

# MARITIME SECTOR IMPACT ON THE ECONOMY OF LITHUANIA

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## Abstract

This paper reviews and analyzes the Lithuanian Maritime sector impact on the Economy of Lithuania. During the Lithuanian Maritime sector of the Economic impact analysis, four levels were distinguished: direct impact also indirect, induced and incentive (catalytic) effects. The economic impact was measured on these parameters: the number of employees, sales revenue and value-added (costs of production).

Lithuanian maritime sector consists of the following sub-sectors: Shipping and Ports, Shipbuilding and Repair, Fishing and Aquaculture, Energy, Marine Recreation and Tourism. The most important sub-sectors are: shipping and Ports, Ship Building and Repairing sub-sectors that generate the most revenue. Recreation and Tourism sub-sector accounting for nearly a quarter of all marine sector jobs and is important for small businesses. The Energy sub-sector is the most productive one.

*Keywords:* maritime sector, impact, evaluation, regional development, Lithuania.

*JEL Classification:* O18, O32, P25, R11.

## Introduction

Europe has a great maritime tradition and today the Maritime sectors play an important role in the economy, creating value and employment. The strength of the European maritime industry is based on the strength of the individual maritime sectors, but also on the synergies that exist within the entire maritime cluster (Winjolst *et al.*, 2003).

The notion of maritime sectors has increasingly been integrated into European economic and political thinking, and today it functions as a cornerstone in innovation and industrial planning policies (Vivero, 2007). Much has been done by maritime organizations to evaluate, further develop and exploit the potential of maritime sectors as enablers of competitiveness, often with the support of public authorities.

The gradual integration of European countries within a single market also affects the maritime sectors. It creates opportunities within Europe itself, for example, for short sea shipping, but it also creates export opportunities and opportunities for joint research and innovation.

Many of researchers have consistently emphasized the economic significance of maritime sectors, concluding, that the direct and indirect economic impacts in terms of employment and contribution to GDP make maritime sectors of vital importance to a society (Hansen & Clasen, 2010). The economic impact can be evaluated as factors, affecting both positive and negative influence on the level of the country's economic activity. Assessment of a particular sector in the overall national economy is measured by the expenditure arising from the sector of economic activity and assesses the cumulative impact of these costs.

The main research goal – to evaluate Lithuanian marine sector economic impact to the whole economy of Lithuania by measuring direct, indirect, induced and incentive effects. Economic impact can be measured by using several indicators: the number of employees, creation of an added value and sales revenue.

The added value of manufacturing output prices (i.e. costs of production), measured as the value of intermediate consumption and the difference, plus subsidies and minus taxes.

In the Lithuanian Maritime sector economic impact analysis, impact of the sector was assessed at four levels:

- Direct impact - directly in the enterprise sector created economic benefits (jobs, value added, etc.);
- Indirect effects - in other country-sector enterprises created economic benefits arising from their direct links to companies operating in the sector (eg, companies that supply raw materials sector, income);
- Induced effect - sector and related sectors of the country's firms and workers' income and consumption;
- Incentive (catalytic) effect - the economic benefit generated indirectly in other sectors, with indirect connected sectors and the overall economy (such as marine transport also contributes to market efficiency and cost reductions for companies which need transportation services an additional transportation alternative).

Incentive effects in this paper were not assessed as it is objectively difficult to express in numerical value. Possible example: the marine sector effect on international trade is widely accepted as a significant,

but in order to calculate it, cannot be assumed that the removal of the port, in Lithuania won't be transferred neither passengers nor cargo, the average number of passes through the port and treated according to the port of the country's economy.

*Research methodology:* science literature analysis, synthesis, statistical gives research, qualitative, non-experimental research. Analysis was carried out in accordance with the Scottish Government set up in 2007 multiplier lists, as the Lithuanian Statistics Department does not calculate such multipliers. Scottish government the weighting factors (in the options) were chosen as they best meets the Lithuanian maritime sector features.

### **Impact on economy measurement importance**

Any economic activity should measure its fundamental parameters (*Cluster Maritimo Espanol*, 2006; (Benito *et al.*, 2003):

- How much employment does it generate?
- How much does it produce?
- How much added value is obtained from its activity?

