

# ECONOMIC PERFORMANCE OF EU FISHING FLEETS AND CONSEQUENCES OF FUEL PRICE INCREASE <sup>1</sup>

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## SUMMARY AND CONCLUSIONS

Many EU fleets have been facing economic problems since 1995-2000 due to decreasing availability of resources, constant fish prices and more recently increasing fuel price. The size of the EU fishing fleet has gradually decreased. While around 1990 the fleet of EU-12 employed some 300,000 men on board, by the end of 2005 it was probably no more than 170,000 i.e. about 4% per year. This is normal for a primary industry in an industrialized / services orientated economy. Long term costs and earnings data indicates that this decline maintained the average operational results approximately at a break-even level, i.e. at the level of zero profits. Evidently, there are major variations between countries, fleet segments and years, but on average profits in one segment were compensated by losses elsewhere.

With the recent increase in fuel price, the zero profit fishing has turned into losses, of which it is uncertain whether they are temporary or structural. Results of many fleets segments have been deteriorating and consequently the reserves of many firms have been probably largely depleted already before the summer of 2005.

It is estimated that the EU fleets spent in 2004 about 1 bln Euro on fuel, with prices ranging between 0.25-0.38 Euro/ litre. In the April of 2006 the fuel price was approximately 60% higher. Should the fuel price stabilize 40-50% above the 2004 level, the EU fleets will be faced with additional costs of 400-500 mln Euro.

However, the fundamental problem of the EU fisheries sector today is its low productivity. Average gross value added<sup>3</sup> per employed is estimated at mere 19,000 Euro, which can be compared to 35-60,000 Euro in manufacturing industries around Europe. The fleets are facing vicious circle – low profits – low investment - lagging productivity – low profits. It has been repeatedly demonstrated that the dissipation of profits is a consequence of the common property characteristic of fish stocks.

The short term problem of the increased fuel costs only highlights the structural economic weaknesses of the EU fishing fleets. Economic solution can be only found by resolution of the structural problems and not by addressing short term issues. Economic management needs to focus on revitalization of the fishing sector through combination reduction of the fleet, investments in new technologies, increase of efficiency and improvement of productivity on vessel level. It is necessary to explore options of management measures which will be consistent with and reinforced by the operation of the market. In broader economy such developments are achieved by specialization (separation of ownership and use of different means of production, e.g. knowledge, vessels, fishing rights) and by attracting new 'players' (venture capital, risk takers in futures markets).

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<sup>1</sup> This paper is based on Annual Reports 'Economic Performance of Selected European Fishing Fleets', editions 1998-2005.

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<sup>3</sup> Total of income to labor (crew share) and capital (profit, depreciation and interest).

Furthermore, it needs to be recognized that increasing scarcity of the European fish stocks does not trigger a market response in terms of higher prices because of the globalized fish trade. This is an evident case of a market failure, which leads to degradation of stocks and environment. In other areas such market failure has been addressed by introduction of proper economic incentives like environmental taxes, levies or carbon credits.

Also in fisheries similar measures may initiate economic processes which will lead to environmental sustainability and sufficient economic resilience of the fisheries sector to face and survive adverse economic developments which are beyond its influence.

**1. OVERVIEW OF EU FISHERIES**

The fishing fleets of the EU produced in 2004 approximately 5.7 mln tonnes of fish with an estimated value of 6.7 bln Euro. In 2006 the EU fleet register contains some 90,000 vessels (7.9 mln kW), of which 73,400 are below 12m. There are about 186,000 men working on board. (see table A.1 for details by country).

The size of the fisheries sector of the EU-15<sup>4</sup> has been decreasing. Employment and volume of landings were in 2004 about 30% below the level of 1998. Value of landings and the number of vessels have decreased at a lower pace and were 15% and 19% respectively lower than 6 years earlier. The real value of landings, i.e. after accounting for inflation, has decreased by about 24%. This implies that average nominal revenues per vessel have remained approximately constant, although their real value eroded due to inflation. The average value per landed tonne has increased somewhat, which may have been caused by a combination of better prices and changing composition of catches towards higher priced species. The production value per man has increased by a few percentage points.

The fishing fleets of the new Members States have experienced and even more dramatic restructuring during their transformation to market economy.

