



IMPRINT-EUROPE

*Implementing Reform in Transport
Effective Use of Research on Pricing in Europe
An European Commission funded Thematic Network (2001-2004)*

Marginal cost pricing in the maritime sector Cost calculation, acceptance and Swedish infrastructure charging practice

Henrik Swahn

Senior Adviser, Swedish Maritime Administration

henrik.swahn@telia.com

This essay was prepared for the third seminar of the IMPRINT-EUROPE Thematic Network: "Implementing Reform on Transport Pricing: Constraints and solutions: learning from best practice", Brussels, 23rd - 24th October 2002

Table of contents

Table of contents.....	2
Preface.....	3
Abstract.....	4
1. Introduction.....	5
2. What cost elements need to be calculated?.....	7
Introduction.....	7
Ship navigation in coastal waters.....	7
Ship navigation in port access fairways and in the port basins all the way to the quay side.....	9
Port operations - Loading and unloading of goods (passengers).....	11
A Concluding remark on the credibility of available maritime sector cost estimates.....	12
3. Learning from (best?) practices.....	15
The Swedish practice.....	16
KM-charging for diesel vehicles.....	17
Railway infrastructure charges.....	17
The Swedish system of environmentally differentiated fairway charges.....	18
Air traffic charges.....	19
Institutional initiatives.....	20
References.....	22

Preface

This paper has been produced for the third imprint seminar. The purpose of the paper is to introduce into the discussions of implementation of marginal cost pricing two important issues. The first is to provide some input for a discussion on how far cost calculations really have to be elaborated in the framework of implementation of marginal cost pricing. The paper questions the idea that to solve the pricing problem in the context of infrastructure charging for seaports it would also be necessary to solve the entire pricing problem for ports, which is very complex. The second issue is to bring into the marginal cost pricing discussion once again the option to differentiate infrastructure charges, an option which has been used successfully in Sweden.

The views expressed in this paper are entirely my own and do not necessarily coincide with the views of the Swedish Maritime Administration, which is my organisational affiliation.

Stockholm October 11, 2002

Henrik Swahn

Abstract

It has been argued that accurate marginal cost calculation is an almost mandatory prerequisite for the implementation of marginal cost pricing. In this paper this view is questioned from two different perspectives. First it is argued that reasonable priorities for cost calculations could be established. In the case of port infrastructure charging it is argued in the paper that given certain boundary conditions of accounting and transparency, the entire pricing issue could be left with the ports as market actors without causing any significant distortions. Second, referring to Swedish practice a case is developed for e.g. environmental differentiation of charges in an imperfect world where fiscal considerations and international interdependencies makes pure marginal cost charges problematic. Finally some Swedish institutional arrangements for dialogue and reconciliation of views between shippers, transport industry and policymakers are presented briefly.

1. Introduction

While the principles of marginal cost pricing lately have been endorsed by most transport sector players the prospect of concrete steps being taken towards an actual implementation of such a charging regime seems to provoke resistance. This is not only true for the maritime sector but by and large also for road and air transport. This is seemingly a contradiction, which needs to be scrutinised. What are the reasons for the persistence over the years of co-existence of acceptance in principle with resistance to practical implementation? Why is it that regulation based on standards eventually seems to be more acceptable than economic instruments which in most cases could be demonstrated to be superior from an efficiency point of view.

There are a bundle of well known arguments advanced in favour of postponing the actual implementation of short run marginal cost pricing (in the following the abbreviations SMC-pricing or MC-pricing are used), of which some of the most frequent arguments are listed below:

- International competition will be distorted both in product markets and in transport services market
- Paramount uncertainty exists of the precise level of cost for different elements which constitute the marginal cost
- Cost of charging system and enforcement will be too high or even impossible to devise.
- Conflicts with existing international or national legal frameworks
- The effectiveness to divert traffic between modes is questioned
- The effectiveness to reduce pollution is questioned
- It would be unethical to rely on economic instruments to control pollution
- Political acceptability is low

Some of these arguments are touched upon in this paper in the context of discussing other slightly more technical issues of marginal cost pricing in maritime transport.

