequences if the capacity by pallet changes due to different cartons. In this case there is the chance to have a larger capacity with the new boxes as there is the chance to add one row of cartons onto the pallet. This effect is neglected in the following.

Remarkably, in Croatia it is still the case that the supplier is replenishing the shelves at the retailer. In many instances in other European countries, like Germany, Austria, or France, the retailers occupy own employees or outsourced shelf-replenishment teams for this work. The reason is that the retailer has more control on the activities and realizes economies of scale as the teams fill all different products of a shelf in a single process. Hence, there the logistics related gains from shelf-ready packaging are all to the retailer.

Contrarily, in our case the logistical benefits occurring at the store are to the benefit of Kandit. The shelf ready carton brings savings in replenishment time that is paid by Kandit. It is estimated that the savings are about 7 cents per selling unit (bag of candies):

For the shelf ready carton, it is estimated that the employee requires 15 seconds to put box on shelf and needs additional 15 seconds to open it and make it ready for shoppers – so 30 seconds in total. Hence, with shelf ready packaging, 120 boxes can be replenished per hour, i.e. 120 boxes à 40 bags equals 4800 selling units per hour.

For the standard boxes a worker needs at least 1,5- 2 minutes in order to open the boxes, take out the candies (average 40 bags) and make them presentably for sales. So, a minimum of 30 boxes can be placed on shelf per working hour (1200 bags per hour). This is a quarter of the amount found with shelf ready boxes.

The monthly salary is around 4.000 HRK for an average of 168 hours (21 working days times 8 hours) of work so their hourly pay is around 24 HRK. Then, the cost of putting a bag carried by a shelf ready carton on shelf is 20 lipa, i.e. 0,03 EUR. The cost of putting product from standard box on shelf is 80 lipa, i.e. 0,105 EUR per selling unit.

Netting these with the cost increase due to new carton Kandit can realize a net gain through introducing shelf ready packaging of about 0,105 – 0,03 – (0,191 – 0,169) = 0,051 EUR per box.

In the case considered here, there is no change in the packing process at the manufacturer. The machinery will be the same and the packaging process is the same regardless on boxes. Though, there is a need for programming the new dimensions into the machinery control software. But there is no change in machinery. Manpower is estimated to stay at same level when switching to shelf ready boxes. Obviously, for other products of Kandit's portfolio it may be different.

3.5. Effect on sales

Shelf Ready Packaging not only a driver to reduce logistics handling costs. It changes the appearance of the products' presentation in-store. Shelves filled with products in shelf-ready cartons may appear better filled, though on the other hand the additional cardboard on the shelfs may be unattractive also. For example, in Germany the retailer REWE promotes shelf ready cartons to be used on shelves whereas its large competitor EDEKA is reluctant to apply shelf ready cartons to a large extent. See also their TV campaigns. So, shelf ready cartons change the appearance of supermarkets. Other effects have been researched for example by Waller et al. (2010). They find that when shelves layout is bound to the size of shelf ready packaging, i.e.

the dimensions of the carton shape the contact line to the consumer, the market shares of manufacturers evolve accordingly. Here, we did not research the effect on sales.

4. CONCLUSION

We described a case on the introduction of shelf-ready packaging in the consumer goods retailing industry. We found that the economic effects regarding cost of packaging are offset by the savings in in-store handling. This is in line with the theoretical literature. Effects on sales are not considered.

The savings in the supply chain are not distributed between manufacturer and retailer. However, in the future as we know from quite competitive markets, like in Germany, the bargaining power of the retailers will extract these savings from the manufacturers. Then, potential effects on better in-store presentation and fill-level of shelves can still generate a positive net effect for the supplier. Also, the supplier having shelf-ready cartons is ready to export his products in many European markets where shelf-ready packaging became a standard.

5. REFERENCES

Dujak, D., Ferencic, M. & Franjkovic, J. (2014), Retail Ready Packaging – what's in it for Food Manufacturers?, *13th International Scientific Conference Business Logistics in Modern Management*, Segetlija, Z., Mesarić, J., Karić, M., Potočan, V., Rosi, B., Jereb, B., Trauzettel, V. (ed.) Faculty of Economics in Osijek, Osijek, 16 October 2014, p. 31-42

ECR Europe (2007). *Shelf Ready Packaging (Retail Ready Packaging). Addressing the challenge:a comprehensive guide for a collaborative approach*. ECR Europe Report.

van Donk, P., Akkerman, D. & Van der Vaart, T. (2008). Opportunities and realities of supply chain integration: the case of food manufacturers. *British Food Journal*, 110(2), 218-235.

Ganesan, S., George, M., Jap, S., Palmatier, R. W. & Weitz, B. (2009). Supply chain management and retailer performance: emerging trends, issues, and implications for research and practice. *Journal of Retailing*, 85(1), 84-94.

Gustafsson, K. (2006). *Retailing logistics and fresh food packaging: managing change in the supply chain*. Kogan Page Publishers, 2006.

Hellstrom, D. & Saghir, M. (2007). Packaging and logistics interactions in retail supply chains. *Packaging technology and science*, 20(3), 197-216.

Ketzenberg, M. & Ferguson, M.E. (2008). Managing slow-moving perishables in the grocery industry. *Production and Operations Management*, 17.5 513.Van Zelst, S., Van Donselaar, K., Van Woensel, T., Broekmeulen, R., & Fransoo, J. (2009).

Logistics drivers for shelf stacking in grocery retail stores: Potential for efficiency improvement. *International Journal of Production Economics*, 121(2), 620-632.

Prendergast, G. & Leyland, P. (1996). Packaging, marketing, logistics and the environment: are there trade-offs*?*. *International Journal of Physical Distribution & Logistics Management*, 26(6), 60-72.

Villas-Boas, J.M. & Zhao, Y. (2005). Retailer, manufacturers, and individual consumers: Modeling the supply side in the ketchup marketplace. *Journal of Marketing Research*, 42(1), 83-95.

Waller, M. A., Williams, B. D., Tangari, A. H. & Burton, S. (2010). Marketing at the retail shelf: an examination of moderating effects of logistics on SKU market share. *Journal of the Academy of Marketing Science*, 38(1), 105-117.

Wisner, J.D., Tan, K. & Leong, G.K. (2014). *Principles of Supply Chain Management: A Balanced Approach*, 4th edition, Cengage Learning.

ROLE AND IMPORTANCE OF DISTRIBUTION OF MEDICATIONS IN THE DEVELOPMENT OF THE HEALTHCARE SYSTEM IN CROATIA: A CASE OF MEDICATION WHOLESALERS

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Abstract

Healthcare within the health services, customers and operators providing these services is one of the most important economic activities of any state. Medications as products are the basis of the development for improving the quality of health services. In the past it was believed that the product is a medical procedure performed by the medical personnel. Today, medical product encompasses goods and services offered by the health institutions through specific health programmes that is again dependent on medications. In the logistic chain of medications the wholesalers have the most important role since the medication wholesale business is characterized by the megalogistic chains of distribution, which include all subjects starting from medication manufacturers to patients as users. With regard to the method and the type of activity and the number of subjects, the wholesalers are a part of the global logistics networks. In the Republic of Croatia the pharmaceutical market earns about 5-6 billion Croatian kunas annually, which shows the importance of this segment and the necessity to analyse the further development of the logistic distribution of medications through the convergence of standards of more developed countries in the European Union. In this paper we start with the assumption that, through further rationalization of the logistic distribution of medications in the form that combines optimal location, selected transportation routes and contemporary alternative selection of the transport units, we could influence the quality of the healthcare development in the Republic of Croatia. In this paper we analysed the secondary data and use the method of comparison, the case study method and the quantitative analysis of the fiscal indicators in the healthcare segment in the Republic of Croatia. The research results indicate that the positive implications for the healthcare system in the Republic of

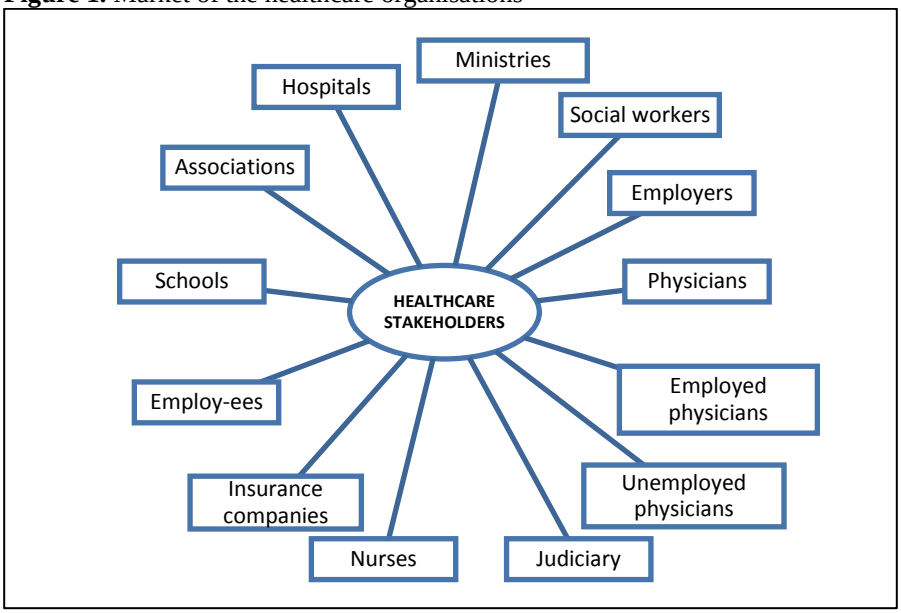
Croatia may occur in the segment of prices reduction of medications through the rationalization of the logistic distribution of medications, which is a goal of this paper.

Key words: medication distribution, distribution channels, healthcare, medication wholesalers

1. INTRODUCTION

Healthcare is not only an economic activity, it represents a concept of primary healthcare, where people are not only voluntary buyers and users, but they have to use health services and medications for their treatment. By definition, healthcare is an activity aimed at protecting the health and treating the diseases and it is provided by the institutions and experts on health services (Anić, 1998, p. 853). The activities connected with health services are closely linked to the needs and desires. Health workers, who rethink the quality of health services, often ask themselves whether the users of their services really need everything they want. Ethics and professionalism requires from them to provide services that are really necessary. The most common examples have occurred recently in one of the most propulsive branches of medicine, the aesthetic surgery. It is an example how various TV shows and series, and celebrities affect the desires and "needs" of ordinary people, so that the visit to the surgery is considered as visiting the hairdresser. Operations in aesthetic surgery could turn terribly banal, and desires are often very unrealistic and then health professionals find themselves in the gap between the patient's wishes and needs. On the other hand, the desire is longing for something. The patient needs a medication for hypertension or an overweight person wants a remedy for loss of appetite and weight loss, and so there are different levels and types of health services. People who work in the healthcare system are also responsible for their patient’s needs or desires. The basic responsibility of the health professionals lies in the quality of the care for their patients. The important thing is to listen to the patient and not to ignore their wishes, but the final decision is on the healthcare providers, because, ultimately, it is their responsibility. Apart from these concerns, there is also a doubt who the "buyers" of the health services are and who the people, especially the health workers involved in the chain of the healthcare system are. Figure 1 shows the potential market for the subjects in the health sector.

Figure 1. Market of the healthcare organisations



Source: Berkowitz (1996), p.10.

In general, the effects on healthcare can be considered broadly based on the following factors:

- stakeholders - *suppliers, management, clients, physicians, employers*
- environmental factors - *legal, social, technological, economic, competition*
- society as a whole.

Interest groups represent each part every hospital wants to establish business relations with. These are patients, physicians interested in certain type of health facility, social services interested in some adolescent programmes, insurance companies, and organizations providing certain healthcare programmes or contracted occupational health institutions. The third group includes suppliers, who represent medication and laboratory equipment sellers or technical services. For some hospitals physicians are also clients, for example, those working off-site, i.e. in the institutions providing some broader health services. In group practice physicians are shareholders or owners. In other organizations, physicians in charge of the operation rooms or emergency rooms are interested in equipment these suppliers offer. Regarding the environmental factors the health institution does not have much influence. The health institution cannot influence the trend of aging population, but it may develop a marketing strategy that will meet the needs of this trend. And also the legislation regulates the ordinance and requirements. Without respecting legislation not a single programme can be implemented in any institution. For example, some strategies to pay physicians for sending them to work in certain institutions are illegal. Social factors include demographic and cultural trends that health services must be sensitive of. The need for health protection is one of the most basic human needs, together with the need for food and drink. There is a great number of people in health institutions

seeking prevention, from general practitioners to different specialties.

2. SERVICES AND MEDICATIONS IN HEALTH CARE SYSTEM

In comparison with other branches of economy it is certainly difficult to determine precisely what the product in healthcare system is. Primarily, it is the medication as the most important product, which is defined by the pharmacy market, but also makes further correlations among other subjects in the healthcare system. The medication is any substance or combination of substances that is manufactured and aimed for the treatment or prevention of diseases in humans or animals, for the purpose of diagnosing, restoring, healing or modifying their physiological functions, as well as achieving other medical and veterinary justified objectives through Law on Medicines (2014). Medications can be also divided on the basis of the obtained permits for transport and as such they must contain one of the following designations:

1. Prescription medications, issued only on the basis of the valid prescription given by a physician, dentist or veterinarian, or at the request of the health institution.
2. Nonprescription medications (OTC).
3. Medications with psychotropic or narcotic effects, that are legally used for medical purposes or in accordance with the international conventions. They are prescribed in a special way and their prescription is subject to controls by the competent authority.
4. Alternative medications (homeopathic, herbal and traditional herbal medications).
5. Veterinary medications (intended exclusively for use with animals).

However it can be conclusively established that the product is a service through which medications come indirectly as usual forms of products from the standpoint of the production principles. In the past it was believed that the product is a medical procedure performed by the medical personnel. Today medical product includes goods and services offered by the health institutions through certain health plans, agreed and approved by a third party that usually pays for this product. Hospitals offer a wide range of services and goods. Larger hospitals offer hundreds, if not thousands of different procedures. Of course, additionally they also offer a variety of products such as medications, food, equipment, etc. It can be called a product mix of some health institution because it is a combination of services, products and ideas. The product in the healthcare system can refer to any product or service. The product is something that is tangible, based on a one-time purchase, while the service is a result of a process that lasts. In the USA the consumer healthcare products also include some products that are considered to be household necessities (toothpaste, condoms) in other parts of the world, together with the supplemental remedial products, medical and therapeutic equipment, which are sold in pharmacies without any special recommendation of a physician. It is difficult to conceptualise and quantify a service; it is intangible and difficult for the user to assess, especially when compared with tangible products. The service is much more personal, especially in healthcare. It is hard to be objective in evaluating the quality of services provided. The service is

inseparable from the manufacturer because it is delivered at the designated place. It is momentary, cannot be stored and doesn't have a so-called residual value.

Theoretically in the healthcare system every citizen is a potential user of health services. The user is the person who actually uses the product or service, but they are not the purchasers at the same time. The decision on receiving the services can be made by another person in the name of the patient (family members). That is the reason why health organizations are interested to address the wide range of customers, including patients, physicians (due to the possibility of sending patients to other institutions and other medical procedures), employees and other people and organizations that may purchase and order goods and services. That is also the reason why the identification of potential users in the healthcare system is much more difficult than in other service sectors, and also due to the large number of consumers there is a problem to fulfil their requirements because they all have different needs, desires and demands. The user of certain health services at the institution eventually becomes a client of the institution. The relationship with the client includes personal and long-lasting relationships. It is also evident that the healthcare today is more expensive and that the funds provided by the state are insufficient so the healthcare system has to enter the market, and the only way for better healthcare is improving the quality and differentiation of their services. Consequently, the two proprietary relations differentiated in the meantime, the public and the private, and they face the emergence of such diseases that require very expensive and effective research. The problems of increasing of existing diseases also arise, despite the fact that the medical science constantly develops and makes achievements in various research areas (cancer, cardiovascular diseases, infectious diseases, nutrition deficiency disease). Furthermore, an increasing number of people seek health care and health insurance (agricultural population), the emergence of increasing number of older people as a result of the aging population (users of health services mostly) and the development of medical science that leads to new diagnostic and therapeutic methods that increase health costs (such as laparoscopy, CT, NMR).

In the healthcare sector it is critical to define the costs of health services, as well as medications and this segment belongs to one of the crucial problems due to the fact that it has a great impact on the end-users, where a significant role is played also by the state in the form of co-financing of the healthcare. The decision making process of defining the costs of health services is shown in Figure 2.

Figure 2. Decision making process of defining costs

Source: Mihajlović & Kostić (2005), p.14.