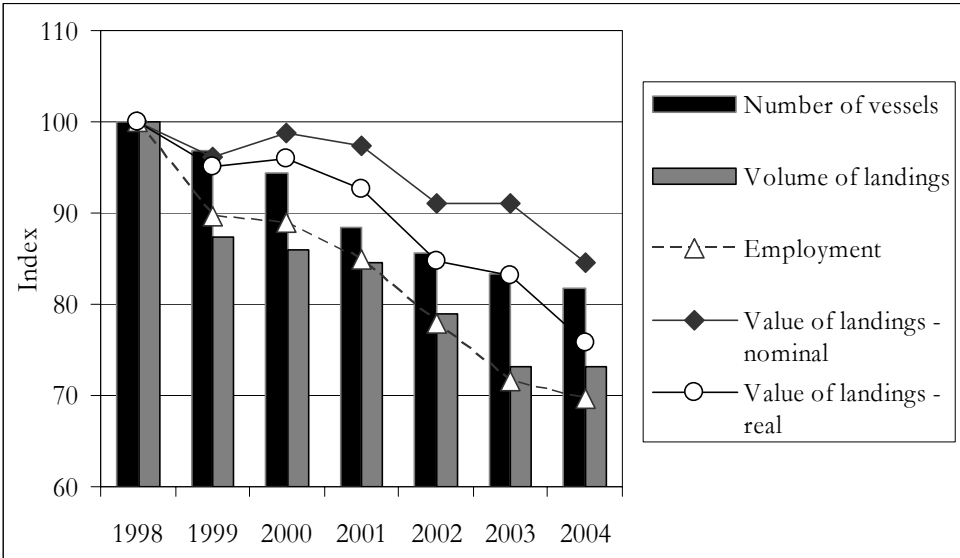


Fig. 1.1 Trends in the fisheries of EU-15

<sup>4</sup> Time series are not yet available for the new Member States.

Approximately 10,000 trawlers of 12-40 m account for 40-45% of the total production value,, but employ only 25% of fishermen. On the other hand almost 67,000 coastal vessels employ almost 90,000 fishermen (50% of total) but account only for 18% of the production value.

Table 1.1 Composition of the EU fleet by gear and size

Gear	Size	Registered number of vessels	1000 kW	Value of landings (mln Euro)	Employment
Beam trawlers	<12 m	294	17.8	1.4	164
	12m – 24m	544	115.7	136.9	1,650
	24m – 40m	178	157.1	289.7	1,680
	> 40m	119	234.2	16.4	325
Demersal and pelagic trawlers and seiners	<12 m	5,248	319.5	158.0	2,906
	12m – 24m	7,641	1,604.3	1,860.7	31,999
	24m – 40m	2,522	1,224.9	1,151.3	16,102
Passive gears	> 40m	396	1,139.3	1,041.0	9,623
	<12 m	66,762	1,917.2	1,275.8	88,254
	12m – 24m	3,503	514.0	626.8	24,121
	24m – 40m	553	267.2	274.7	5,490
Dredges	> 40m	47	52.4	37.7	707
	<12 m	1,054	68.3	35.7	1,141
	12m – 24m	867	119.9	128.5	2,204
	24m – 40m	177	66.0	36.1	489
	> 40m	46	44.9	na	na
<b>Total EU</b>		<b>89,951</b>	<b>7,862.7</b>	<b>7,070.5</b>	<b>186,854</b>

Source: EU fleet register.

Note: Value of landings and employment are estimated and refer to the average 2002-2004

The costs and earnings of the total EU fishing fleet can be summarized as follows (average 2002-2004, mln Euro):

Revenues	7,070
Fuel costs	1,060
Other operational costs	2,075
Crew share	2,455
Total costs	5,590
<b>Gross profit</b>	<b>1,480</b>

(gross profit is before tax, depreciation and interest costs)

Four general conclusions regarding the performance in 2002-2004 can be drawn from the above figures:

1. Average crew share per man amounted to about 12,500 Euro per year.
2. Average gross value added (crew share plus gross profit) amounted to 21,800 Euro. This measure is relevant considering that many vessel owners work also on board.
3. If engine power is taken as a unit of capital, average gross profit per kW amounted to about 200 Euro. In other words, an average vessel equipped with 100 kW engine generated a gross profit of 20,000 Euro per year.
4. Increase of the fuel price by 40% will reduce the gross value added by about 10% and gross profit by almost 30%.