But as this is a sector that covers a very wide range of activities, the National Statistics department does not provide specific information about it. Therefore, one of the most important tasks being carried out by this sector involves studying - by conducting surveys and preparing statistics based on the statistical public information and other sources - these important values for the Maritime sector.

At present, we have rigorous data relating to fields within the Maritime sector, and approximate data about all the other sub-sectors.

It has been used the Input-Output methodology (complete and disaggregated analysis of the economy), the most powerful statistical tool to describe any economic activity on the basis of the interrelations with the other activities that supply it and those it supplies.

Obviously, the *sea sector* does not appear in the official tables because it is not an *official sector*, but one of our aims is precisely to include this sector in Lithuania's Input-Output tables.

This is crucial for discovering the sector's most important figures:

- a) Significance in the VAMC (Value Added in Costs of Production)
- b) Its multipliers

The values obtained (known as multipliers) indicate that one Litas spent in the maritime sector is distributed throughout the economy through the customer and supplier sectors and multipliers; giving rise to a result that exceeds the Litas originally spent.

- c) Its importance in other sectors and the importance of other sectors in the maritime sector

The methodology also enables to determine the extent of the maritime sector's links with other sectors and value these relations in Litas, as well as classify the sector according to whether it is very important because it drags the other sectors or less important because it has less dragging power. This drag effect is also analyzed through the relations between the maritime sector and its suppliers and customers (Baird, 2003).

- d) Its effects:

- Direct: value added and employment contributed directly to the economy.
- Indirect: output of other sectors that meets the maritime sector's demand for goods and services, and the output generated considerably to its supply of goods and services.
- Induced: increased output generates more employment, and this means an increase in earned income and, therefore, higher consumption, which in turn produces a new chain of effects such as those described below.

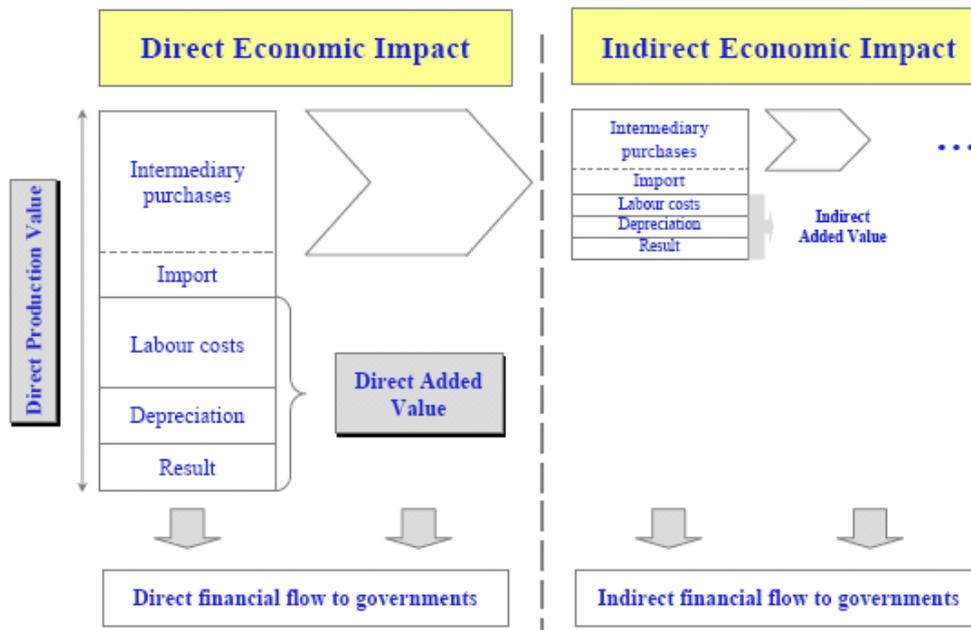
### **Economic significance of Maritime sector**

At the heart of maritime sector research has been the pursuit of an enhanced awareness of the economic contribution of maritime-related sectors to a National or Regional economy. Some observers have commented that the largely international, global nature of maritime transport makes the localized benefits negligible. However, the research base concludes overwhelmingly that it is the derived economic impact from the core sectors to the Maritime sector (cluster) and the economy as a whole, which should be considered to define the true economic significance of maritime sector.