There are three themes in this paper.

The first one has to do with the problems of estimation of relevant marginal costs, which is sometimes looked upon as an insurmountable task. Starting from a simple structure of the relevant cost items the discussion in the paper tries to establish the relative importance of the various cost items. As for marginal costs of ports, which have proven to be a notoriously difficult issue, it is argued in the paper that, from an efficiency point of view, omitting the port costs from the infrastructure charges would not seriously hamper the structure of maritime charges, since the port costs would anyway be included in a reasonable way as market determined prices. Provided this position is correct, research on cost as a basis for marginal cost based infrastructure charges could initially focus on other issues. The alternative priorities are discussed in the paper. The crucial remaining cost item turns out to be the marginal environmental costs.

The second theme is differentiation of infrastructure charges. From Swedish infrastructure charging practice there are examples of differentiated infrastructure charging schemes, where differentiation could address environmental properties of vehicles/vessels/craft or other priority dimensions. A differentiated scheme could be demonstrated to be inferior to a pure marginal cost pricing scheme from an efficiency point of view. However, in the light of international competition in transport and other sectors second best alternatives could be worth considering.

The third theme, which is only briefly touched upon in the last chapter, is to report on a couple of institutional arrangements in Sweden, which aim at improving the knowledge base for marginal cost pricing as well as to establish and maintain a forum for a dialogue between shippers, transport industry and policy makers.

2. What cost elements need to be calculated?

Introduction

In the discussion of implementation of marginal cost pricing there have been signs of a general feeling of desperation when facing the real world problem of price calculation. Meersman et al (2002) discuss the complications of calculating prices for port services. Ricci (2002) highlights the problems of calculation of actual costs of intermodal transport chains, noting that one major complication is the reluctance of major players involved in the transport chains to disclose relevant cost data. Jansson (2002) in a paper on a Swedish seaport case study also refers to similar problems to acquire relevant data for marginal cost estimation purposes. There might, however, exist some relevant simplifications.

Consider a general formulation of the pricing problem (Jansson (2002):

$$MC = MC \text{ prod} + Q * \frac{dAC_{user}}{dQ} + MC_{ext} \quad (1)$$

For maritime transport it is reasonable and suitable to define this MC-function for three separate major parts of maritime transport activity namely:

1. Ship navigation in coastal waters and to and from the access fairways controlled by the respective ports.
2. Ship navigation in port access fairways and in the port basins all the way to the quay side.
3. Loading and unloading of goods (measured in a suitable way e.g. tons, number of TEU, number of semitrailers etc.) and boarding/alighting of passengers.

In the pricing formula, the quantity Q should most conveniently be related to the characteristics of the ship for cases 1 and 2 but related to goods handling units or tons in case 3. The characteristics of the elements of the pricing formula are discussed below for each of these three cases.

Ship navigation in coastal waters

The expression “coastal waters” is used here in a rather tentative meaning. It is clear that maritime safety as well as environmental considerations are a cause of concern for

the coastal states of the EU and therefore for the EU as such. In the Commissions white paper on the CTP it is said:

“Maritime transport will need to integrate charges which incorporate costs relating to maritime safety (bouyage, availability of tugs such as l’Abeille). All ships sailing in European waters should pay such charges” (p 78) and further on pages 95-97 (ibid.) there is a discussion on applying stricter regulation/control and a traffic management system off the EU coast. The establishment of the European Maritime Safety Agency creates part of an institutional framework to enhance maritime safety as well as the environmental quality of maritime transport off the EU coasts.

Besides the concern for oil spillage, not to mention oil disasters and other types of waste disposal, it seems to be fairly well established that exhaust emissions to air off the EU coasts will have various negative effects ashore in the EU.