To put these productivity indicators in perspective of the broader economy, gross value added per employee ranges in most old Member States from about 40,000 Euro in Spain and Italy to 70,000 Euro in Belgium and the Netherlands.

Evidently there are large differences between countries and segments, which are addressed in the following section.

## 2. PERFORMANCE OF THE MAIN SEGMENTS

### 2.1 Available and deduced data

Three main segments in terms of production value and employment were identified above: trawlers / seiners 12-24 m, trawlers / seiners 24-40 m and passive gear vessels < 12 m. Before addressing the trawlers / seiner segments it is necessary to elaborate briefly the background of the presented costs and earnings data.

Sample costs and earnings data is available for fleet segments covering 26,500 vessels with total production of 4.5 bln Euro and about 81,000 men on board. Therefore the data represents the relatively more commercially active fleets and less small scale coastal fishing. On the other hand the remaining fleets are composed of relatively small vessels.

Table 2.1 Performance of fleets according to data availability \*

	Total EU	Available data	Deduced data**
Production value (mln Euro)	7,100	4,500	2,600
Number of vessels	90,000	26,500	63,500
Engine power (1000 kW)	7.860	3,850	4,010
Employment	187,000	81,000	106,000
Average vessel size (kW)	87	145	63
- crew	2.1	3.1	1.7
Productivity (Euro)			
Value / man	38,000	55,600	24,500
Gross value added / man	21,850	30,600	15,200
Crew share / man	12,500	18,300	8,100
Gross profit / kW	200	260	140

\* All figures have been rounded up. \*\* Productivity indicators are based on small scale fisheries for which data is available.

The figures presented in table 2.1 indicate that there is a major difference between productivity levels of small and medium sized vessels. Recent research<sup>5</sup> concludes that:

- The national fishing fleet registers contain significant numbers of vessels which are not commercially active. This concerns roughly at least 10,000 very small boats.
- About 40-45,000 coastal small scale fishermen are probably active only on part time basis in fishing and obtain possibly complementary income from other sources.

Therefore, the productivity level in small scale fisheries is partly affected by statistical definitions.

<sup>5</sup> P. Salz et. al., *Employment in the fisheries sector: current situation*, Report to the European Commission, April 2006; and LEI / Framian, *The impact of the increase of the oil price in European fisheries*, Report to the European Parliament, April 2006

The total use of fuel can be estimated at about 3.8 mln tonnes. In other words, each kg of landed fish requires 0,66 l of fuel.

## 2.2 Performance of trawlers / seiners 12-40 m

The trawler segments are well covered by available data. At the EU level the labor productivity is 60% higher than the average productivity of all fishing fleets. However, this difference is substantially lower when performance is compared for segments for which data is available.

Table 2.2 Performance of trawlers / seiners 12-40 m, average 2002-2004 \*

	Total EU	Available data		Deduced data
	Trawlers 12-40 m	Trawlers 12-24 m	Trawlers 24-40 m	
Production value (mln Euro)	3,000	1,700	700	600
Number of vessels	10,200	6,400	1,300	2,500
Engine power (1000 kW)	2,800	1,500	600	700
Employment	48,100	27,200	9,800	11,100
Average vessel size (kW)	280	230	490	290
- crew	4.7	4.2	7.7	4.5
Productivity (Euro)				
Value / man	62,600	63,500	70,700	53,300
Gross value added / man	34,700	34,800	32,900	35,900
Crew share / man	20,700	22,100	24,200	14,000
Gross profit / kW	240	230	140	340

\* All figures have been rounded up.

The productivity of capital at approximately 200 Euro / kW is at zero profit level. This can be illustrated by the following example. A trawler of 21-24 m with 400 kW engine costs roughly 1.5 mln Euro (range 1.2-1.8 mln Euro). Capital costs (depreciation and interest) can be summarized as follows:

- Hull and fixed structures, 80% of investment, depreciation in 25 years.
- Engine and other equipment, 20% of investment, depreciation in 10 years.
- Interest rate 4%, 50% of the investment funded by loan.