It can be assumed that the clustering process ensures a more sustainable sector development, the new quality of the activities, combining the ability to compete on lower prices and innovation. Sectoral clustering

process should consider the following factors: competitive opportunities for sustainable development of the region and others (Grubliene, 2009).

In evaluating economic impacts of industries or clusters, one commonly distinguishes between direct and indirect impacts of activities. Direct impacts occur from the employment and activity, i.e. investments and other spending, in the cluster companies themselves. In general terms, the indirect impacts consist of the derived employment and activity in surrounding industries, arising from the cluster firms' purchasing of goods and services in the supply chain, as well as the induced spending and consumption of those employed in the cluster and the supply chain. Figure 1 shows Policy Research Corporation's definition in their 2008 study of direct and indirect economic impacts, while also demonstrating the breakdown of the key variables, production value and direct/indirect added value.



**Figure 1.** Definition of Direct and Indirect economic impacts of economic activity

Source: Policy Research Corporation (2008)

As mentioned previously, one of the major limitations to sector analysis is the non-existence of a Maritime sector as a statistical entity. Without a uniformly defined sector (cluster), it requires considerable judgment on the part of the researcher to draw the sector's boundaries, which in turn influences the outcome from the input/output analysis of the national statistics (Hansen & Clasen, 2010). The demand multipliers, which measure the indirect impact of an additional unit of direct demand in the sector, are particularly hard to estimate. Thus, the results are not exact, but the sheer sizes of the figures are highly indicative of the economic importance of maritime industries.

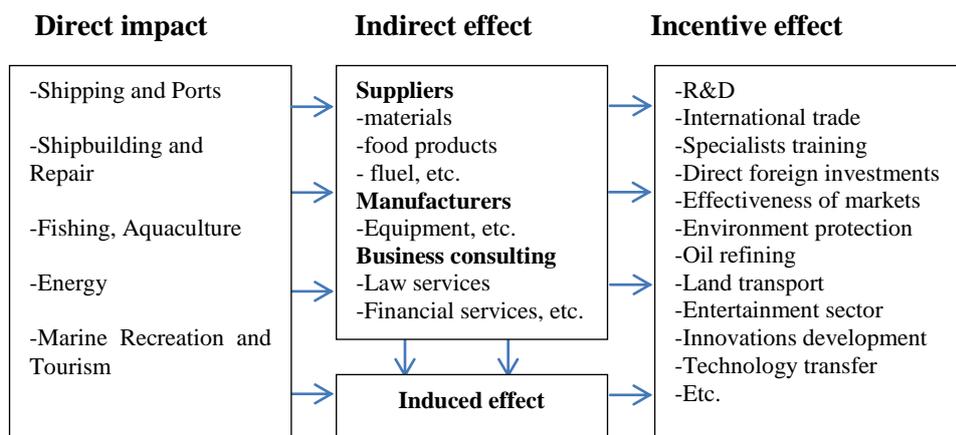
### Lithuanian maritime sector effects

The maritime sector comprises a set of companies whose activity is directly related to the sea. All companies whose activity is fishing constitute a part of the *maritime sector*, and the same goes for companies that build or repair ships or form part of the associated auxiliary industry (Meersman & Voorde, 1997). These companies belong to the economic sectors known as *fisheries and agriculture* and *industry*. However, there are also companies in the services sector that are included in this sector due to their close links with the sea. Thus, companies that provide maritime transport services and port services also form part of the *sea sector*, as of course do the companies that distribute *maritime* products (Voorde, 2005).

Finally, other service companies who provide education, financial services and services for maritime companies also belong to this sector (*Cluster Maritimo Espanol*, 2006). The maritime services sector includes both public and private services.

Department of Statistics traders and distribute the data according to the classification of economic activities, so this article presents an analysis of sub-sectors as the economic activities of the group consisting of 4-digit level classes (according to EVRK, 2 edition).

According to valuation principles discussed above the Lithuanian Maritime sector on the economy can be shown in the Figure 2. The following figure specifies all the activities included in the Lithuanian Maritime sector.