Considering what has been said above, it seems obvious that there are out of pocket as well as environmental damage costs and risk costs associated with maritime transport off the EU coasts. There will be out of pocket costs for traffic control, navigational support including pilots and tug assistance in some cases, rescue and support operations resources etc. To the extent these cost items are dependent on traffic volume and traffic structure there is also a marginal cost element relevant for charging (MC_{prod} in equation (1) above). The second term in equation (1) captures the cost of interaction between ships when traffic grows. In this case relevant elements may be user waiting time/lower speed due to heavy traffic as well as the traffic volume dependent increase in the accident risk cost of the ship collective. The third term, MC_{ext} is clearly also a relevant marginal cost component considering the dispersion pattern of exhaust gases, oil spillage and the associated damage cost. Emissions of greenhouse gases is also a case in point.

The Swedish experience, considering the comparatively low maritime traffic density in most Swedish waters, is that for navigation off the coast the marginal cost elements defined by the first and second term of equation (1) are of minor importance. Once the relevant systems are in place the marginal cost component will generally be small. The cost of pilots and assisting tugs are examples of two marginal cost items with a non

negligible magnitude. The emission costs included in the third term of equation (1) will, on the other hand, be significant.

To summarise, for a marginal cost calculation of shipping to be complete, it seems necessary to also include in the calculations the marginal costs of traffic off the EU coasts whether it is intra-EU or international. From a welfare perspective, the relevant area to include (territorial waters of 12 nautical miles or economic zones 200 nautical miles or something in between) is the area where the traffic incurs significant marginal cost for the EU. In the discussion on marginal cost pricing, it seems as if the issues dealt with above have been largely neglected¹.

There is a considerable volume of maritime transit traffic in EU coastal waters – especially if there are wide borderlines of what is defined as EU coastal waters. It is an open issue to what extent the provisions of UNCLOS² and IMO³ would make it possible for EU to levy and enforce charges for navigational support, safety measures etc. as well as for external user costs and environmental costs.

The possible charging regime for coastal navigation aids discussed in this section was mentioned in COM(97) 678 and earlier in COM(93)66. According to these documents a charging system should aim at recovery of the development and investment cost for such facilities and provide a mechanism to equitable share the financial burden with users. Thus, despite the obvious “public goods” nature of these services an average cost approach seems to be advocated as opposed to the marginal cost approach favoured for similar navigational aids, which are more directly related to ports.

Ship navigation in port access fairways and in the port basins all the way to the quay side

Basically the same cost components are relevant for navigating in port access fairways as for navigation off the coast, but the marginal cost structure will vary between individual ports. One dimension which varies very much between ports is the distance

¹ Special considerations may be required for marginal cost calculations applying to waters north of 60 N latitude regarding e.g. ice-breaking, which is eligible for TEN support.

² UNCLOS : United Nations Conference on the Law of the Sea

³ IMO International Maritime Organisation, a United Nations organisation for co-operation on maritime safety and the marine environment.

between the coast line and the berths in the port. For Swedish ports this distance varies from 0 to more than 100 nm. The distance among other things influence the pilot costs, in some cases the cost of tug assistance.

Another factor is the propensity of ship generated as well as autonomous erosion of the fairway, which will incur costs for dredging and shore side maintenance/protection. Still another factor is the ports situation in relation to the population, which will affect the impact of ships' emissions. Therefore, a local damage cost component in some cases have to be added to the regional/global marginal emission cost components which dominate for off coast navigation.

For Swedish ports the average cost for access fairways vary strongly between ports. The Swedish Maritime Administration (SMA) has estimated the average fairway infrastructure cost to the port of Trelleborg at 0,10 SEK/ton while the corresponding cost for a port in lake Mälaren is 5 SEK and for the port of Göteborg 0,25 SEK. It should be noted, however, that these figures represent average costs for the ports' access fairways. The marginal infrastructure costs for the access fairways are much lower. The most significant marginal cost item is also in this case marginal emission costs related to the third term of equation (1) above.

