



Tonnage Measurement Study

MTCP Work Package 2.1

Quality and Efficiency

Final Report

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Content

0. Executive Summary	1
1 Introduction and Background	2
2 Structure of Report.....	3
3. The London Tonnage Convention (1969)	4
3.1 Brief History	4
3.2 Purpose and Regulations of the Convention.....	5
3.3 Definitions.....	8
3.4 Operational Experience.....	8
3.5 Conclusions.....	9
4. Calculation and Use of GT by Ports.....	10
4.1 General Remarks on Port Tariffs	10
4.2 Use of GT as a basis for Port Charges	11
4.3 Use of GT as a basis for Other Charges.....	16
5. Impact on the Market.....	18
5.1 Impact on Vessel Selection.....	18
5.2 Impact on Vessel Design	19
5.3 Impact on Port Income.....	21
5.4 Impact on Cargo Revenue.....	23
6. Alternatives to the Use of GT as basis for Port Charging.....	25
6.1 French and Polish Systems	25
6.2 Croatia and Slovenia.....	28
6.3 Other Possibilities: A New Proposal.....	29
7. Impact on Market of any Change from GT-based Port Charging.....	34
7.1 Impact of Vessel Selection.....	34
7.2 Impact on Vessel Design	34
7.3 Impact on Port Income.....	35
7.4 Impact on Cargo Revenue.....	35
7.5 Conclusions for Market Impacts.....	35
8. Policy Issues	36
8.1 General.....	36
8.2 Do-Nothing-Option.....	36
8.3 Provision of Information.....	37
8.4 Institutional Action	37
8.5 EU Policy Action	38
9. Cost-Benefit Analysis.....	40
9.1 Selection of Ships and Port Tariffs	40
9.2 Hamburg	41
9.3 Rotterdam.....	43
9.4 Le Havre.....	44
9.5 Luka-Koper	45
9.6 Results of the analysis of port tariffs	46
9.7 Conclusions from the Cost-Benefit Analysis.....	48
10. Recommendations	50
Annexes	53

0. Executive Summary

Across the EU Gross Tonnage has been used as the basis of port charges for almost 25 years, with the notable exceptions of the French and Polish ports, who use/used the product of length, breadth, and summer draft as the basis.

The replacement by the 1969 Tonnage Convention of GRT by GT was not intended to have any impact on port charges and its introduction in no way compelled ports to use GT as the basis for port charges, as may be seen from the example of the "French" port charges system. The use of GT appears principally to be 'convenient'.

The use of GT has, however, introduced, over the years, discrimination and bias in the design and usage of vessels. This has led, particularly affecting short sea shipping, to inefficiencies and safety problems as a result of the discrimination against high freeboard, high steel content vessels. Hence Ro-Ro vessels and open hatch container vessels suffer relatively higher charges and conventional container vessels (including those used for feeding) have the unsafe and inefficient seven-tier stacking of containers on deck.

Though it may be argued that port charges are not a large element of total voyage costs, at the margin and in the case of short sea shipping they do affect decisions as to which vessels and ports to use on routes and to overall inefficiencies and hence market failure.

Examination of the arguments for changing the IMO Convention are not persuasive (except for the adjustments already being suggested by Germany and Australia). The Convention does not, after all, introduce any legal compulsion to use GT as the basis for port charges and there are other cogent reasons for the use of GT as a statistical measurement system for recording tonnage.

The case for EU action is more persuasive as there is evidence of market failure and discrimination leading to an un-level playing field across the EU. The situation could be remedied by EU action in the context of the new ports policy linked to the necessity of increasing the share of short sea shipping in freight transport and developing sea motorways.

The action to be taken could include options ranging from hard actions (e.g. a Directive to enforce say the French system or the 'actual displacement ton' system on all EU ports) to soft action via a Recommendation, including a Code of Good Practice. It may be preferable to adopt a staged approach with, initially, the use of a Recommendation. Resorting to a Directive only if the softer action fails to remedy the situation and that the use of GT appears to be preventing a further substantial increase in short sea shipping.

However, the form of the action to be taken has to be left finally to the European Commission, after consultation with appropriate industry bodies, Member States, and the European Parliament. If the European Commission decides to follow the route of a legislative action then this route would necessarily be accompanied by an impact analysis.

1 Introduction and Background

The issues surrounding the use of gross tonnage in the maritime sector are numerous and complex. Notwithstanding the essential simplicity, reliability, and consistency of the gross (and net) tonnage there has been a growing concern about the problems that use of the measure has created for ship and port efficiencies. Consideration is currently being given to some of the issues at IMO, with a number of countries urging some amendment of the 1969 Tonnage Convention. Other concerns have been expressed, particularly by the Dutch, about the safety issues of ship designs biased in favour of low freeboard vessels.

The problems are not always related to the use of GT (NT) itself, but to the use of the various *thresholds* associated with other IMO conventions such as STCW, SOLAS, MARPOL, etc. However, it is also the case that the thresholds encourage ship design as well as operation to avoid crossing thresholds to minimize ship capital and operating costs. It should be said that ship-owners and operators are not acting either illegally or unreasonably in attempting to minimise ship costs and maximise revenue generation. Rather is the problem that, as with any set of rules and regulations governing economic activity, here are unintended consequences as operators seek imaginative and flexible interpretations within the rules to maximise economic potential. This implies that from time to time it will be essential to adjust the rules to provide an improved framework to ensure both fair competition and economic activity in line with societal needs. This is what is meant by 'intelligent regulation'.

In relation to issues surrounding port pricing strategies there are a set of arguments dealing with potentially optimal pricing strategies. There is a considerable academic literature on this issue and though the issues raised are relevant to port pricing, they are not considered as a mainstream part of this study which is principally concerned with the potential 'irrational' bias that may be introduced into port pricing – and its impact on short sea shipping operations – by the use of GT (NT) as the *basis* for port tariffs.

Moreover, even if it may be demonstrated – which seems likely from earlier studies and the work of this study – that GT is an unsuitable basis for port charging, particularly in relation to its impact on short sea shipping – then we will need to examine whether it is necessary to act at EU level or IMO level to persuade ports to abandon GT as the basis or whether the current 'adjustments', made to tariffs at a number of ports to cope with the 'anomalies' produced by GT-based pricing may be extended and developed to provide a solution.

Finally, it is worth setting the context of the examination of GT, port charges, and the impact on short sea shipping in a wider port and ship efficiency context. According to UNCTAD, the definition of a modern seaport is that of the seaport as an "interface between several modes of transport, and thus a centre for combined transport. *And* a multi-dimensional system which must be integrated within logistic chains to fulfil properly their functions". Clearly this multiple service role should be reflected in and influenced by the tariff structures operating within the port. The port price system is both an information system providing

signals to port users and part of a wider mechanism for overall transport efficiency in the context of goods movement.

This particular study – commissioned by DG TREN under the Maritime Transport Coordination Platform (MTCP) – is specifically targeted on an examination of the impact of GT as a basis for port charges on vessel selection, ship design, port revenue, and cargo revenue in relation to the development of short sea shipping. The outputs will provide an analysis of the situation in the context of these parameters and policy recommendations dependent on the qualitative and quantitative results of the analysis. The Terms of Reference for the study are set out in Annex 1 of the Report.

2 Structure of Report

The report is structured in the following manner. Following the brief introductory section above the report discusses in order:

- The 1969 London Tonnage Convention
- The Calculation and Use of GT by Ports
- The Impact on the Market from a Number of Aspects
- Alternatives to GT as the Basis for Port Charges
- The Impact of any Change in the GT basis of Port Charges
- Policy Issues
- A Cost-Benefit Analysis
- Recommendations

The annexes cover the T.O.R., an annex to the “London 1969 Convention”, figures on the relationship between GT and TEU, and annex 4 indicates the Consultations that took place with various industry players.

3. The London Tonnage Convention (1969)

3.1 Brief History

The "International Convention on Tonnage Measurement of Ships, 1969", in short "Tonnage 1969", was the first successful attempt to introduce a universal tonnage measurement system. Previously, various systems were used to calculate the tonnage of merchant ships. Although all went back to the method devised by George Moorsom of the British Board of Trade in 1854, there were considerable differences between them and it was recognized that there was a great need for one single international system.¹

¹ www.imo.org/Conventions/mainframe

² Thomas, Stephen: Tonnage measurement, in: Seatrade Review, April 1994, p. 35-37

³ Redding, Tony: Forty nine countries measure up to IMO tonnage system", in: Lloyd's Ship Manager, August 1982, p. 44

⁴ Tonnage regimes in shipping: a critical overview, in: The Scandinavian Shipping Gazette (SSG), September 2005, p. 36 ff

⁵ Lloyd's Shipping Law Library: The Ratification of Marine Conventions, Tonnage 1969, I.3.70, page I.3-63

⁶ www.pancanal.com: Tolls – PanCanal.com

⁷ www.imsalex.com: Suez Canal Information

⁸ "Report on analysis of costs, benefits and socio-economic impacts of selected port and vessel operations" = Deliverable D1.4 of SPIN-HSV, Project GRD2/2000/30303, "Competitive and Sustainable Growth"

⁹ BIMCO Manual: Port Costs, Bagsvaerd 1996

¹⁰ Analysis of the cost structures of the main TEN ports (ATENCO), Contract WA-98-RS.3011, Transport RTD Programme, 4th FP, 2001, p.25 ff

¹¹ Suykens, F.: Influence of Port Tariffs on Maritime Transport. Paper presented at the VI International Congress of Maritime Traffic and Port Handling, Vigo, Spain, 1966

¹² www.pancanal.com: Tolls – PanCanal.com

¹³ www.imsalex.com: Suez Canal Information

¹⁴ Containers lost overboard present a significant danger to shipping. In particular small craft and yachts are vulnerable to containers floating at, or near, the surface. There are also potential dangers in handling by stevedores and by ships' crews because of the height of containers, and a tendency to leave minimal space between tiers. Moreover, the costs of lost containers will obviously become incorporated in insurance costs via an added element of premium in the insurance premia paid by shipowners, charterers.

¹⁵ Translation of the original French documents by ISL

The original concept was designed to accommodate the fairly simplistic designs of ships then trading. Changes in the way ships were constructed soon meant that amendments had to be made and in addition, individual countries began applying their own interpretations to the idea. This resulted in 12 major methods worldwide of tonnage measurement. The application of two sets of tonnage to a vessel also became popular. This evolved from owners enclosing well decks with covers to provide protection for deck cargoes. In time a more permanent covering became the norm with openings incorporated to exclude spaces from tonnage measurement. This open/closed shelterdeck system was subsequently replaced by the tonnage mark in international conventions in the early to mid 1960s. For fees based on tonnage this perpetuated the nonsense that a ship could be charged one rate inbound and another outbound.²

The fact that different tonnage systems were in use led to problems, such as sister ships given different tonnages because they operated under different flags. Another peculiarity has been the Ro-Ro vessel. Under most national rules only space below the deck with Ro-Ro doors were counted while under others it might have been the weather deck. This is the reason why many Ro-Ro vessels more than doubled their GT under the new Convention. A general advantage of the Convention is that measurement needs less time and expense than before.

The Convention was adopted by IMO 23 June 1969 and entered into force 18 July 1982. The rules apply to all ships built (keel laying) on or after 18 July 1982 while ships built before that date were allowed to retain their existing tonnage for 12 years after entry into force, or until 18 July 1994. "When the 12 years is up, existing ships will retain their existing tonnages for the purposes of application of international conventions. This will ensure that they do not have to meet more onerous requirements as a result of increased tonnage."³

The Convention meant a transition from the traditionally used terms gross register tons (GRT) and net register tons (NRT) to gross tons (GT) and net tons (NT).

When the Convention entered into force in July 1982 it had been ratified by 49 countries with around 75 % of world gross tonnage; the requirements had been set to 25 states with at least 65 % of the fleet which was achieved by the early 1980s. In 2005 it was reported that 141 states have contracted in and 98.18 % of the world tonnage comply with the Convention.⁴

3.2 Purpose and Regulations of the Convention

N.B. The following subchapter is written in layman's words and cannot replace the original wording of the international convention.

The purpose of the Convention "Tonnage 1969" is to establish uniform principles and rules with respect to the determination of the gross tonnage (GT) and net tonnage (NT) of merchant ships of 24 m length and more engaged in international voyages.

These two figures are the main content of the "International Tonnage Certificate (1969)" which is issued to a ship by the government of the flag state or a person/organization recognized by it. The certificate is to be

renewed in case of the transfer of the ship to another flag or following alterations in the arrangement, construction, capacity, use of spaces, total number of passengers, assigned load line or permitted draught.

Annex I to the Convention is defining technical terms like upper deck, moulded depth, breadth, cargo spaces, enclosed and excluded spaces.

- Cargo spaces to be included in the computation of the net tonnage are enclosed spaces appropriated for the transport of cargo, provided that such spaces have been included in the computation of gross tonnage.
- Enclosed spaces can be closed by watertight hatch covers, doors etc. that in any sea conditions water will not penetrate into the ship.
- Excluded spaces often form part of erections and have wide openings (Regulation 2) like the upper cargo deck on Ro-Ro ships which often has a weather protection but cannot be closed.

The calculation of the GT is just $GT = K_1V$, whereby

V = Total volume of all enclosed spaces in cubic metres and

K_1 = a coefficient as tabulated in Appendix 2. This coefficient ranges from 0.22 to 0.32 for the smallest to the largest volumes and cares for results being similar to the former tonnage figures based on 100 cubic feet.

For the calculation of the NT the same coefficient is used together with the volume of cargo spaces, the depth and the draught. In case the ship is certificated to carry more than 12 passengers, the additional NT is calculated based on the number of cabin passengers, deck passengers and a further coefficient. NT shall not be taken as less than 0.30 GT.

Thus, GT and NT are calculated independently. The results are, because of the coefficient, non-dimensional figures.

The IMO Conference which has adopted the Convention recommends that GT and NT as determined by the Convention **“should be accepted as the parameters referred to where those terms are used in conventions, laws and regulations, and also as the basis for statistical data relating to the overall size or useful capacity of merchant ships. In addition, recognizing that the transition from existing tonnage measurement systems to the new system provided in the Convention should cause the least possible impact on the economics of merchant shipping and port operations, the Conference recommends that Contracting Governments, port authorities, and all other agencies which use the tonnage as a basis for charges should carefully consider which parameter is most appropriate for their use in the light of their present practice.”**

This recommendation is clearly useful regarding other conventions, laws and regulations as well as statistical purposes. However, the transition from existing tonnage measurement to the new convention has provided more impact than expected for a few ship types like Ro-Ro ships and double-hull tankers. In such cases where the economics of merchant

shipping and port operations are affected **the application of the Convention is not required in any case** but Governments, authorities and agents should carefully consider which parameter is most appropriate. Via conventions, laws and regulations the Convention has an impact on manning regulations, safety rules and registration fees.

