

# Value Added by Maritime Industry in Poland

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## Abstract

Value added refers to the additional value created at a particular stage of production. Gross value added is the value of output less the value of intermediate consumption. It can be used as the measure of the contribution to GDP made by an individual producer, industry or sector. As the maritime sector of economy is very important in European Union there is a remarkable lack of statistical data. The paper presents the results of Gross Value Added estimation for maritime industry in Poland. It was estimated using output approach, that is as a difference between gross output and intermediate consumption. Necessary data for GVA estimation was retrieved from annual reports on incomes, costs, financial results and investment outlays on fixed assets collected by Central Statistical Office. Data for 2002, 2003 and 2004 was used. Accurate and reliable information is an essential tool for the development of a strategy for the maritime industry. Without reliable information no assessing of maritime industry role in the general economic arena is possible. Research on the Value Added estimation should be continued.

JEL classification numbers: L11, L52, L62

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## 1. Introduction

As value added can be used as the measure of the contribution to GDP made by an individual producer, industry or sector, it is then applied here to examine, what is the relative importance of maritime sector in Poland. Unfortunately, the term *maritime sector* is not strictly defined in Poland by any regulations. Traditionally following activities are included:

- shipping with connected services, sea port operations, shipbuilding, ship repairing, sea fishery, sea mining, sea building (artificial islands, structures and devices, cables and pipelines), etc.;
- activities of some state services connected with safety of sailing, safety on ships, appropriate use of sea routes, ports and harbors, environmental protection, sea rescue, technical inspection, firefighting, protection of shores.
- scientific, recreational and military activities.

The essential role in the identification of the maritime industry members plays a classification system. Statistical Classification of Economic Activities in the European Community (NACE), divides activities based on the character of the goods and services produced rather than production-oriented or supply-based framework. Polish Classification of Activities (PKD) was compiled on the basis of NACE (as in European Community EUROSTAT publication „*Nomenclature des Activités de*

*Communauté Européenne NACE rev. I*”). PKD was introduced on 01.01.1998 by the decree of the Council of Ministers regarding the Polish Classification of Activities, dated 07.10.1997 (Journal of Laws No. 128, item 829) with later amendments.

## **2. Gross Value Added**

Value added refers to the additional value created at a particular stage of production. Technically, Gross Value Added (GVA) is difference between gross output and intermediate consumption and is valued at basic prices. Net Value Added (NVA) Net value added is obtained by deducting depreciation from gross value added. Basic price is defined as the amount of money received by a producer (trade entities included) from a buyer for a unit of product (good or service), decreased by the tax on the product as well as by applicable rebates and deductions and increased by subsidies received for the product. The category of taxes on products comprises the following taxes:

- VAT on commodities and services (domestic and imported),
- excise tax (on domestic and imported products),
- duties and taxes on import,
- taxes on certain services (e.g. gambling and betting, lump-sum tax on occasional transport of passengers).

Gross output includes the value of goods and services produced by all national institutional units. According to the kind of conducted activity, gross output includes:

- revenues from the sale of commodities,
- margins realized on sale of commodities purchased for resale,
- products designated for increasing value of own fixed assets,
- changes in inventories of finished goods and work in progress.

Gross output is valued at basic prices or according to the production costs.

Intermediate consumption includes:

- value of consumed materials in net terms (after subtracting value of recyclable wastes),
- raw materials (including packaging),
- fuel, energy, technological gases,
- external services (outside processing, transport services, equipment rental, telecommunication and accounting services, commissions paid for banking services),
- costs of business trips as well as other costs (e.g. advertising, representation, rental costs, ticket costs for business trips, costs of lump-sums payments for using personal vehicles for official business).

## **3. Estimation**

Gross Value Added of maritime industry was estimated using output approach, that is as a difference between gross output and intermediate consumption. Gross Value Added for a class is equal to the sum of gross value added calculated for all entities from the class.

Necessary data for GVA estimation was retrieved from annual reports on incomes, costs, financial results and investment outlays on fixed assets (F-02) collected by Central Statistical Office. Data for 2002, 2003 and 2004 was used.