Since the access fairways by definition are located within the territorial waters of each state, levying charges on the maritime traffic should not encounter any legal problems relating to UNCLOS or IMO conventions. The total marginal cost for using the access fairway will in any specific case be dependent on safety and other regulations as well as the characteristics of the built and/or natural fairways, the traffic volume and its composition. In any actual calculation case, the short term marginal cost will be influenced by the regimes of investment/maintenance and maritime safety, whether capacity is scarce or abundant.

Any organisation which is in charge of the fairway could influence short term marginal cost relating to the first and second terms of equation (1) above via its safety, investment, and maintenance policy. In Sweden and Finland the major parts of the access fairways are operated by state agencies. In other EU-countries the organisational responsibilities are arranged differently. It seems safe to conclude that the institutional

structure will influence safety and investment/maintenance regimes, and therefore also the marginal cost structure. Excess capacity will go along with low marginal costs. Following the Commissions proposed directive on market access to port services, COM(2001) 35 final, the facilities discussed under this heading will qualify as “public infrastructure” and therefore public funds could be used to finance these facilities. It would be reasonable to assume that prudent use of public funds would lead to the application of transparent efficiency criteria for investments/measures financed by public funds. However, there is no mechanism preventing a public body to lower the short run marginal cost by means of excess capacity or more than optimal service levels.

Port operations - Loading and unloading of goods (passengers)

“Thus the port industry is increasingly viewed as moving from a situation where predominantly public capital was used to provide common user facilities, to one where capital from different sources is being used to provide terminals which serve the logistical requirements of more narrowly defined groups of commercial users. In such a way, the ‘general economic interest’ argument loses weight, leading to a more commercial attitude towards pricing and infrastructure funding.⁴”

We mentioned above the problems encountered by different researchers trying to come to grips with the cost structure of ports for pricing purposes. In port operation a complex mix of resources is used to provide the logistical services in demand. Land is an important input in the operations of a modern port. The infrastructures of maritime access and hinterland connections by road, rail and inland waterways which are all eligible as public infrastructure elements are mostly necessary facilities and the same goes for berths and quays. In the production process of a port the public infrastructure components are interacting with user specific infrastructure. To actually produce the logistic services the existence and services of public and private infrastructures need to be supplemented by superstructures as well as various activities, using more or less capital equipment and labour such as stevedoring, cargo handling, storage, bulk-break etc.

Jansson (2002) argues that there is no simple way to separate the elements of the port production process and that optimal price calculation should integrate all basic elements

⁴ COM(97)678 final Green paper on sea ports and maritime infrastructure

of the production process. It seems therefore as if ports (being mainly a logistic business entity) ideally should optimise land allocation, infrastructure, superstructure and cargo handling operation together and use pricing within this framework. The easy and seemingly simple way out of the headache of calculating marginal cost based infrastructure charges as a component of the total port cost would be to allow ports to set prices at their own discretion. Since EU state aid rules precludes subsidising losses of public companies and the transparency directive will make it possible to verify irregular use of public funds, there are two remaining distortions:

- infrastructure cost is charged below short run marginal social cost
- individual ports might exploit a monopolistic position and charge too high prices for public infrastructure services

Considering the lack of uniform infrastructure investment/maintenance/service criteria for infrastructure services the bottom level of charging for the infrastructure part anyway approaches zero. It should, however be comparatively easy, given more transparent accounting of ports for any external party, to verify the marginal cost calculations of the services provided by public infrastructure. The check on too high prices is basically executed by market competition. It has been asserted in the process of developing the so called “port package” that there is tough competition between ports and also to some extent with other modes of transport. Nevertheless, there are always customers which due to various reasons are captive and therefore could be subject to price discrimination from the monopolist. This risk of overpricing due to monopolistic powers, must be dealt with within the framework of EU competition law.

Therefore, the remaining cost item of real concern here is the third term of equation (1) above – the marginal cost of external effects outside the logistic operation of the port itself. We are then talking about exhaust gas emissions, noise etc. Albeit complicated it seems like a more reasonable task to tackle than the pricing of port logistic services in its entirety, given the recent EU-level development of calculation tools for external cost based on the impact pathway method.