Consequently average annual costs are (over 25 years):

Depreciation hull	48,000 Euro
Depreciation equipment	30,000
Interest payments	15,000
Total capital costs	93,000
<b>Capital costs per kW</b>	<b>232 Euro / kW</b>

This numerical example illustrates that even without any profit to the owner (remuneration of equity capital is not accounted for) the capital costs per kW are approximately at the level of the earnings achieved presently. In this situation the income of the owner is on average the crew share per man. At this level of profitability (or rather the lack thereof) it is not surprising that investment levels are low and crew shortages intensify. Particularly the larger trawlers show low earnings to capital.

An additional factor is the increasing need to invest in intangible assets – fishing rights like licenses, individual quota, etc. This topic has not yet been researched in depth, but there are strong indications from the balance sheets of fishing firms that the value of intangible assets is often equal to the tangible assets (vessel, etc.). Independently of the question whether intangible assets should be depreciated or not, acquisition of fishing rights will further increase total capital costs.

In the years 2002-2004 the fuel costs of the trawlers / seiners of 12-40 m amounted to about 17% of their value of landings. Should the fuel price remain structurally 40% above the 2002-2004 level, than the share gross value added in total production value will decrease from about 55% to 48%. This means that the earnings of the crews and the remuneration of the capital would decrease by approximately 13%. In other words, the crew share / man would decrease by about 3,000 Euro and gross profit / kW by 26 Euro.