F-02 reports are collected only for entities with more than 9 employees, so GVA was estimated only for these entities. The following classes of PKD were chosen as basic for the maritime industry:

- Section B: Fishing:
  - Class 05.01: Fishing
  - Class 05.02: Fish farming
- Section D: Manufacturing:
  - Class 35.11: Building and repairing of ships
- Section F: Construction:
  - Class 45.24: Construction of water projects.
- Section I: Transport, storage and communication land transport; transport via pipelines:
  - Class 61.10: Sea and coastal water transport
  - Class 63.11: Cargo handling
  - Class 63.22: Other supporting water transport activities
  - Class 63.40: Activities of other transport agencies

PKD class 63.12, Storage and warehousing, was not included, because most of the entities with this activity, declared as basic activity PKD class 63.11, Cargo handling. Including a whole 63.12 class would lead to overestimation of GVA, larger than underestimation when not taken.

Tables 1-3 presents the estimates of gross output, intermediate consumption and gross value added by maritime industry in Poland according to individual activities for 2002, 2003 and 2004. Estimates are in current prices.

Table 1. Gross value added by maritime industry in Poland in 2002

Symbol of activity class (PKD)	Kind of activity	Gross output	Intermediate consumption	GVA
		10 <sup>3</sup> PLN		
0501	Sea fishing and fish's farming	116 503	73 295	43 208
1520	Fish and fishing products processing and preserving	1 486 265	1 198 956	287 309
3511	Production and repair of ships	4 429 607	3 122 952	1 306 655
4524	Building of objects of water engineering	1 389 001	970 253	418 748
6110	Sea and coastal water transport	1 617 150	1 493 186	123 964
6311	Cargo handling in seaports	939 043	490 237	448 806
6322	Other activity supporting water transport	379 292	162 686	216 606
6340	Activity of transport agencies	6 727 972	5 389 730	1 338 242
	Maritime economy (total)	17 084 833	12 901 295	4 183 538

Source: (Hozer et al 2006).

Table 2. Gross value added by maritime industry in Poland in 2003

Symbol of activity class (PKD)	Kind of activity	Gross output	Intermediate consumption	GVA
		10 <sup>3</sup> PLN		
0501	Sea fishing and fish's farming	87 760	50 781	36 979
1520	Fish and fishing products processing and preserving	1 972 442	1 592 583	379 859

3511	Production and repair of ships	4 353 412	3 162 713	1 190 699
4524	Building of objects of water engineering	1 485 017	1 058 133	426 884
6110	Sea and coastal water transport	1 905 241	1 692 929	212 312
6311	Cargo handling in seaports	1 020 506	540 942	479 564
6322	Other activity supporting water transport	381 688	164 750	216 938
6340	Activity of transport agencies	7 946 324	6 371 477	1 574 847
	Maritime economy (total)	19 152 390	14 634 308	4 518 082

Source: (Hozer et al 2006).

Table 1 presents the estimates for 2002. Gross value added was about 4,184 billion PLN. Transport agencies had the biggest share (31,99%), next were: shipbuilding industry (31,23%) and cargo handling (10,73%). The lowest share had fishery (1,03%). The share of the transport agencies improved during 2003 to 34,86 %. At the same time the contribution of shipbuilding declined to 26,35%. The share of seaports was approximately the same. In 2004 the shrinkage of shipbuilding continued, and its share was only about 24,4%. The situation of transport agencies improved again (35,35% in 2004). Similarly for seaports (12,62%).

Table 3. Gross value added by maritime industry in Poland in 2004

Symbol of activity class (PKD)	Kind of activity	Gross output	Intermediate consumption	GVA
		10 <sup>3</sup> PLN		
0501	Sea fishing and fish's farming	159 039	88 206	70 833
1520	Fish and fishing products processing and preserving	2 542 271	2 078 643	463 628
3511	Production and repair of ships	5 719 496	4 555 237	1 164 259
4524	Building of objects of water engineering	1 424 955	1 046 583	378 372
6110	Sea and coastal water transport	1 333 149	1 120 292	212 857
6311	Cargo handling in seaports	1 215 280	613 078	602 202
6322	Other activity supporting water transport	315 909	123 556	192 353
6340	Activity of transport agencies	9 491 661	7 804 769	1 686 892
	Maritime economy (total)	22 201 760	17 430 364	4 771 396

Source: own calculations.