A Concluding remark on the credibility of available maritime sector cost estimates

From the discussion above it can be concluded that it is essential for a marginal cost based pricing scheme for maritime transport to be able to calculate environmental

external cost with reasonable precision. Another potentially important cost category are the marginal producer and user cost associated with off coast navigation. A third category is the producer and user cost of the access fairways, which may be handled differently in various countries due to varying natural conditions and institutional traditions. The overall costs of ports are probably as such a significant cost item, but according to the above argument, the charging for these costs could be delegated to the market actors, despite the existence of support from public funds to public infrastructure and associated services.

To my knowledge there is no solid knowledge base on the cost structure of off shore navigational, maritime safety and rescue infrastructure, and it seems to be unclear to what extent marginal cost pricing or average cost pricing would be applied in this area. Given the provisions of international conventions like UNCLOS, MARPOL and SOLAS⁵ the implementation and enforcement of compliance with a charging scheme within this field will need further investigation. It will be important to consider also the costs of charging and enforcement per se, when deciding on an appropriate charging scheme.

The producer marginal cost components of navigational aids, pilots etc, and maintenance of the fairway e.g. by dredging etc, are generally not expected to cause any major problems of acceptance with the stakeholders. Assuming that these cost will be calculated on a marginal cost basis instead of on an average cost basis, the financial impact for the ship owners will be positive. However, there may be more confusion as well as discussion relating to the second term of equation (1) especially in crowded port approaches with complicated navigation. In these instances the short run average user cost may well be rising which would introduce a price relevant element, which is not present in the accountants records. Therefore, it seems important to introduce and to explain this cost element and its likely significance in suitable stakeholder fora.

Given that we accept the view presented above on port charges, the remaining cost category to consider is external costs affecting others than the directly involved

⁵ MARPOL = IMO International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78).

SOLAS = IMO International Convention for the Safety of Life at Sea ,

shipping/logistic stakeholders. These cost elements have to be assessed for off coast navigation, for access fairways, and in ports. Judging from available cost estimates these costs could be expected to be significant and if included in charges/dues they would directly influence the profit of ship owners as well as shippers' transport costs. Therefore, it is realistic to assume that there will be an intense debate on methods for cost estimation as well as controversies on the various impacts of such user charges. To avoid a stalemate of the implementation process, it will be necessary both to continuously improve the cost estimation models and methods. Considering the existence of emission targets at the EU level as well as at the national level it seems wise to supplement the damage cost approach with a "shadow price" approach. Credible tools for analysing impact on demand, profits, and the competitive position of the European industry are also a must in an implementation process.

Alternative schemes will be launched by stakeholders. One early example is the scheme for tradable emission credits for NO_x and SO_x, which was recently presented by the Swedish ship owners association. The basis for this scheme is the assumption that the abatement cost of SO_x and NO_x emissions are much lower in shipping than in the "capped" land based emission sources of these emissions. By combining a grandfather rights system and the tradable emission credits, the maritime sector abatement measures would by and large be financed by land based firms with high abatements costs.

The issue of correcting other already existing taxes has been highlighted by the Commission and should not be forgotten as the implementation process for marginal cost based infrastructure charges goes on. The following statement of the White paper on the common transport policy must be given a concrete formulation as a part of an implementation process

"..such integration would not work against European competitiveness. It is not so much the overall level of taxes that needs to change significantly but rather their structure, which needs to be altered radically to integrate external and infrastructure cost into the price of transport. .. by offsetting any increase in infrastructure charges by lowering existing taxes such as taxes on labour, or by allocating revenue to the financing of infrastructure.(COM (2001) 370 p. 75)"

3. Learning from (best?) practices

There are few if any full fledged short run marginal cost pricing regimes for infrastructure charging including external effects in operation in Europe today. In the railway sector such a regime may be approaching when the railway directives now have to be implemented in national legislation (by March 2003). Even if access and user charges at the outset will be calculated differently in various EU-countries, the implementation of the directives requires that data and arguments underpinning prices will have to be transparent. This regime will probably foster a pragmatic Europe wide pricing discussion, which eventually could lead to converging views. This view on convergence might be too optimistic, but no doubt much of value for MC-pricing in other transport sectors could be learnt from the coming pricing discussions for European railways.