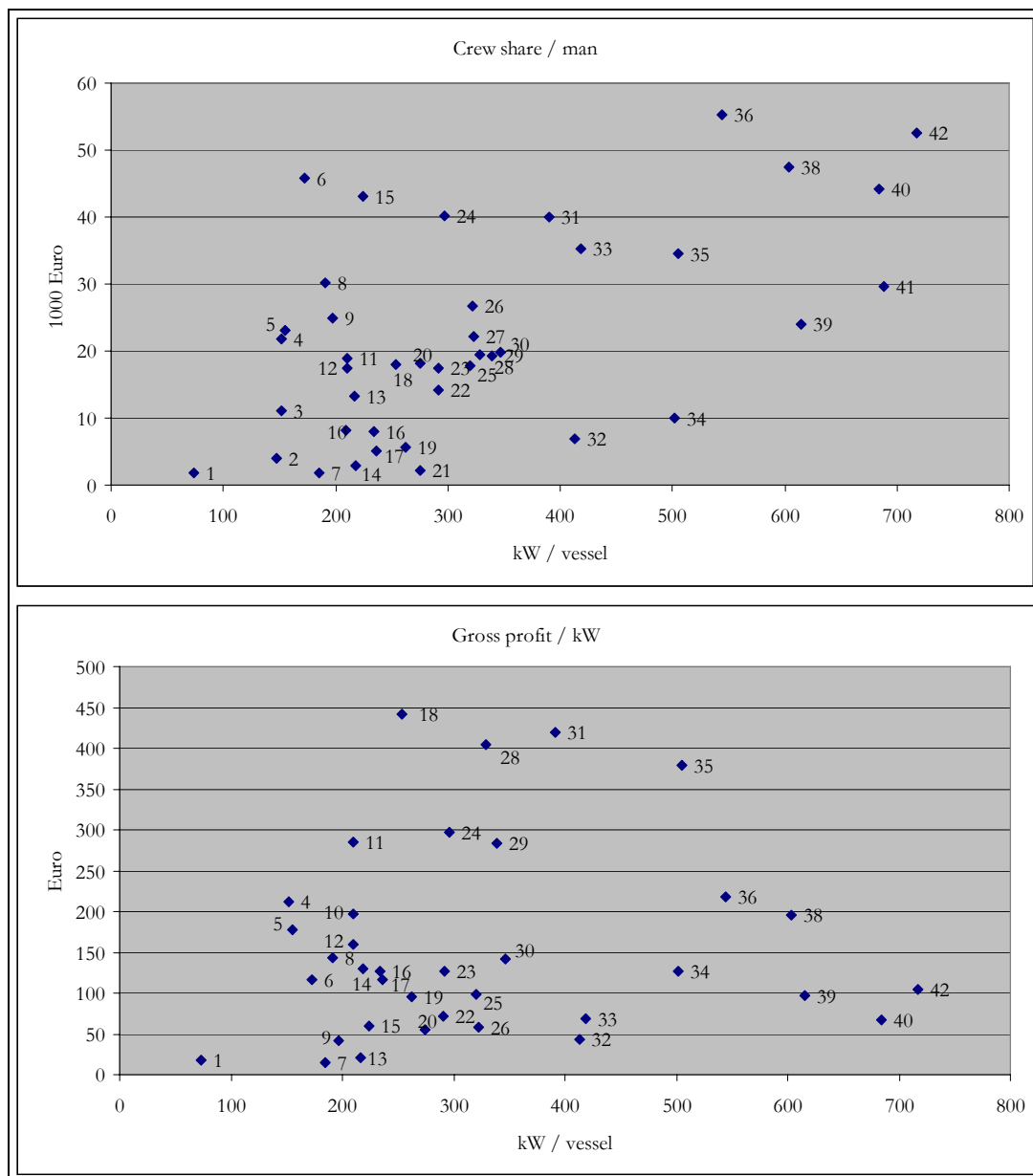


Fig. 2.1 Productivity level of individual fleet segments, trawlers / seiners 12-40 m

Note: Details of the segments can be found by corresponding numbers in table A.2

Figure 2.1 illustrates the differences in performance among various segments. Level of productivity is not dependent on the size of the vessel (at least not at this level of statistical detail). However, that average productivity of many segments is rather low. Several segment with negative gross profit are not presented.

### 2.3 Performance of vessels < 12 m using passive gears

This segment is particularly important because of its apparent employment effect, especially in the Mediterranean countries. Table 2.3 shows that available data regards generally small passive gear vessels which could be classified as commercially active, although also in their case crew share / man remains below 8,000 Euro per year. The performance of a large part of the remaining fleet shows even substantially lower labor productivity.

Table 2.3 Performance of passive gear vessels < 12 m, average 2002-2004 \*

	Total EU		
	Passive gear vessels		
	< 12 m	Available data	Deduced
Production value (mln Euro)	1,300	500	800
Number of vessels	66,800	12,900	53,900
Engine power (1000 kW)	1,900	400	1,500
Employment	88,300	21,100	67,200
Average vessel size (kW)	29	31	28
- crew	1.3	1.6	1.2
Productivity (Euro)			
Value / man	14,500	22,900	11,800
Gross value added / man	9,400	15,900	7,300
Crew share / man	5,100	7,700	4,200
Gross profit / kW	200	430	140

\* All figures have been rounded up.

Due to the large variety of vessels (hull materials), required deck equipment and gear it is not possible to calculate to which extent the indicated remuneration of capital would be sufficient to justify investments in new vessels. On the basis of the assumptions made in section 2.2, it could be concluded that investment in an active passive gears vessel (available data column) must not exceed some 230,000 Euro. In view of the available data this is, however, a highly speculative conclusion.

In case of passive gear vessels the role of fuel costs is not as pronounced. In 2002-2004 these costs amounted to 8-9% of the value of landings. An increase of the fuel price by 40%, would imply some 46 mln Euro in additional costs. This would reduce the gross value added by 5-6%. Crew share per man and gross profit per kW would decrease by this percentage.