In theory there are pricing strategies that have been rarely used in the past. The end users of the health services hadn't known the cost of services before they received them. The physicians have rarely taken the price into account when deciding on the therapy. For these reasons, the healthcare system gave only a few possibilities to the health institutions providing the services to patients to be competitive with the price. On the other hand, smaller providers had to include the pricing strategy in its business in order to ensure sustainability. Pricing is one of the most sensitive issues in the strategy of marketing communications of the health institutions with their patients. Defining the prices is a very complex process, especially if there is more competition in the market because then prices change frequently. In the healthcare system monopolies are often present and they dictate prices, and therefore the elimination of the monopoly must also be taken into account. It is present, in particular, in the delivery of medications and medical supplies. The health institutions should define objectives and possible methods that will enable their successful emergence on the market. Defining the demand for the service is another step in the hierarchy of defining the strategy of the objectives, which is followed by the cost estimation, the competition's price for the same or similar services, as well as a selection of methods for pricing to its final setting. The issue of defining prices of medications and healthcare services is particulary significant due to two proprietary relationships in offering services and the ways of financing such services. Since the market environment is still not established in the Republic of Croatia (a hybrid of public and private markets) there are certain ambiguities in the offers of the healthcare providers resulting in tolerance for certain irrationalities and illogical actions, visible in higher costs within the healthcare system. The starting point in forming the price is the trend in income size, i.e. purchasing power of the users. Furthermore, the population age structure is also important and the type and the desire to provide appropriate services, the quality of the health services, the competition, and the logistic distribution network which accompanies the health services provision. The economic policy measures of the state also have an impact on defining and setting prices. The psychological aspect of providing the health services is also important and it is associated with the decision of a user how much they are willing to pay for some service and to whom, and this

aspect is reflected in the prestige and capability of the user with regard to the stability of the quality of healthcare institutions and the fact whether the user was satisfied with the provided service and the courtesy of staff. Sometimes these factors are crucial in the choice of healthcare and health services, especially for those services outside of the domain of the compulsory healthcare. In the process of making decision about choosing the healthcare services the relationship of the physicians and the staff, price, confidence, expertise and discretion are all taken into account. The role of the wholesalers is also important having a significant impact on defining the quality of the health services, especially from the standpoint of the prices.

2.1. Consumption and expenditure in the health sector in the Republic of Croatia

In the Republic of Croatia there are about 4.3 million people, who are, depending on their status and age, registered as users of the healthcare services. The most important group of insurance holders are active workers, who make about 1.4 million people. The structure of the income for the healthcare system consists mainly of the income from contributions paid by the employees and they make up about 81% in the total revenue. Other significant revenues are those from the budget and the supplementary health insurance revenues. The revenues from the budget include the contributions for persons who are given a specific status under the Law on Compulsory Health Insurance (2013). The problem of consumption and expenditure is related to the fact that the negative growth in the number of pensioners against the active insurance users continues, so in 2015 to a single pensioner there is 1.38 active insurance user. Table 1 shows an overview of expenditures on healthcare by the type of insurance that people use in the Republic of Croatia for the year 2012 to the year 2015.

Table 1. Costs and expenses by the type of healthcare

Costs - expenses (in 000 HRK)	**2012**	**2013**	**2014**	**2015**
Mandatory healthcare insurance	18,028,001	20,247,831	19,128,774	18,829,544
Supplementary healthcare insurance	1,609,246	1,085,625	1,056,088	1,193,163
Health safety at work and professional diseases	103,204	85,373	74,796	78,587
Total – healthcare	**19,740,451**	**21,418,829**	**20,259,658**	**20,101,294**
Total of costs and expenses	**22,604,919**	**24,202,834**	**22,836,871**	**22,746,178**

Source: authors examine to http://www.hzzo.hr/o-zavodu/izvjesca/ (accessed August 29,2016)

Costs and expenses by the type of healthcare in the Republic of Croatia may be analysed through a number of ways, regardless of the increase or decrease of the users in certain categories; the wholesalers take it into account when making plans medications and health products, as well as distribution itself. It is evident that the number of people who use mandatory healthcare insurance in the year 2015 compared to the year 2013 decreased by 9%, which indicates a certain disorders in financing, but also in payment by the owners of health institutions, which is, in this case, largely

the state. Table 2 is focused on the presentation of costs and expenses in the analytical records of healthcare, all forms of healthcare financial compensations and forms of material expenditures in the Republic of Croatia for the period from 2012 to 2015.

Table 2. Costs and expenses according to the financial indicators of the Croatian Health Insurance Fund by major categories of health service

	Costs	2012	2013	2014	2015
1	Primary healthcare	2,969,982,492	2,813,172,420	2,979,279,712	3,029,168,732
2	Emergency medical care and medical transport	674,194,695	736,702,741	750,874,031	751,227,825
3	Prescription medication	3,303,254,909	5,436,581,830	3,260,776,283	3,113,501,649
4	Orthopedic devices	719,829,092	858,958,154	684,589,250	695,977,180
5	Hospital healthcare	7,913,133,635	7,453,178,373	6,376,797,089	8,551,840,306
6	Expensive medications	566,772,111	608,650,665	634,079,035	747,436,776
7	Specialist consultative healthcare	633,202,895	698,355,668	507,747,221	610,953,731
8	Supplementary healthcare	1,609,246,586	1,085,625,708	1,056,088,925	1,193,163,396
9	Settlement of liabilities	465,423,246	711,600,784	1,951,368,099	-
Total healthcare (1-9)		**18,855,039,661**	**20,402,826,343**	**18,201,599,645**	**18,693,269,595**
1	Illness and disability reimbursement	1,044,700,384	1,002,081,528	932,645,754	994,526,135
2	Maternity benefits - compulsory maternity leave	907,596,550	866,589,985	827,271,532	853,782,648
3	Other reimbursements	206,128,219	190,969,868	188,347,838	174,784,886
4	Specialization and interns	100,571,787	77,826,727	52,718,361	51,749,252
5	Compensation for pain, work injuries and occupational diseases	190,913,407	168,304,304	165,610,891	168,419,896
Total reimbursement (1-5)		**2,449,910,347**	**2,305,772,412**	**2,166,594,376**	**2,243,262,817**
1	Costs of employees	242,468,845	235,215,625	230,561,633	228,335,271
2	Material costs	88,512,501	191,936,680	128,947,932	97,500,958
Total material costs (1-2)		**330,981,346**	**427,152,305**	**359,509,565**	**325,836,229**
Total costs and expenses		**21,635,931,354**	**23,135,751,060**	**20,727,703,586**	**21,262,368,641**

Source: authors examine to http://www.hzzo.hr/o-zavodu/izvjesca/ (access August 29, 2016)

This category of costs and expenses shows more specific indicators of needs that exist in the organization of the healthcare system in the Republic of Croatia, not only from the providers' viewpoint, but also from the users' perspective. In the category of costs and expenses from 2012 to 2015 visible is a slight but negligible increase in spending on primary healthcare, emergency medical care and medical transport and hospital healthcare. In relation to the fact that the number of people who use

mandatory healthcare insurance decreased, while the expenditure on primary healthcare increased, the role of the state is obvious, and in this case it has a significant negative impact on the future activities of the wholesalers. Further reduction of costs and expenses in the category of supplementary healthcare insurance also shows the same trends, regardless of the fact that almost all forms of reimbursements and other material expenses during the observed period are significantly reduced. Table 3 displays the records of costs and expenses according to the share of medications and orthopedic aids in total healthcare expenditures from 2012 to 2015.

Table 3. Costs and expenses in a way medications and medical products are purchased

Costs	**2012**	**2013**	**2014**	**2015**
Prescription medication	3,303,254,909	5,436,581,830	3,260,776,283	3,113,501,649
Orthopedic devices	719,829,092	858,958,154	684,589,250	695,977,180
TOTAL HEALTHCARE COSTS	**19,740,453,244**	**21,418,831,286**	**20,259,659,961**	**20,101,295,820**
The share of prescriptions in the healthcare costs	16.73%	25.38%	16.09%	15.49%
The share of orthopedic devices in the healthcare costs	3.65%	4.01%	3.38%	3.46%
TOTAL COSTS OF CROATIAN HEALTH INSURANCE FUND	**22,604,919,347**	**24,202,834,953**	**22,836,871,790**	**22,746,178,850**
The share of prescriptions in the healthcare costs	14.61%	22.46%	14.28%	13.69%
The share of orthopedic devices in the healthcare costs	3.18%	3.55%	3.00%	3.06%

Source: authors examine to http://www.hzzo.hr/o-zavodu/izvjesca/ (access August 29, 2016)

This category of costs and expenses is important for wholesalers while planning the procurement of medications and medical products due to the fact that medications and certain medical products are prescribed and it is clear that once again there is a decrease of 9% in the consumption of prescription medications through from 2012 to 2015.

3. DISTRIBUTION OF MEDICATIONS IN CROATIA - THE CASE OF MEDICATION WHOLESALERS

The wholesalers are legal entities that organize the wholesale traffic of medications and medical products. The distribution chains in the pharmaceutical market go from medication manufacturers and / or importers, wholesalers, pharmacies to the consumer - the patient. The role of the wholesalers in this distribution chain is to ensure the delivery and transportation of medications to pharmacies and other healthcare institutions in the shortest period. According to the Law on Medicines and Medical Devices wholesalers may purchase medications from manufacturers of medications and medical products in domestic or foreign markets, or from other wholesalers. The wholesalers in the Republic of Croatia can deliver and sell drugs and medical products to the following subjects: pharmacies, hospitals, doctor's and other specified types of offices, optician shops, public health institutions, other specialised shops and stores in the area of health and other wholesalers. The largest customers are hospitals, since they have a large daily intensity of consumption of medications and medical products. The wholesalers in the scope of their activities have to respect the regulations that define the conditions for wholesale storage and transport of medications or medical products through the organization, execution and supervision of the storage and transport from the delivery stage of medications and medical products from the manufacturer to the end user. The wholesalers are, as organizational subjects, organized as wholesale logistic distribution systems whose business performance can be viewed through internal and external factors within the industry of logistic distribution systems, in this case focused on medications and medical products. In this case the wholesalers represent the frame for logistic system present in the pharmaceutical market. Internal factors of a company are: organizational culture and corporate identity, the concept of management and incentive schemes for employees, information-technology development of a company and other factors resulting from the activities in the economy, science and institutional and regulatory factors of the company. In Croatia, there is a great competition among wholesalers, since there are four wholesalers that hold 98% of the market distribution of medications and medical products, and these are: Phoenix Pharmaceuticals, Medika, Oktal Pharma and Medical Intertrade. The wholesalers' positions change within a competitive market due to changes in external and internal factors of entrepreneurship that are in the pharmaceutical industry usually dependent on market negotiations with repeat and new customers as well as changes in the payment obligations and legislation within the pharmacies and hospitals using the wholesalers' services. As an important criterium of wholesalers' performance from the standpoint of analysing the forms of logistic distribution of medications in the Republic of Croatia we take the positioning of the distribution and storage centers in accordance with their level of management. The differences come from the fact that the main warehouses are located in Zagreb and which results in better performance, considering that all the other medication warehouses are manual and are of the transitional character regarding their volume. The further distinguishing effects among wholesalers result from the segment of stock management, because the concept of reducing stocks and maintaining optimal levels of stocks is a difficult question to answer due to the fact that these are

medications and medical products, which have to be available in the market at any time. Other categories that distinguish the efficiency of the wholesalers start from the following distribution effects such as: transport distance in the distribution of medications, the number of people engaged in the distribution, the number of medication deliveries to the customers and the number of orders that are carried out during the year. Unrelated to the above parameters the EU prescribed the role (Toković, 2012, p.159) and activities by wholesalers with good distribution practices, taking into account the specificity of the product - medication and the needs the end users have. Consequently, the wholesalers must ensure optimal distribution chain and deliver medications regardless of the price, quantity, frequency and in accordance with the prescribed regulations of the institutions. The wholesalers as business entities represent a kind of healthcare industry that makes important impacts on the functioning of the healthcare system, but also on the processes to improve the health services. The most important business function of the wholesalers is distribution, so that the effects of the logistic distribution of services and medications are those having the most important role in generating future perspectives of the medication wholesalers.

3.1. Strategies for logistic distribution of services and medications in healthcare system

There are certain types of the logistic distribution strategies that are, in line with the position of the distribution routes, most frequently selected at the discretion of the storage and the means of transport to the end users in order to improve health services. Above all it is about the place strategy and particular alternative distribution channels. In the Republic of Croatia, there are 14 storages of medications. The logistic distribution centers for all wholesalers are located in Zagreb and these centers have automated, semi-automated and manual warehouses. In other Croatian cities there are manual warehouses. The system of the logistic distribution of medications is commonly analysed through the following parameters (Toković, 2012, p. 156):

- state of the stock - it is impossible to reduce the stock, because the medications must be available,
- transport distance in the medication distribution,
- number of people involved in the distribution of medications,
- number of deliveries,
- number of orders.

Since the pharmaceutical market changes in accordance with the state policies that continue to rationalise the healthcare costs, and together with it the costs for medications, the most optimal logistic distribution system of medications includes well chosen location and distance between the logistics and the warehouse centers and a cost-effective and profitable transportation. According to this, the most commonly considered strategies of the logistic distributions are the place strategy and particular alternative distribution channels.

3.1.1. The place strategy

The place refers to the method of distribution of goods and services. It represents how, what way and where the product is accessible to the end user. In the healthcare system it refers to the place where services are provided and medications distributed. An important factor for the place is a distribution channel, i.e. the moving of goods or services from the producer to the user. There are some important decisions, which are included in the distribution channels, and they are based on the following factors: how the product is distributed, who performs that functioning within the channel, what coverage of the channel is needed and how the channel can be controlled. Different channels are used for the delivery of health services and medications. Primary healthcare institutions (health centres, infirmaries, health stations) are located close to the patients, while the other levels of healthcare institutions are usually concentrated in the medical centres no matter their proximity to the population. Emergency services are a combination of distribution methods, so we have them at the institutions of primary and also secondary healthcare. In the production era there was little importance given to the location of the hospital. Many activities were carried out in hospitals and patients are expected to travel to the hospital. In the early nineties, in the USA, hospitals wanted to take control of the distribution channels of the service providers at the primary care level. But soon they realized that this was not easy and they gave it up. The focus has shifted from as many hospital days to the quality of service and location. If the service is efficient the user did not mind if this institution is near his home.

3.1.2. Alternative distribution channels

All medical institutions have to decide how many other organizations are needed in distribution of their products or services. Direct channel is the one where there is no intermediary between the manufacturer and the end user. In the healthcare system an example of a direct channel is primary healthcare, where there is no one between a physician and a patient (Manufacturer→User). Indirect channel requires intermediaries between the manufacturer and the end user, for example these are medications and supplies for health institutions (Manufacturer→Wholesaler→Retailer→End user). Tertiary but also secondary healthcare is an example of the channel (Clinical Hospital Centre→General Hospital→Specialist→General Practitioner→Patient). An example is the clinical hospital centre where intermediaries are general hospitals, specialists and general practitioners. All of them are involved in the earlier stages of diagnosing, intervention and care (Berkowitz, 1996, p.10). The role of the intermediary is to bring a product or a service to the user. For example, a general practitioner can offer their clients a service of availability for 24 hours and, if necessary, making home visits, for a certain fee. Nowadays intermediary is very useful in the industry of medications and medical disposables because they make these products more accessible to the end users. The persons responsible for the distribution management should decide how the service will be available to the end users. It includes a lot of questions regarding the number of infirmaries and health stations at a health centre. If there are two or more

participants in the channel there is a possibility of some disputes. Also, we know that conflict can arise between the employees of the hospital administration and the medical staff. The conflict is possible between the Croatian Health Insurance Fund and the physicians or the hospital administration. For each distribution the intensity of the distribution is essential and in the consumer industry it is divided into: intensive, selective and exclusive. The main conditions in the selection of the distribution intensity is the user and their decision how much energy they are willing to spend while searching for a service. Intensive distribution is characteristic for primary healthcare, where the patient has their physician who is constantly on their disposal without any major restrictions. Contrary to the intensive distribution is exclusive one, where the service is offered at very few places. In the healthcare system, this type of distribution usually belongs to highly specialized institutions. In the healthcare system selective distribution is at the hospital level. Often some specialized hospitals due to their good reputation and demand for their services open particular programmes in other places (off-site). Further efforts for rationalization and optimization of the logistic distribution of medications and medical services are aimed at redefining distribution functions that depend on the final determination of the number of distribution centers through the location that is optimal not only within the country but also in the wider region, and according to this the process of the transport of goods is defined within the distribution system directed to the end users and health institutions. Another tendency in the process of optimization of logistic distribution of medications is focused on minimizing the costs of medication distribution, where the distribution of medications still represents the core business activity of the wholesalers.