**Figure 2.** Lithuanian Maritime sector activities and effects

Assessing the marine sector of Lithuania on Lithuania's economy, the total economic impact (direct, indirect, induced) was calculated using the following indicators: number of employees, corporate income and value added at manufacture (production) cost (VAMC). Overall economic impact assessment of the use of multipliers, which expresses a certain sector or subsector in touch with all the other sub-sectors of the country - the higher the multiplier, the greater the influence of a particular sector is doing overall national economy. The analysis carried out in accordance with the Scottish Government set up in 2007 multiplier lists, whereas the Lithuanian Department of Statistics does not calculate such multipliers. Scottish Government set multipliers choice (possible choices) to best meet the Lithuanian maritime sectors.

Total for the marine sector jobs created in 2010 was nearly 30 thousand, which accounted for 3,5 percent all jobs created in Lithuania. Sector have directly created almost 17 thousand jobs, buying raw materials, products and services due to an additional 7 thousand job creation / maintenance supplier companies. It has also been created (preserved), over 5 thousand jobs in other sectors of the direct and indirect sector employees and revenues resulting from the administration. The total economic impact of the sector the number of employees was 1.75 multiplier, i.e. one statistical employee of the company in the sector during the indirect and induced effects created an additional 0.75 jobs in the economy.

Marine sector businesses in 2010 was about 4 billion LTL revenue. In the indirect and induced impact on Lithuania's economy, the company has developed an additional 3.2 billion LTL or 4,15 percent Lithuanian companies generated total revenues. Thus, each sector of the company generated revenues of LTL in the economy due to the additional revenue generated is 80 cents.

The total VAMC developed for the maritime sector, by direct, indirect and induced operating in the Lithuanian economy in 2010 was 2.3 billion LTL or 7,14 percent Lithuanian companies' value added in costs of production. So every marine sector companies created value added Litas, has created an additional 85 cents.

The tables below set out and the sector, and each sub-economic impact (decomposed into direct, indirect and induced effects) of the country's economy by three indicators: number of employees, revenues and VAMC.

**Table 1.** Economic impact assessment: number of employees, 2010

Subsectors of Marine sector	Direct impact	Indirect effect	Induced effect	Common effect (direct+indirect+induced)
Shipping and Ports	6.244	3.782	2.452	12.478
Shipbuilding and Repair	5.213	1.922	1.645	8.780
Fishing and Aquaculture	1.323	0.662	0.284	2.269
Energy	0.321	0.423	0.210	0.954
Marine Recreation and Tourism	3.772	0.595	0.520	4.887
<b>Total</b>	<b>16.873</b>	<b>7.384</b>	<b>5.111</b>	<b>29.368</b>

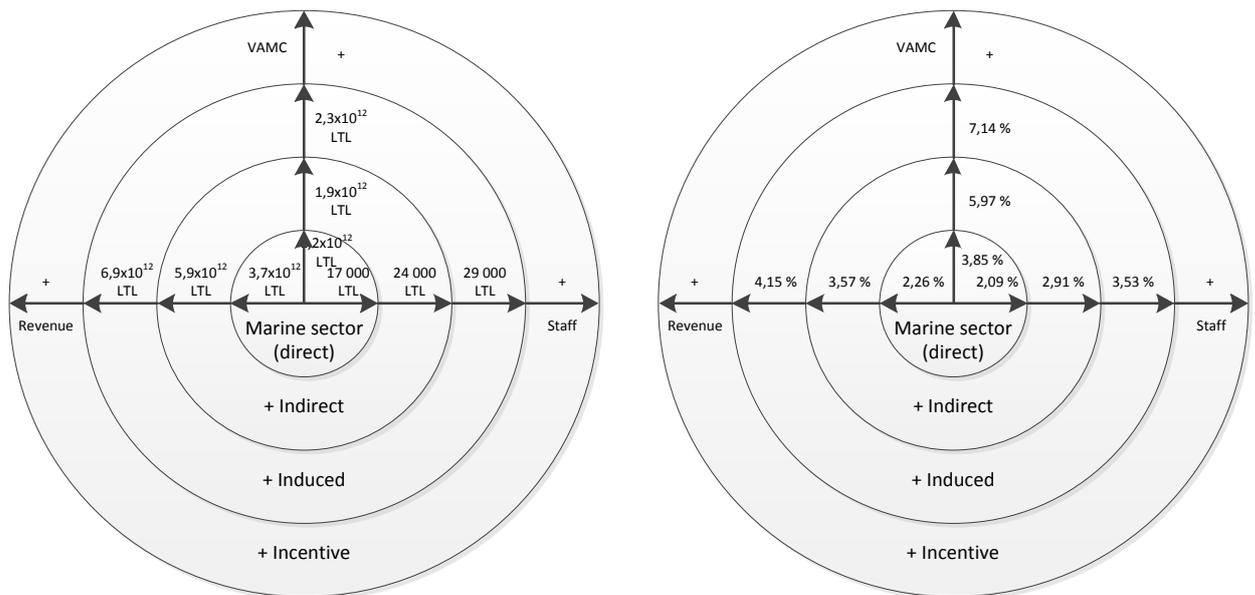
**Table 2.** Economic impact assessment: sales revenue, 2010