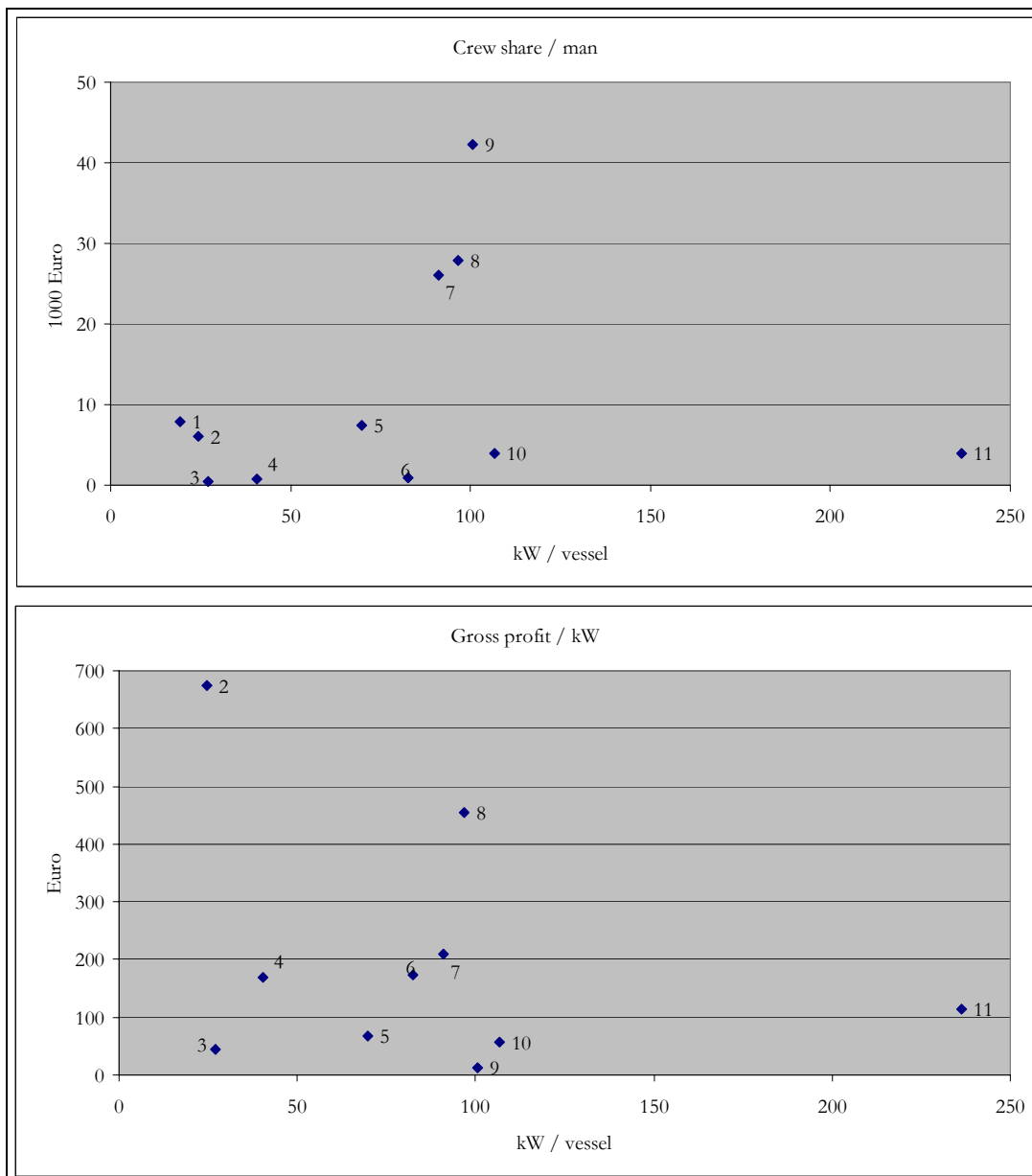


Fig. 2.2 Productivity level of individual fleet segments, passive gear vessels < 12m  
 Note: Details of the segments can be found by corresponding numbers in table A.3.

## 2.4 Conclusions

Empirical evidence on three most important segments in EU fisheries shows that:

- Average productivity of labor and capital was relatively low already in 2002-2004, i.e. before the fuel price rise. It needs to be increased to assure economic viability in the long run.
- There are major differences between individual segments.
- Increase of fuel costs only highlights structural weaknesses of the performance of many EU fishing fleets.
- In the short run significant stock recovery cannot be expected. Consequently physical productivity (catch per unit of effort) will remain relatively constant. Performance of the individual vessels can therefore be only increased by substantial increase of its fishing effort, which in its turn is only feasible when the total fleet segment is proportionately reduced. However, in some cases it may even be operationally difficult to increase effort per vessel to the required level.



## STATISTICAL APPENDIX

Table A.1 EU fishing fleets by country, average 2002-2004

	Number of registered vessels	1000 kW	Value of landings (mln Euro)	Employment
Belgium	123	67	86.0	578
Cyprus	3,352	362	10.9	922
Denmark	7,850	1,068	351.4	3,351
Estonia	2,146	173	8.6	567
Finland	1,386	220	21.7	540
France	14,659	1,231	1,185.8	13,532
Germany	3,283	177	180.2	2,324
Greece	866	534	290.9	30,414
Ireland	9,985	394	199.5	5,162
Italy	13,875	1,427	1,410.3	37,237
Latvia	6,892	887	79.2	2,385
Lithuania	1,617	244	47.7	3,480
Malta	1,022	64	12.7	1,271
Netherlands	932	70	384.6	2,275
Poland	282	98	39.7	3,797
Portugal	1,098	133	353.3	20,538
Slovenia	1,358	137	3.2	142
Spain	18,183	519	1,548.6	45,306
Sweden	894	49	97.3	1,446
United K.	148	9	758.9	11,588
<b>Total EU</b>	<b>89,951</b>	<b>7,863</b>	<b>7,070.5</b>	<b>186,854</b>