4. CONCLUSION

In the healthcare sector the role of the wholesalers is very important, considering the fact that the main activity of the wholesaler is based on the traditional logistic services, it is clear that the wholesalers' business can be influenced only in the area of rationalisation of logistic distribution services. In other words, the appropriate logistic activities should be prepared in accordance with modern development trends in healthcare, starting from the involvement and importance of medications to the optimization of health services in the already explored and defined markets, but also adapt the same to certain market segments. This means increasing the quantity of logistic services, but also the quality of logistic services, which is primarily focused on the continued improvement of post-sales activities of wholesale with the emphasized investment in modern information technology. It can be concluded that once again the principle of the universal applicability of logistic distribution principles is confirmed. Taking into account the increasing number of activities within the competition wholesalers in healthcare, it is evident that the wholesalers have an increasingly important role in the daily work of healthcare institutions, as well as a significant impact on the improvement of health in the Republic of Croatia.

5. REFERENCES

Anić, V. (1991). *Rječnik hrvatskog jezika*, Zagreb: Novi liber.

Berkowitz, E. (1996). *Essential of Health care Marketing*, Burlington: Jones and Bartlett Publishers.

Croatian Institute for Health Insurance (2015). Zagreb: Financial reports [available at: http://www.hzzo.hr/o-zavodu/izvjesca/, access August 29, 2016]

Kesić, T. (1999). *Ponašanje potrošača*, Zagreb: Adeco.

Law on Compulsory Health Insurance (2013). No. 137, Zagreb: Narodne novine.

Law on Medicines (2014). No. 90, Zagreb: Narodne novine.

Merriman, C. & Barlow, C. (2003). Lessons learned? Why healthcare sales is more important than ever. *Healthcare Marketing Report* [available at: http://www.hmrpublicationsgroup.com/Healthcare_Marketing_Report/ , access June 05, 2010]

Mihajlović, B. & Kostić, N. (2005). *Menadžment u zdravstvu*, Beograd, Čigota.

Previšić, J. & Ozretić-Došen, Đ. (1999). *Međunarodni marketing*, Zagreb: Masmedia.

Segetlija, Z. (2008). *Uvod u poslovnu logistiku*, Osijek, Ekonomski fakultet u Osijeku.

Toković, K. (2012). *Racionalizacija logističke distribucije lijekova u Republici Hrvatskoj*, Rijeka: Futura.

III. RETAIL LOGISTICS

NEW VIEWPOINTS ON THE FORMATION OF RETAIL BUSINESS UNITS AND DISTRIBUTION CHANNELS – THE CASE OF THE REPUBLIC OF CROATIA

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Abstract

The grounds for this paper are the disharmonies in a quantitative development of retail capacities (sale area) and the economic results achieved in the overall national economy.

On the basis of available literature, the paper analyzes a retail business unit form (a retail format), its characteristics, and an importance of connection in a distribution channel and in a supply chain. Due to the development of the new logistic tasks of a retail company, the very distribution channels are modified as well, concerning the physical, informational, and financial flows in these channels. However, in addition to a modification in the distribution channel types, the retail business unit forms of the existent, the so-called "stationary" retail, are changed as well.

The paper analyzes the fluctuations in the growth and development of the retail industry and the retailing capacities in the Republic of Croatia in the 1989 – 2014 period. Furthermore, the achieved level of an overall economic development (per capita GDP) is being compared for the year 2013 with regard to the retail capacities (sales areas) in the Republic of Croatia and in other select countries of the European Union. Also, the data on the realized retail sale pursuant to the retail business unit forms and the shares of electronic retail sale in the overall retailing are compared for the select European countries. The analysis deploys the data of the Croatian Bureau of Statistics and *Eurostat*. It has been found that an enlargement of sale areas occurred more rapidly than the level of an overall economic development in the Republic of Croatia and in some other countries, for the retail development in a technical-technological sense has been missing. Thus, the achieved level of electronic retail is more adequate to the level of an overall economic development of a country.

The paper should serve as a foundation for further research and evaluations of the role of retail industry in the functioning of economic systems in certain countries.

Key words: retail business unit form (retail format), distribution channel, supply chain, Republic of Croatia

1. INTRODUCTION

Based on the available literature and statistical sources (Croatian Bureau of Statistics, *Eurostat*, and the data published in other sources), the paper analyzes new trends in the retail business unit formation and distribution channels while pinpointing to

the significance of their new forms. An analysis of the select retail growth and development indices and of the retail development and efficacy in the Republic of Croatia, i.e., its comparison with the select European countries, derives a conclusion on a necessity of the new retail business unit formation and distribution channels in the Republic of Croatia.

The following European countries have been selected for a comparison with the Republic of Croatia (HR): Austria (AT), Finland (FI), Italy (IT), Germany (DE), United Kingdom (UK), Bulgaria (BG), Hungary (HU), Poland (PL) and Rumania (RO).

The paper should contribute to the observation of the main developmental processes in the retail industry in the Republic of Croatia and to the evaluation of its efficacy. Naturally, the paper should merely be a basis for further research and evaluations of the role of retailing in the functioning of economic systems in certain countries.

2. RETAIL BUSINESS UNIT FORM – A RETAIL FORMAT

A topic analysis in this paper are the retail business units, distribution channels, and supply chains within which they operate, for the retail business takes place in them, i.e., through them.

2.1. The Notion of a Retail Business Unit Form

A phenomenal image of a retail business unit based on the applied market strategy variables might be considered as a business unit form. Similar business units could be grouped (Müller & Hagedorn, 2015, p.81), thus designating a "retail business unit form."

The notions of a "retail business unit form" and the "retail business unit type" may be comprehended as synonyms (cf. Berekoven, 1990, p. 29). Nevertheless, some authors still distinguish these two terms, emphasizing that in business unit form it pertains to a systematization that transcends the limit of a commercial enterprise, being created on the basis of classification and typization, whereas it pertains to the individual business concept systematizations of a separate commercial company in business unit types (cf. Ahlert & Kenning, 2007, p. 111, qtd. lit.).

Business unit forms of a retail company affirm its image acquired by the customers. Naturally, a planned strategy design pertaining to the business unit forms is a significant hypothesis for company's success (cf. Ahlert & Kenning, ibid.). In fact, the retail companies develop certain forms of their business units to gain competitive advantages. Additionally, teleshopping and m-commerce are also taken into account as the business unit forms without a sale area.

The category of retail business units with the equal or similar marketing instruments or their combination may be considered a form, i.e., a retail business unit type. These instruments pertain to the profession, location, sale area size, assortment composition and size, services, customer contact modalities or to the price formation (see Eitner, 2008, p. 48, qtd. lit.). Also, it has been emphasized that most research is based on the retail business units' form attributes pertaining to the prices, services, consulting, assortment, store layout and accessibility (Bosshammer, 2011, p. 36).

Actually, it is related to a retail mix that performs with its "retail formats" (see Levy & Weitz, 2012, p. 112).

Analyzing the criteria delimiting certain retail business unit forms and the ways of their expression, it has been noted in certain authors that they are controversial and are not unanimously determined.

Namely, in addition to the aforementioned marketing variables, certain authors cite a legal form and financing (affiliate or a company) and the horizontal and vertical cooperation features (enterprises on one side or an affiliation with the groups, cooperatives, etc. on the other side) as the criteria distinguishing the retail business unit forms (cf. Nieschlag, 1972, p. 108; Haller, 2001, p. 34; Turban, 2005).

The aforementioned characteristics of the retail business unit forms in present conditions may be further complemented, especially taking into account a state-of-the-art development of concentration and the possibilities provided by contemporary Informatical technologies. The existent classifications and typizations of the retail business unit forms could also be complemented by these features.

Contemporary classifications and typizations of the retail business units (see Eitner, ibid., p. 49, qtd. lit.) primarily start from a location (static or movable), further dividing the statically located retail business unit forms in those having a sale area and those without it. A mail shipment retail, a vending machine retail business, an electronic retail business, etc., may be considered the retail business unit forms without a sale area. On the other hand, the retail business unit forms having a sale area (the so-called "store-based retail") may be further divided with regard to an emphasis on consumer perks while shopping (e.g., a convenience store, a drive-in store, a kiosk, etc.), with regard to an assortment (e.g., a vocational store, specialized store, a boutique, a hypermarket), with regard to the emphasis on favorable prices (e.g., a discount store, an off-price store, a factory outlet, a second-hand store, and the like), and with regard to other amenities (e.g., a supermarket or a third-world shop). For instance, the retail business unit forms with a movable location are an ambulatory sale, home delivery, etc.

Nonetheless, the retail business unit forms without a sale area ("nonstationary retail") may be further categorized (see Gittenberger et al., 2013, p. 12). A mail shipment retail may be specialized or the one having a broader assortment. The forms of an electronic (Internet-based) retail may be pure player, bricks and clicks, clicks and sheets, clicks and bricks and sheets, etc. Yet, additionally, teleshopping and m-commerce are also taken into account as the retail business unit forms without a sale area.

When logistically observing the retail business unit formation, essential are the flows, for logistics always pertains to the flows: the material, informational, and value-based ones. In a contemporary logistics consideration (Göpfert, 2006, p. 58), it has been emphasized that logistics is a *contemporary managemental concept for the development, design, management and realization of efficacious and successful object flows (goods, information, money and finances) in the broadly established value-creating systems within a company and in those that transcend the corporate boundaries.*

Therefore, in such a realization of business logistics, essential is the management of a supply chain (SCM), representing an "overall integrated planning and process

conduct within a complete value-creating chain, with an objective to optimize the purchasers' need satisfaction" (Kämpf et al., 2008, p. 2). It pertains to a delivery or a logistic chain. However, it is being observed in a broader perspective, for the approach also contains marketing solutions.

2.2. Formation of Retail Business Units in a Distribution Channel

A distribution channel is comprised of one or more companies or individuals participating in a goods and service flow from a producer to an end user or purchaser (Hill, 2010, p. 93).

Within marketing conditions, a term "marketing channel" may also be deployed, as the links of the chain are interconnected to multiple flow types (Kotler & Keller, 2008, p. 473; Kotler et al., 2006, p. 861), so the following is existent: (a) a physical flow; (b) entitlement flow (proprietary flow); (c) payment flow; (d) information flow and (e) promotion flow.

Thus, the marketing channels, i.e., the distribution channels, imply all those organizations that a product has to go through from production up to consumption (Kotler et al., ibid., p. 858).

As the distribution channel participants may be interconnected while unifying their functions, various forms of the so-called "integrated distribution channels" have also been developed. On the other hand, the nonintegrated channels, in which each participant would perform individually and competitively concerning the others, may be presently considered as the theoretical models only.

The so-called "vertical marketing systems" are created while interconnecting the functions of the individual incumbents within a distribution channel. They have been created as a consequence of competitive and concentrational fluctuations, so certain business systems have been expanded, assuming the functions of other channel participants.

When a product is sold to the purchasers having an unequal status or to those on different markets (possibly in various countries), it is possible to design the so-called "multichannel systems." Namely, a multichannel architecture optimizes coverage, adjustment, and channel control while simultaneously minimizing the cost and conflicts. Therefore, various channels should be formed for the clients of different sizes (Kotler & Keller, ibid., p. 490).

In this sense, the hybrid distribution channels are exceptionally important nowadays, for they represent an opportunity for various innovations, especially for the small fast-growing companies.

The retail companies may develop the so-called "multichannel retail," whereby they also parallelly operationalize an electronic retail, in addition to the forms of retail business units with a static location. A multichannel retail is also related to the forms of a complete electronic (Internet-based) retail or only to the enrichment of certain variables of an existent retail mix within a retail company's system that physically possesses the stores. Nonetheless, should an Internet-based retail be integrated with the stores in a physical sense as well as with a catalog sale, established is the so-called "cross-channel retail" (see Groß et al., 2014, p. 347). Thus, the new combinations of

instruments within a retail mix are being created, i.e., the new, enriched forms of retail business units.

Therefore, one should not be surprised by an alteration in the definition of electronic retailing, for the electronic retail is not merely a "format" any more (Levy & Weitz, 2009, p. 55) but is considered to be a "channel" (Levy & Weitz, 2012, ibid., p. 58):

> Internet retailing**,** also called online retailing, electronic retailing, and e-tailing, is a retail *channel* in which the offering of products and services for sale is communicated to customers over the Internet. A decade ago, retail experts predicted that a new breed of high tech, Web-savvy entrepreneurs would dominate the retail industry.

2.3. Formation of Retail Business Units in a Supply Chain

Nowadays, major corporations expand their analyses of distribution channels—marketing channels—to the analyses of all supply (delivery, logistic) channels while aspiring to manage them. Namely, as emphasized above, supply chain management (SCM) has been developed.

When a retail company domineers a supply chain, it pertains to a "retail supply chain," in which not only the management of the so-called "downstream flows" (distribution channels) but also the management of the "upstream flows" is expressed. Thus, the significance of the large-sized retail chains that are being expanded internationally lies in the fact that they may also integrate all the preceding levels (producers and market mediators), directing and developing the production itself.

As a supply chain also involves the suppliers and mediators and even the mediators' clients, established are the so-called "value delivery networks" (cf. Kotler/Wong/Saunders/Armstrong, 2006, pp. 857, 859). Consequently, a demand chain management is most important in the supply chain management, while establishing the so-called "value networks."

There is a multiplicity of communicational, sale, and logistic channels within the functioning of the retail business unit's forms in a supply chain.

On the occasion of communication channels' integration, one speaks about the so-called "omnichannel retail," i.e., about an evolution of the multichannel into an omnichannel retail. Specifically, a complete channel integration is defined as an "omnichannel," through which the purchasers may buy any product anywhere while being simultaneously involved in all the cannels. Anyway, recognizability of a retailer brand is vital for the "omnicustomers." A major role herein is played by cellphones (e.g., smartphones, see Segetlija & Dujak, 2013, pp. 135f.). For the provision of an expanded channel selection, the retailers utilize powerful databases and robust informational technologies (see Goworek & McGoldrick, 2015, p. 283).

Thus, the patrons may be informed on the goods in a stationary store as well as via Internet, printed catalogs, television broadcasts, and specialized sale exhibitions, whereby they may purchase the merchandise locally or dispatch their orders online, via telephone, or via fax. In addition to the purchase websites, the

usual retail formats have the cellphone-adjusted webpages (for purchasers' purveyance via smartphones or tablets).

In the stationary retail business units, accustomed is cashless payment via ECs and credit cards; however, other payment systems are being tested and already deployed in the Internet retailing. A merchandise can be delivered to a purchaser's address, to a stationary store, or to another reception place. Cumulatively, the retail companies increasingly integrate various communicational, purchase, and logistic channels to provide the customers with an option selection concerning a sale platform, payment, delivery, return, added services, and the like. In such a way, an interchannel retailing facilitates a planned and coordinated communication with the customers, whereby they are provided with an opportunity to be informed about various sale avenues and an offer while interconnecting and checking this information with other information channels (e.g., via social networks) and passing a final decision on a purchase in due course.

In any case, the individual features of a retail business unit form concerning a corporate individualization (business unit type) should be also analyzed as a created "business model." This individualized expression variously stipulates merchandise and information flows from the customers to the external partners, being concluded at their tangential points. These flows determine a business model flexibility, as well as a turnover structure development and expenditure structure (Merkel & Heymanns, 2003, p. 2).

The business models pertain to an application of modern informational and communicational technologies in an interaction with business partners (cf. Bosilj-Vukšić & Kovačić, 2004, p. 2). Therefore, there is a business model influence on a change in business processes. However, a retail company's competitive advantages are additionally expressed due to the economy of scale (large-size stores, affiliates, and the like), as well as due to a successful process management, i.e., due to a value chain management.

3. THE SIGNIFICANCE OF DISTRIBUTION CHANNELS AND RETAIL FORMATS FOR NATIONAL ECONOMY

Currently, the significance of distribution channels and retail business unit forms for a national economy is especially visible in the development of channel system and integration. E.g., the major vertical marketing systems in the US presently cover 70 to 80% of the consumer-oriented merchandise market (Kotler & Keller, 2008, p. 487).

Equally, the vertical marketing systems are also especially important from the standpoint of a foreign trade exchange, for the opportunities to develop the entirely new retail supply chains and effectuate an alteration in a country's retailing structure are being immediately opened by virtue of an entrance of the large-size retail companies and their business units in that country. Namely, these retail companies select their (domestic and foreign) product and service suppliers.

In the conditions of a strong development of the vertical marketing systems and supply chains, a new retail company competition also emerges, for the so-called

"retail supply chains" launch production in a broader geographic area and may abandon their former suppliers of certain products (cf. Kotler & Keller, 2008, ibid., p. 488).

In such a way, the significance of supply chains for a national economy is actually reflected in the capacities to activate its business entities (irrespective of the fact whether they are the traders or producers or some other service companies) in any market, home and abroad.

The preconditions for the expansion of business activities of the large-size retail supply chains lie in the successful developmental strategies, based on the modern knowledge management, IT management, HR management, and the like. Thus, the especially innovative business structures, i.e., the value-creating chains, are being established.