Value added increased by 8% in 2003 and 5,6% in 2004 (see also table 4). In 2003 the decrease in the fishery (-14,4 %) and shipbuilding was observed (-8,9 %), what caused the significant changes in the structure of value added.

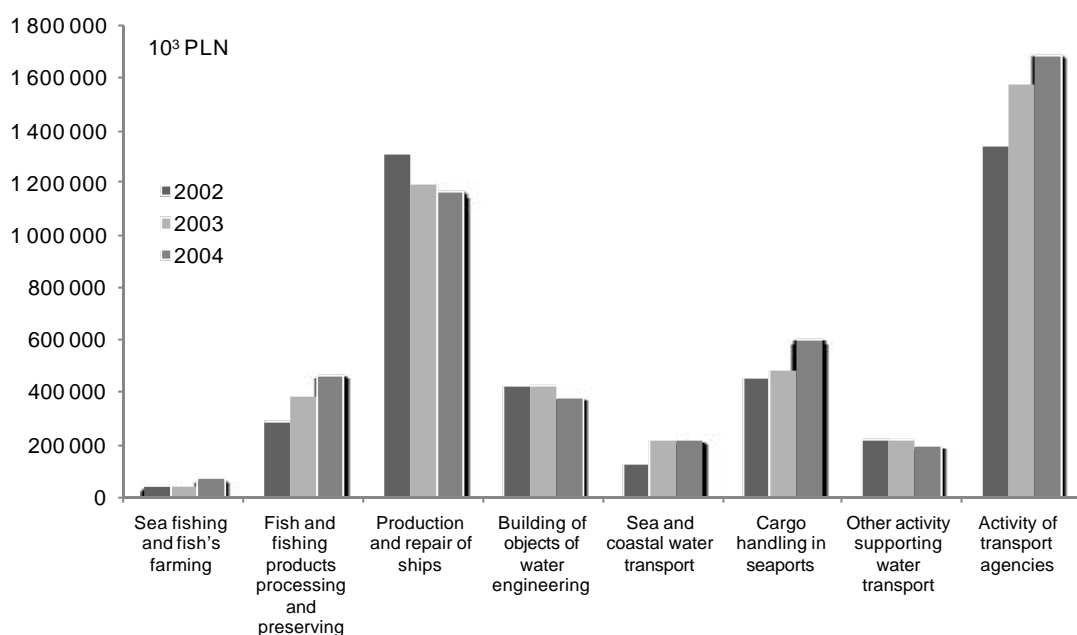
Table 4. Dynamics of gross value added by maritime industry in Poland in 2002-2004

Symbol of activity class (PKD)	Kind of activity	2003/2002	2004/2002
0501	Sea fishing and fish's farming	-14,42%	63,93%
1520	Fish and fishing products processing and preserving	32,21%	61,37%
3511	Production and repair of ships	-8,87%	-10,90%

4524	Building of objects of water engineering	1,94%	-9,64%
6110	Sea and coastal water transport	71,27%	71,71%
6311	Cargo handling in seaports	6,85%	34,18%
6322	Other activity supporting water transport	0,15%	-11,20%
6340	Activity of transport agencies	17,68%	26,05%
	Maritime economy (total)	8,00%	14,05%

Source: own calculations.

Figure 1. Dynamics of gross value added by maritime industry in Poland in 2002-2004 by activities.



Source: own calculations (2004), historical data (2002-2003) from (Hozer et al 2006).