The instrument of acceptance can be accompanied by declarations, reservations and statements. Most interesting is the instrument of the USA containing the following understanding: "That in the assessment of tolls for transit of the Panama Canal, the United States will continue to have the right to apply the present Panama Canal tonnage system or to adopt any other basis, in computing tonnages derived from volumes or other measures developed in connection with the said Convention."⁵

3.3 Definitions

Before entering into more detail it seems useful to present some definitions, especially for the different tonnages used in ship building and sea transport.

GT	Gross tonnage	Tonnage determined under the 1969 Tonnage Convention by a formula using the total volume of enclosed spaces; non-dimensional
NT	Net tonnage	Tonnage determined under the 1969 Tonnage Convention by a formula using the volume of cargo spaces; non-dimensional
cGT	Compensated GT	Measure for the output of shipyards, "c" depends on ship type and size
(GRT)	Gross register tonnage	Former definition of enclosed spaces (with some exceptions) in 100 cubic feet
(NRT)	Net register tonnage	Former definition of earning capacity (cargo holds and cabins) in 100 cubic feet
ldt	Light weight	Weight of empty ship in t (used for calculation of scrap value)
t, ton	Displacement, loaded	Weight of loaded ship in t. Displacement is also the unit used for naval vessels.
dwt	Dead weight t	Difference between lwt and displacement loaded, resp. weight of cargo, fuel, fresh water, ballast, stores, crew, passengers, luggage etc.
m ³	Cubic metres	Capacity of tankers, gas tankers for liquid cargo
TEU	Container capacity	Loading capacity in twenty-foot equivalent units

3.4 Operational Experience

Panama Canal and Suez Canal

Before the 1969 Convention the canal authorities of Panama and Suez established their own measurement systems.

The Panama Canal Authority used its own system until 1994. The Panama Canal Universal Measurement System (PC/UMS) uses the same basis of the Convention. In 2002, the Panama Canal changed its flat rate for all ships to flexible rates depending on ship size and type. Container vessels are now excluded from the calculation of tolls based on the NT. They currently pay toll of US \$ 49.00 applicable the total TEU allowance. This method avoids the issue of cargo below and/or above deck. Instead the maximum total cargo space is considered in accordance to the NT of other ship types and independent of the actual cargo volume.⁶

In Suez the unique system has been used until today. In the "Suez Canal Information" effective as of 1st January 1999 the Suez Canal Authority still asks the arriving ship to provide the "Inter. GRT/NRT S.C.N.R.T.

S.D.W.T. max. arr. draft L.O.A./breadth" figures. Tolls are calculated on the basis of the Suez Canal net tonnage and in the case of container and Ro-Ro ships special attention is paid to deck cargo.⁷

3.5 Conclusions

The 1969 Tonnage Convention has not been changed since it entered into force in 1982. It is a convention which – compared to others – is easy to understand and to apply and has been accepted by most countries of the world. Some institutions like the Suez Canal Authority never accepted it to the full extent, but many others make use of it, even if they are not compelled to do so.

Since the entering into force some ship types have experienced technical developments which could not be foreseen in the 1960s. The issues are whether or not the accepted discrimination against some ship types built into GT-based port charges and the unintended 'skewing' of the design of vessels, leading to safety and operational efficiency concerns are sufficient to lead to a reconsideration of the widespread use of GT as the basis for port charges. This question is dealt principally in Section 5 of this report. However, even if it is decided that such reconsideration is justified then what are the quantitative implications of any change (considered in Sections 7 and 9 of this report) and how might any potential change be best effected. This last point is discussed in Section 8 of this report. The short study "Consequences of the Gross Tonnage Measurement", presented by Policy Research Corporation in September 2005 has provided a useful input to this current study.

4. Calculation and Use of GT by Ports

4.1 General Remarks on Port Tariffs

There is no common regulation for the compilation and publication of tariffs for port users in the EU. Some nations have common rules for their ports but in most cases ports are free to decide about the nature and absolute level of charges. It depends on the organisation of the port who is responsible for the publication of tariffs and which tariffs are included in such a publication. Purely private ports such as tanker jetties far away from another public port are not compelled to make their tariffs public. These are even not compelled to charge any tariffs as long as ships and ports belong to the same group of companies. Others will show the tariff on request only.

Often only the charging for the use of the port infrastructure is in the responsibility of the port authority. A charge is levied for each entering and leaving of a ship including some time required for unloading and loading. Names for this type of charge are "port dues", "harbour dues", "tonnage dues", "conservancy" etc.

An additional "berth due" can be levied in case the ship stays for an unusual long time. The berth due replaces the charge for the normal port call if there is no cargo or passenger movement or for ships laying permanently. Quay fees that are based on GT can be found in Turkish ports like Gemlik and Izmir. This study focuses on the normal port/tonnage dues.

Before entering the port ships use natural waterways or dredged entrance channels. For save navigation in these entrance channels a lot of aids to navigation are provided like buoys, light houses, radar assistance, AIS stations etc. It is often a national task to install, maintain or operate these "navaids". Therefore, on behalf of the state, the ports levy dues called "lighthouse dues", "fairway dues" or similar. In Germany these "Pilot dues" are charged by the pilots together with their payment called "Pilot fees". GT based light fees are mainly found in Spanish and Swedish ports within Europe (e.g. Barcelona, Valencia, Bilbao, Pasajes, Santander Vigo, Wallhamn, Grimsby, Malmö, Halmstad, Södertälje and Trelleborg) (Summary of European Port Tariff Structures 2003)

There are many other charges for which in most ports private enterprises are responsible. These are towage, mooring and waste disposal. Towage means tug assistance to larger ships during entering and leaving the port. The number of tugs used depends on the size of ships and the existence of bow or stern thrusters. Mooring and unmooring is the assistance in handling the ropes of the ships which is offered in nearly every port. Sometimes the berth dues are called "Mooring". Ports also offer waste disposal for solid waste and different types of liquid waste typical for the operation of ships.

The cargo terminals may be operated by the port authority, but in major ports it is quite normal that single private enterprises invest in the supra-structure of more or less specialised terminals and operate these. The pay back of investments and the operation has to be paid for by the berthed ships and the cargo turnover operations. In former times a berth fee

according to the ship's size in GRT was more common than today. Private terminal operators often negotiate a lump sum with their clients which is to be paid per container or other load unit and can include berth charges, crane fees, stowage and other activities linked to cargo turnover and storage. Since GT is seldom used these terminal fees are not scrutinised further-on.

The share of port costs in total transport cost should be kept in mind during the discussion of effects. Calculation by ISL⁸ have shown that in short sea Ro-Ro shipping port costs range from less than 10 % to more than 20 % of total sea transport, depending on ship size, route length, ship age, bunker costs etc.. In deep-sea shipping the share is lower because of the lower number of port calls.

The total of these tariffs may be found altogether in an official publication called "Port Tariffs" or similar. If not, a publishing house may be interested to collect all the information. For other ports shipping agents offer such information. In many cases it is difficult to get a fast overview and the different tariffs have to be asked from the service providers.

4.2 Use of GT as a basis for Port Charges

In a first step the tariffs of 35 ports in 20 European countries have been analysed (see annex 2). Following charges have been looked for:

- Fairway dues
- Pilot fees
- Tonnage dues
- Towage
- Mooring/unmooring
- Waste disposal
- Agency fees

The "Standard Disbursement Account" form recommended by the BIMCO lists more charges:⁹ The corresponding charges are printed in bold. It is quite self-evident that other charges listed in the BIMCO form should not be linked to the GT measurement. "Shifting" is understood as moving the ship from a berth to another which may require pilotage, towage and mooring/unmooring.

Tab. 1: BIMCO Standard Disbursement Account

Port Charges	Harbour Dues Light Dues Pilotage Towage Mooring/Unmooring Shifting Customs Charges Launch/Car hire Agency Remuneration Telex, Postage, Telegrams
Cargo Charges	Stevedoring expenses Winchmen/cranage Tally Overtime
Ship Charges	Cash to Master Water Stores/Provisions Crew Expenses Repairs

Not all charges were found for every port but a first overview shows the dominance of GT for the calculation of dues. The results of this analysis are presented charge by charge. For detailed data see Tab. 2.

Fairway dues/lighthouse dues:

GT is in most cases the basis for the calculation of these dues. It is charged twice for incoming and outgoing ships according to the tonnage in GT. Normally the tariff shows size classes of ships and, in case the ship uses only a section of the respective fairway, the sum may be reduced by a certain percentage. A minority of ports or states use the NT instead of the GT, i.e. they use also the Tonnage 1969 Convention but not the more controversial GT figure.

Sweden has introduced environmental differentiated fairway dues to foster the reduction of air emissions. Ships not surpassing certain limits in sulphur content of fuels and the NOx content in air emissions enjoy reductions in fairway dues. However, the basic amount of fairway dues is calculated on GT. Thus, GT or NT are used in most analysed countries to calculate the fairway dues.

Pilot fees:

Pilot fees are the salary of the pilots. These may be employees of the state, of the harbour authority or of private companies. In Germany they are organised in regional brotherhoods. The salary is often calculated in a similar way as fairway dues, i.e. based on GT and length of the fairway.

While GT is the base in most cases several other options are applied. The ports of Aarhus and London use GT in combination with the draught of the vessel. A little more complicated is the approach of Lisbon. There, different services are offered by the pilots and the unit tax for the specific service is multiplied by the square root of the GT figure.

Gdansk is one of a few ports doing without the GT figure. Gdansk

calculates the Volume which is the product of length over all by breadth extreme by summer draught ($V = L_oa \times b \times dr$).

Tonnage/Harbour Dues:

Harbour dues are like a flagship amongst port charges. If harbour dues are based on GT other dues and fees are often too. But there is no stringent dependency. GT is the most common base for the harbour dues; in Finland it is the NT.

Tonnage dues are easy to calculate unless the many exceptions and differentiations are applied. Most tariffs have different levels for ship sizes, for ship types and for the number of calls per year. Regarding types the charge per GT or per 100 GT is different. Regarding the size there are steps like 0 to 500, 500 to 1000, 1000 to 2000 etc. If ships call regularly, reductions are granted for the 11th to 20th call, further reductions for the 21st to 50th call or similar. If Ro-Ro ships do not enjoy an advantage by a lower tariff for the ship type, they will often profit on reductions for higher numbers off calls and/or for short sea tonnage. Such exceptions and differentiations are not in the focus of this study.

If the basic figure is derived from another value than the GT this does not lead to any problems. Since neither the Tonnage 1969 Convention nor other conventions require the GT to be used for port dues, a few countries have introduced other methods of calculating. Most famous for the exceptions is France where several autonomous ports use the $L \times b \times dr$ formula giving the volume of the ship by multiplication of length by breadth by draught. In the case of a 7,981 GT feeder ship the volume is 25,062 m³.

Taking the volume instead of GT is not familiar but the method is similar to the use of GT. The method used in former Yugoslavian states of Slovenia and Croatia is really different. The ports of Luka-Koper and Dubrovnik prefer the amount of cargo discharged or loaded and calculate the harbour dues by cargo tonnes (see chapter 6).

Towage:

If tugs are called they could just be charged by number and size of tugs. This becomes difficult if the choice of tugs is too small and the ship operator has to accept whatever is available. This may be one reason that in the major part of ports tug fees are also based on GT.

Exceptions to the GT calculation are Aarhus and Constantza. The Danish port assesses the size of the job to do by length and breadth of the ship ($L \times b$) while in the Romanian port the length alone is sufficient.

Mooring/Unmooring:

Mooring becomes more difficult with the increasing size of the ships. Large ships need more hawsers and these are heavier to handle. This may be the reason for taking the GT as base for mooring fees in most ports. Finnish ports which rely on NT for several charges do it also in the case of mooring fees. Constantza uses the method already applied to tug fees, i.e. just the length of the ship determines the fees.

Tab.2: Calculation Basis for Port Charges

GT used for:								
Country	Port	Tariff published	Fairway dues	Pilot fees	Tonnage dues	Tugs	Mooring	waste disposal
DK	Aarhus	06		GT+d	GT	LxB	GT	
	Esbjerg	06			GT			
S	Gothenburg	06	a		GT			GT
SF	Helsinki	06			NT		NT	NT
	Hanko	05			NT		NT	NT
RU	Kaliningrad c	99	GT	GT	GT	GT	GT	GT
ES	Tallinn		GT		GT		GT	GT
LA	Ventspils	05		GT	GT	GT	GT	m3
LT	Klaipeda	02	GT	GT	b			GT
PL	Gdansk	05		V g	GT		V	e
	Gdynia	06		V	GT		V	
D	Hamburg	06			GT			
	Emden	05			GT			GT
NL	Amsterdam	06			GT			
	Rotterdam	06	L	draft	GT (+t)	L	L	m3/kW
UK	London	06	NT	GT+d	GT			
	Liverpool	06					GT	
F	Rouen	06			Lxbxdr			
	Le Havre	04		Lxbxdr	Lxbxdr	L	L	
	Saint-Malo	06			Lxbxdr			
	Bordeaux				Lxbxdr			
	Sete	06	Lxbxdr	Lxbxdr	Lxbxdr	Lxbxdr	Lxbxdr	
	Marseille	06			Lxbxdr			m3
PT	Lisbon	06		GT h	GT			GT
E	Bilbao	06		GT	GT	GT	GT	m3
	Sevilla			GT	GT	GT	GT	
IT	Genoa	05		tdw+Lxb				
SLO	Luka-Koper	04	NT	GT i	cargo t	GT	GT	m3
CRO	Dubrovnik	06	GT	GT	cargo t		GT	GT
	Rijeka	06	GT	GT	cargo t	GT	GT	GT
	Vukovar	04	GT	GT	cargo t			
GR	Piraeus		NRT	NRT	GRT	GRT		
BUL	Varna		GT		GT			
	Bourgas		GT		GT			
RUM	Constantza			GT	GT	L	L	

- a) GT: costs depend on sulphur content in fuel and NOx in exhaust gases
b) Klaipeda charges berth dues and vessel dues, both based on GT, as well as tonnage dues based on vehicles and container units in case of ro-ro cargo vessels and container vessels
c) the "Table of Rates of Harbour Dues" says GRT but means probably GT
d) Ships below 10,000 GT are exempted from paying tonnage dues.
e) included in tonnage dues, otherwise based on m3
f) includes wharfage
g) Gdansk: V = Volume = LxBxT (LOA /breadth extreme /summer draught)
h) Square root of GT multiplied by unit tax according to service
i) for ships not holding a Tonnage Certificate: Lxbxh

Waste disposal:

Under waste disposal a variety of issues is summed up. The methods for charging are similarly variable and the GT is not the generally accepted one. Here cubic metres are clearly an alternative. For several reasons many ports don't charge according to the volume of solid or liquid waste but to the size of the ship. Another method is to include the waste disposal charge into other charges as done in Gdansk where the harbour dues include waste disposal.