Subsectors of Marine sector	Direct impact	Indirect effect	Induced effect	Common effect (direct+indirect+induced)
Shipping and ports	2.243.480	1.532.840	629.548	4.405.868
Shipbuilding and Repair	821.940	365.232	195.260	1.382.432
Fishing and Aquaculture	302.043	140.090	43.243	485.376
Energy	177.420	114.329	44.728	336.477
Marine Recreation and Tourism	175.475	60.992	45.347	281.814
<b>Total</b>	<b>3.720.358</b>	<b>2.213.483</b>	<b>958.126</b>	<b>6.891.967</b>

**Table 3.** Economic impact assessment: VAMC, 2010

Subsectors of Marine sector	Direct impact	Indirect effect	Induced effect	Common effect (direct+indirect+induced)
Shipping and ports	786.423	423.620	226.422	1.436.465
Shipbuilding and Repair	229.421	116.243	79.840	425.504
Fishing and Aquaculture	52.942	26.242	112.243	191.427
Energy	112.460	88.782	42.102	243.344
Marine Recreation and Tourism	38.842	12.104	10.003	60.949
<b>Total</b>	<b>1.220.088</b>	<b>666.991</b>	<b>470.610</b>	<b>2.357.689</b>

Lithuanian Maritime sector in general economic impact of the economy (2010) reflected in the results shown in Figure 3.



**Figure 3.** The structure of Economic impact to Lithuania economics, 2010

The most important sub-sectors are: Shipping and Ports, Shipbuilding and Repair, which together generated almost 80 percent of total government revenue. Less income generated by recreation and tourism sectors, but this sub-sector accounting for nearly a quarter of all marine industry jobs and is important for small businesses. The lowest energy sub-sector employees' work, but this is the most productive sub-sector - value added per employee is close to 300 thousand Litas a year.

### Conclusions

This paper explores evaluation of the Lithuanian maritime sector on the economy of Lithuania calculated the total economic impact (direct and indirect, induced and incentive economic impacts) using the following indicators: number of employees, corporate income and value added.

Overall economic impact assessment of the use of multipliers, which are expressed in a particular sector or subsector of the relationship with all other sub-sectors of the country - the higher multiplier, the greater influence of a certain sector activities it has to a common national economy.

Baltic Sea region has the largest marine sector (both: employees and value-added terms) in Germany, but the most added value a worker creates - in Finland. Lithuania is the second in all Baltic Sea countries in the region (the Russian maritime sector data are not presented) concerning the maritime sectors size and productivity (value-added employee).

Total for the marine sector jobs created in 2010 was nearly 30 thousand, which accounted for 3.5 percent all jobs created in Lithuania. Sector have directly created almost 17 thousand jobs, buying raw materials, products and services due to an additional 7 thousand job creation / maintenance supplier companies. It has also been created (preserved), over five thousand jobs in other sectors of the direct and indirect sector employees and revenues resulting from the administration.

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The total VAMC developed for the maritime sector, by direct, indirect and induced operating in the Lithuanian economy in 2010 was 2.3 billion LTL or 7.14 percent Lithuanian companies' value added at costs of production.

The most important sub-sector are: Shipping and Ports, Shipbuilding and Repairing, Recreation and tourism and Tourism sub-sectors accounting for nearly a quarter of all marine industry jobs and is important for small businesses; Energy sub-sector is the most productive one.

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