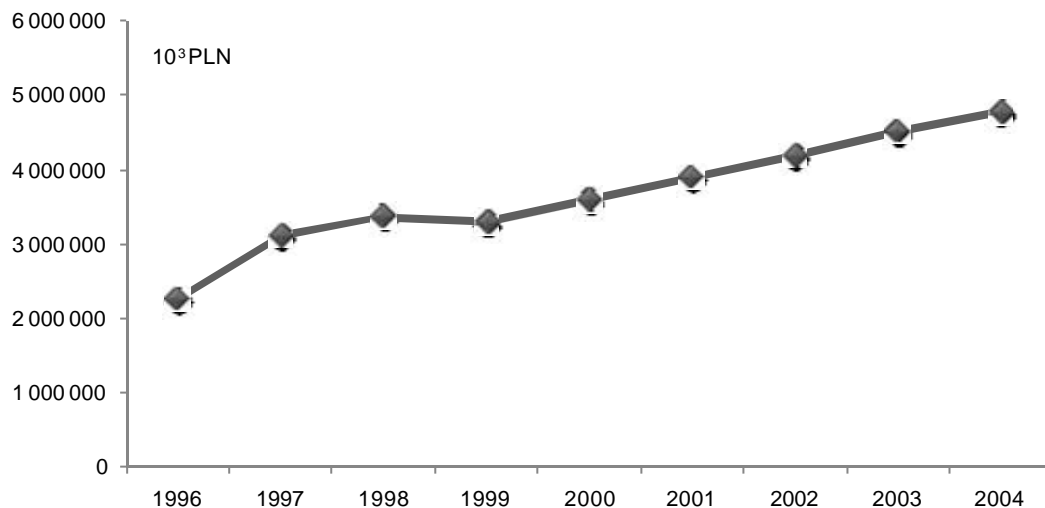
Table 5. Structure of gross value added by maritime economy in Poland in 2002, 2003 and 2004.

Symbol of activity class (PKD)	Kind of activity	Structure		
		2002	2003	2004
0501	Sea fishing and fish's farming	1,03%	0,82%	1,48%
1520	Fish and fishing products processing and preserving	6,87%	8,41%	9,72%
3511	Production and repair of ships	31,23%	26,35%	24,40%
4524	Building of objects of water engineering	10,01%	9,45%	7,93%
6110	Sea and coastal water transport	2,96%	4,70%	4,46%
6311	Cargo handling in seaports	10,73%	10,61%	12,62%
6322	Other activity supporting water transport	5,18%	4,80%	4,03%
6340	Activity of transport agencies	31,99%	34,86%	35,35%
	Maritime economy (total)	100,00%	100,00%	100,00%

Source: own calculations.

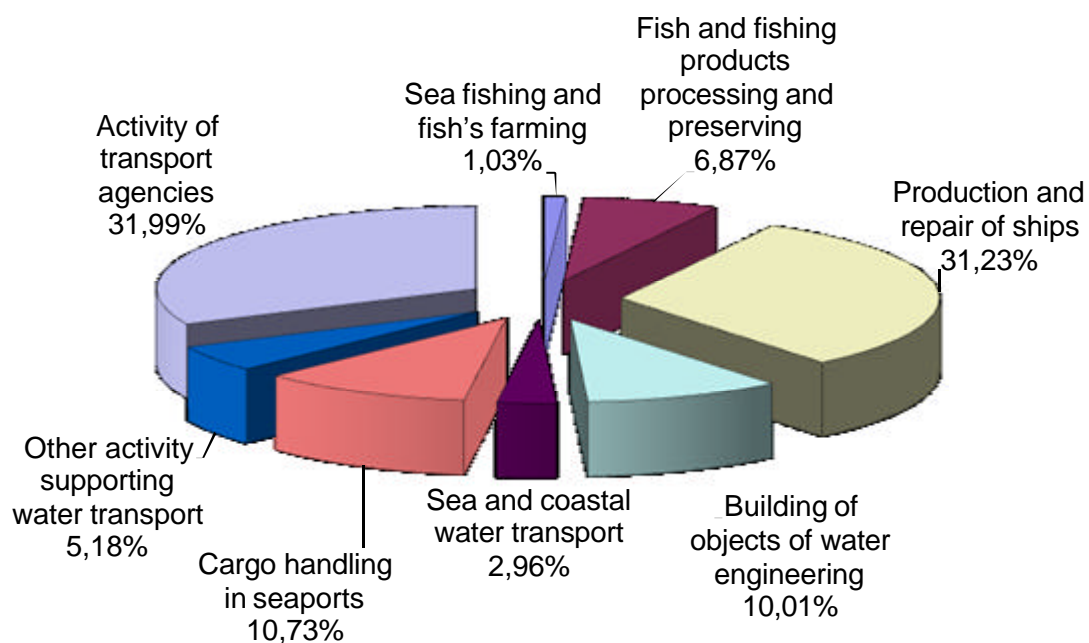
In 1996-2004 gross value added of sea industry was systematically increasing. In the analyzed period GVA increased on average 274,55 million of PLN, which was about 9,8% yearly. In 2004 GVA was 5,6% bigger than in 2003.