Some information on the port pricing structure is also found in the ATENCO¹⁰ study. While the study focuses on port financing and pricing principles as there are,

- cost recovery,
- charging what the traffic can bear,
- promotion of specific objectives and
- strategic pricing

there is also a summary of charging bases:

Tab. 3: Port pricing structure and charging base

Tariff	Charging base	Tariff (cont.)	Charging base
Port dues	GT, NT, tons of cargo	Pilotage	NT, GT
Berth occupancy	GT, NT, ship length	Towage	GT / tug time
Navigation aid	NT	Storage	Days
mooring	service	Cargo handling	Weight/volume of cargo

Source: UNCTAD (1975, p. 19-21) (Original references to GRT and NRT replaced by GT,NT)

Subsequently, the authors of the ATENCO Study state that: "It seems straightforward to charge ship specific services (such as berthing) on the basis of some measurable aspect of the ship, *such as GT*, and cargo specific services, such as cargo handling, on some measurable aspect of cargo, such as weight". They appear not to have considered the possibility of other metrics that might be (and indeed are) used. The ATENCO Study also presents the overview compiled by Suykens of the relative importance of the different charges in the total payment by ships in a port. Summarising several studies, he finds that the following shares apply:

Charge	Share (%)
Port dues	5-15
Pilotage, Towage, Berthing	2-5
Cargo handling	70-90
Agent fees	3-6

Source: Suykens (1966)¹¹

This qualifies the importance of the method of calculation of port dues. For the ship operator it is of minor importance, for ports as a whole too, but for the port authority depending on the dues it is of utmost importance.

4.3 Use of GT as a basis for Other Charges

Light and quay fees

Apart from towage, pilotage, mooring and port dues where GT is frequently used as a basis for the cost calculations, it is also used for e.g. light and quay fees. Whilst not directly belonging to port charges chapter 4.2 has already dealt with it.

Environmentally differentiated fairway dues

Due to historical reasons the calculation of the Environmental Differentiated Fairway Dues is based on the GT of the individual ship. However, in this case, the GT gives with a few exceptions, a fair reflection of the amount of installed engine power, a key variable. The incentive scheme was introduced in January 1998. It is a voluntary system that gives reduced fairway dues for ships that apply and qualify to the rules that are set up by the Swedish Maritime Administration (SMA). The aim of the incentive scheme is to reduce emission from nitrogen oxides (NO_x) and Sulphur oxides (SO_x) emitted by ships calling on Swedish ports. 50 % of the 50 major Swedish port apply a differentiation scheme for NO_x and SO_x. The basis is the SMA-certification process which is taking the emissions from ships at berth and emissions from other machinery into account.

For SO_x the fee deduction is pending on the sulphur content of the fuel for normal operation of the ship. For NO_x deduction the fee level depends on the measured NO_x emission at 75% of engine output on all engines weights and calculated as NO₂ in grams/kWh.

Since January 2005 a restructured incentive system with tighter emission values has been put into operation to reflect the technical development regarding the NO_x abatement technology and to avoid interference with the mandatory MARPOL Annex VI, which will soon enter into force. Deductions from fairway dues are differentiated according to the amount of emissions, starting for NO_x at < 10 grams NO_x/kWh and for SO_x with < 1 (sulphur content in fuel, % by mass).

(Issue Group for Sustainable Shipping: Information concerning the applied incentives to curb ship emissions from vessels calling upon Swedish ports, March 2005, p. 1-5) One example for the pricing structure of a Swedish harbour can be found under http://www.soeport.se/eng_documents/prislista_eng_2004.doc

Panama Canal and Suez Canal

Before the 1969 Convention the canal authorities of Panama and Suez established their own measurement systems.

The Panama Canal Authority used its own system until 1994. The Panama Canal Universal Measurement System (PC/UMS) uses the same basis of the Convention. In 2002, the Panama Canal changed its flat rate for all ships to flexible rates depending on ship size and type. Container vessels are now excluded from the calculation of tolls based on the NT. They currently pay toll of US \$ 49.00 applicable the total TEU allowance. This method avoids the issue of cargo below and/or above deck. Instead the maximum total cargo space is considered in accordance to the NT of other

ship types and independent of the actual cargo volume.¹²

In Suez the unique system has been used until today. In the "Suez Canal Information" effective as of 1st January 1999 the Suez canal Authority still asks the arriving ship to provide the "Inter. GRT/NRT S.C.N.R.T. S.D.W.T. max. arr. draft L.O.A./breadth" figures. Tolls are calculated on the basis of the Suez Canal net tonnage and in the case of container and Ro-Ro ships special attention is paid to deck cargo.¹³

5. Impact on the Market

5.1 Impact on Vessel Selection

One key question to be answered is whether the methods of port charging (including specifically the use of Gross Tonnage (GT) as the basis for port charges) have a structural impact on the sea transport market, i.e. in terms of ship operators' choices of vessel types?

It is obvious that, *ceteris paribus*, faced with charges based on gross tonnage – essentially the interior/enclosed volume of the vessel – ship operators will seek to minimize the port charges levied on their vessels. While it is true that, in the short term, operators will be able only to vary the sailings of vessels according to the vessel types held in their fleets; in the medium to long-run the structure of port charges will determine the preferences expressed by shipowners for vessel types. This will mean – and has meant – selection of vessels with smaller interior volumes for a given size of a ship's carrying capacity, as measured by gross tonnage.

It is not surprising, therefore, that faced with pressure from operators, particularly in the Ro-Ro sector, ports have sought to introduce variations in tariffs to reduce the distortion created by basing port dues on GT/NT measurements alone. This type of market adjustment has, however, not allowed any substantial development of open-hatch container vessels – except recent short sea ships which may balance higher charges by savings in port time – and, according to Ro-Ro operators maintains discrimination against Ro-Ro operations. In both cases there has been a negative impact on short sea shipping.

Some evidence of the quantification of the impact may be deduced from the reduction in the ratio of Gross Tonnes per TEU carried. This reduced from 18.2:1 in 1969 to 12.1 in 1998. This statistic implies a reduction in the burden of charges for ship operators of around one-third over that 30 year period.

It is now the case, after some years, that the skewing of vessel selection because of the use of GT as the main basis for port charges at most EU ports has distorted the design of vessels in operation to enable the fleets of shipowners to be structured so as to minimize port charges. In so doing the market is now structured in a manner that distorts the choice of vessel to the detriment of short sea shipping and associated intermodal transport. Vessels types that are likely to enhance the use of short sea shipping and provide an incentive to increase multi-modal/inter-modal transport face higher port charges. The vessel 'beneficiaries' have been Lo-Lo container vessels with containers stacked on deck up to seven tiers with consequential crantage requirements.

Notwithstanding this 'distortion' affecting the choice of vessels, it is true that under pressure from shipowners and from other market factors (including the desire of ports not to lose revenue by losing trade from vessels that are unable to reduce their interior volume, e.g. Ro-Ro vessels and Car Carriers), a number of adjustment factors/discounts have been introduced by ports to counteract the distorting effect of GT as a basis for port charging.

The adjustments in port charges that have taken place at the level of the ports may also be in response to the increasing perceived unreliability of *container short sea shipping*, despite its other obvious advantages. The adjustments may have been partly responsible, for instance, for the movement in the Mediterranean towards the increased use of Ro-Ro vessels and particularly RoPax vessels.

Having established that distortion of short sea vessel selection – in the sense of being less than optimum were the basis of the charging to be neutral as between vessel types – has been occurring (with a preference for container vessels with minimised interior volumes and against vessels, e.g. Ro-Ro with high sides and Open Hatch Container vessels with high freeboards and a higher steel content) then what other vessels selection impacts might there be?

Though the above comments relate to vessels carrying unitised cargo the impact of GT-based port charges (and the impact on other Conventions) has also influenced the selection of other vessels types. Bulk carriers, for instance, have been designed with reduced freeboards; non-reinforced hatch covers on forward holds, and until the introduction of Regulation 39 of the IMO Load Lines Convention (ICLL), with no forecastle. Many in the maritime industry attribute the poor loss record of bulk carriers to this 'distortion' in design encouraged by the GT tonnage Convention and the application of the thresholds governing the application of other Conventions.

5.2 Impact on Vessel Design

The introduction of the Tonnage Convention in 1969 (it was not fully ratified until 1982) coincided a few years later with the development of container vessels. Hence, the design and use of these vessels has been concurrently influenced by the use of GT by most European ports as the basis of their vessel charging systems. The unintended result has been to skew the use of vessels that have minimal GT. The thresholds involved have led to further distortions in terms of crew space and safety features as these enclosed spaces count against the GT calculation. This is despite the fact that GT was meant to reflect better the earning capacity of the vessel than the earlier applied DWT measures.

There appears to have been a significant impact on the type of ships being built since the 1969 IMO Convention, related to the desire of the shipowners ordering vessels to minimize the interior volume of container vessels, and particularly smaller feeder container vessels. As has been stated in the *Policy Research Corporation Discussion Document produced for the Dutch Government (September 2005)*: "The application of the GT measurement induces naval architects and shipbuilders to build ships with 'odd' shapes (relatively short and narrow ships with no forecastle, but with cut-off stern, small engine room and tight crew accommodation spaces)."

Ironically, as observed earlier in this report, one of the reasons for introducing GT and NT was to have a measure, other than DWT, that better reflected the *earning capacity* of vessels.

It should be clear that when introduced the intention of the move from DWT to GT was not *intended* to introduce any distortion into vessel design. The impact of container vessel design has probably occurred because of the concurrent introduction of the London Tonnage Convention and the development and widespread use of container vessels for both deep sea and short sea trades.

It is worth pointing out some of these unintended, and potentially dangerous, ship design parameter consequences. What is now apparent is a long-established trend of building container vessels that will have considerable numbers of containers stacked on deck, to minimise the GT of the vessels. These container vessels will be unsheltered by the protection afforded by a traditional cargo hold.

These include:

- Problems in container securing - the weight of containers plus the lashing forces (and in the case of post-Panamax vessel parametric roll), the relative movement between containers - hatch-covers - and coamings, non-standard lashing bars and twist locks, and there being no ties between tiers, all contribute to the failure of securing arrangements and the loss of containers overboard¹⁴.
- The limitation on depth produces vessels with low freeboard and reduced stability, unnecessarily compromising the inherent safety of the vessel. Further, if many containers are lost overboard the loading distribution is changed, which will effect the stress distribution and stability of the vessel.
- Difficulty in fighting cargo fires when access to the fire is virtually impossible due to the sheer number of containers on deck
- The problems outlined herein are exacerbated by container weights not being known accurately. Hence the loading distribution is difficult to determine, leading to potential problems with stress distribution and stability.

In addition to the above dangers there are ship operational cost implications. The numbers of containers lost overboard has been reported to be somewhere between 2,000 to 10,000 each year. The UK P&I Club announced in 2000 that 11% of its container claims were due to boxes lost overboard. They also reported that the average value of each claim in that year was around \$400,000 for loss overboard.

One solution for the above safety and lashing problems (with consequential losses of lives, vessels, and containers) would be the deployment of open-hatch container vessels. However, as indicated earlier it is precisely these vessels that are discriminated against by the GT measurement and the GT-based port charges. There is a further general problem for such vessels as the Tonnage Convention does not envisage these vessels being larger than 30,000 GT. With the size of deep sea container vessels exceeding 10,000 TEUs the design limits of conventional container vessels may have been reached. This is a further inducement to modify the Convention rules to allow the construction of open-hatch vessels to enable safe designs of these very large container vessels to be realised.

For the smaller feeder container market, if the current situation persists – and is not ameliorated by the port charge adjustment factors increasingly being used (to get round the GT problem) – then there is likely to be a major reinforcement of the distortive design trend as larger feeder container vessels are ordered, moving from the current average size of 500 TEU to the envisaged 2000 TEU being considered by Maersk and other shipowners, to cope with the anticipated substantial increase in container feeding.

Considering for the moment this increasing utilisation of feeder container vessels – though, of course, we are talking about the combined use of large deep sea container vessels together with the smaller feeder vessels – the research (e.g. the EU FP4 *Trapist* project) that has been done in comparing conventional container vessels design (and Ro-Ro) and usage with open-hatch vessels suggests that the role of GT-based port charges has had a significant constraining impact on vessel selection, and hence on vessel design. Unless rectified this tendency seems destined to hamper attempts to increase the efficiency of cargo transfer at ports, and the pursuance of increased short sea shipping and intermodal transport.

It is obvious that any re-adjustment of ship design would take some time to filter through to substantial fleet modifications. It may be that the adjustments to port charges that have emerged at ports in response to the otherwise distorted choice of vessel types will themselves have an impact. However, it may be important to send a signal that all EU ports are willing (as have French and Polish ports) to abandon GT-based port charges in favour of charges based on length, breadth, and draught) to reinforce the other growing pressures to modify GT measurement and its thresholds in connection with other IMO Conventions.

5.3 Impact on Port Income

At first sight it might be thought that the basis on which port charges are levied will have a significant impact on port income. However, it is important to be clear about the exact nature of the impact, and the implications for any alteration of the basis of port charging that might be suggested later in this report. It is the basic contention of the authors of the report that analysis of the basis of port charges is not an analysis of the overall levels of port income. Hence, any alteration in the basis of port charges need not, of itself, alter overall port income levels. Any such change will, however, have an impact on the proportions of total port revenue obtained from different classes of vessel.

It would be possible, for instance, to alter the basis of port charges and still maintain the overall level of port income, and even, by a process of specific charge adjustments to maintain (assuming it was desirable or appropriate to do so) the income streams from the differing vessel categories. Indeed, as we have seen current adjustments (via discounts and the application of various coefficients) do affect individual vessel type income streams and, hence, overall income.