For the author of this paper the detailed knowledge of processes and thinking pertaining to pricing of infrastructures is restricted to the Swedish arena. The following discussion will therefore, unfortunately, have to be restricted to the Swedish context.

When international access to the transport markets in Sweden was restricted and regulated, the discretionary power of the state to determine taxes and charges relating to fuel and infrastructure use was high. A corollary to this state of affairs for taxation was less stringent demands on calculations of external cost, which in some cases influenced vehicle and fuel taxation levels. Errors in cost calculation influenced transport industry profitability but regulation and restrictions on international competition ensured that these errors could be passed on to the transport users, which was less of a headache for transport industry.

Deregulation and opening of transport markets has, however, gradually made the problems of infrastructure charging, fuel taxation more and more difficult to handle at the national level at least for a small open economy like Sweden. The opening of the transport markets for international competition is incompatible with levying charges for the national infrastructure only on the national vehicle/vessel fleets if fair competition between transport operators of different nationality is to prevail. Since shippers (producers, trading companies etc) also increasingly are exposed to intra EU and other

competition the cost level of transport including infrastructure charges, becomes a problem. This translates to demands for good infrastructure as well as (low and)well founded charges for the national infrastructure. In this competitive situation between industry and nations it is natural that the cost calculations underpinning infrastructure charges will become targets for intense scrutiny. In the absence of good and reliable cost data the normal position to take by industry and policy makers is to revert to whatever minimum charges that might be fixed at the EU level. Therefore, the required quality of cost calculations for charging purposes has been increasing over the years.

The Swedish practice

It is an open issue, whether it could be argued that the Swedish practice in any respect provides an example of “best practice”. Anyway, there is an experience in the Swedish context of arguing for and dealing with economic instruments relating to charging infrastructures and transport externalities, from which hopefully something could be learnt.

The Swedish infrastructure charging practice during the last 10-15 years is largely based on fiscal considerations, which sometimes were supported by analyses of the marginal societal cost of certain types of transport. Such analyses could probably be viewed as a means to ensure, that charges are at least roughly in line with the price relevant societal cost of each type of transport operation, which for long has been a key principle of Swedish transport policy. Undoubtedly, such cost calculations have indeed played a role e.g. for the structure of taxes/charges for heavy goods vehicles in Sweden. The corollary of the transport policy principle of marginal cost based charges is that investment decisions are in principle based on Cost Benefit Analysis (CBA). However, the CBA framework is only occasionally, for major investments, applied to the maritime and air sectors. Road and rail infrastructure are financed over public budgets while maritime and air infrastructure provisions are financed by user charges.

The issues of congestion and wear and tear of the infrastructures, have tended to loose grounds in the discussions on marginal cost pricing in Sweden over the years, and environmental issues have gradually come to the fore as the most important issue. Congestion is generally small in Swedish waters, on the roads and in the air, with the notable exception of Stockholm and a couple of other major cities. Wear and tear of the

infrastructure is not important for air and sea traffic but have greater relevance for road and rail.

Looking back at the various infrastructure charging schemes that have been devised over the years in Sweden, there is one aspect which should be emphasised namely *differentiation*. The various charging regimes have been less concerned with absolute levels than with the provision of incentives by means of differentiation of charges. The focus of differentiation has shifted from wear and tear to environmental aspects. Below we will give brief comments on a few important examples from the Swedish practice of infrastructure charging in retrospect, which also illustrate the use of economic instruments for differentiation rather than applying a full-fledged marginal cost approach.

KM-charging for diesel vehicles

This scheme was in operation until Sweden effectively joined the EU, when the system was abandoned since it was deemed not to be compatible with EU legislation. The km-charges were differentiated according to the estimated cost of wear and tear of the road network for various types of heavy goods vehicles. The technical charging system had a few flaws and was increasingly exposed to fraud. The system was based on an on board metering device the registrations of which were passed on to a card and at fixed periods sent to the relevant authority. Special arrangements had to be made for vehicles in international traffic. In this system, differentiation focused wear and tear, but the system was judged as being reasonably designed to promote environmental objectives.