Figure 2. Dynamics of gross value added by maritime industry in Poland in 1996-2004.



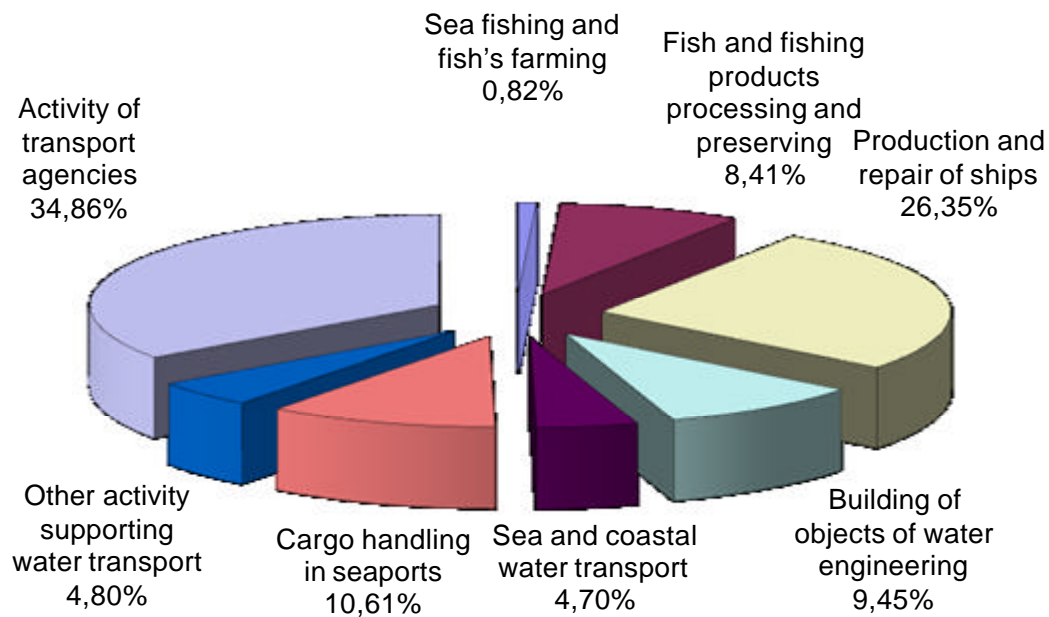
Source: own calculations (2000, 2001, 2004), historical data (2002-2003) from (Hozer et al 2006), and (1996-1999) from (Bernacki 2001).

Figure 2. Structure of gross value added by maritime economy in Poland in 2002.



Source: own calculations.