However, it should be noted that the observed tendency in relation to the selection and design of container vessels has been for ship operators to

seek *lower* port charges levied on their vessels at ports. Moreover, discounts for Ro-Ro and other vessels are discounts set against conventional container vessel tariffs. Hence, ceteris paribus, port income would appear, on a prima facie reckoning, to be lower – on the basis of GT – than it would otherwise be. Indeed, there is some suggestion (*Policy Research Corporation Discussion Document*) that “port dues in French ports”, set on volume (*calculated as the product of length, breadth, and draught*) rather than GT, are generating “much higher revenues” than other competing European ports). No evidence is adduced to support the contention, but it seems inherently plausible.

Some quantification might be possible by comparing the vessel revenues of those ports that do not use GT as the basis of port charges with those that do. However, any comparison would be distorted by market factors which mean that actual contract revenues will not reflect in a monotonic manner the comparisons of GT as the basis and, say, the French ports system.

Another possible comparison route as to income differentials might be to compare the port income that is currently being foregone by GT pricing ports were the adjustments/discounts to charges currently provided to Ro-Ro vessels to be removed and the charges applicable to container vessels to be hypothetically increased accordingly. A range of ports will need to be selected, sorted by geographical region and size. As the distorting effect is appears most pronounced in relation to (and possibly restricted to) unitised cargo then the comparison would avoid bulk ports or at least bulk handling at mixed ports. It would also exclude small ports as these ports are principally bulk ports. This comparative static approach might provide an estimate of *potential* income forgone, though this would not necessarily be the same as the actual income difference. Moreover, this procedure will not estimate the effects of *a change* in the port charging regime.

The suggestion that port revenues may be higher as a result of using a different basis for port charges than GT does not necessarily imply, therefore, that *a change* in the basis of port charges will raise GT-based EU ports’ revenues. This point may be challenged by shipowners and though theoretically sound the proposition requires quantification. Unfortunately, practical proof may be difficult as it is likely to ignore the competitive pressures that will to produce a gradual convergence of port charges and hence port revenues as between the changed charging regimes at the ports involved.

It is important to note that selection of a non-GT basis for port charging is likely to have a more significant longer-run impact on the types of vessels used for short sea container trades and, to a lesser extent on deep sea container trades, than on total revenues. In the longer-run overall port income is likely to be determined by competitive pressures between ports than by the basis of the port tariffs apparently used at the majority of EU ports (see Annex 2 for information on GT usage by EU ports).

5.4 Impact on Cargo Revenue

Port transshipment costs are a relatively high proportion of total cargo costs, up to 20% at some ports. Moreover, port charges as a proportion of overall transit costs for short sea container shipping may be between 40-60% dependent on the number of calls per annum (compared to 5-10% for deep sea transport (*European Commission, 1997*)). Any suggestion that port incomes and hence charges are too low, because of the use of GT as a basis for port charges may not be welcome news to shipowners!

Nonetheless, it is clear that in so far as the basis of port charges has a significant impact on cargo revenue, and that these charges and port income appear, on prima facie grounds, to be *lower* than would otherwise be the case *then* the cargo revenues derived by shipowners will be *higher* than otherwise.

Both sets of market players will be concerned as to what effect any change in the basis of port charging would have on their relative incomes. This issue, as to what alternative bases might be introduced (or are already being used at some ports) is considered later in this report (Section 6). Suffice to state at this point that there is no *logical* necessity for an alteration of the basis of port charging to have any impact on the *general level* of charges and hence on the incomes of either ports/terminals or ship operators. Inevitable, however, there will be an impact on the charges for vessel types.

It is worth remembering that – as indicated in Section 3 above – one original reason for introducing GT/NT as a measure was better to reflect the earning capacity of vessels than the measure of GRT and DWT. Though, as observed in Section 5 above, there was no intention to introduce any distortion into vessels design, the use of GT by ports as the basis of their vessels charging systems has had precisely that effect.

It is worth observing that the distorting impact of GT-based charging regimes may be wider than those indicated in the above sub-sections.

A vessel operator will calculate the prospects for an existing route when renewable or a new route to be opened on the basis of whether or not the total transit costs enable a satisfactory profit to be made. Assume that a new Ro-Ro feeder route is being considered. Into the calculation will be taken the port costs incurred on the voyage considered. This may result in the selection of a different set of ports than would otherwise be the case, based on the relative port costs, comparing say a GT port and a non-GT port. However, it may also result in *no voyage* being undertaken on the route in question. Instead the shipper or freight forwarder may have to use the option to *ship by road instead*. Such an outcome obviously has implications for short sea shipping.

Leaving aside the various other reasons for modifying the terms of the Tonnage Convention and the use of GT and its thresholds as a criterion for the various maritime purposes, it is clear that whatever, port charging regime is adopted, ship-operators will attempt to minimise their voyage and port operational costs. Similarly, port and terminal operators will seek to maximise their revenues. Providing there is fair competition in the market then this aspect of port charges and the basis used for them need

not concern us. This study is principally concerned with the issue of the impact of GT-based port charges on the development of short sea shipping and more widely with the expansion of the intermodal transport market, including short sea shipping.

The concern about the use of GT as the basis for port charges is precisely because, combined with the other uses of GT, it has produced a vessel fleet profile and usage that appears inimical to developing short sea shipping. Given that there is no compulsion on ports to use GT as the basis, and given the current introduction of adjustments/discounts to charges for 'unattractive' vessels types, it seems unlikely that any new port charging regime for EU ports, based on the French and Polish ports' systems, would *in the long run* have any significant impacts on ship operators' revenues, providing there is a competitive market in operation. There appears to be no evidence that any substantive market distortions exist. (This is not to say that there will not always be complaints voiced by one shipowner/operator or port/terminal operator!). However, this tentative conclusion is based on qualitative, a priori reasoning and there is a need – to be met later in this report – to attempt to supplement these arguments by an attempted quantification on the effects of a possible change in the basis of port charges for the majority of EU ports.

6. Alternatives to the Use of GT as basis for Port Charging

6.1 French and Polish Systems

The analysis of European port charges has only shown two exceptions from the GT resp. NT based harbour dues. These are French ports where national legislation prescribes the volume of vessels to be the base for calculations. Individual port tariffs are very similar because they follow that system described below. Polish ports had used the French System for some time.

France

In France the port tariffs are based on the "Code des Ports Maritimes". Volume I of the Code describes the organisation of ports and Volume II the port and navigation charges, amended by the edict of 29 June 2001.

Article R.*211-1 requires charging commercial operations and a stay in a harbour. The elements of the tariff in case of commercial vessels are¹⁵:

- a) a charge on the vessel
- b) a charge on lay time
- c) a charge on the commodities
- d) a charge on passengers

Article R.*212-1 says that the charges are applicable to commercial ships for every arrival and every sailing from the port of ships of any nationality. Hydrofoils and hovercraft in commercial sea transport operation are treated like commercial ships in this volume.

The calculation of port charges is regulated by articles 221-2 ff in Section I:

Article R.*212-2:

The charge on the vessel and, if applicable, the charge on lay time are to be paid by the ship owner/operator.

Article R.* 212-3:

The base for calculation of the charge on the vessel is the volume given by its physical characteristics by the formula:

$$\mathbf{V = L \times b \times dr}$$

where V is expressed in cubic metres, L, b, dr represent respectively the length over all, the extreme breadth and maximal summer draught and are expressed in metres and decimetres.

The value of the draught of the ship in the formula mentioned before should in any case not be less than the value of $0.14 \times \sqrt{(L \times b)}$.

For hovercraft the base of calculation of the charge is the volume V given by the dimensions of its platform structure and an assumed draught of one metre.

The level of charge on the vessel is fixed in every port in cubic metres or multiples. It may vary according to ship types determined by article R.212-9.

A particular level is foreseen for ships either effecting repairs, supplying or disposing of waste and residual cargoes. The levels may also vary according to different sections of the port.

Article R.*212-4:

A ship is classified by its dominant purpose of utilisation if it carries different cargo at the same time; the units for that calculation are the passenger and the cargo tonne. However, the tariffs for every port may earmark the possibility to class certain ships by the function of the operation independent of the cargo carried.

Article R.*212-7:

The charge on the vessel decided in every port may be modulated under following conditions:

- I. Modulations applicable to vessels carrying passengers are determined by the ratio between the number of passengers debarked, embarked or in transit and the capacity of the vessel.
- II. Modulations applicable to vessels carrying cargo are determined by the ratio between the amount of cargo discharged, loaded or transhipped and the volume V of the ship calculated according to article R 212-3.
- III. However, if the ship is used for several purposes the modulation for the dominant purpose is applied.
- IV. Ships either effecting repairs, supplying or disposing of waste and residual cargoes are excluded from the benefits of modulation.
- V. Ships in regular liner services for common users with timetables published in advance may profit from rebates depending on the frequency of departures of the liner service. Other ships may profit from rebates limited to 30 % of the base level dependent on the frequency of departures.

Article R.*212-8:

The modulations and rebates (article 212-7) may be added to by an additional rebate in favour of new traffic links and in favour of new intra-community services for passengers, for cargo on chassis (called Ro-Ro) or for containers. The additional rebate cannot be applied for more than two years. The level cannot exceed 50 % of the basic amount.

Article R.*212-9:

The modulations and rebates according to Article R.212-7 cannot be cumulated. If the conditions of several modulations and rebates are satisfied the most favourable is applied.

Article R.*212-10:

The charge may be reduced or increased by up to 30 % of the basic amount depending on the period of time of the day, week or year.

Article R.*212-11:

Diverging from articles R.211-1, R.212-3, R.212-7 to R.212-10 the fixing of charges on the vessel in every port may provide for lump sums for new intra-EU services for no more than three years (shortened).

Article R.*212-12:

Charges on lay time are applied on ships staying longer than required for normal operations in that port.

Section II (Articles R. 212-13 ff) deals with the charges on commodities which are to be paid by the shipper or consignee. The level of the charge is fixed by every port according to weight or units.

Section III (Articles R. 212-17 ff) deals with the charge on passengers which is to be paid by the ship operator. The charge is calculated per passenger debarking, embarking or in transit.

In essence the system (like most port tariffs is complicated) assesses charges based on a charge in euros/cubic metre. The charges run from a container vessel less than 140 metres having a the charge of 0.2136 for unloading and 0.1475 for loading to a container vessel of more than 220 metres having a charge of 0.3593 for unloading to 0.2324 for loading. A Ro-Ro vessel will have a charge of 0.1503 euro/cubic metre with no differentiation between loading and unloading.

There are discounts for container vessels based on the ratio of the volume of cargo to the volume of the vessels.

Poland

Poland has introduced a new system of port tariffs as from January 1st 1994 authorized by the (Polish) Inter-port Tariff Commission and the presidents of the maritime Ports of Gdansk, Gdynia, Szczecin, Swinoujscie and Kolobrzeg. The system allowed to the ports to apply separate rates according to their needs.

The structure of ship levies (harbour dues) was totally changed by implementing the French system. This makes fees dependent on the capacity of the ship calculated on the basis of its length, breadth and draught according to the summer Plimsoll mark (Lxbxdr). The scale of fees depends on ship types. The lowest charges are levied for passenger vessels (0.65 tariff units per 1 m³) and Ro-Ro, container and car carriers (0.60 tariff units) while the highest rates are charged for tankers > 100,000 m³ (0.95 tariff units).The tariff does not include fees for ship services like towage and pilotage which are offered and the charges agreed by separate companies.

The reason for the introduction of the new system was the frequent alterations of measurement certificates while ships are in port and making the port independent on current conventions. In the event of disputes data in Lloyd's Register of Shipping will be taken as authoritative when it comes to the determination of ship type and dimensions.¹⁶

¹⁶ Changes to Tariffs in Polish Ports, in: Polish Maritime Industry Journal, No. 2, October 1993

¹⁷ Port of Rijeka Authority

¹⁸ www.EMPA-pilots.org

¹⁹ United Nations Conference on Trade and Development: Strategic port pricing, UNCTAD/SDD/PORT/2, 21 February 1995 (GE.95-50533)

Meanwhile Polish ports have abandoned the volume based system and returned to GT. Asked for the reasons of the change to volume and back to GT and for advantages and disadvantages the answers from the port industry were hardly satisfying. For the port authorities the main reason was that the ministry had decided to do that for all Polish ports.

The advantage of the GT system is the easy handling, i.e. it is only one figure which can be read in Lloyd's Register or the measurement document. To get the volume one has to multiply length by breadth by draught.

The step back to the GT was only made by the government. Pilots and WUZ Ltd, the company handling towage and mooring in the Polish ports, still adheres to the volume system. In the end the advantages or disadvantages of both systems may not be important, at least from the ports' and port services providers' view.

6.2 Croatia and Slovenia

A totally different approach was chosen by some former Yugoslavian ports which use the cargo tonnage. The port dues in all ports of Croatia are determined by a National Maritime Code which is only available in Croatian language. Single port tariffs show that the port dues - paid by vessels for use of the piers - are levied per metric ton of cargo loaded/discharged. The Port Authority of Vukovar explains that "dues are calculated upon the gross weight of cargo. Quantity of transhipped goods has to be proven with official documentation (bill of lading). Weight is rounded on the whole metric ton."

The confirmation for the absence of any GT based charges is found in the Port Regulations which require following data in the Notice of Arrival¹⁷:

- ship's name, nationality, deadweight, draft and length
- number of crew members and passengers
- type and quantity of cargo to be discharged / loaded and in transit
- last port of call and date of departure from the same
- date and hour of estimated arrival.

The GT measurement is not asked for because it is not needed but, otherwise, dwt, draught, length and cargo are asked for.

According to the dues levied per cargo tonne the modulation of this charge is not by ship type as with GT based methods but by type of cargo. In the end the system is not suitable for all ships since certain types don't carry cargo. An exception from the calculation based on cargo tonnes is made for cruise ships which pay the port dues per GT plus per passenger. Cruise ships are divided into 16 size groups.

In the following chapters the system is called "Croatian System".

Other dues in Croatia have been based on GT measurement, except the **light dues**. With effect from 1 July 2006 this has changed and under the new tariff all vessels will be charged at the basic rate of US \$ 0.60 per GT. Previously, monthly light dues were charged at the rate of US \$ 0.95 Per NRT.

Pilotage is regulated by "The Maritime Code" (1994) and the "Pilotage Regulations" (1995). There are seven pilotage organisations, all of them 100 % private. Tariffs are determined by the Ministry taking into account the costs of performing the service. They are based on GT.¹⁸

Slovenia has only a short coastline and the only port is Luka-Koper. The method of calculating the port dues follows the Croatian system.