Consequently, the importance of retailing and its correspondent business unit forms should be observed not only as its GDP share or as its share in the number of employees but also as a stimulator of supply chains in the function of consumption, production, and competition development. Precisely, GDP and the number of the employed in retailing are analyzed for a country (realization on its territory), but a supply chain may be organized so that some of its processes are executed in different countries. Thus, from this perspective, for the evaluation of retail significance one would also necessitate the comparisons with the large-size international retail companies, i.e., with the retail supply chains, and the role of correspondent retail business units in them.

In this sense, this paper aims at an evaluation of its efficacy in the creation of supply chains of economic entities in the geographical area of the Republic of Croatia, in addition to an analysis of the growth and development indices and of the development of retailing in the Republic of Croatia.

4. SELECT INDICATOR ANALYSIS

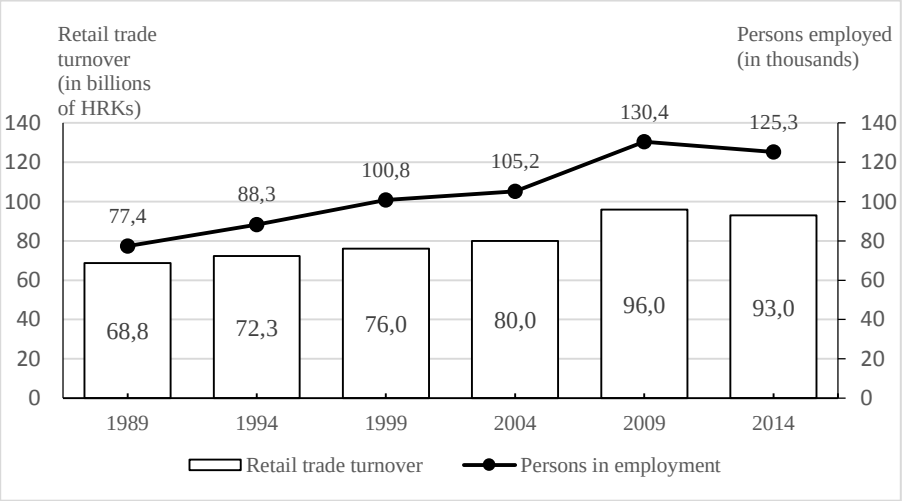
The analysis of growth and development of the retailing industry in the Republic of Croatia establishes the trends (indices) and primarily graphically depicts the data pertaining to the retail turnover, number of employees, number of stores, and the sale area size from 1989 to 2014. The year 1989 was selected as the basic one, concerning the former socioeconomic system within which the former Republic of Croatia was situated at that time.

Based upon the data adduced, one may calculate the sale area productivity (as a realized turnover per a square meter) for the observed 25-year period. The calculation and a comparison of sale area productivity and the productivity of the employed in the retailing sector in the Republic of Croatia with the select European countries is effectuated for the year 2013. Also, the data on the GDP realized (by an overall economy) per a sale area unit, i.e., those pertaining to the Republic of Croatia, are being compared with those for the select European countries for the same year. Comparing these indices, one may evaluate the successfulness of retail companies headquartered in the Republic of Croatia in the deployment of domestic potentials when creating the supply chains.

Eventually, the data on the structure of sale areas per the retail business unit forms in the FMCG sector and in the expanded grocery sector (German: *Lebensmittel*) in the Republic of Croatia and Germany in 2012 are compared, as are the percentages of retailing obtained via mailed shipments and via Internet in the overall retailing for the Republic of Croatia and the select European countries in 2013.

Graph 1 depicts the turnover and the number of the employed in the retailing sector in stores in the Republic of Croatia in the 1989 – 2014 period.

Graph 1. Turnover and number of persons employed in retail stores in Croatia, 1989 – 2014



Annotation: Turnover per price in 2004 (a nominal turnover corrected, with the retail price indices), without kiosks, open-air sale areas, and open-air sale areas at gasoline stations, with no pharmacies for the year 1989.

Sources: (a) *Prodajni kapaciteti u trgovini na malo 1989., Dokumentacija 809*, Republički zavod za statistiku, Zagreb,1991.
(b) *Prodajni kapaciteti u trgovini na malo u 2004., Statistička izvješća 1293*, Državni zavod za statistiku, Zagreb, 2006.
(c) *Prodajni kapaciteti u trgovini na malo u 2009., Priopćenje br. 4.1.3. od 28. travnja 2011.*
(d) *Prodajni kapaciteti u trgovini na malo u 2014., Priopćenje br. 4.1.3. od 28 travnja 2016.*
(e) *Mjesečno statističko izvješće,* razni brojevi. Državni zavod za statistiku Republike Hrvatske, Zagreb.
(f) *SLJH*, razna godišta, Državni zavod za statistiku, Zagreb.

Comparing a turnover fluctuation and the number of employees in retail stores with the overall economic development level (GDP) in a period prior to the onset on an economic recession (1989 – 2009), one may observe that retailing has developed much more rapidly. From the sources adduced under Graph 1 one may notice that the store turnover rose by 39.5%, whereas the number of employees rose by 61.9% in the

1989 – 2009 period. That was much more rapidly than the overall economic development of the Republic of Croatia, for the GDP in the 1990 – 2009 period (according to the 2009 prices) rose by only 11.6% (Turčić & Turčić, 2013, p. 70). According to the same sources, in the conditions of an economic recession, the store turnover was reduced by 4.2%, whereas the number of employees was reduced by 3.9% in the 2009 – 2014 period. GDP in that period was reduced by 5.5% (SLJH 2015., p. 214).

The aforementioned trends are a reflection of a disharmonized socioeconomic development of the Republic of Croatia even prior to a global crisis (after the year 2008). Such trends have been negatively reflected on a further economic development. Namely, due to the more favorable prices in foreign countries, the retail companies in the territory of the Republic of Croatia could exclude the domestic producers (Segetlija, 2011, p. 462).

Graph 2 depicts a fluctuation in the number of stores and the number of inhabitants per a store in Croatia in the 1989 – 2014 period.

Graph 2. Number of stores and number of inhabitants per store in Croatia, 1989 – 2014

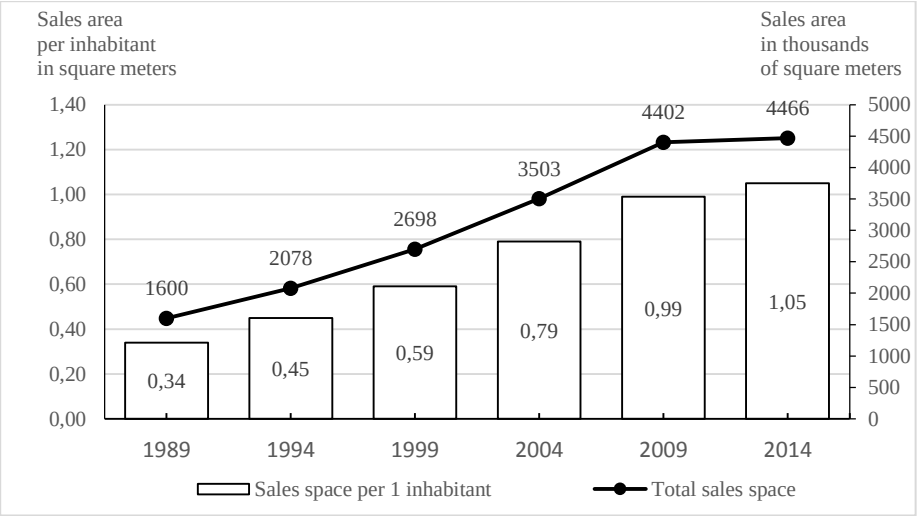
Annotation: Number of stores without kiosks, open-air sale areas, and open-air sale areas at gasoline stations, with no pharmacies for the year 1989. The number of stores in 1994 and 1999 was estimated on the basis of various data in statistical annals and lists kept with the Croatian Chamber of Trades and Crafts, Zagreb, and individual regional chambers of trades and crafts.

Sources: (a) *Prodajni kapaciteti u trgovini na malo 1989., Dokumentacija 809*, Republički zavod za statistiku, Zagreb,1991.
(b) *Prodajni kapaciteti u trgovini na malo u 2004., Statistička izvješća 1293*, Državni zavod za statistiku, Zagreb, 2006.
(c) *Prodajni kapaciteti u trgovini na malo u 2009., Priopćenje br. 4.1.3. od 28. travnja 2011.*
(d) *Prodajni kapaciteti u trgovini na malo u 2014., Priopćenje br. 4.1.3. od 28. travnja 2016.*
(e) *Mjesečno statističko izvješće,* razni brojevi. Državni zavod za statistiku Republike Hrvatske, Zagreb.
(f) *SLJH*, razna godišta, Državni zavod za statistiku, Zagreb.

It is visible from Graph 2 that the number of inhabitants per store has increased after 2004, with regard to an increase in their size. Such fluctuations were observable in the market-developed countries much earlier (prior to the launch of the concentration processes).

As the obtained level of retail development is frequently (quantitatively) expressed by a sale area per an inhabitant, Graph 3 depicts the fluctuations in sale areas totally and per an inhabitant in retail stores in Croatia for the 1989 – 2014 period.

Graph 3. Sales area in retail stores in Croatia, 1989 – 2014



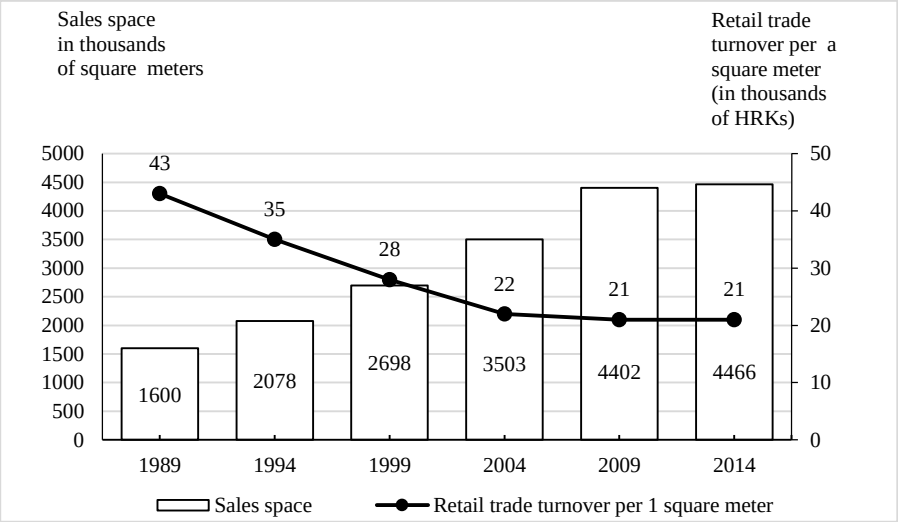
Annotation: as in Graph 1.
Sources: as in Graph 1.

On the basis of data depicted in Graph 3, one may establish that the store sale area in Croatia was increased by 179.1%, whereas the sale area per inhabitant was increased by 298.8% in the observed period.

Graphs 2 and 3 demonstrate that an average store size in 1994 was reduced when compared to the one in 1989, since many small entrepreneurs ushered into the trade business in the Republic of Croatia; however, an average size amounting to 143.5 m^2 was reached in 2014 (whereas the average store size in 2004 amounted to 87.8 m^2).

Graph 4 depicts the fluctuations in sale area sizes and its productivity in Croatia's stores in the observed period (1989 – 2014). That general tendency of an increase in sale areas and of a decrease in their usability (due to the development of a large-area store type) has been launched in the market-developed countries earlier than in the Republic of Croatia, so such graphic depiction models have been known for quite a while (see Oehme, 1983, pp. 63, 65; *Einzelhandel für massiven Strukturwandel – Perspektive 2020*, p. 17; Rumetsch & Roeb, 2014, p. 12; Lademann, 2013, p. 8).

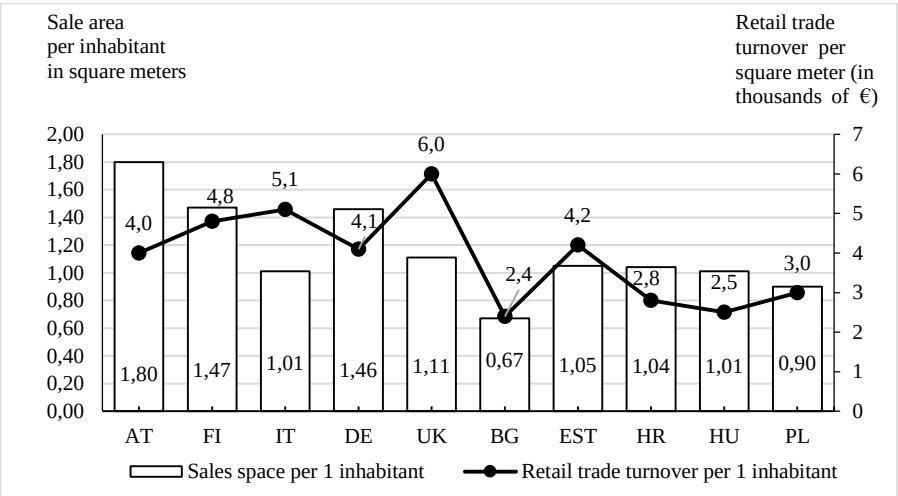
Graph 4. Sale area productivity in retail stores in Croatia, 1989 – 2014



Annotation: as in Graph 1.
Sources: as in Graph 2.

Sale area per inhabitant and sale area productivity for the Republic of Croatia and the select European countries in 2013 is depicted in Graph 5.

Graph 5. Sales area per inhabitant and sale area productivity in the select European countries in 2013

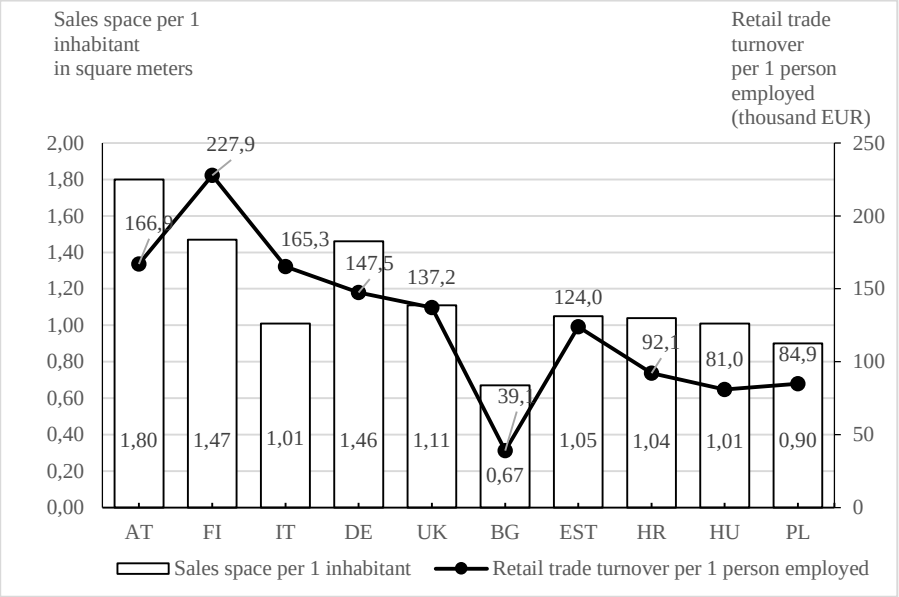


Annotation: *G-47 retail trade, except motor vehicles and motorcycles.
Sources: (a) *Einzelhandel Europa 2014*, GfK Studie zu den Handelsindikatoren 2013 und Prognose für 2014
(b) *Annual Detailed Enterprise Statistics for Trade (NACE Rev. 2G)*, Eurostat, 2016.

The data can be utilized merely orientationally, since the retail effects achieved are not reduced to the equal prices but were calculated according to the official rates of exchange pertaining to the domestic currency with regard to euro. Hereby, the overall retail industry was taken into account, so that out-of-store retailing has increased the sale area productivity (especially the electronic one) in certain countries (United Kingdom, Germany, Estonia, Poland, Austria). In any case, the sale area deployment rate in the Republic of Croatia, Bulgaria, and Hungary is unsatisfactory, with regard to the other countries observed.

Graph 6 depicts a retail employee productivity in the select European countries.

Graph 6. Retail trade turnover* per person in the select European countries in 2013



Annotation: *G-47 retail trade, except motor vehicles and motorcycles.
Sources: as in Graph 5.

Additionally, one may conclude from Graph 6 that a higher labor productivity of retail employees is being realized in the countries with the larger sale areas per inhabitant, for the story types having larger sale areas might be formed, in which the area is specially utilized as a factor of the labor process. Certainly, the out-of-store retail industry increases the productivity indices of persons employed with the retail industry, calculated in this way.