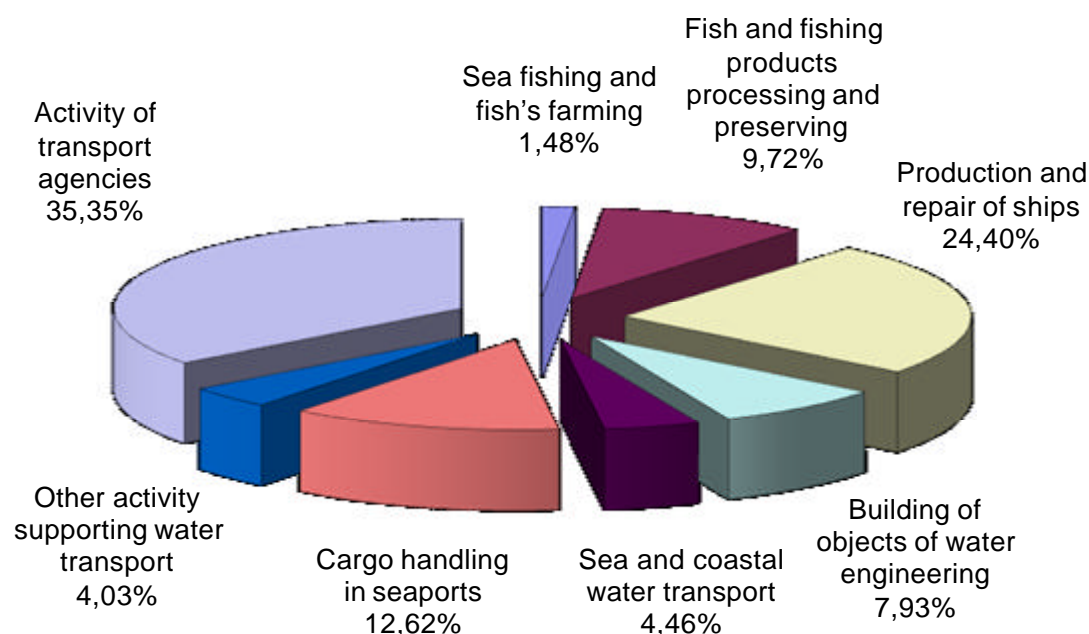
Figure 3. Structure of gross value added by maritime economy in Poland in 2003.



Source: own calculations.

In the period of 2002-2004 the relation between gross value added by maritime industry and total gross value added oscillated around 0,6% (see table 6). It doesn't seem to be a significant number, but we have to remember about the limitations of the used methodology. This number represents only what might be called a direct value added by the companies in maritime sector, because an important contribution into the general maritime value added is made by companies not directly recognized as maritime companies. To examine this contribution, much more complicated methodology, based on direct research would have to be used. Unfortunately direct research is much more expensive. Nevertheless obtained statistics are adequate to analyse tendencies of maritime economy in Poland, its share in the economy and relations between individual activities. The productivity of maritime industry systematically increased during 2002-2004 period. Its value increased by 20,5% from 50 155 PLN in 2002 to 60 461 PLN in 2004.

Figure 4. Structure of gross value added by maritime economy in Poland in 2004.



Source: own calculations.

The biggest share in gross value added in 2002 had transportation agencies (31,99%), shipbuilding (31,23%) and seaports (10,73%). In 2004 the share of transportation agencies increased (35,35%) while decreased for shipbuilding (24,40%). The smallest share in value added creation had fishery (1,48%). The importance of sea transport increased from 2,96% to 4,46% in 2004.

Table 6. Main economic indicators for Poland.

Indicator	2002	2003	2004
GVA of maritime industry [ $10^6$ PLN]	4 184	4 518	4 771
Gross Value Added [ $10^6$ PLN]	714 354	743 321	820 375
Gross Domestic Product [ $10^6$ PLN]	807 860	842 128	923 248
Employment in Maritime Industry	83 421	78 826	78 911
GVA of maritime industry / GVA	0,59%	0,61%	0,58%
GVA of maritime industry / GDP	0,52%	0,54%	0,52%
GVA of maritime industry per capita [PLN]	50 155	57 316	60 461

Source: collected from Central Statistical Office.

#### 4. Conclusions

Gross Value Added of maritime economy in 1996-2004 grew systematically till level 4,77 million PLN in year 2004; 0,54% GDP. Activity of transport agencies, production and repair of ships and cargo handling in seaports had the largest part in creating Gross Value Added of Polish maritime economy in 2004. Because of improvement in transport infrastructure: roads, motorways as well as terminals, berths, warehouses and barriers for ship building in Poland, we may expect further



decrease in the share of the shipbuilding and increase in the share of cargo traffic in seaports in value added by maritime industry in Poland.

Summing up, there appears to be a remarkable lack of information about the maritime industry. Accurate and reliable information is an essential tool for the development of a strategy for the maritime industry. Without reliable information no assessing of maritime industry role in the general economic arena is possible. Research on the Value Added estimation should be continued also because of the strong linkages between maritime industry and other sectors of the economy, which are very important. These however are more difficult to analyze as more funds need to be collected for such research.

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