6.3 Other Possibilities: A New Proposal

Although GT is used by many European ports as the basis for port dues and related cost there are a number of ports where, for example, the origin or type of vessel, the number of port calls per month or year are taken into account and offered a price reduction.

There is for example often a preference for regional or coastal shipping in ports and canal managing authorities in their pricing structure (e.g. canal of Corinth, Suez canal). This is because of the importance of *short sea shipping* that is responsible for a great number of port visits. Thus the number of port calls per week, month or year is also a subject for discounts.

Apart from using other measures than GT as the basis for the cost calculation – e.g. the French volume system or the Slovenian cargo charging system - it would be a possibility to change the pricing structure of ports by including efficiency as a variable to pricing. However, this aspect of port pricing is not the subject of this study and will not be considered.

EU Maritime Policy

Any proposals for new charging methods in European sea ports should take into regard the maritime policy of the EU. The appropriate document in which the European Commission has expressed this policy is the "Green Paper on Sea Ports and Maritime Infrastructure" COM(97) 768 final. This green paper includes Chapter 4.5 "A Framework for Port Charging". Like the ATENCO Study which followed this green paper it deals mainly with pricing, not with methods or bases of calculation. Nevertheless, a few basic aims have to be kept in mind when discussing calculation methods:

- 58.A. A Community framework on port charges would require **charges to be linked with costs** and contain guidelines on the extent to which port charges should reflect the cost of infrastructure investments. It would form the subject matter of a Council directive establishing an appropriate framework whilst leaving sufficient scope for divergent traditions in port organisation. This could take the form of minimum requirements on charging principles that would have to be met throughout the Community.
- 65. The charging framework would, in principle, apply to ports with international traffic. ...
- 68.A A charging framework would also be based on **transparency** of the systems applied by different ports in order to ensure fair competition between and within ports and at the same time enable

the users to check whether they are receiving the facilities and services they are being charged for.

Details concerning the methods of calculation are not mentioned.

UNCTAD Proposals

Two years before the UNCTAD had published its report on "Strategic Port Pricing" which goes more into detail¹⁹. The first UNCTAD Report "Port Pricing" which provided guidance for ports in developing countries, had been published in 1975. While the techniques proposed in the first proposal were still valid the purpose of the later study was to provide a framework how pricing studies may be used to improve the efficiency and sustainability of ports and related port services.

In the 1995 report the UNCTAD lists the form of different tariff categories:²⁰

²⁰ *ibid.*, p. 15

²¹ ATENCO Public Final Report, p.25

GENERAL TARIFFS

Conservancy, port dues

Charging unit – Vessel GRT, NRT, Length*Beam*Draught
Differentiation – Type of vessel

Wharfage

Charging unit – Freight or metric ton, cubic metre, TEU
Differentiation – Type of commodity

FACILITIES TARIFFS

Berth Hire

Charging unit – Metre-hour, Berth-hour, Berth-day
Differentiation – Type of berth

Transit Storage (short term)

Charging unit – Day
Differentiation – Open or closed storage, days in storage

SERVICE TARIFFS (*selection by ISL*)

Pilotage

Charging unit – Vessel movement
Differentiation -

Towage

Charging unit – Vessel movement
Differentiation – Vessel GRT, NRT, Length*Beam*Draught

Berthing/Unberthing, Mooring

Charging unit – Vessel movement
Differentiation - Vessel GRT, NRT, Length*Beam*Draught

GT/NT resp. the former units GRT and NRT occur in the UNCTAD document only in relation to the port dues, pilotage and towage. In each of these cases GT/NT is not the only proposal but the alternative of L*b*dr has already been presented. This proves, once more, that the use of GT /NT is not required and an alternative is known for a long time.

The user pays principle

In general, the fulfilment of the user pays principle is strongly dependent on the right choice of the charging base. The latter should somehow reflect the amount of service that is enjoyed. If the charging base does not give a proper measurement of the amount of use, then the principle cannot be satisfied. An important aspect in the discussion of charging basis is the structure of services that are provided in a port. The "use" may have to be measured differently for different services. This then results in different charging bases and in an extensive tariff structure.²¹

A New Proposal

The charge what for GT is mainly used is the port dues (conservancy). While two alternatives (L*b*dr and cargo t) are already in use in France or in Adriatic ports, a completely new method is proposed here which combines the volume, hitherto expressed in GT or by L*b*dr of the ship and the actual load condition.

The disadvantage of the volume based methods is that the ships have

always to pay according to their size independent of the amount of cargo discharged or loaded. This contributes in short sea shipping to a concentration of cargoes and ship calls in larger ports and to more land transport. The reason is that, e.g. in container shipping, it costs less to carry the containers by truck or feeder ship to a smaller port than to pay the full port dues for a large ship, up to a certain number of boxes. Otherwise it is the advantage of the Croatian system that also larger ships with smaller par cargoes can call at these ports since the port dues are based on the amount of cargo discharged and/or loaded.

The new proposal is to base the calculation of a volume-related part of the charge on the light weight of the ship. The light weight is the weight of the empty ship being the same as the volume of water displaced by the ship. Independent on ship types this displacement is related to the size of the empty ship. Ships with a small displacement (weight) need less port infrastructure than ships with a high displacement. The relation of length, breadth and draught may vary, but this is also true for the GT measurement.

A parameter preferably to be included in the calculation of port dues is the draught. The draught, first of all, requires the costly dredging for deepening the port entrances or for keeping the water depth on the charted level. Ships with higher displacement normally have a higher draught and would pay more.

The draught augments when the ship is loaded. As a consequence, a second component is added to the proposed charge which depends on the cargo. Like in the Croatian system the cargo discharged and the cargo loaded will be charged. In a first approach the proposed charge is defined as follows:

- Charge inward: $\text{light displacement (t)} + \text{cargo discharged (t)} = \text{actual displacement inward (adi)}$
- Charge outward: $\text{light displacement (t)} + \text{cargo loaded (t)} = \text{actual displacement outward (ado)}$

The question will arise what about the difference between the deadweight capacity and the loading capacity. It is the same value which remains if the full cargo is subtracted from the full displacement. This difference is made up by fuels, fresh water, passengers, luggage, stores etc. The largest by far share is made up by fuels. It would be sufficiently accurate to focus on the fuel capacity and to assume a weight corresponding to half the capacity of the fuel tanks. This way the light weight plus 50 % of the fuel capacity (in t) are always the same ship-related figure, unless the ship is reconstructed. Then the final calculation of the charge is:

- Charge inward: $= \text{actual displacement inward (t)} = \text{light displacement incl. 50 \% of fuel capacity (t)} + \text{cargo discharged (t)}$
- Charge outward: $= \text{actual displacement outward (t)} = \text{light displacement incl. 50 \% of fuel capacity (t)} + \text{cargo loaded (t)}$

A modulation of such a charge should be possible because of the different port infrastructures required by different types of ships and cargo. However, it seems sufficient to apply a modulation on types of cargo. The first component is charged according to the real displacement with the

same amount per t for all ship types. The second component should be differentiated according to commodity types and, it remains to be checked, according to smaller or larger amounts. The cargo of passenger ships is the passenger, either the cruise passenger or the ferry passenger.

The proposed "actual displacement tonnes" ("adt" or "adi/ado") are not only suitable for the port dues but also for all other port dues and fees. The light weight of the ship is not published in the Lloyd's Register books but it is found in the ship's documents, usually in the "Trim & Stability Booklet" or in the loading manual.

If the light weight is known – the weight of the cargo is also known – and "adt" is used for several charges the whole system is very easy to handle. It is also applicable to passenger ships if the charge per light ton is decreased and the cargo t is replaced by the passenger.

7. Impact on Market of any Change from GT-based Port Charging

7.1 Impact of Vessel Selection

As was argued in Section 5.1, though vessel selection by ship-operators has been distorted by the use of GT as the main basis for port charges in the EU, and beyond, this does not mean that vessels will necessarily not be used for specific trades between specific ports. This is partly because – aside from French and Polish ports – most European ports are equally discriminatory. Hence, there is no particular advantage and disadvantage to be traded off from one route or another. Moreover, as explained in Section 4.1 above, port dues themselves may not form a major proportion of total ‘call charges’.

Nonetheless, for Ro-Ro operators there has been and there remains a significant financial penalty vis-à-vis container vessels. This has not prevented, for instance, the development and use of RoPax vessels in the Mediterranean over recent years. However, as the construction economics of these vessels may permit the effective subsidising of freight carriage by passengers, it may still be argued that the discrimination against Ro-Ro vessels inherent in GT-based charging has an impact on the use of ‘pure’ Ro-Ro vessel selection.

Similarly any change to the French systems may not lead – with existing vessels – to any substantial impact on vessels selection.

However, with increasing pressure on costs due to increased bunker fuel charges it may be that, when new decisions are being made on contracts for particular trades, the calculation for Ro-Ro operator may at the margin sway a decision in favour of one route or another. There is some anecdotal evidence of this occurring, but it may not be statistically significant.

7.2 Impact on Vessel Design

It was argued in Section 5.2 that there has been a significant impact on vessel design over the almost 25 years since the Tonnage Convention came into force. In particular the design of conventional container vessels for short sea operations has been seriously affected with potentially disastrous safety consequences. Moreover, the Tonnage Convention has militated against the development and use of open-hatch container vessels.

As indicated in 7.1 above – including distorting the type and operating conditions of the container vessels used (i.e. the practice of high, 7-tier, stacking of containers on deck) – GT-based charging has influenced the design of vessels, both Ro-Ro and container vessels to the detriment of short sea shipping operations. Short sea shipping operations require the handling of cargo at port terminals to be extremely efficient if the reliability of the mode required by shippers is to be achieved. Innovative design – particularly those with high freeboard and thus high relative steel content – tend to be discriminated against by GT-based port charges.

A change from GT-based charging seems, therefore, likely to have a greater impact in the longer-run on the design of vessels than on the selection of current vessels. The impact of the practice appears to be incremental and hence to have an impact in the longer term greater than that in the short term.

7.3 Impact on Port Income

Though there appears to be anecdotal evidence that French ports earn more from port dues than GT charging ports, it is not easy to confirm this suggestion with statistical evidence. Hence, it may be the case that overall revenue from port charges may be inclined to rise as a result of any change to the French system of charging. However, as part of the argument of this study is that this is not necessary – since overall income could be held constant – it is certainly the case that, in this situation, revenue from Ro-Ro vessels and open-hatch containers would fall and that from conventional container vessels would necessarily rise.

With new and larger container feeder vessels being ordered this would provide an opportunity to redesign these vessels to take advantage of the new pricing regime; to the advantage of short sea shipping. Moreover, it would also mean that Ro-Ro feeder vessels would also receive a boost.

7.4 Impact on Cargo Revenue

The reverse of the above impacts would occur from the position of the ship operators. There is little doubt that such a change of pricing regime would not be popular among conventional container vessels operators. Deep sea operators would also be affected. However, in the case of deep sea operators the impact would be proportionately smaller and unlikely to be a of significant concern. Moreover, for ship operators as a whole, if total port incomes and therefore cargo revenues were held constant the shipping community as a whole would be no worse off than before the change.

7.5 Conclusions for Market Impacts

In *qualitative* terms The impact of the changes would seem to be neutral as far as the revenues of ship operators and port/terminal operators, as an overall group, are concerned. However, the balance between those operating the main ship types would be affected. The benefits in the longer run, particularly on ship design, would appear to be considerable and to the benefit of short sea shipping.

The impact in *quantitative* terms is considered in Section 9.

8. Policy Issues

8.1 General

In essence, the policy options (not necessarily mutually exclusive) for the EU are:

1. To *do nothing*; on the basis that, essentially, the various discounts for vessel types that are discriminated against, e.g. Ro-Ro vessels, are sufficient to rectify any distortions that may hamper the development of short sea shipping
2. To *provide information* on the distortions arising from the use of GT as the basis for port charges (as indicated in this study report)
3. To introduce, at *EU level*, *action* to rectify the situation (e.g. to provide a Directive harmonising the basis of port charges, aligned on the French and Polish ports practice)
4. Take an *initiative towards IMO* to amend or otherwise modify the London Tonnage Convention (e.g. in line with the German Government proposals or those in the Policy Research Corporation Discussion Document prepared for the Dutch Government and presented at a meeting of the IMO Load Lines Committee).

Each of these options is discussed in turn below.

8.2 Do-Nothing-Option

It is clear that – faced with the distortions arising from the GT basis for port charging used (though not because of legal compulsion) by most EU ports – some EU ports have introduced discounts and other adjustments to the tariffs applied to vessels that (by virtue of having higher GT values than comparable vessels, e.g. Ro-Ros) would otherwise be discriminated against. To an extent this practice has partially remedied the defects of GT-based charging. However, the use of GT(NT) for port charging has – together with the use of GT in relation to a number of IMO Conventions – nonetheless, led to a chronic distortion of vessels selection. In particular it has discouraged the use of open hatch container vessels and has led to longer container vessel stays than necessary because of the time taken for loading and unloading (related to the need for cranes and lashing time). It has also effectively weakened the incentives to develop short sea shipping in the context of intermodal transport chains. It appears still to be discriminating against Ro-Ro vessels at many ports and may not only have distorted feeder trades and routes, but may also have led to some cargo being put on to roads rather than routed via short seas shipping. It may also have been an inhibiting factor in ports developing more sophisticated pricing policies aimed at encouraging ship and port efficiency, e.g. slot auctioning.

Faced with this catalogue of apparent distortions, the ‘do nothing’ option would appear to leave the various market distortions in place, to the detriment of short sea shipping development. Moreover, there is available a market-tested alternative to GT-based port charges readily available, namely the system used by the French and Polish ports.

In favour of the 'do nothing' option is that changing the basis of charging may lead to confusion in the shipping and ports markets. It may also be argued that the current and developing practice of introducing discounts and other price adjustments for different vessels (e.g. Ro-Ros) and different shipping operations, e.g. short sea shipping, can deal with the obvious anomalies arising from GT-based charging. This essentially 'conservative' argument has some merit. The judgement that has to be made is whether the benefit/cost ratios of the 'do nothing' option are higher than those of the 'change option'. In qualitative terms it has been argued in Section 7 that the balance of argument appears to be in favour of change. The *quantitative* issue will be examined in the final section of the report, Section 9.

8.3 Provision of Information

Obviously the provision of information, such as that given in this study report, should draw attention to the issues and problems raised by the use of GT and the current debate on suggested action to modify the use of GT and, hence, to avoid the various distortions introduced into the maritime transport market since the establishment of the 1969 Tonnage Convention and its full coming into force in 1982.