Table A.2 Details of trawlers / seiners 12-40 m

Sequence number	Country / segment	kW / vessel	Share / man	Gross profit / kW
1	EE: Trawlers < 24m	73	1.8	17.6
2	LV: Trawlers < 24m	147	3.9	-4.7
3	IE: Polyvalent 12 -< 18 m	152	11.0	-286.8
4	UK: Scottish nephrops trawlers	152	21.8	212.3
5	ES: Galician purse seiners	155	23.0	177.1
6	DK: Danish seiners	173	45.8	115.8
7	PL: Demersal trawlers 12 -< 24	185	1.9	14.9
8	UK: Scallop trawlers	191	30.2	143.0
9	DE: Baltic trawlers	197	24.9	41.7
10	SE: Pelagic trawlers < 24 m	209	8.2	197.3
11	IT: Mediterranean trawlers	210	18.9	284.5
12	UK: Scot. Ir. nephrops trawlers	210	17.5	159.0
13	SE: Nephrop trawlers	216	13.3	21.5
14	LT: Baltic trawlers	218	2.8	129.6
15	DK: Trawlers < 24 m	224	43.1	60.1
16	PT: Coastal purse seiners	234	8.1	126.9
17	LV: Trawlers > 24m	236	5.1	116.9
18	IT: Purse seiners	253	17.9	441.4
19	EE: Trawlers > 24m	263	5.7	96.0
20	FI: Trawlers < 24 m	275	18.2	54.5
21	PL: Demersal trawlers 24 -< 40	275	2.1	-86.1
22	GR: Thermaikos trawlers<24m	291	14.2	72.3
23	SE: Cod trawlers < 24 m	291	17.5	127.1
24	FR: Medit. trawlers 18-25 m	297	40.2	297.0
25	SE: Shrimp trawlers	320	17.8	98.0
26	UK: Scot.demersal trawlers<24m	322	26.7	58.6
27	IE: Polyvalent 18 -< 24 m	323	22.2	-463.5
28	IT: Midwater pair trawlers	328	19.4	404.6
29	ES: N and NW trawlers	339	19.2	283.3
30	GR: Thermaikos trawlers>24m	347	19.8	141.1
31	FR: Atlantic bottom trawlers	391	40.0	419.4
32	PL: Pelagic trawlers 24 -< 40	413	6.9	44.0
33	UK: Scottish seiners	418	35.3	68.0
34	PT: Trawlers	502	10.0	127.6
35	ES: 300 fleet	505	34.6	378.8
36	NL: Trawlers > 24m	544	55.3	218.4
37	DE: North Sea trawlers	595	0.0	0.0
38	DK: Trawlers 24 - < 40 m	604	47.4	195.9
39	SE: Cod trawlers >= 24 m	615	24.1	96.9
40	FI: Trawlers > 24 m	684	44.2	67.0
41	IE: Polyvalent >= 24m	688	29.6	-350.5
42	UK: Scot. demersal trawlers>24m	717	52.5	104.3
43	SE: Pel. trawlers/purse s.>24m	1152	31.1	116.2

Table A.3 Details of passive gear vessels < 12 m, 2002-2004

Sequence number	Country / segment	kW / vessel	Share / man	Gross profit / kW
1	DE: Baltic coastal vessels	19	7.9	-24.6
2	IT: Small scale fisheries	25	6.1	673.7
3	LT: Coastal vessels < 12 m	27	0.4	45.4
4	PL: Passive gear vessels < 12	40	0.8	168.6
5	SE: Gillnetters < 12 m	70	7.4	66.8
6	FI: Coastal vessels	83	0.9	173.9
7	FR: Atlantic Longliners & liners	91	26.1	208.3
8	FR: Atlantic potters	97	27.9	454.5
9	DK: Gillnetters	101	42.3	13.2
10	PL: Longliners < 12	107	4.0	57.8
11	PT: Gillnetters, north>40GT	236	4.0	114.3