Due to a rapid increase in sale areas in the Republic of Croatia, the contemporary large-area stores have been formed. A rough comparison of the realized turnover structure per the types of retail business units in the Republic of Croatia and in Germany in the FMCG sector (i.e., in the grocery sector) is depicted in Graph 7.

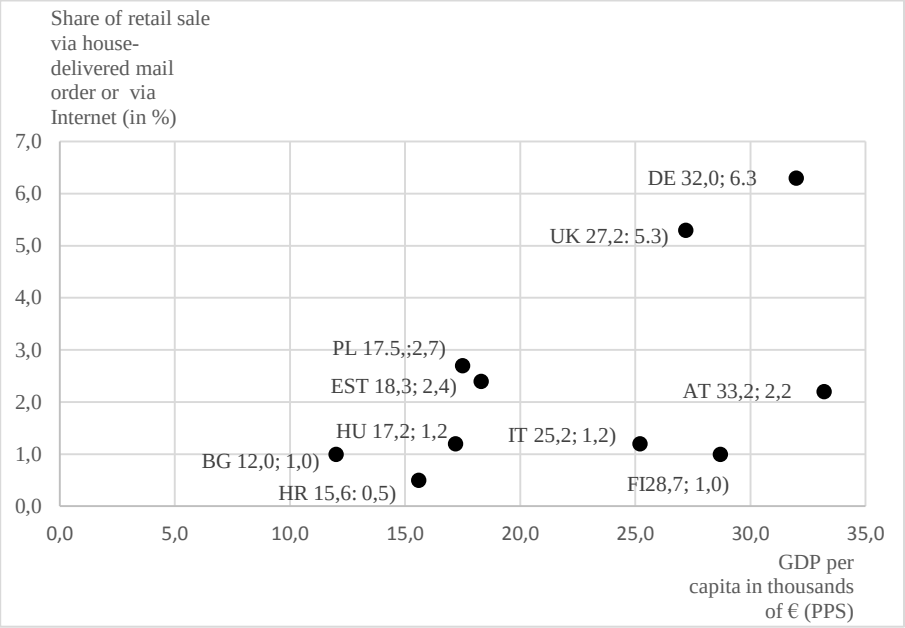
Graph 7. Turnover structure in retail sale by type of retail business units in Croatia and Germany, 2012

Sources: (a) GfK 2013. Croatian Retail Monitor, March, 2013, qtd. in: *Konzum. Marketing i prodaja na policama 2010 – 2013.*
(b) *Situation des Einzelhandels 2016*, IHK Industrie- und Handelskammer, Chemnitz, 2016.

In spite of the establishment of large-area stores, the structure of realized turnover per retail business unit types in the Republic of Croatia still differs from the structure in the market-developed countries, in which the shares of smaller stores are significantly smaller (see *Hypermärkte versus Supermärkte: welcher Betriebstyp regiert in Europa*, 2014). Also, according to the data in Graph 7, the small stores in the FMCG sector participated up to 28% in the overall turnover realized in 2012 in the Republic of Croatia, whereas the discount store took merely 8%. Nonetheless, some malls were closed recently, and a tendency to reduce the number of small stores has continued. Pursuant to the data from statistic reports, *Sale Capacities in Retailing in 2009* and *Sale Capacities in Retailing in 2014*, the overall sale area in the Republic of Croatia has remained the same, but it has been reduced in ten counties.

In an analysis of the retail development quality, the data on its structure per the existent retail business unit forms should be amended by those on the electronic retail and the ones on the mail-delivered shipment sale, for a significant feature of contemporary forms is the so-called "interchannel retailing." Thus, Graph 8 depicts the shares of retail sale via house-delivered mail orders and electronic retailing in the overall retail industry with regard to the per capita GDP realized in the select European countries in 2013. It is visible in Graph 8 that the Republic of Croatia has the lowest turnover share of the house-delivered mail orders and of the electronic retailing in the overall retail industry. That is commensurate to the level of its overall economic development.

Graph 8. Share of retail sale via mail order houses or via Internet in the retail trade* of the select European countries in 2013

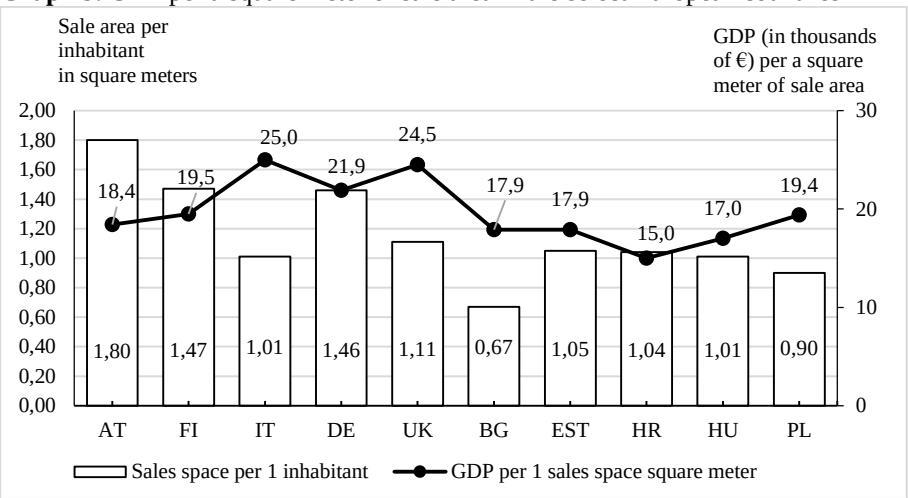


Annotation: *G-47 retail trade, except motor vehicles and motorcycles. GDP in the Purchasing Power Standard (PPS).

Sources: (a) *GDP and Main Components – Current Prices*, Eurostat, 2016.
(b) *Annual Detailed Enterprise Statistics for Trade* (NACE Rev. 2G), Eurostat, 2016.

A GDP realization per a square meter of sale area in the retail industry demonstrates retailing efficacy in a country with regard to the launch of supply chains while activating the (productive, serviceable, etc.) companies that transact their business in the country's territory (Graph 9). Hereby, essential is the size and the market stamina of an individual retail company and the implementation of the state-of-the-art technology. Among the countries observed, the Republic of Croatia realizes the lowest GDP per a retail area unit. The reasons for that phenomenon are not only the entrance of the foreign retailing supply chains on the Croatian retail market but also a lack of readiness of the domestic production to get involved in the supply chains that end on the territory of the Republic of Croatia (mostly due to its higher prices), what has consequently caused an increased import.

Graph 9. GDP per a square meter of sale area in the select European countries



Annotation: GDP in the Purchasing Power Standard (PPS).
Sources: (a) *GDP and Main Components – Current Prices*, Eurostat, 2016.
(b) *Einzelhandel Europa 2014, GfK Studie zu den Handelsindikatoren 2013 und Prognose für 2014*.

5. CONCLUSIVE THOUGHTS

All the changes in the retail environment are reflected in the development of the new retail business unit types and in a change of their characteristics. These changes may be observed at their best while analyzing the logistic flows: material, informational, and the value-based ones. Therefore, their new forms have been created nowadays, but they are currently not statistically monitored.

In a period preceding the intensification of globalization processes, in the conditions of a relatively sealed national markets, the significance of distributive commerce (and especially of retail within it) for a national economy might be evaluated based upon its share in the number of employees or in the GDP creation. Nonetheless, one should presently observe its importance not only in a completion of an economic process as rationally as possible and a delivery of the merchandise produced to a consumption phase but also in its strength to launch the international (retail) supply chains (that may be terminated in any country's territory) and thus the very production of the finalized products and services.

In the Republic of Croatia as a transitional country, the retail capacities in a quantitative sense (sale areas) have increased more rapidly than the level of an overall economic development as of the year 2009, whereas in the post-2009 recession period certain trade centers, i.e., stores (especially the small ones), were abandoned. With regard to the level of an overall economic development, the retail capacities in the Republic of Croatia are (quantitatively) discrepantly developed, so that a lesser overall economy GDP is being realized per a sale area unit than in other countries observed. Additionally, in a qualitative sense, the retail capacities are not sufficiently developed

(as the Republic of Croatia has the lowest share of retail turnover per house-delivered mail order shipments and via electronic retail in the overall retail turnover).

6. REFERENCES

Ahlert, D. & Kenning, P. (2007). *Handelsmarketing*, Springer Verlag, Berlin – Heidelberg.

Berekoven, L. (1990). *Erfolgreiches Einzelhandelsmarketing*, Verlag C. H. Beck, Munich.

Bosilj Vukšić, V. & Kovačić, A. (2004). *Upravljanje poslovnim procesima*, Sinergija, Zagreb.

Bosshammer, H. (2011). *Erfolg der Handels-Betriebsformen im internationalen Vergleich*, Dissertation, EBS Universität für Wirtschaft und Recht, Wiesbaden [available at: http://econstor.eu/bitstream/ 10419/44594/1/diss%2003.25_15.30.pdf, access August 13, 2011].

Eitner, C. (2008). *Die Reaktionsfähigkeit des deutschen Einzelhandels auf den demographischen Wandel. Eine qualitative und quantitative Analyse unter zielgruppen- und netzwerkspezifischen Gesichtspunkten*. Inauguraldissertation zur Erlangung des akademischen Grades eines Doktors der Sozialwissenschaft der Ruhr-Universität Bochum [available at http://www.ruhr-uni-bochum.de/heinze/ Downloads/ Dissertation Carolin%20Eitner.pdf, access May 24, 2015].

Gittenberger, E., Lienbacher, E., Ziniel, W.: Handel 2020 (2013). *Aktuelle Entwicklungen in ausgewählten Bereichen des Handels in Österreich*, AWS Arbeitsgemeinschaft Wirtschaft und Schule, Institut für Bildungsforschung, Wien, Aktuelle Unterlage, September, 2013 [available at http://aws.ibw.at/resource/ download/7 access May 24, 2015].

Göpfert, I. (2006). "Die Anwendung der Zukunftsforschung für die Logistik," in: Göpfert, I. (ed.); *Logistik der Zukunft – Logistics for the Future*, 4th rev. ed., Verlag Dr. Th. Gabler, Wiesbaden 2006, p. 39–87.

Goworek, H.; McGoldrick, P. (2015). *Retail Marketing Management*, Pearson Education Limited, Harlow (UK).

Groß, W.; Seeck, S.; Bötel, M. & Herrmannsdörfer, M. (2014). *Logistik im deutschen Groß- und -einzelhandel. Herausforderungen und Trends*, 31. Deutscher Logistik Kongress, 22. – 24. Oktober, 2014, pp. 330–372 [available at www.bvl.de/misc/filePush.php?id=27318...E1, access April, 29, 2016].

Haller, S (2001). *Handels-Marketing*, 2nd ed., Friedrich Kiehl Verlag GmbH, Ludwigshafen.

Hill, A. V. (2010). *The Encyclopedia of Operations Management – 2010 Edition: A Field Manual and Encyclopedic Glossary of Operations Management Terms and Concepts*, Clamshell Beach Press.

Kämpf, R.; Növig, T. & Yesilhark, M. (2008). *Supply Chain Management*, EBZ, Beratungszentrum, Stuttgart [available at: http://www.ebz-beratungszentrum.de/logistikseiten/artikel/scm-1.htm, acces March 28, 2008].

Kotler, Ph. & Keller, K. L. (2006). *Marketing Management*, 12th ed., Prentice-Hall, Translated in Croatian, MATE, Zagreb, 2008.

Kotler, Ph.; Wong, V.; Saunders, J. & Armstrong, G. (2005). *Principles of Marketing*, 4th European ed., Person Education Limited, Prentice-Hall, Translated in Croatian, MATE, Zagreb, 2006.

Lademann, R. P. (2013). *Wettbewerbsökonomische Grundlagen des Betriebsformenwettbewerbs im Lebensmitteleinzelhandel*, 3rd ed., Springer – Gabler, Springer Fachmedien, Wiesbaden [available at: http://www.lademann-associates.de/images/docs/Lademann_-_Retail_Business_3._Auflage_____H.-Chr._Riekhof_(Hrsg.)_Wettbewerbs%C3%B6konomische_Grundlagen_des_Betriebsformenwett bewerbs_im_ LEH_-_S.3ff.pdf, access March 28, 2016].

Levy, M. L. & Weitz, B. A. (2009). *Retailing Management*, 7th ed., McGraw-Hill, Irwin, New York,

Levy, M. L. & Weitz, B. A. (2012). *Retailing Management*, 8th ed., McGraw-Hill, Irwin, New York,

Merkel, H. & Heymans, J. (2003). *Geschäftsmodelle im stationären Einzelhandel*, 2003. [available at: http://www.imC~ag.com/_artikel/Festschrift-03-02.pdf, access April 10, 2005].

Müller-Hagedorn, L. (2005). *Handelsmarketing*, 4th ed., Verlag W. Kohlhammer, Stuttgart.

Nieschlag, R. (1972). *Binnenhandel und Binnenhandelspolitik*, 2nd rev. ed., Duncker&Humblot, Berlin.

Oehme, W. (1983). *Handels – Marketing*, Verlag Franz Wahlen, Munich, 1983.

Rumetsch. S. & Roeb, Th. (2013). *Einzelhandelimmobilien. Entwicklung der Handelsstrukturen und ihre Bedeutung für Einzelhandelsimmobilien in Deutschland und Großbritannien, KPMG AG, Wirtschaftsprüfungsgesellschaft* [available at: https://www.kpmg.com/DE/de/_Documents/_Analyse_ Einzelhandelsimmobilien_2013_KPMG.pdf, access June 15, 2016].

Segetlija, Z. (1999). *Maloprodaja u Republici Hrvatskoj* (Retailing in the Republic of Croatia), Ekonomski fakultet u Osijeku, Osijek.

Segetlija, Z. (2011). Distributivna trgovina u strukturi hrvatskoga gospodarstva (Distributive Trade in the Croatian Economy Structure), *Ekonomija* (17)2, pp. 445–465.

Segetlija, Z. (2012). *Maloprodaja u Republici Hrvatskoj* (Retailing in the Republic of Croatia), 3rd rev. ed., Ekonomski fakultet u Osijeku, Osijek.

Segetlija, Z. & Dujak, D. (2013). *Upravljanje kategorijama proizvoda. Category Management*, Ekonomski fakultet u Osijeku, Osijek.

Turban, M. (2005). *Handelsbetriebslehre* (Vorlesung) [available at: http://www. fh. duesseldorf.de , access December 24, 2005].

Turčić, I. & Turčić, I. (2013). Bruto domaći proizvod Republike Hrvatske po županijama i regijama 1990., 2000. i 2009. godine (Gross domestic product of the Republic of Croatia's Counties and Regions in 1990, 2000, and 2009, *Ekonomski pregled* (64), 1, pp. 64–81.

Xxx (1991). *Prodajni kapaciteti u trgovini na malo 1989., Dokumentacija 809*, Republički zavod za statistiku, Zagreb. (*Sales Capacities in Retail Trade 1989*, Documentation 809, Croatian Bureau of Statistics, Zagreb, 1991).

Xxx (1993 – 2015). *Mjesečno statističko izvješće*, razni brojevi Državni zavod za statistiku Republike Hrvatske, Zagreb. (*Monthly Statistical Report*, various issues, Croatian Bureau of Statistics, Zagreb).

Xxx (1995. – 2015.). *Statistički ljetopis Hrvatske (SLJH)*, razna godišta, Državni zavod za statistiku, Zagreb (*Statistical Yearbook of Republic of Croatia*, various years, Croatian Bureau of Statistics, Zagreb [subsequent to the year 2006, available at: www.dzs.hr, access June 15, 2016].

Xxx (2005). *Einzelhandel vor massivem Strukturwandel – Perspektive 2020* [available at: http://www.ihk-saarland.de/ihk/handel/down/Perspektiven%202020.pdf, access July 17, 2005].

Xxx (2006). "Prodajni kapaciteti u trgovini na malo u 2004.," *Statistička izvješća 1293*, Državni zavod za statistiku, Zagreb, 2006. (*Sales Capacities in Retail Trade in 2004, Statistical Reports 1293*, Croatian Bureau of Statistics, Zagreb, 2006).

Xxx (2011). *Prodajni kapaciteti u trgovini na malo u 2009., Priopćenje, Br. 4.1.3. od 28. travnja 2011.*, Državni zavod za statistiku Republike Hrvatske, Zagreb. (*Sales Capacities in Retail Trade in 2009, First Release, Number 4.1.3., April 28, 2011*, Croatian Bureau of Statistics, Zagreb [available at: http://www.dzs.hr, access June 15, 2016].

Xxx (2014). *Einzelhandel Europa 2014, GfK Studie zu den Handelsindikatoren 2013 und Prognose für 2014* [available at: http://www.oberursel.de/ fileadmin/ inhalte/dokumente/wifoe/Handel-Europa-2014_GfK_ Studie.pdf, access April, 29, 2016].