Railway infrastructure charges

Since 1998 the railway user charges are entirely based on short run marginal cost, with a few minor exceptions. There is for instance a special charge for raising a contribution to the financing of the Öresund bridge, which is not based on marginal costs. Before 1998 there was a two part tariff with a wagon charge and a charge based on variable costs. When the railway charging system now is being revised in Sweden there are a few difficult and crucial issues to deal with. One is how to deal with external cost in electricity generation and others are the calculation of marginal cost of rail noise as well as how re-investment should influence marginal cost. There are diverging views of these issues in Sweden. It is noteworthy in the case of rail, that both the absolute level of marginal costs and the cost structure are expected to influence railway charges.

The Swedish system of environmentally differentiated fairway charges

This system has been presented in detail in Swahn(2002), a paper produced for the second Imprint seminar. hydrographics, navigation aids for coastal navigation including lighthouses, sea marks and buoys as well as for port approaches to port boundaries, ice-breaking services in coastal waters, pilots, vessel inspection (flag and port state) and rescue services are carried out and managed by the Swedish Maritime Administration, which is a state agency, financed by user charges. These charges are today based on ships' GT⁶ and loaded/unloaded tons of cargo. From this basis and given the total yearly cost of the above operations, an environmental differentiation addressing SOx and NOx was launched in the beginning of 1998, which is financially neutral for the Swedish Maritime Administration. For the details of this system see Swahn (2002). The system has been observed as a potential pricing model by the Commission in the White Paper on the Common Transport Policy.⁷

In Sweden there are politically defined objectives for a gradual reduction of traffic emissions, and maritime sector emissions are particularly important with regard to emissions of SOx and NOx, which is the reason for focusing those two gaseous emissions in the fairway charging system. During the first two years differentiation of fairway dues was supplemented by an investment subsidy for measures taken to reduce NOx emissions (catalysts, HAM⁸ technology etc) , but the subsidy scheme was closed in 2000. The differentiation scheme was not based on calculation of emission damage cost, but rather on rough estimates of abatements costs, which was intended to be partly financed by discounts of the fairway charges. Within a tripartite framework for the launching of the scheme involving ports and the ship owners' association besides the Swedish Maritime Administration (SMA), the first mentioned parties were each expected to contribute approximately as much as the SMA to finance the abatement measures. As reported in Swahn(2000) the environmental differentiation of the charging

⁶ GT = gross tonnage, a number representing a ships volume

⁷ COM(2001) 370, p 77

In maritime transport, the Commission is looking at the tariffs currently applied in Sweden in this sector, particularly port taxes and taxes to reduce pollutant emissions in order to see whether this approach might encourage greater account to be taken of external costs elsewhere in the community. In the light of this examination a Community framework may be proposed, which link port taxes to these costs.

⁸ HAM –humid air motor

scheme together with the tripartite agreement has induced considerable reductions of maritime SO_x and NO_x emissions.

Interestingly enough in the present context of implementation of marginal cost pricing, it seems as if one of the driving forces behind the differentiated charging scheme from the shipping industry viewpoint was to reduce the risk of introduction of a pure system of maritime emission charges, which for shipping on Swedish ports would have meant significant cost increases.

The system of state fairway dues is now once again being revised. The purpose of the revision is to further strengthen the incentives for reductions of maritime emissions to air. However, the revision of the dues once again is not directly addressed towards marginal cost pricing. Rather, the idea is to bring charges more in line with relative marginal costs for different external effects of commercial maritime transport within a financial constraint defined as unchanged overall income from fairway dues. Therefore, marginal costs do not determine the level of charges but marginal cost (for ship types, different approach fairways etc.) are influencing the distribution of charges between user categories. The calculations of major items of the environmental external costs are partly based on the ExternE findings. For other marginal cost items other tools and data support are used.