However, it is not clear that the provision of information alone will suffice to induce the changes in port pricing practices necessary to remedy the apparent defects created by the current charging system. After all the problems have been evident for some time and unless it is assumed that the current adjustments to charges are sufficient (and above it has been suggested that, on *a priori* grounds, this is not enough) then it seems unlikely that the provision of information alone will persuade ports to alter the charging basis.

8.4 Institutional Action

Amendment of IMO Tonnage Convention - Potential for Amendment

Notwithstanding the many anomalies created by the London Tonnage Convention, it is not clear that amendment of the Convention is the correct route to take. Indeed this point was made by the Policy Research Foundation, with which we concur. There are two problems with wholesale amendment of the Convention. First, it would take a considerable amount of time to achieve agreement on any amendment; measured in years. Even after agreement was reached it would take an even longer period of time to achieve sufficient ratifications to reach a position where the Convention came fully into force. It should be noted that the original Convention took from 1969 to 1982, a period of 13 years. Second, any amended Convention, including thresholds would almost inevitably lead to the same devotion of resources to providing imaginative solutions to work around the new parameters. Nor would these solutions necessarily prove to be benign. In the same way that the current circumventions have engendered unintended damaging and even dangerous economic and safety consequences.

This is not to say that certain modifications that fall short of formal amendment could not be made. The proposals of the German and Australian maritime administrations are modest, but intelligent proposals that would improve the situation, particularly for open hatch container vessels.

However, in relation to the issue with which this study is concerned – the use of GT as a basis for port charging – it is neither necessary nor effective – to look for an amendment of the IMO Tonnage Convention.

Rather should the solution be sought, as indicated above, at EU or at port level. The content of an EU level initiative is now considered in more detail, and compared with the 'do nothing' option (effectively, action at port level) in order to develop recommendations for what action, if any, should be taken at EU level.

8.5 EU Policy Action

Two possible types of EU action have been suggested above: 'soft EU action' and 'hard EU action'. These two options/routes may now be explored.

Soft EU Level Action

The advantage of soft action is that it does not require the full rigour of the EU legislative process, as does hard action. However, it may be the case that the effort to develop effective 'soft action' would not necessarily be substantially less than that required for harder action, such as the Directive considered above, but with less chance of effective impact.

Such action could take the form of a Commission Communication or a joint Commission and Council Recommendation (this was done in relation to Integrated Coastal Zone Management in 2001).

The arguments to be deployed at EU level by the Commission to justify soft action will be exactly the same as those for hard action. Hence, there will be no savings in time and resources on this aspect of action, as between soft action and hard action. The discussions by national experts, the impact analysis to be done, and the EU Institutional consideration will be similarly the same whichever route is adopted.

Hard EU Level Action

Such action would take the form of a Council Directive, proposed by the Commission. The advantage of this form of EU level initiative is that apart from its legal force it would send a strong declamatory signal to other maritime countries and regions and to the IMO. This would strengthen those forces arguing for modifications to the Tonnage Convention, or at least to its interpretations, to ease the numerous anomalies arising from the use of GT measurement and the thresholds incorporated in the Tonnage Convention.

Moreover, the justification for EU action via a Directive is strong. There is a situation where the lack of harmonisation of the bases of port charges is causing a distortion of pricing in relative terms. The distortion affects particular classes of ship operators; affects the design of vessels to

produce accidental loss of containers and adversely affects the safety of vessels, ships crews, and stevedores, and acts to reduce the volume and efficiency of short sea shipping, against a key transport policy objective of the EU.

Ports policy is becoming an important element in European, national, and regional transport and logistics policy development. This in turn affects trade and economic growth and hence the competitiveness of the EU as a whole.

9. Cost-Benefit Analysis

9.1 Selection of Ships and Port Tariffs

The aim of this chapter is to compare the most important port costs for different ship types and to assess the effects of eventual changes in the tariff structures. Three ship types have been selected for the comparison:

- A hatchcoverless container vessel
- A conventional container vessel
- A Ro-Ro vessel with a similar cargo capacity

The three ships have very different GT measurement but a similar capacity:

Table 4: Characteristics of Selected Short-Sea Vessels

Characteristics	Type 168	Type 162	Con Ro 4600
GT/NT	9981 / 6006	7981 / 3814	50000 / 15000
Tdw	11,600	11,400	14,600
L / b / dr	133.94 / 22.5 / 8.7	138.1 / 21.75 / 8.35	200 / 31.0 / 7.8
V (L x b x dr)	26,230	25,062	48,360
Capacity	868 TEU	864 TEU	300 Trailers

Type 168 of Sietas Shipyard of Hamburg is the most successful design of an 'hatch coverless' (open hatch) feeder vessel to date. More than 50 ships have been delivered or are on order. Type 162 is a container vessel of similar size with hatch covers built by the same shipyard. The not yet realised design of the large ConRo vessel of Flensburg Shipyard has been chosen because only such a huge ship has a similar carrying capacity. Assuming an average truck load of 15 t the ConRo vessel would carry 4500 t only. Assuming two containers à 12 t per truck or a mix of trucks and containers the total cargo could be 7,200 t or more. In practice Ro-Ro ships ply between two ports and the average load is much below the maximum. Container ships in feeder trades can visit two or more ports at each end of the route, why the cargo turnover in one port is less than 50 % of the carrying capacity.

General remarks on Port Tariffs

The ports chosen apply different systems of calculation of charges and three of them are competitors and could accept the ship types chosen for the analysis. The fourth has been chosen because of its different port dues structure.

The tariffs of the ports vary considerably in their structure. The extracts shown in the following pages are directly related to the selected ship types and omit any special provisions for other ship types and sizes. Most tariffs comprise some basic prices for the normal services and have made provisions for special services, time limits, conditions for the regular fulfilment of services etc. As an example: For mooring there is a standard fee inward and outward. Special fees could be applied for shifting from one berth to another, for berthing ships alongside another, for mooring ships with dangerous cargo, for waiting time if the arriving vessel is late

and so on.

Ro-Ro vessels normally berth without the assistance of tugs, smaller container vessels often too. Large ships need several tugs. Thus, it depends on the room for manoeuvring in the port and on weather conditions whether towage is necessary or not. The price shown is for the minimum solution of using one tug.

9.2 Hamburg

In German ports the pilots not only collect their remuneration, the pilot fees, but also the pilot dues which correspond to fairway dues in other countries. Port authorities charge the port dues/tonnage dues for the use of the port while cargo turnover is mostly in the hands of private terminal operators. Towage and mooring is offered by private companies. Port policy is in the responsibility of the Federal States. Therefore, no common port tariffs for German ports exist. Private ports like the oil terminals in Wilhelmshaven are not under the responsibility of the port authority and are not obliged to charge port dues/tonnage dues. The federal Ministry of Transport decides only about the pilot dues. In some cases a sea pilot, a river pilot and a harbour pilot are required.

Fairway dues/Pilot dues

The pilot dues are based on the GT measurement of the vessel and vary from port to port. There is a general reduction of the GT of Ro-Ro vessels by 15 %. The distances from the pilot stations at sea to the main ports are defined as 100 %. Ships calling at another river port pay for a certain leg of the total distance. Ships taking the pilot from the pilot vessel at sea and go to Hamburg pay 100 % inward and 100 % outward. The basic dues for the Elbe is 649.00 € for ships between 9,500 and 10,000 GT and 2,131.80 € for the 50,000 GT Ro-Ro ship. A rebate of 10 % is granted for ships exempted from the obligation to take a pilot.

Pilotage/Pilot Fees

Pilot fees are published in the same tariff, but prices and definitions of distances are different. The legs of the Elbe waterway between the pilot vessel and Brunsbüttel (entrance to the Kiel Canal) and between Brunsbüttel and Hamburg are 100 % each. An exemption from the obligation to take a pilot is not mentioned in the federal regulations, but the regional authority can provide exemptions for the Elbe. For ships with a length of 120 m and more the captain has to prove his knowledge of the waterway, sufficient knowledge of the German language and that he has made 24 trips in the waterway during the last 12 months on the same ship assisted by a pilot. The exemption is valid for 12 months and the period can be extended. For the test calculation 100 % or half of the full cost is applied.

Port dues

Port dues are calculated according to the GT measurement, to ship types and whether it is deep-sea or short sea traffic. Ships >4,000 GT in North Sea, Baltic Sea and Bay of Biscay traffic pay 5.70 € per 100 GT; Ro-Ro vessels >6,700 GT operating in the same area pay 2.90 € per 100 GT.

Towage

The five Hamburg-based tugboat operators offer a joint service in competition to international companies having positioned several tugs in Hamburg. The joint service tariff is based on GT and the rate is per tug.

Table 5: Comparison of Port Costs for selected Vessels 2006

Assumptions for the estimation of port costs:

- Calculation of average costs for 50 calls per year and port
- Discharging 5,000 t and loading 5,000 t in every port
- All ships in short sea traffic
- Excluding surcharges for night work, holidays etc.
- No dangerous goods on board
- Lightweight estimations: type 168 = 4,000 t, type 162 = 3,600 t, ConRo = 8,000 t

	type 168		type 162		ConRo 4600		Remarks: all prices in Euro
Hamburg							
Fairway dues	GT	1298.00	GT	1054.00	GT	4263.60	RoRo - 15 %
Pilot fees	GT	1268.00	GT	1114.00	GT	2776.10	RoRo - 15 %; Hamburg to Kiel Canal
Port dues	5.70 €/100 GT	1137.84	5.70 €/100 GT	909.83	2.90 €/100 GT	2900.00	inbound and outbound = two times
Towage	per tug and GT	3200.00	per tug and GT	3200.00	per tug and GT	7250.00	1 tug inward and outward
Mooring/unm.	GT	798.00	GT	798.00	GT	2278.00	
Total		6403.84		6021.83		15204.10	total excluding fairway dues
Rotterdam							
VTS Tariff	L.o.a.	375.59	L.o.a.	414.14	L.o.a.	884.45	
Pilot fees	draught	5044.00	draught	4618.00	draught	4098.00	
Port dues	0.379/GT	2837.10	0.379/GT	2268.60	0.128/GT + 0.435/t	8062.50	(6400 + 4350) * 0.75
Towage	L.o.a.	1850.00	L.o.a.	2130.00	L.o.a.	3280.00	Kotug Tariff
Mooring/unm.	L.o.a.	466.00	L.o.a.	509.00	L.o.a.	1176.00	
Reporting	dwt	158.00	dwt	158.00	dwt	186.86	Dirkzwager tariff
Total		10355.10		9683.60		16803.36	total excluding fairway dues
Le Havre1)							
Pilotage	V x b x dr	1969.36	V x b x dr	1926.08	V x b x dr	2788.30	
Droits de port	V x b x dr	1747.53	V x b x dr	1669.71	V x b x dr	8940.24	feeder ships rebate 70%
Remorquage	length	1383.85	length	1383.85	length	3357.74	1 tug inward and outward
Lamanage	length	482.20	length	465.60	length	1101.40	inbound and outbound = two times
Total		5582.94		5445.24		16187.68	
Koper							
Fairway dues	0.85 €/ NT	51.05	0.85 €/ NT	32.42	0.85 €/ NT	127.50	lumpsum per year; 50% rebate
Pilot fees	GT = 200 pts	180.15	GT = 200 pts	180.15	GT = 495 pts	445.88	1 point = 0.96 €
Port dues	0.89 / t	8900.00	0.89 / t	8900.00	1.07 / t	8900.00	
Towage	GT	417.26	GT	417.26	GT	585.17	per GT; 13 calls per quarter
Mooring/unm.	0,035/GT	698.67	0,035/GT	558.67	0,035/GT	3500.00	
Total		10196.08		10056.08		13431.05	total excluding fairway dues
"adt port"							
Fairway dues	adt 4000+5000 t	1700.00	adt 3600+5000 t	1580.00	adt 8000+5000 t	2900.00	inbound and outbound = two times
Pilot fees	adt 4000+5000 t	1700.00	adt 3600+5000 t	1580.00	adt 8000+5000 t	2900.00	0.15 per ldt + 0.05 per cargo t
Port dues	adt 4000+5000 t	4200.00	adt 3600+5000 t	4080.00	adt 8000+5000 t	5400.00	0.15 per ldt + 0.05 per cargo t
Towage	adt 4000+5000 t	1700.00	adt 3600+5000 t	1580.00	adt 8000+5000 t	2900.00	0.15 per ldt + 0.3 per cargo t
Mooring/unm.	adt 4000+5000 t	640.00	adt 3600+5000 t	576.00	adt 8000+5000 t	1280.00	0.15 per ldt + 0.05 per cargo t
Total		8240.00		7816.00		12480.00	0.08 per ldt + 0.00 per cargo t total excluding fairway dues

Source: ISL 2006

1) Tariff 2004, Port dues = 2006

Mooring

Ship fasteners in Hamburg have a quite simple tariff based on GT. The price for 7,501 to 10,000 GT is 479 € for mooring and 319 € for

unmooring, applicable 7 days per week and 24 hours per day. For 50,000 GT it is 1,367 € resp. 911 €. Feeder vessel up to 7,500 GT would enjoy a rebate of 50 %.

9.3 Rotterdam

The Rotterdam port tariff is particularly complicated but it is worth mentioning that the Port operating company has collected the tariffs for several independent service providers under the title "Rotterdam Port tariffs 2006" and they are easy to find in the internet. Excluded are the prices of the private terminals, as usual.

Fairway dues/VTS

Fairway or light dues are not mentioned in the comprehensive port tariff booklet. Instead a VTS tariff for Vessel Traffic Services is obligatory. The structure is simply 113.45 € (up to 100m) basic price plus 7.71 € for each additional metre above 100 m ship length.

Pilotage

Pilotage costs of the sea pilot are strictly according to the draught of the ship in decimetres, e.g. 2.159 € for 80 dm "in or out". This is the only case where the larger Ro-Ro vessel pays less than the container vessels. The quantity discounts apply only for ships longer than 200 m and or for more than 48 calls per year.

The tariff for river pilotage into ports situated further upstream depends on the draught and the distance sailed in miles.

Port Dues/Harbour Dues

There are many tariffs for different ship types, services (liner, tramp, short sea) and/or frequency reductions. For the Ro-Ro vessel the Tariff LR2/TR2 is applied which means 0.128 € per GT +0.435 per metric ton of discharged and/or loaded cargo. "This tariff is used when the quantity of discharged and/or loaded cargo (incl. the tara of the containers) amounts to less than 67.9 % of the GT of the vessel".

For the container vessels the Tariff LF1 is applied, i.e. 0.379 € per GT. "This tariff is used when the quantity of discharged and/or loaded cargo amounts to 50.2 % or more of the GT of the vessel."