Xxx (2014). *Hypermärkte versus Supermärkte: Welcher Betriebstyp regiert in Europa*, RegioData [available at: http://www. regiodata.eu/de/news/576-hypermaerkte-versus-supermaerkte-welcher-betriebstyp-regiert-in-europa, access April 15, 2016).

Xxx (2015). *Konzum. Marketing i prodaja na policama 2010. – 2013.* [available at: https://beta1.finance.si//files/2013-10-22/Darko-Knez-Finance-2013.pdf, access June 15, 2016].

Xxx (2016). *Annual Detailed Enterprise Statistics for trade* (NACE Rev. 2G), Eurostat, [available at :www.eurostat.eu , access June 30, 2016].

Xxx (2016). *GDP and Main Components – Current Prices*, Eurostat [available at: www.eurostat.eu , access June 30, 2016].

Xxx (2016). *Marktanteil einzelner Betriebsformen am Einzelhandelsumsatz in Deutschland in den Jahren 2006 bis 2014*, Statista, Hamburg [available at: http://de.statista.com/statistik/daten/studie/ 202096/ umfrage/marktanteile-im-deutschen-einzelhandel-nach-betriebsform/, access June 15, 2016].

Xxx (2016). *Population on 1 January by Age and Sex*, Eurostat [available at: www.eurostat.eu, access June 30, 2016].

Xxx (2016). *Situation des Einzelhandels 2016, IHK Industrie- und Handelskammer*, Chemnitz, 2016 [available at: https://www.chemnitz.ihk24.de/blob/ cihk24/ servicemarken/branchen/Handel/downloads/ 3119768/ a809df508299 a6d48 abd1 ee300a95533/Situation-im-EH_2016-data.pdf, access June 15, 2016].

Xxx (2016.). *Prodajni kapaciteti u trgovini na malo u 2014., Priopćenje, Br. 4.1.3. od 28. travnja 2016.*, Državni zavod za statistiku Republike Hrvatske, Zagreb. (Sales Capacities in Retail Trade in 2014, First Release, Number 4.1.3., April 28, 2016, Croatian Bureau of Statistics, Zagreb [available at: http://www.dzs.hr, access June 15, 2016].

DYNAMIC PRICING: THE FUTURE OF RETAIL BUSINESS

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Abstract

Dynamic pricing is a pricing strategy in which businesses set flexible prices for products or services based on current market demands. Businesses are able to change prices based on algorithms that take into account competitor pricing, supply and demand, and other external factors in the market. Dynamic pricing can be found in a wide variety of industries such as hospitality, travel, entertainment, and retail. The practice is spreading to physical retailers, which are installing electronic price displays and borrowing pricing models from e-retailers. The aim of dynamic pricing is to increase revenue and profit. Accordingly, the fundamental objective of this paper is to investigate effects of dynamic pricing in retail industry i.e. how demand responds to changes in price. This paper is dedicated to simulation models in terms of competition systems. Findings of this study should represent real-life situations, and provide a realistic way that leads to the maximum expected revenue and profit.

Key words: retailers, dynamic pricing, demand, revenue, profit

1. INTRODUCTION

Price is one of the instruments of marketing mix and should contribute to achieving company objectives. Pricing is one of the most important, but also one of the most sensitive questions, because sales and revenues of companies depend on it. Besides companies, price level is of interest to consumers, competition companies and society. Price is one of the main determinants in the consumer's choice of goods. The importance of price in the consumer's choice depends on the goods offered and the consumer themselves. Some consumers always attach great importance to price, regardless of the type of goods they're buying. This is still true with poorer nations, among poorer groups, and with commodity-type products (Kolter, 1988, p.495).

Consumers, affected by the crisis, have recently become suspicious and wary of buying and more attentive to the value given for their money. They are much more prone to consolidation of their purchases and searching for cheaper products (Anic, 2010, p.145). Prices are also closely monitored and products with discount are bought more often, and this increases the importance of retail prices and favours the development of retail businesses focused on price. To attract consumers, retail prices are reduced, discount sales are more often and consumers are promptly noticed when they occur. Consumers' tendency to buy the product with discount compels manufacturers to cooperate more closely with retailers and to establish the common policy of pricing. This particularly refers to the policy of price cuts - their time, duration and the amount, but also to decisions about carrying the burden of reduced

prices. All this often results in strong price competition between manufacturers and between retail businesses, which always tend to offer as many exclusive products with discount as possible. Manufacturers are very often at disadvantage and must accept the dictate of trading companies. Certain products (oil, coffee) in Croatia are sold with discount so often that their retail prices are actually dynamic.

2. THOERETICAL BACKGROUND AND RESEARCH PROBLEMS

Asking prices are based on calculation and consist of production costs (procurement costs) and remainder to the retail price. The lowest limit is determined by the cost of production (procurement cost) magnified for the cost of sale, while the upper limit is determined by the market. The market price is either higher or lower than the asking price, and if the operating costs are not covered, losses are inevitable. Price is a result of market laws. Due to the development of information technology and information systems within and between enterprises, the price has become extremely important and a more dynamic variable in the marketing mix.

The formation of price should be based on the following principles (Barković et al., 1986, pp. 154-155): 1) prices must be affordable for consumers, 2) prices must ensure expanded reproduction of companies, 3) prices must ensure an increasing volume of sales, and an increase in market share, 4) prices must be competitive, 5) prices must be in the function of stabilizing markets and 6) prices must reflect an appropriate rate of return.

The formation of price should also take into account particular factors (Barković, et al., 1986, p. 156): 1) the level and structure of the product's cost price, 2) the general market situation and characteristics of the market, 3) conjunctural movements and absorption power of the market, 4) elasticity of demand, 5) company goals, 6) the existence of competition and awareness of their prices, 7) sale channels and distribution modes, 8) value and quality of products, 9) position of the product on the curve of its life cycle, 10) differentiation of products in the manufacturing (retail) program, 11) features of consumer segments, 12) relation of prices and other instruments in the marketing mix, 13) other factors.

The objectives of the pricing policy are derived from the basic goals of the company. According to Kotler (1988, p. 497), there are six major business objectives that a company can pursue through its pricing: survival, maximum current profit, maximum current revenue, maximum sales growth, maximum market skimming, and product-quality leadership.

Modern commercial enterprises in accordance with the set objectives and factors that affect pricing, lead an active pricing policy. There are several types of active pricing policy (Benic, 1990, p. 147): one price policy, policy of price differentiation, price line, prices with promotional character, psychological prices, discount policy, a common policy of manufacturing and trading companies and price reductions. In practice, commercial enterprises, to the detriment of producers, now dictate the policy of minimum prices, discount sales, competitive prices and permanently low prices.

The policy of dynamic pricing is of recent date, and is better known in theory and practice as yield (or revenue) management. Its use dates back to the 1980s when

American Airlines's reservation system (called SABRE) allowed the airline to alter ticket prices, in real time and on any route, based on demand information. If it seemed that demand for expensive seats was low, more discounted seats were offered. If demand for full-fare seats was high, the number of discounted seats was reduced (Heizer & Render, 2004, p. 504). American Airlines's success and yield management encouraged many other companies and industries to adopt the concept.

Industries traditionally associated with revenue management operate in quadrant 2 of Figure 1.

Figure 1. Yield Management Matrix

		Price	
		Tend to be fixed	Tend to be variable
Duration of use	Predictable	Quadrant 1 Movies Stadiums/aremas Convention centers Hotel meeting space	Quadrant 2 **Hotels** **Airlines** **Rental cars** **Cruise lines**
	Unpreditable	Quadrant 3 Restaurants Golf courses Internet service providers	Quadrant 4 Continuing care hospitals

Source: Author prepared according to: Heizer, J. & Render, B. (2004): *Operations Management*, seventh edition, Prentice Hall., p.506

To make yield management efficient, the company needs to manage three issues (Heizer & Render, 2004, p. 507): 1) **multiple pricing structures** must be feasible and appear logical (and preferably fair) to the customer; 2) **forecasts of the use and duration of the use** and 3) **changes in demand**.

Businesses have always offered different prices to different groups of customers. They offer “matinée specials” for afternoon cinema-goers or “happy hours” for early-evening drinkers. They offer steep discounts to students or pensioners. Some put the

same product into more than one type of packaging, each marketed to a different income group. Dynamic pricing takes all this to a new level—changing prices by the minute and sometimes tailoring them to whatever is known about the income, location and spending history of individual buyers.

Dynamic pricing is becoming one of the fundamental pricing policies as e-commerce develops. The oldest form of dynamic pricing is still seen today in outdoor markets. Sellers set the prices in the morning before customers arrive, and then during the day the prices are changed (usually lowered) depending on demand. The next day a new starting price is set and the whole process starts anew.

The price of goods and services sold online can be varied constantly and effortlessly, in accordance with the numbers and characteristics of those making purchases, and factors such as the weather. Competitors can be monitored constantly, and their prices matched. Amazon updates its price list every ten minutes on average, based on data it is constantly collecting, according to Econsultancy, a research and consulting firm (The Economist, 2016).

The practice is spreading to physical retailers, which are installing electronic price displays and borrowing pricing models from e-retailers. Kohl's, with nearly 1,200 stores in America, now holds sales that last for hours rather than days, pinpointing the brief periods when discounts are most needed. Cintra, a Spanish infrastructure firm, has opened several toll roads in Texas that change prices every five minutes, to try to keep traffic moving at more than 50mph (80kph). Sports teams, concert organisers and even zookeepers have embraced dynamic pricing to exploit demand for hot tickets and stimulate appetite for unwanted ones (The Economist, 2016).

In order to make dynamic pricing policy successful, it is necessary to implement the following: 1) demand for products must be flexible regarding the price, 2) demand for products must be flexible and 3) revenues generated by lowered prices must be higher than manufacturing costs and sales of additional product units.

Effective implementation of dynamic pricing policy, which, in addition to the market flexibility include reaction from the competition, support the following three models: 1) cost-oriented model, 2) price volume model, 3) heuristic model (computer simulation).

3. RESEARCH RESULTS AND DISCUSSION

Total revenue of a company based on production and/or sale of a product is determined by the relation between its quantity and price. On assumption of the existing link between the quantity of a sold product and demand for that product, the total income can be expressed in the form R = p × q, respectively

$$R = p \times f(p) \qquad (1)$$

where R stands for the total revenue, p for price, f (p) for the function of demand of the product in question. Thus, the total revenue can be expressed as a function of price,

wherein the function of the total revenue is defined for all values of price with the corresponding function of demand.

As for each function of demand the corresponding inverse function can be expressed in the form p = φ (q), the total revenue can be expressed as a function of the quantity of demand, ie

$$R=q\times \varphi(q) \qquad (2)$$

Accordingly, examination of movement of total revenue, based on the known function of demand can be made with respect to the price of the observed product, as well as in relation to the movement of demand. That can be an alternative way of observing movements of the total revenue.

In order to research the movement of total revenue when function of demand is known, designating and testing marginal revenue is particularly important. Marginal revenue, which shows the increase in total revenue when there's an increase in price (demand) per unit, is examined and reported through the corresponding function of the marginal revenue. Assuming that the function of the total revenue is a continuous function of price (demand) in the interval (a, b), the function of marginal revenue can be expressed in the form retracted from the function of total revenue (Backović & Vuleta, 2002, p. 32). If the total revenue is expressed as a function of price, or

$$R = p \times f(p)$$

function of the marginal revenue is $R'=\frac{dR}{dp}$

and if R=q× φ(q), marginal revenue is defined thus: $R'=\frac{dR}{dq}$.

When the mark of the first copy is identified, or the positivity (negativity) of the marginal revenues, changes in total revenue may be determined, and expressed as the change in price of the observed product. Thus

$\frac{dR}{dp}>0$ total revenue grows when the price is increased

$\frac{dR}{dp}=0$ extreme value (maximum) of the total revenue is examined

$\frac{dR}{dp}<0$ total revenue drops when the price is increased.

In order to fully understand the impact of dynamic pricing on total revenues of trading and manufacturing companies, what follows is a practical example inspired by the situation of cooking oil in Croatian market. Let us assume that the demand in one segment of the market is defined in the form of the function

$$q=-975p+19300$$

After insertion of this function into the function of total revenue (1):

$R = p \times (-975p + 19300)$
$R = -975p^2 + 19300p$

Function of the marginal revenue is

$R' = -1950p + 19300$

Maximum total revenue is achieved when

$R' = 0$ i $R''<0$

Which in this example is conditioned by the following:

$-1950p + 19300 = 0$

That is

$1950p = 19300$
$p = 9{,}90$

Because $R'' = -1950$, the price $p = 9{,}90$ is the price by which the maximum total revenue would be achieved, and maximum is calculated by replacing this value in the function of total revenue, so that we get

$R_{max} = R(9{,}90) = -975(9{,}90)^2 + 19300 \times 9{,}90$
$R_{max} = 95510{,}26$

Retail trading company can accept the price prevailing in this market segment as a given price or to independently form a price of cooking oil in accordance with the estimated demand for it in the course of the next fifteen days at its own retail facilities. Daily demand for cooking oil in retail facilities is defined by the initial function in the following form:

$q_1=-8{,}5p+220.$

Each subsequent function is based on the previous function, while the parameter of the function shows a downward trend of 5.5.

$q_2=-8{,}5p+214{,}5$
$q_3=-8{,}5p+209$
...
$q_{15}=-8{,}5p+143$

Based on the function of demand the calculated price for the first day is 12.94 HRK, which would achieve the maximum total daily revenue of 1,423.53 HRK.

In accordance with the aforementioned, retail trading company is given three options: 1) to sell the oil at a price of 9.90 HRK which would achieve the maximum total revenue in a given market segment, 2) to sell at a price of 12.94 HRK which would achieve the maximum total daily revenue, 3) to implement the dynamic pricing policy with the aim of obtaining maximum total revenue at the end of a particular period. In addition to the total revenue, the following will take into consideration net income as well, achieved when the total income is reduced by the costs of stock, estimated at the amount of 0.35 HRK per one litre of cooking oil.

To examine all the three options, a problem solving model was set in the spreadsheet Excel (cf. Table 1).

Table 1. The problem of pricing which would achieve the maximum total revenue

	A	B	C	D	E	F
3	Initial Inventory			1500		
4	Demand Slope			8,5		
5	Demand Intercept for Day 1			220		
6	Salvage Value			$ -		
7	Inventory Cost			$ 0,35		
8	Intercept Trend			5,5		
9						
10	Week	Price	Intercept	Demand	Sales	End Inv
11	0					1500
12	1	$ -	220,0	220,0	0,0	1500,0
13	2	$ -	214,5	214,5	0,0	1500,0
14	3	$ -	209,0	209,0	0,0	1500,0
15	4	$ -	203,5	203,5	0,0	1500,0
16	5	$ -	198,0	198,0	0,0	1500,0
17	6	$ -	192,5	192,5	0,0	1500,0
18	7	$ -	187,0	187,0	0,0	1500,0
19	8	$ -	181,5	181,5	0,0	1500,0
20	9	$ -	176,0	176,0	0,0	1500,0
21	10	$ -	170,5	170,5	0,0	1500,0
22	11	$ -	165,0	165,0	0,0	1500,0
23	12	$ -	159,5	159,5	0,0	1500,0
24	13	$ -	154,0	154,0	0,0	1500,0
25	14	$ -	148,5	148,5	0,0	1500,0
26	15	$ -	143,0	143,0	0,0	1500,0
27						
28		Revenue from sales				$0,00
29		Inventory Cost				$0,00
30		Revenue from salvaged units				$0,00
31						
32		Net Profit				$0,00

Source: author

Table 1 is fed data on the initial inventory, function of demand for cooking oil in retail facility, costs of holding inventories and trending of parameter function (upper part of the table). Decision variables are the prices and quantities of sold oil. Total revenues, costs of stock and net revenue are shown in the lower part of the table.

The model defined in Solver is as follows:

Set Target Cell: K 32

Equal To: maximize

By Changing Cells: B 12: B 26; E 12: E 26

Subject to the Constrains:

Quantity of sold oil cannot exceed the demand. $E$12:$E$26 ≤ $D$12:$D$26

Quantity of sold oil cannot exceed the stock. $E$12:$E$26 ≤ $F$11:$D$25

Having thus formulated the model in the Solver Parameters, the button Solve calculates the value of decision variables in the address sequence B 12: B 26; E 12: E 26th Decision variables define optimal solutions to the problem, that is maximum total and net revenues. Table 2 shows the optimal solution to dynamic pricing using the MS Excel spreadsheet.

Table 2. The optimal solution to the problem of dynamic pricing

	A	B	C	D	E	F
3	Initial Inventory			1500		
4	Demand Slope			8,5		
5	Demand Intercept for Day 1			220		
6	Salvage Value			$ -		
7	Inventory Cost			$ 0,35		
8	Intercept Trend			5,5		
9						
10	Week	Price	Intercept	Demand	Sales	End Inv
11	0					1500
12	1	$ 10,63	220,0	129,7	129,7	1370,3
13	2	$ 10,48	214,5	125,4	125,4	1244,9
14	3	$ 10,33	209,0	121,2	121,2	1123,7
15	4	$ 10,18	203,5	116,9	116,9	1006,8
16	5	$ 10,03	198,0	112,7	112,7	894,1
17	6	$ 9,89	192,5	108,5	108,5	785,6
18	7	$ 9,74	187,0	104,2	104,2	681,3
19	8	$ 9,59	181,5	100,0	100,0	581,3
20	9	$ 9,44	176,0	95,8	95,8	485,6
21	10	$ 9,29	170,5	91,5	91,5	394,1
22	11	$ 9,14	165,0	87,3	87,3	306,8
23	12	$ 8,99	159,5	83,0	83,0	223,7
24	13	$ 8,85	154,0	78,8	78,8	144,9
25	14	$ 8,70	148,5	74,6	74,6	70,3
26	15	$ 8,55	143,0	70,3	70,3	0,0
27						
28		Revenue from sales				$14.558,58
29		Inventory Cost				$3.259,72
30		Revenue from salvaged units				$0,00
31						
32		Net Profit				$11.298,86

Source: author

Data in Table 2 shows that by using dynamic pricing the maximum total revenue from sale of oil is 14,558.58 HRK or maximum net income of 11,298.86 HRK. It is important to point out that thanks to dynamic pricing, all of the oil has been sold. To draw a valid conclusion, the result obtained in Table 2 will be

compared with the results obtained when the retail facility chooses to sell at a price of 9.90 and 12.94 HRK (cf. Table 3). The method of calculation is the same, except that this model needed another constrains. In the first case it is B12: B26 = 9.90 and in the second one B12: B26 = 12.94.

Table 3. Comparison of results obtained by different pricing policies

Price	Total revenue	Stock costs	Net revenue	Stock status
9,90	14456,48	3247,30	11209,18	40
12,94	13880,09	4332,58	9547,51	427
Dynamic prices	14558,58	3259,73	11298,86	-

Source: author

Data in Table 4 shows that maximum total and net revenues and an emptied stock are achieved through dynamic pricing.

4. CONCLUSION

Dynamic pricing policy is a recent strategy and better known in both theory and practice as yield (or revenue) management. Industries traditionally associated with revenue management are hotels, airlines, car rental companies and cruise lines. They apply variable pricing for their products and control product's use or availability. A growing number of companies keep their prices in a constant state of flux—moving them up or down in response to an ever-shifting multitude of variables. The dynamic-pricing revolution provides plenty of benefits for businesses. Besides helping them even out the demand, it's easier to get more money out of wealthier customers.

Dynamic pricing is becoming one of the fundamental pricing policies through development of e-commerce. The practice is spreading to physical retailers, which are installing electronic price displays and borrowing pricing models from e-retailers.

In practice today, the lowest price policy is still dominating, as are discount sales, competitive pricing and permanently low pricing. Discount sales are common, and the use of dynamic pricing is on the rise. The practical example above proves that the maximum total and net revenues are achieved through dynamic pricing.

5. REFERENCES

Anić, I.D. (2010). *Ponašanje cjenovno osjetljivih potrošača u vrijeme krize u Hrvatskoj*, in Renko, S., Knežević, B. & Vouk, R. (Ed). Izazovi trgovine u recesiji, Zagreb: Sveučilište u Zagebu Ekonomski fakultet, pp. 145-159.

Backović, M. & Vuleta, J. (2002). *Ekonomsko matematički metodi i modeli*, drugo izdanje, Ekonomski fakultet Beograd, Beograd.

Barković, D., Meler, M. & Novak, B. (1986). Odlučivanje u marketingu, Informator, Zagreb.

Benić, Đ. (1990). *Trgovina i politika cijena*, Školska knjiga, Zagreb.

Heizer, J. & Render, B. (2004): *Operations Management*, seventh edition, Prentice Hall.

Kotler, Ph. (1988). *Marketing Management*, sixth edition, Prentice-Hall Inc., New Jersey.

The Economist (2016). A growing number of companies are using “dynamic” pricing, Jan 30th.

INTENSIFYING OF COMPETITION AND DOMINANT POSITION IMPACT OF LARGE RETAILERS IN RELATION TO MANUFACTURERS

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Abstract

Increasing concentration and increase in the size of retail companies plays a crucial role in permanent and apparent strengthening of retail position in marketing channels. Purpose and motive of this paper is increase in competition and concentration in contemporary market. Contemporary trade management and marketing with use of modern information technology intensify the development of large retail chains. Retailers are forcing manufacturers they cooperate with to directly participate in building a competitive position in the global market. Competition between producers in the battle for entry into the network of large a retailer is intensive. In order to analyse competition on the market we used analyses and syntheses. Strengthening of products with private label allows differentiation from competition and successful market positioning. The effects of power of large retailers and the retail concentration are in favour of producers, thanks to the possibilities of a wide and intensive coverage of the market. The development of partnership and long-term relationship between large retail chains and producers requires mutual trust and sharing of long-term relationships vision. Market impact of the paper is in insight to development of relationships between participants in marketing channels in conditions of increasing competition and concentration.

Key words: global market, competition, concentration, retailers, manufacturers

1. INTRODUCTION

In contemporary market conditions are manifested Legal flows of strengthening the retailers' power in marketing channels are manifested in contemporary market

conditions, which greatly changes the position and relations among participants in marketing channels. The structure of retailing is rapidly being transformed by the presence of a large number of small and independent retailers to the existence of dominant role of strong national and multinational retailers. Retailers are growing and developing rapidly, and their strength in marketing channels is growing. They are growing their market share and market power, thereby increasing the concentration of the retail market. Accordingly competition sharpens. Also, a growing part of the market goes into the hands of fewer retailers, which become ‘‘gatekeepers’ for access to the consumers (Dobson, 2003, p. 111). Retailers are becoming stronger individually, but the retail sector at national and in the global level are becoming stronger as well.

Retailers today are, as measured by the volume of retail revenue, assets or share capital, significantly stronger than the manufacturer in most commodity groups. They begin to put conditions even to the world's largest manufacturers whose huge part of the production is sold through huge global retailers’ sales network. Manufacturers are becoming increasingly dependent on retailers, their negotiating position weakens and they invest more effort in building relationships with retailers, and less with consumers. In this situation, retailers take many marketing functions that have been traditionally performed by wholesalers and manufacturers. It takes a leading role in the development of relations with consumers, and therefore dominant position in the marketing channels.

There is a shift of power from manufacturers to retailers and is primarily associated with the growing concentration of the retail industry, the successful introduction of products with the private label, the development of a new concept of management of product categories, greater use of information technology in retail, insufficient and limited space on the shelves for a large number of new products being introduced to the market every day, and the like. Consolidation and raising the level of concentration of the retail sector allow retailers a better negotiating position towards manufacturers, lower purchasing prices, boosting price competition among retailers, as well as lowering retail prices for consumers themselves.

Undoubtedly, large retailers who are going through the process of restructuring, which apply modern technological innovations and implement internationalization of business, are becoming the main initiators and leaders of the development of trade and market in the national and global level. Changes in the retail sector involve a large number of stakeholders and very intensively reflect on the activities of all market participants: manufacturers, wholesalers, retailers themselves, consumers, and government institutions. Therefore, strengthening the power of entities in retail marketing channels intensively opens numerous questions of theoretical and practical nature. It essentially brings down issues related to the functioning of the marketing channels, and first of all to whether the concentration of retailing is really in the interest of consumers and manufacturers.

The topic of this work concerns intensifying competition in the new conditions as well as domination and influence of large retailers on the position of manufacturers in marketing channels. As a basic question to be answered the question of how producers can cope with these asymmetrical relationships within modern marketing channels can be asked. Are producers able to oppose the accumulated power of

retailers, their pressure in terms of price and many other elements of their mutual business relationship, and to leverage the benefits that the cooperation with large retailers might provide them with?

2. THE CURRENT STRUCTURAL CHANGES IN MARKETING CHANNELS UNDER THE INFLUENCE OF RETAIL FORCES CONSOLIDATION

Under the influence of retailer's power strengthening, along with the transformation of the retailing structure, significant structural changes in marketing channels occur. The structure of distribution channels that link manufacturers and retailers is largely determined by the structure of the retail market, and is highly dependent on the distribution strategies that manufacturers and retailers employ (Maruyama, 2004, p. 27). Now, therefore, the question of how manufacturers can achieve equalization of power in relation to retailers rises (Lovreta, 2013, p. 558). What all of this is based on are changes in terms of power of participants and influence that the more powerful ones have on management and general operation of marketing channels in the market.

Modernization of retailing, especially in the field of food and other products of everyday purchases and consumption was very intense in developed markets in recent decades. Retailing has transformed from a system where the predominant model was the traditional one to the system based on dominant role of the modern supermarket chains and hypermarkets retail stores with a very significant share of foreign investments. This process has resulted with a strong concentration of the market and the intense spatial dominance of a small number of participants in the final phase of marketing channel. In addition to that, it has provided big distribution groups with the power to demonstrate great negotiation skills in their relations with the producers (Duffy, 2003).

Intensive dynamics and intensifying competition in the retail sector has led retailers to adopt marketing orientation and a proactive role in creating marketing channels. In that way, with the use of modern distribution strategies, they have caused very significant changes in the structure of retail market, and further in its relations with other participants in marketing channels. New roles and functions that were taken over by retailers have caused visible structural changes in marketing channels.

Information and communication technologies and other impacts based on technological development and improvement of commercial management enable retailers to take a much stronger and more stable role in the overall economy. Significant market potential, intensive expansion of large retail stores since the beginning of the 90s, the economies of scale with global sources of supply and international expansion of the retail network have enabled retailers to become one of the largest participants in the global market. A few decades ago the fact that the world's largest company would be a retailer was unimaginable; today increasing number of retailers exceeds the largest manufacturers in their size (Figure 1).

There were only two retailers ahead of the world's largest manufacturers of food products, "Nestle" which was at the 42nd place in 2011, but in the meantime suffered a decline even to the 70th (there are now five retailers) (Stankovic, 2014, p. 45). The

second largest manufacturer of FMCG sector, "Procter & Gamble" was on the 80th place on the list of world's largest companies four years ago and in the meantime experienced a drop of twenty places. Then there were five stronger retailers, while in 2015 the group consisted of one retailer more.

Table 1. The largest market participants in the world 2015

Rank	Company name	Country of origin	Dominant field of operations	Revenue (US$ mil.)	Profit (US$ mil.)
1.	**Wal-Mart Stores, Inc.**	**USA**	**hypermarket**	**485,651**	**16,362**
2.	Sinopec Group	China	Oil and gas	446,811	5,177
3.	Royal Dutch Shell	Netherlands	Oil and gas	431,344	14,874
4.	China National Petroleum	China	Oil and gas	428,620	16,359
5.	Exxon Mobil	USA	Oil and gas	382,597	32,520
6.	BP	UK	Oil and gas	358,678	3,780
7.	State Grid	China	Electricity	339,426	9,796
8.	Volkswagen	Germany	Motor Vehicles & Parts	268,566	14,571
9.	Toyota Motor	Japan	auto-industrial	247,702	19,766
10.	Glencore	Switzerland	Mining, Crude-Oil Production	221,073	2,308
52.	**Costco**	**USA**	**Retailing**	**112,640**	**2,058**
54.	**Kroger**	**USA**	**Food & Drug St.**	**108,465**	**1,728**
62.	**Tesco**	**UK**	**Food & Drug St.**	**101,580**	**-9,321**
64.	**Carrefour S.A.**	**France**	**Food & Drug St.**	**101,238**	**1,656**
70.	Nestle	Switzerland	Food Consumer Products	100,115	15,797
97.	**Metro AG**	**Germany**	**Food & Drug St.**	**85,505**	**172**
100	Procter & Gamble	USA	Household & Personal Products	84,537	11,643

Source: according to: http://fortune.com/global500/

American retailer Wal-Mart Stores Inc. was the leading company in 2015, as measured by sales revenue, which surpasses even the largest companies operating in the energy sector and the world's largest automobile manufacturers. Among the top 100 largest participants in the global market six are retailers all of which are from the FMCG field. These five largest retailers achieved sales revenue greater than that of the "Nestle" company, the world's largest manufacturers of food products, which found itself in the 70th place. All six retailers are ahead of the world’s second-largest sales revenue "Procter & Gamble" manufacturer of food and other products of everyday purchases and consumption, which is located at 100th place.

Previous analysis related to the world's largest companies confirms that there is a very high level of concentration and strength, market and negotiation, concentrated in the hands of big retailers. It also confirms that the changes occurring in the same direction continue, and very rapidly. The growth of large retailers took place in

response to the size and market power of existing manufacturers, which are their suppliers. Today, however, we see that manufacturers are unable to compete with accrued retailers. All of them, especially smaller producers, can be strongly affected the situation in which they are no longer able to resist the accumulated cost of effective retailer. Besides price fighting, producers come to an inferior position in comparison with the powerful retail chains of many other elements of their mutual business relationship.

Distributive tasks and numerous functions that were traditionally conducted by wholesalers and the producers and now taken over by empowered retailers (Rosenbloom, 2013). Some participants only partially, voluntary or forcefully, give their functions to other participants, while other participants completely go out of marketing channel. Strengthened retailers took over the role of so many participants in marketing channels and made them superfluous intermediaries. This led the position of all participants in the channel, especially the traditional role of wholesale trade, as well as the position and the role of producer to question.

"It is clear that retailers nowadays ask for as little big suppliers that they could cooperate with as possible" (Hingley, 2005, p. 69). Also, with increasing market share large retailers with large retail formats are becoming more and more able to demonstrate their purchasing power over the producers and their suppliers in general. Manufacturers yield to its ability to ruthlessly and callously lower the purchase price on the low, uneconomic level, which often means a threat to the very survival of the suppliers. It is assumed that in this situation 'supplier will participate in the supply chain channel as long as his profit is non-negative' (Ertek, 2002: 695). Large retail chains have begun being those that control access to consumers and to reimburse that from others.

Also, the products with the private label today strongly compete for a place on the shelves of retailers, and in these conditions the struggle from the perspective of the manufacturers' brands does not seem fair at all. The introduction of products with the private label in the retail range meant that 'retailers are no longer only agents selling manufacturers' brands: they are now also their competitors' (Amrouche, 2009, p. 362). Competition for space on the shelves has become so debilitating that many manufacturers are rightly seen as the most expensive real estate in the world.

However, although producers are faced with increasingly numerous and complex requirements posed by large retail chains and at the same time become increasingly dependent on ever-smaller number of stronger and stronger retailers, they observed significant benefits that business with such partners may bring. For many companies, the lure of partnering with a mega-distributor is irresistible (Thomas, 2011, p. 25), and acceptance of power-imbalance is a key first-step to successful relationship building (Hingley, 2005, p. 63).

The power of large retailers is located in the heart of all business activities they participate in. More power means possibility of greater influence on their own as well as on their partners' position, and also the possibility of expressing individual interest. Taking into account that power has its positive and constructive side, but also negative and somehow destructive one, strong retail chains take on huge responsibility in terms of creating and using an effective mix of mechanisms of power. On the other hand

their partners, producers and other suppliers, there is never enough caution and wisdom if they want a long-term successful cooperation with these dominant buyers.

3. COMPETITIVE POSITION OF THE INTERNATIONAL RETAILERS IN THE GLOBAL MARKET

The development of competition in retailing, either on developed or in emerging markets, and strengthening the power of retailers on the market leads to intensive process of internationalization of their retail activities. There could be even said that the expansion of retail stores outside the borders of national markets is direct result of the concentration of retailing on the national markets. The expansion of the retail network in the national market is done in order to achieve economies of scale, but it is after a certain level made difficult for many reasons. In addition, the concentration on the national market can only be achieved up to a certain point which is usually determined by the anti-monopoly legislation. All in all, it is certain that the "domestic saturation and the high growth nature of emerging markets are the biggest drivers of the internationalisation of retail" (Lahouasnia, 2012, p. 2).

Saturation of retailers' expansion opportunities onto the domestic market makes retailers to expand into foreign markets. Encouraged by its ability to respond to new consumer spending cultures in the domestic market, retailers usually go out on the market in the region close to them, that is similar and more readily available. It mostly consists of the purchase or merger with existing chains. In this way they pass the barriers of entry defined by existing legislation. In the new markets they internationalize their business in both directions, so that they spread retail network as well as find international sources of supply. Yet national markets remain strongholds of operations of each retail chain, as most of their sales and purchases are achieved on the national market.