Towage

Harbour Towage is provided by three private companies which have slightly different tariffs each. All towage tariffs are based on the length of the ship and two different harbour areas. The KOTUG tariff shows a minimum price of 925 € in or out, applicable for ships up to 138m. Several surcharges exist.

Mooring

For this service the companies have joined to offer one common tariff based on the length of the ships. The price for unmooring is slightly lower than the price for mooring, e.g. 224 € and 242 € for a vessel below 135 m. For the 200 m Ro-Ro ship the invoice is significantly higher: 565 € + 611€.

Reporting

A tariff not made public by other ports is the reporting. It is a minor cost position in Rotterdam but nearly as much as the pilot fee in Slovenia.

Conclusion for Rotterdam

Charges based on GT and on length result in heavy disadvantages for the Ro-Ro vessels in Rotterdam. Even the advantageous pilotage tariff based on the draught cannot balance the effects of length and GT measurement on the amount of other dues and fees.

9.4 Le Havre

Pilotage:

Pilotage tariffs are based on the ship's volume as defined by the national regulation. Ships are charged inbound and outbound. Additional volume charges come to the minimum collection which is according to five size groups. To all the test ships the second group (10,001 – 58,500 m³) applies with the minimum charge of 499,35 € (Tariff 2004). The additional charges are per ten m³. Container ships >13,000 m³ can get a rebate if the total annual turnover is > 150,000 €, an amount too high for a weekly service with large feeder vessels. In case the captain holds a "pilot exemption certificate" the price is only 30 % of the tariff (not applied here). Several additional services and penalties are charged separately.

Port Dues/Droits de Port :

The tariff for port dues is based on the volume, on two port zones and on 16 different ship types and sizes. For Ro-Ro ships the price is 0.1503 € per m³ inward or outward and for container ships < 140 m 0.2136 € inward and 0.1475 outward. Vessels carrying containers to be transhipped (feeder vessels) are entitled to a rebate of 70 %. One of two further rebates can be combined with this rebate, either a low capacity utilisation of the ship or regular calls. In the test case the abatement for regular calls is more favourable. Abatements according to the number of calls per calendar year are:

Calls number	Abatement
1-2	0 %
3-7	10 %
8-12	15 %
13-17	25 %
18-24	35 %
25-59	55 %
60-700	70 %

From the 25th call in a year the port dues for the weekly services are lowest. For the comparison of ports the yearly average costs have been calculated.

Towage/Remorquage:

The tariff of the private towage and salvage company Les Abeilles is based on the overall length of the ship. The price is per tug and per movement

(entering/leaving). The first tariff section applies to container and Ro-Ro vessels and shows somewhat lower prices than the second section for all ships except container and Ro-Ro ships. A rebate applies to container and Ro-Ro traffic based on the annual overall amount individually invoiced to each vessel. The minimum is between 76,000 and 305,000 € to qualify for a rebate of 15 %.

Mooring/Lamanage:

The tariff is based on the length of the ship. The length is corresponding in the tariff to a certain moulded breadth and maximum draught. If length or draught are more than the corresponding value, the price given for the length or draught is to be applied. The main tax is applicable to a single ship movement (arrival or departure). There are several tariffs for additional services like shifting and surcharges for additional personnel, steel wires, overrun of normal time etc.

9.5 Luka-Koper

The Slovenian Port of Luka-Koper has, like the Croatian ports, not only a different but also a much easier to handle charging system. The tariff of port dues and wharfage comprises less than one page compared to 21 pages for the tariff for Le Havre.

Fairway dues

Fairway dues in Luka-Koper are charged by the harbour master office which belongs to the Maritime Directorate and to the Ministry of Transport. Light dues are paid by the ship for a period of one month or twelve months. The base for calculation is 0.35 € per NT per month or 0.85 € per NT per year. Container vessels and Ro-Ro vessels get 50 % discount on the official rates.

Pilotage

The tariff of Sea Pilotage Ltd. is based on GT according to the regulations in the Maritime Code of Slovenia. In the tariff scale 7,000 to 10,000 GT are equivalent to 200 points and 50,000 GT are 495 points. The value of the point is 0.96 € since mid 2005. It is adjusted according to the retail price index. A discount is available for multiple arrivals within a calendar quarter: 90 % of the tariff is charged for the 6th to 15th call and 85% for the 16th to 25th call. An entry of the ship comprises one arrival and departure as well as evtl. shifting, whereas elsewhere ships have to pay for each movement separately.

For ships not holding an International Tonnage Certificate the IMO method to calculate the volume is explained. Provision is also made for SBT tankers. Usual surcharges are requested for night hours, weekend and holidays, for dangerous cargo etc.

Port Dues

Port dues for using the port are charged per each ton of cargo to be loaded or discharged, resp. per passenger. The price per ton is differentiated between five commodity types and passengers. Container and Ro-Ro cargo apparently is summarised under LP0103 "Piecemeal and

packaged goods, timber and other goods”, paying 0.89 € per ton. No further variations, conditions or rebates.

Wharfage (per metre L.o.a.) is only paid upon expiration of two hours after completed loading/discharging operations or when using the berths for any other purpose than loading/discharging and/or embarking /debarking.

Towage

Towage is performed by Adria-Tow d.o.o.. The price for ships between 5,000 and 10,000 GT is 430.50 €, for 50,000 GT it is 603.75 €. The tariff is calculated per movement of one hour per tug including arrival from the base and return of 15 minutes each. Several surcharges are listed. Rebates are granted for the 6th to 15th call (5%). An entry comprises arrival and departure.

Mooring

Mooring and unmooring is 0.035 € per GT each. Other prices are only valid for special or additional services or for overtime work.

9.6 Results of the analysis of port tariffs

Fairway Dues

Compared to Hamburg the fairway dues are extremely low in Slovenia and also very low in Rotterdam. It seems that the high pilotage tariff for Rotterdam includes some of the costs which are elsewhere defined as fairway costs. The reason for the high fairway costs in Hamburg where they are called pilot dues is the long navigation channel to this river port which needs a lot of navaid and maintenance.

Fairway dues are not suitable for the comparison and are excluded from the total costs per port call. The negative effect of the GT in Hamburg or of the NT in Luka-Koper on the fairway dues for Ro-Ro vessels can be seen clearly.

Pilotage

The effect on pilot fees in Hamburg is similar to the effects on pilot dues because of the same base GT. Once more the Ro-Ro vessel pays more than twice as much as the feeder carriers. On a lower level it is similar with the NT in Slovenia. The French system based on the volume results in a smaller but still significant difference between the ship types. The advantage of the French system is that the calculation of the volume uses the draught and not the depth of the ship as used for the GT. Based on this volume the Ro-Ro ship pays for the greater length and width, not for the additional decks. Rotterdam is the only port where the Ro-Ro ship can enjoy the advantage of the lower draught.

Port Dues/Tonnage dues

The port dues are in the centre of interest, but often they are not the highest port charges. Only for the Ro-Ro ships port dues are mostly the highest charge. There are quite large differences in the absolute price and this is an outcome of the port policy.

Hamburg tries to mitigate the effects of the high GT of Ro-Ro ships by a lower due per GT and Rotterdam uses another tariff structure for Ro-Ro tonnage. Le Havre, however, is avoiding any 'discrimination' against container ships by an extra bonus. The only system not discriminating the ship types is the Slovenian one where only the cargo tonnes are the main basis of the charges. If the same quantity of cargo is carried in different ships they have to pay the same charges.

Towage

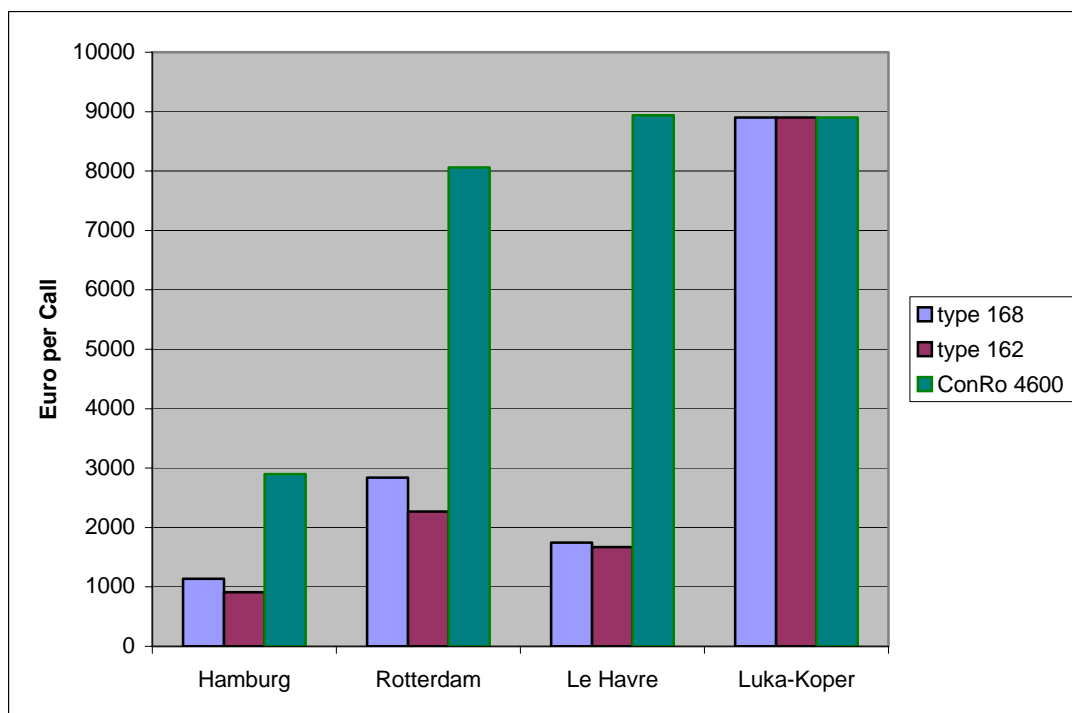
Towage should not be discussed in detail here because the ships often do not use a tug. However, the examples show two interesting issues: First, using the GT is a heavy disadvantage for the Ro-Ro ship, but using the length too. Second, the base of the calculation (GT,V,L) is only one component of most tariffs, the value given to a certain size is another component and rebates for selected groups add further variations or modulations. In Luka-Koper the GT is also the base but the difference between the selected ships is smaller.

Mooring

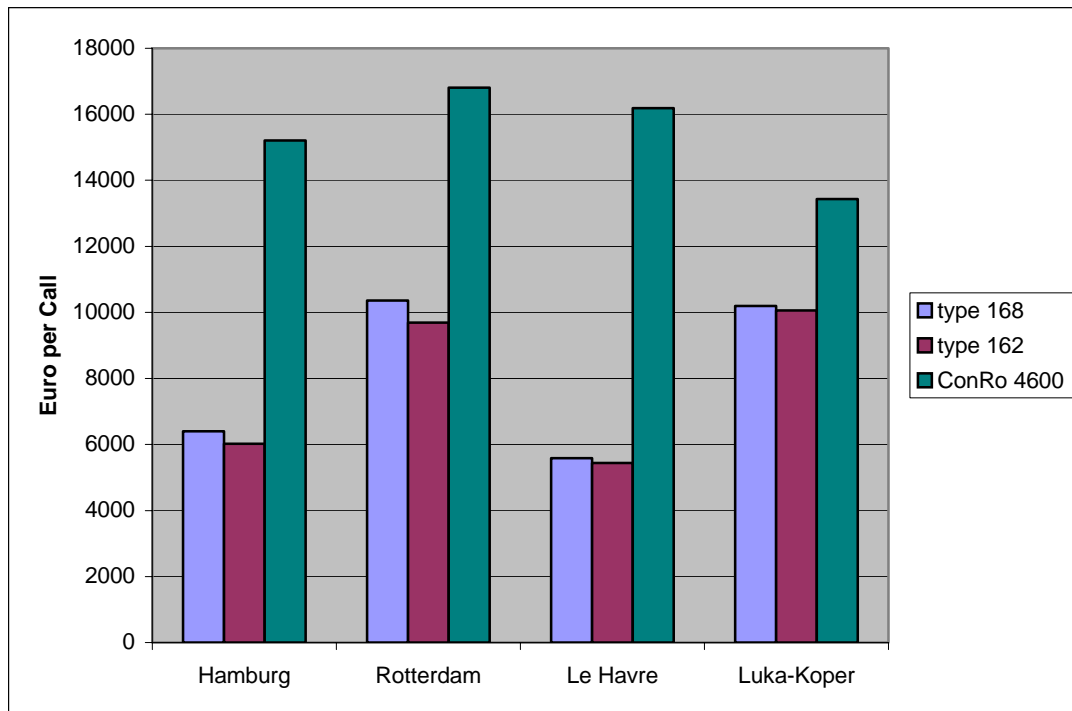
The structure of mooring tariffs is comparable to towage and, thus, the effects are also comparable. Luka is an exception in so far that mooring/unmooring is more expensive than towage.

The comparison of the two feeder types shows similar effects on a smaller scale. The open top ship without hatch cover often pays more because of the higher Gross Tonnage. If the charge is exactly the same, both ships are in the same size group by chance, e.g. 7,500 to 10,000GT. Where length or volume is used the discrepancies are smaller.

Table 6: Port Dues in Selected Port 2006



Tab.7: Total Port Costs (Pilotage, Port Dues, Towage, Mooring) in Selected Ports



Source: ISL 2006

9.7 Conclusions from the Cost-Benefit Analysis

Several main conclusions can be drawn from this analysis:

- The use of the GT seems to be the reason for the discrimination of Ro-Ro ships and hatchcoverless feeder ships. It is true for the feeder ships because both types of container vessels are treated equally by the tariffs. It is only partly true for the Ro-Ro vessels because there are already variations built into the tariffs recognising the higher GT of Ro-Ro vessels.
- These variations underline that the GT is not the ideal base and that the absolute amount of charges is not the result of the GT alone, but of any modulations and rebates. The examples of France and Slovenia show that systems without the GT are viable.
- Port dues are often a means of port policy. The GT just seemed to be an easy to reach basic value for the calculation of charges. The ever progressing differentiation of ship types makes the use of the GT more difficult than ever. A less discriminating system could be welcome as long as it is also easy to handle.
- The graphs prove that the port dues should not be assessed separated from other port charges. Looking at the port dues alone Hamburg seems to be a "low fare port". In fact, differences are smaller if the total costs are taken into consideration.

The figures drawn from the cost analysis allow now to answer the main

questions:

1. Do the differences in port costs of the selected ships have a significant influence on the total transport costs of container transport?
2. Do the differences in port costs of the selected ships have a significant influence on the total transport costs of Ro-Ro transport?
3. What are the effects on port income when the discrimination of ship types is ended?
4. Could the GT be replaced by another base for calculation?

Question 1:

The difference of total port costs between the two feeder ship types is up to 671 € per call, the difference of port dues up to 568 € per call. That is less than 1 € per container discharged or loaded. There is a chance to balance these additional port costs by a shorter duration of the cargo turnover operations. The influence on the total transport costs, in terms of cargos carried, seems to be negligible.

Question 2:

The difference of total port costs between the container vessel type 162 and the Ro-Ro vessel is much more interesting. The minimum difference in total port costs is 3,375 € the maximum is 10,743 €. Focusing on port dues there is no difference in Slovenia but close to 6,000 € in Rotterdam. Disregarding the maximum figure an amount of 6,000 € is yet ten times the difference between the container ship types. Broken down to one trailer of an average load of 167 trailers the Ro-Ro operator pays 19 € more per trailer or per 2 TEU. This is a figure which could be of some influence on transport decisions. However the handling charges for Ro-Ro units in the port are much lower than the handling charges for containers per cranes. Port costs including handling are lower for the Ro-Ro mode and the ports increase the port dues since they know about that. Ro-Ro ships are not generally discriminated in the ports as mentioned above but only by the port dues.

Question 3:

There are ports where port dues and handling fees (ramp fees or like that) form part of the same budget and one could be balanced by the other. In other ports the port authority gets only the port dues and a cut back of the port dues would have a negative impact in the port income. But, again, that is not a question of GT but of the level of port dues, independent of the base of calculation.

Question 4:

Consequently, the GT could be replaced by other elements for the calculation of dues and fees. Working examples are the volume in the French system and the cargo tonnage charging in Adriatic ports.

10. Recommendations

Based on the findings of the study it can be stated that the GT, when used as basis for the calculation of port costs, has a negative effect on Ro-Ro, open top container vessels and other high-freeboard vessels. These ship types are facing higher port dues because of the higher GT measurement. Many ports (but not uniformly) across the EU have, therefore, mitigated the effects by introducing discounts according ship type, number of calls etc..

With reference to the calculation of port charges, the study can conclude that:

- the cost effect could be balanced by a modulation of charges, but the evidence suggests that the discounts applicable in some ports for Ro-Ro vessels are not applied uniformly across all EU ports and that, therefore, there remains distortion and discrimination against Ro-Ro vessels;
- on the other hand, port dues may be seen as part of *total* port costs where Ro-Ro cargo necessarily enjoy lower handling costs which are often individually negotiated.
- alteration of the basis of calculation of the port tariffs from the GT basis would not have major immediate operational impacts because of the low share of port dues in total voyage costs. However, the marginal positive impacts are likely to have larger effects in the longer run, particularly on the design of vessels and the efficiency of short sea shipping operations.

Regarding safety and operational efficiency aspects for container vessels, an evidence of long-term market failure can be observed. These vessels have, over the past 20+ years, shown design characteristics influenced by the use of GT that have led to the minimisation of the interior volume of such vessels with the resultant high stacking of containers on deck, leading to problems of vessel instability and the loss of containers overboard. This has led to a further discrimination against high-freeboard open-hatch container vessels.

Based on these findings there appears to be a need for action to correct the market failure caused by the use of GT as the basis for port charges.

In connection with the most appropriate action to be taken to rectify the market failure, it does not seem that an approach to amend the Tonnage Convention (beyond the current proposals for amendments from the German and Australian governments) at IMO would represent either a necessary or valid mechanism. After all there is no legal compulsion for ports to use GT as the basis for their charging. However, overall, ship design and safety should remain under the responsibility of the IMO and the classification societies.

Nonetheless, we believe that, because of its apparent impact on short sea shipping, the market distortion arising from the current calculation of port charges on GT basis is a matter to be tackled at EU level. Initially, an

attempt should be made via soft actions at EU level to achieve a level playing field, e.g. through guidelines for port charges calculations, incorporated in a Recommendation, to replace GT and to use the French system. (N.B. *As an alternative to the French port charges basis the "Actual Displacement Ton", a combination of the volume and cargo methods, could be considered. This approach combines the advantages of both methods and mitigates the disadvantages and moreover, it seems to be suitable for port dues and also for other port charges*).

Should this soft action fail to improve the situation and to lead to the removal of barriers to expanding short sea shipping and to the development of sea motorways then hard action via a Directive may have to be considered.

Advantages resulting from a revised basis for port charging could be:

- Reaching a level playing field;
- A simplification of sometimes very complicated tariffs;
- A better transparency of tariffs and port costs;
- An integration of the "user pays principle".
- Less distortive port charges could foster short sea shipping.

However, the form of the action to be taken has to be left finally to the European Commission, after consultation with appropriate industry bodies, Member States, and the European Parliament. If the European Commission decides to follow the route of a legislative action then this route would necessarily be accompanied by an impact analysis that should provide a more detailed assessment of the impacts of any change on the market than we have been permitted to do in this short study.

Annexes

Annex 1: TERMS OF REFERENCE (MTCP)

TONNAGE MEASUREMENT OF SHIPS

The European Commission's policy to promote Short Sea Shipping tackles the fast growth of heavy road transport, congestion, road accidents and pollution caused by heavy trucking. Furthermore, it enhances cohesion and links to peripheral areas and islands. The overall policy objective is modal shift from road to short sea in order to minimise unsustainable trends in transport.

One reported problem area for Short Sea Shipping refers to the measurement of gross tonnage (GT) under the IMO International Convention on Tonnage Measurement of Ships (signed in London on the 23 June 1969). The GT calculated under this Convention seems disproportionately higher for certain types of "volume" vessels (e.g. Ro-Ro, car carriers, open-top container vessels) than for other types of vessels (e.g. closed-top lolo container vessels). Furthermore, this GT measurement seems to be frequently used in Europe as a basis to calculate port charges and dues entailing higher charges for "volume" vessels which frequently call at ports.

In this context, the following issues are to be examined:

London Convention

- Background and brief description of the London Convention.
- Has the London Convention been amended since it was established? Have there been unsuccessful attempts to amend the Convention, by which countries, and for which purposes? Can one draw conclusions?

Impact on the market

- Do the methods of calculating port charges and dues have a structural impact on the market (e.g. in terms of choosing vessel types, shipbuilding, port income, cargo costs)?

Calculation and use of gross tonnage

- Is it the case that port charges and dues are frequently based on GT in accordance with the London Convention. How wide-spread is this practice in the EU, and which are the individual port charges and dues normally based on this method? Is the method extended beyond ports (e.g. to fairway dues)? What could be the reason for ports to use this method? Are there relevant obligations under international or national law?

- Does the calculation method of GT adversely affect some types of ships both in terms of GT and port charges and dues? Which types of ships and in what proportion? A couple of concrete examples should be provided of the differences in GT and, consequently, port charges and dues for corresponding ship sizes (e.g. Ro-Ro vs. closed-top lolo).

Alternative calculation methods

- What other calculation methods are used in the EU ports for determining port charges and dues? Details of all calculation methods are not required. A general description of methods is sufficient (e.g. correction co-efficient for “volume” vessels, tariffs based on vessel length, use of net tonnage). How commonly are these alternative methods used in the EU? What could be the reasons for ports to use alternative methods?
- How do the alternative methods relate to the port charges and dues of “volume” vessels in relation to other vessels having theoretically a lower GT? Which of these alternative methods would be most opportune to balance the charges and dues of different vessel types (details are needed of the method(s) chosen)?

Policy direction

Policy recommendations, such as:

- Is this a matter where the EU should consider acting? If yes, what kind of an approach could be taken (on what basis and grounds)?
- One approach could be for the Member States to approach the IMO in order to amend the London Convention and create a balance of calculating GT between vessel types? Would this approach contain added value?
- If approaching the IMO seems justified by the findings, the study should contain a draft submission to the IMO by the EU Member States for the purpose of amending the Convention to better accommodate the above types of “volume” vessels for the purpose of GT calculation.

ANNEX I

Comments on Terms of Reference from the High Level Ro-Ro Carriers Action Group.

Two points for consideration:

- A major factor that should not be overlooked is the unique position of Short Sea Shipping (SSS) in the overall transport chain, how SSS operates, who benefits from cargo transported over a sea-leg and identifying, for the most part, the direct competition to SSS which we believe to be (as the High Level Ro-Ro Carriers Action Group) Land Transport, and further, we believe this to be predominantly Road transport.

An innovative consideration is that the fundamental difference in this regard is that the truck is viewed purely as a means of conveyance by road and at port where there is no charge attached to this means of conveyance and all charges relate to the cargo being transported in/out. A Short Sea Liner service vessel is also just a means of conveyance, transporting cargoes between different (intra) European geographical areas by a "sea road", exactly the same as the truck except that the heaviest charges are now attached to the vessel and not the cargo volumes being transported at any given time - but purely on the size of the conveyance/vessel.

- Ports need to be educated that GT based tariffs for dedicated Short Sea liner services are not appropriate for the intra-European market due to the make-up of the competition being Land transport modes. More emphasis needs to be placed on the inter-European cargoes being transported. It has to be noted that Deep-sea vessels are in competition with other Deep-sea operators therefore in this instance using GT based tariffs affect equally all players in the Deep Sea trade within a fair and level playing field. Other alternatives need to be considered but these should not be limited to "how to charge on vessels" but also towards the cargo as a possibility.

Finally it should be pointed out that if anything Short Sea liner services such as feeder vessels actually enhance the Deep Sea services.

Annex 2: Appendix 2 to the Tonnage 1969 Convention

APPENDIX 2. COEFFICIENTS K_1 AND K_2 REFERRED TO IN REGULATIONS 3 AND 4(1)

V or V_c = Volume in cubic metres

V or V_c	K_1 or K_2	V or V_c	K_1 or K_2	V or V_c	K_1 or K_2	V or V_c	K_1 or K_2
10	0.2200	45 000	0.2931	330 000	0.3104	670 000	0.3165
20	0.2260	50 000	0.2940	340 000	0.3106	680 000	0.3166
30	0.2295	55 000	0.2948	350 000	0.3109	690 000	0.3168
40	0.2320	60 000	0.2956	360 000	0.3111	700 000	0.3169
50	0.2340	65 000	0.2963	370 000	0.3114	710 000	0.3170
60	0.2356	70 000	0.2969	380 000	0.3116	720 000	0.3171
70	0.2369	75 000	0.2975	390 000	0.3118	730 000	0.3173
80	0.2381	80 000	0.2981	400 000	0.3120	740 000	0.3174
90	0.2391	85 000	0.2986	410 000	0.3123	750 000	0.3175
100	0.2400	90 000	0.2991	420 000	0.3125	760 000	0.3176
200	0.2460	95 000	0.2996	430 000	0.3127	770 000	0.3177
300	0.2495	100 000	0.3000	440 000	0.3129	780 000	0.3178
400	0.2520	110 000	0.3008	450 000	0.3131	790 000	0.3180
500	0.2540	120 000	0.3106	460 000	0.3133	800 000	0.3181
600	0.2556	130 000	0.3023	470 000	0.3134	810 000	0.3182
700	0.2569	140 000	0.3029	480 000	0.3136	820 000	0.3183
800	0.2581	150 000	0.3035	490 000	0.3138	830 000	0.3184
900	0.2591	160 000	0.3041	500 000	0.3140	840 000	0.3185
1 000	0.2600	170 000	0.3046	510 000	0.3142	850 000	0.3186
2 000	0.2660	180 000	0.3051	520 000	0.3143	860 000	0.3187
3 000	0.2695	190 000	0.3056	530 000	0.3145	870 000	0.3188
4 000	0.2720	200 000	0.3060	540 000	0.3146	880 000	0.3189
5 000	0.2740	210 000	0.3064	550 000	0.3148	890 000	0.3190
6 000	0.2756	220 000	0.3068	560 000	0.3150	900 000	0.3191
7 000	0.2769	230 000	0.3072	570 000	0.3151	910 000	0.3192
8 000	0.2781	240 000	0.3076	580 000	0.3153	920 000	0.3193
9 000	0.2791	250 000	0.3080	590 000	0.3154	930 000	0.3194
10 000	0.2800	260 000	0.3083	600 000	0.3156	940 000	0.3195
15 000	0.2835	270 000	0.3086	610 000	0.3157	950 000	0.3196
20 000	0.2860	280 000	0.3089	620 000	0.3158	960 000	0.3196
25 000	0.2880	290 000	0.3092	630 000	0.3160	970 000	0.3197
30 000	0.2895	300 000	0.3095	640 000	0.3161	980 000	0.3198
35 000	0.2909	310 000	0.3098	650 000	0.3163	990 000	0.3199
40 000	0.2920	320 000	0.3101	660 000	0.3164	1 000 000	0.3200

Coefficients K_1 or K_2 at intermediate values of V or V_c shall be obtained by linear interpolation.

Annex 3: Figures on relationship between TEU and GT

World container ship fleet by year of construction 1 October 2006

	-1981	1982-1986	1987-1991	1992-1996	1997-2001	2002-2006
No.	357	373	294	727	979	1.094
TEU	390.070	584.931	619.990	1.385.703	2.384.761	3.790.778
GRT	5.923.227	8.026.092	7.916.134	16.269.636	27.291.998	41.980.314
DWT	6.417.053	9.256.226	9.121.051	19.421.781	31.685.317	48.561.523
gt/TEU	15,19	13,72	12,77	11,74	11,44	11,07
gt/dwt	0,92	0,87	0,87	0,84	0,86	0,86
dwt/TEU	16,45	15,82	14,71	14,02	13,29	12,81

Source: ISL 2006, based on Lloyd's Register/Fairplay

Annex 4: Consultations with Industry and Port Administrations

<u>Name Organisation</u>	<u>Role of Organisation</u>
ESPO	Association of Port Authorities
High Level Ro-Ro Carriers Action Group	Industry Association
Valencia Port Foundation	Centre of Excellence for Research, Training and Cooperation in the Port Sector
Senator for Economics and Ports	Port Administration
Hamburg Port Authority	Port Administration
Gdynia Port Authority	Port Administration
Luka-Koper Port Authority	Port Administration
Luka-Koper Harbour Master	Harbour Master
Le Havre Port Authority	Port Administration
Germanischer Lloyd	Classification Society
Bundesamt für Seeschifffahrt und Hydrographie	Federal Maritime Administration