It is especially important to note that the development of private label contributed significantly to the rapid and relatively efficient access to foreign markets. In this way, supermarket chains are beginning to increasingly depend on the price and the total supply of domicile manufacturer for specific product categories. In addition, research show that vertically integrated retailers had greater success in the internationalization of activities than chains that act individually in the market.

A key role in the processes of internationalization of business activities belongs to the largest retail chains, which generally perform the greatest participation in the domestic market. The top ten largest retailers of food products and other products of everyday consumption have extremely intense activity on the foreign markets (Figure 2).

Table 2. Business internationalization of the largest participants in the FMCG market

Ra-nk	Company name	Country of origin	Dominant field of operations	Countries of operation 2013	% retail revenue from foreign operations 2013

1.	Wal-Mart Stores, Inc.	USA	Hypermarket/Supercenter/ Superstore	28	28.9
2.	Costco	USA	Cash & Carry/Warehouse Club	9	28.6
3.	Kroger	USA	Supermarket	1	0
4.	Schwarz	Germany	Discount Store	26	59.2
5.	Tesco	UK	Hypermarket/Supercenter/ Superstore	13	30.0
6.	Carrefour S.A.	France	Hypermarket/Supercenter/ Superstore.	33	52.7
7.	Aldi	Germany		17	57.1
8.	Metro AG	Germany	Cash & Carry/Warehouse Club	32	59.3
10.	Walgreen Co.	USA	Drug Store/Pharmacy	2	-
13.	Auchan	France	Hypermarket/Supercenter/ Superstore	13	-

Source: according to: Deloitte (2016)

There is a very noticeable intense business activity among the largest retailers in the world outside their domestic markets. The five largest operate in on average 23.2 different countries and in international markets by an average of 40.8% of their revenue. This speaks convincingly about the high level of orientation of retailers to expand into foreign markets, which obviously becomes one of the basic prerequisites for their growth and development.

Typically, by entering the new markets international retailers intensively change relationship between existing retailers and their manufacturers. They create a different relationship with the manufacturers from the previously existing ones between producers and existing retailers. The fact is that the relationship between suppliers and retailers is becoming more complex with the internationalization of certain retail markets. Introduction of new relationships and requirements to producers in markets will affect the acceptance of the same behaviour by other already existing retailers.

4. DEVELOPMENT OF PARTNERSHIP BETWEEN LARGE RETAIL CHAINS AND MANUFACTURERS

Manufacturers, especially those which are less powerful, are trying above all to modify and present their role as more significant to powerful retailers in modern market conditions. Their goal is to become essential suppliers to strong retailers, as they are aware that in modern marketing channels sustainable position can be built only on the foundations of long-term cooperation and partnership in the relations with interdependent members.

Manufacturers are increasingly accepting the fact that the level and form of interdependence ’it defines power relations between channel members; and, it is also the seed of potential channel conflict’ (Li, 2001, p. 34). For this reason, it is very strongly and thoughtfully devoted to fostering the development and management of their long-term relationships. Such long-term relationships develop mutually beneficial outcomes and are characterized by mutual trust, open communication,

common goals, commitment to mutual gain, and organizational support (Bradford, 2009, p. 25).

Success in that is a prerequisite for survival for producers, especially those weaker in the present conditions of high concentrations of forces and polarization of relations. As economic developments are becoming less and less predictable, 'long-term relationships between distribution channel partners are increasingly becoming even more important part of the company's long-term strategy' (Black, 2010, p. 245).

The transformation of the typical relationship between buyers and sellers, manufacturers and retailers initiated and facilitated in every sense, in the first place, the development of information and telecommunication technologies. This applies, above all, to modern retail chains and their suppliers and the relationship that involves partnership and long-term oriented marketing cooperation. They now openly share and jointly analyze information and knowledge they have integrating their activities and transforming their own organizational structures and processes. In this way, a better coordination of their activities leads to more efficient marketing channels and achieving better business results on both sides.

With the development of such partnerships, partners intensively focus on buyers and on selling what the buyers want, on reducing the need to hold stocks and introducing a system of continuous refilling inventories, they jointly develop and manage category management which is the subject of their cooperation and the like. Transformation of rival relationships into a strong commitment to development of a mutually beneficial partnership is becoming more acceptable to both sides.

But still, manufacturers, especially those that produce food and other products of everyday purchases and consumption, must be able to respond to additional and completely new demands on the process of buying and selling if they want to maintain and improve its position in the eyes of the representatives of the purchasing department of modern retailer, and by that the position of their products in retail stores in the eyes of consumers as well. Changes in requirements occur in accordance with a very dynamic structure of the retail market; changes in technology applied by retailers, higher levels of competition between retailers, but also by changes in the purchasing managers' views regarding the expectations of consumers and creating the planned position in the market.

In accordance with the structural changes that occurred in the retail sector, the availability of sufficient quantities necessary for the entire chain of retail stores is becoming one of the priority criteria for cooperation and development of partnerships. Earlier, when the capacity of producers of food and other products of everyday purchases was relatively large in relation to the requirements of retailers, this problem was not in focus. With the growth of retailers it becomes more evident. There are even less manufacturers that, with the evolving possibilities of their capacity, could follow a very dynamic development in demand from retailers for their products. More and more small and medium-sized manufacturers are for this very reason losing the possibilities of establishing partnerships with retailers who are increasingly having hundreds or even more than a thousand stores.

When manufacturers are able to meet the basic requirements in terms of quantity, in terms of building long-term relationships, first task is to change access to large retailers, their attitudes and ways of thinking. Many manufacturers are only interested

in their products and to where they can get the highest price for them. However, it is important that they want to learn and to understand the nature of the relationship with retailers, the problems faced by the retailers themselves, and why retailers are interested in building long-term relationships with them.

Manufacturers' sales staff plays an important part there. They must be able to develop direct relationships with large retailers purchasing staff. These relationships are now quite different from simple transactional relationships that are maintained in the same way with a number of partners. It is necessary to apply a specific, individually customised, approach in order to succeed in developing long-term relationships with selected representatives of large retailers.

Such long-term relationships develop mutually beneficial outcomes and are characterized by mutual trust, open communication, common goals, commitment to mutual gain, and organizational support (Bradford, 2009: 25). It is clear that we need to go much further than a simple will to cooperate. Sellers who really play the role of "managers to maintain relationships with buyers" have a key position in the development and management of partner relations between the two participants in the market. Apart from just knowing the goods, they have to be familiar with the capabilities and efforts of the house they come from if they wish to succeed in imposing the implementation of certain beneficial activities at the right moment.

In addition, considerable attention must be paid to training of sales staff and development of their ability to resolve any possible conflict with the other side. Manufacturers are by no means able to afford any unexpected expenses such as violation of partnerships with large retail chain these days. For this reason, in the situation of the contemporary development of the retail market, the producers are putting a very important task of the development of sales staff and awareness of the importance of their role and responsibilities if they want to develop partnerships with large retailers.

In conclusion, the attitude is that if they want to develop partnership and long-term marketing relationships with large retail chains, the producers have to have the ability to conduct high-quality cooperation with other participants in marketing channels. There is, above all, the need for manufacturers to develop vertical relations forward with the very retailers, vertical relations back with their own suppliers in order to be able to meet the requirements in terms of product characteristics and the like, to have developed collaborative relationships with its representative offices or branches on a specific market. We should bear in mind the fact that when it comes to a small manufacturer it is able to establish relations of horizontal cooperation with other manufacturers in order to be able to meet the requirements of large retailers for quantities. All this is not a small request to the producers and requires significant adjustments and investments. Networking and partnership development, primarily long-term relationships, become fundamental matrix of thinking of all including these participants in marketing channels in the conditions of contemporary market environment.

On the other hand, in the increasingly severe competition on the retail market, retailers are becoming more aware that „in an organizational setting, the importance of buyer-seller relationship is essential for the better performance of organization" (Mishra, 2011, p. 27). In this sense, modern retailers will seek to develop relationships

with suppliers so that they correspond to the operational practices of their own organizations, their own "operating system". However, given the need to develop long-term partnerships with its suppliers, they must bear in mind that creating a successful partnership is based on a "win-win" situation with a certain level of satisfaction for both partners, mutual respect, a clear understanding and responsibility. For the success of this relationship, mutual trust and sharing the vision of long-term duration of their relationships are necessary.

5. EXCLUSIVE AND STRATEGIC AGREEMENTS BETWEEN MANUFACTURERS DOMINANT RETAILERS

In such conditions where the concentration and the power of retailers are on the increase, stable and long-term business partnerships between manufacturers and retailers are even more difficult to achieve. For this reason, these channel members are ready to accept certain restrictions in their relationships, depending on individual power and position. Exclusive arrangements are significant in situation of the efforts of manufacturers to provide a stable access to consumers. In this way, manufacturers strive to achieve a higher level of stability, predictability and control over the whole way of their products to consumers, turning to, above all, less powerful retailers, which these arrangements consider useful for the improvement of their own position.

Exclusive arrangements between channel members at different levels of distribution are contracts that involve the acceptance of certain restrictions in respect to the activities of one partner, such as limitations in terms of geographical areas in which they operate, the scope of the assortment and the like. Purpose of the manufacturer is to be able to, through contractual restrictions with the retailer, achieve long-term stable partnership with the better performance of existing tasks in retail, to introduce new activities, a higher level of innovation and further investment on the side of retailers, primarily in order to improve sales and strengthen the image of the manufacturer's products in the eyes of consumers.

The manufacturer would be able to contract limitations regarding the retailer selling brands of the competing manufacturers but only with those who recognize it as their own interests. In addition, when the manufacturer negotiates exclusive sales contracts on a given market area, the responsibility for the result, primarily sales and product image, switches to a single retailer. In this case, a higher level of awareness of manufacturers' own responsibility will activate retailer to additional investment and fairer enforcement tasks. Furthermore, the investments will stop him from moving to the opposite direction from the one set by contract and will be less interested in development of cooperation with competitors. Not only that but long-term partnership is encouraging retailers to keep those manufacturer's products which there is less demand for.

With the development of increasingly strong mutual trust retailer will provide more opportunities for manufacturers to propose and create their activities and influence the adoption of a number of decisions on the retail side. The development of mutual relations of manufacturers and retailers will mean the possibility of taking stronger control by the manufacturer. An example of this is the situation of exclusivity

in certain sales transactions when the dependence of the retailer from the manufacturer is in maximum, because retailer does not even procure products of competing manufacturers and neglects any relation to them.

Together with the ability to exercise control over the decisions that are made, bargaining power of exclusive manufacturers grows. It is important first of all because of the management of commercial communication regarding the basic elements of the contract that directly affect the profitability, such as the transaction price at which the retailer buys products from manufacturers and the period in which the payment is made.

In addition, no less important is the question of implementation of marketing activities. The manufacturer was very interested to influence the definition and implementation of policies assortment, merchandising, promotions, retail price formation, consumer service and the like, which is essential for creating the image of its products and the realization of its own marketing strategy. Implementation of these activities is usually left to the side that on the basis of greater knowledge and experience that makes it more efficient. It should be noted that the bargaining power they had gained through the implementation of exclusive arrangement allows the manufacturer to, in their own interest, strongly manage in these areas too.

Besides these one-way arrangements, where in the first case the manufacturer accepts the restriction that the products can only be delivered to one retailer, restricted to a specific market area, and in the second case where the retailer accepts the limitation to purchase and sell the goods of only one manufacturer, there are the two-way arrangements where, at the same time, the manufacturer and retailer accept limits. A manufacturer commits to exclusivity in the sale ('not selling to competing retailer"), and retailer, at the same time commits to exclusivity in the acquisition ("not to buy from competition"). In this situation, allocation of exclusivity in sales in a particular market area of a particular retailer, by the manufacturer, is conditioned by the fact that the retailer does not sell competing products.

The danger of restricting competition is understandable when one considers that the key objective of exclusive contracting arrangements is to exercise control within the marketing channel that one of the members takes, in our case being the manufacturer. Whether vertical restraints will give only positive effects or it will, on the basis of taking strong control by one member, restrict competition, depends on the existing market structure, what is required assessment of the specific case for. The basic criterion for this is that the exclusive arrangement does not limit the selection of products for consumers in a particular market area.

Also, on the other hand, manufacturers are trying to mitigate the impact and power of large retail members and by initiating and implementing joint marketing initiatives with less powerful retailers. With this strategic response to the weak retailers and accepting the offered possibilities of developing cooperation with them, the producers divert consumers from the marketing channel with dominant retailers, where they have lower wholesale prices, to channels with weak retailers, which include higher wholesale prices and potentially higher profits.

These strategic marketing activities carried out with weak retailers may be, in certain situations, a very useful way for the manufacturers to deal with the threat of powerful retailers. However, the collaboration with the dominant retailers quite often

brings many benefits for manufacturers and enables the achievement of higher levels of profitability. This is primarily due to the possibilities of a wide and intensive coverage of the market, taking advantage of economies of scale, lower transaction costs and the like. In these cases, the redirection of the demand for products from the channel with powerful retailers in the channel with less powerful retailers meant the wrong decision.

The conclusion is that the emergence of dominant retailers with significant negotiating power, and cost advantages do not necessarily have to put producers in a worse position. This spites the fact that dominant retailers force producers with lower wholesale prices, contrary to its retail competitors, in respect to those who have better negotiating position. Dominant retailers with their lower costs strategically associate producers by providing them with possibilities for a higher level of profitability and increased market share.

6. CONCLUSION

Analysis of the effect of strengthening the power of retail chains on the competitive position of manufacturers in marketing channels and relationships with manufacturers of large retailers suggests that the expression of their market and purchasing power can have a very noticeable effect on the position of manufacturers. Everyone, especially smaller manufacturers, is being strongly affected by a situation where they are unable to resist purchasing power of retailers. This is when they, feeling under pressure, first of all lower their prices to a level that quite often only a few of them can withstand in the long term. In such a situation, their sustainable growth and development comes into question.

However, manufacturers which are able to work with large retailers often express high levels of satisfaction with this cooperation. Also, those who have failed to find a way to found and/or maintain such cooperation intensively try to do so. First of all it is necessary to develop long-term stable relationship between manufacturers and retailers responsible for the distribution of their products.

7. REFERENCES

Amrouche, N. & Zaccour, G. (2009). A shelf-space-dependent wholesale price when manufacturer and retailer brands compete, *OR Spectrum*, No. 31, p. 361 - 383.

Black S. G. (2010). Relationalism: A Vintage But Sound Concept in Distribution Channel Relationships, *Atlantic Economic Journal*, No. 38, p. 245 – 246.

Bradford D. K. & Weitz A.B. (2009). Salespersons' management of conflict in buyer – seller relationships, *Journal of Personal Selling and Sales Management*, XXIX(1), winter, p. 25 – 42.

Dobson P., Waterson M. & Davies S. (2003). The Patterns and Implications of Increasing Concentration in European Food Retailing, *Journal of Agricultural Economics*, 54(1), p. 111 – 125.

Duffy R., Fearne A. & Hornibrook S. (2003). Measuring Distributive and Procedural Justice: An Exploratory Investigation of the Fairness of Retailer-Supplier Relationships in the UK Food Industry, *British Food Journal*, 105(10), p. 682 – 694.

Ertek G. & Griffin M. P. (2002). Supplier – and buyer – driven channels in a two-stage supply chain, *II E Transactions*, 34(2), p. 691 - 700.

Hingley K. M. (2005). Power Imbalance in UK Agri-Food Supply Channels: Learning to Live with the Supermarkets, *Journal of Marketing Management*, No.21, p. 63 – 88. [available at: http://fortune.com/global500/, access May 28, 2016]

Deloitte (2016). [available at: http://www2.deloitte.com/content/dam/Deloitte/global/Documents/Consumer-Business/gx-cb-global-powers-of-retailing.pdf, access May 28, 2016]

Lahouasnia Lamine. Euromonitor International, [available at: www.euromonitor.com access October 14, 2012].

Li G. Z. & Dant P. R. (2001). Channel Interdependence: Conceptual and Operational Considerations, *Journal of Marketing Channels*, 9(1/2), p. 33 – 64.

Lovreta S., Končar J. & Petković G. (2013). Kanali marketinga, trgovina i ostali kanali, Ekonomski fakultet Univerziteta u Beogradu, Ekonomski fakultet u Subotici.

Maruyama, M. (2004). Japanese Distribution Channels, *The Japanese Economy*, 32(3), p. 27 - 48.

Mishra R.K. (20119. Buyer-Supplier Relationship in SMEs, *The IUP Journal of Supply Chain Management*, VIII(3), p. 26 – 41.

Rosenbloom B. (2013). *Marketing Channels – A Management View*, South-Western, New York.

Stanković Đ. Lj. (2014). Trgovinska revolucija, Čigoja štampa, Beograd.

Thomas R.A. & Wilkinson J.T. (2011). The de-devolution of marketing – Is America's marketing model fighting hard enough to keep up?, *Marketing Management*, spring, p. 19 – 25.