Air traffic charges

The Swedish air traffic charges basically are set to cover the (average) cost of providing navigational aid, air traffic control, security, runway infrastructure etc., which is similar to the system for maritime fairway charges. Also to this system an environmental differentiation is in operation. An emission charge is associated with the “landing charge” component. The emission charge aims at reducing NO_x and HC and the charge is based on the calculated abatement cost of these emissions. The actual charge levied is based on certification data from the manufacturers of aircraft motors. By a suitable reduction of the landing charge excluding the emission charge the total financial effect of the charge is neutral. This system is therefore similar to the system of maritime emission charges discussed above.

Beside the emission charges there are also noise related charges since 1994. The level of charges is set to finance noise abatement measures up to a certain level.

The Baltic strategy for port reception facilities for ship generated wastes

Environmental problems are caused in the Baltic Sea by the discharges of wastes from ships. Under the Helsinki Convention of 1974 (HELCOM) the Baltic states are co-operating to fight such pollution of the Baltic. Moreover the Baltic Sea is designated as a Special Area under MARPOL 73/78 implying that all ship generated waste should be delivered to reception facilities ashore. However, these regulations have been and are still violated at an alarmingly high rate. To address this problem the so called “Baltic Strategy” was adopted by HELCOM in 1996, which among other things set out action to make adequate reception facilities available in all relevant ports.

From the point of view of marginal cost pricing, the Baltic strategy contains the unorthodox mechanism of actually prohibiting the use of a special fee for reception and subsequent treatment of ship generated waste. The real marginal cost of handling of ship generated waste should be covered via other general port dues and be charged to all ships calling the port irrespective of whether the ship delivers waste or not.

Institutional initiatives

Policy level group for analysis of the marginal cost of transport

Despite the traditional Swedish focus on differentiation of charges, the latent basis for a pure marginal cost approach is continuously developed. There is a permanent working group for improvement of marginal cost calculations for all Swedish transport subsectors. This group is chaired by the Ministry, co-ordinated by the Swedish Institute for Transport and Communications Analysis and with active participation from the public agencies for road, rail, maritime and air transport. Associated with the group is a 3-5 year research programme, which is dedicated to issues and problems of implementation of marginal cost pricing.

Another Institutional Platform – the Government Freight Commission.

After a few years of intense activity the first Freight Commission presented its report in July 2001. Members of the Freight Commission were representatives of the Shipper community, transport industry representatives, the research sector, and policy makers

from relevant ministries as well as from the public agencies of the transport sector. The Freight Commission in its report supported the full implementation of marginal cost pricing in all modes of transport. According to the Freight Commission, deviations may become necessary while waiting for an EU wide implementation of the marginal cost principles. Not included in the marginal cost framework of the Freight Commission were the marginal damage cost to the environment of transport activities. According to the Freight Commission these issues should be addressed on an EU wide and fully cross sectoral basis mainly through economic instruments.

Now the mission of the first Freight Commission is continued in the new Freight Commission of 2002. This new Freight Commission, among other things, shall continue to tackle the pricing issues related to intermodal transport, particularly terminals and ports, but shall also consider general pricing issues relevant to goods transport as well as the implementation of a coming EC directive on market access to port services in Swedish law. Moreover the Freight Commission should constitute a forum for continuous dialogue between the shippers, transport industry, and the policy makers.

References

ELEKTROWATT-EKONO, JAAKO PÖYRY GROUP (2002), Estimation of Marginal Environmental Emission Costs of Maritime Transport. pilot study based on the ExternE-methodology. Study commissioned by the Swedish Maritime Administration and the Swedish Institute for Transport and Communications Analysis, May 2002.

EC, COM (97) 678 final Green paper on sea ports and maritime infrastructure

EC, COM(2001) 35 final, proposal for a directive On Market Access to Port Services. Brussels 13.2 2002.

EC, COM(2001) 370 White Paper; European transport policy for 2010; time to decide. Brussels 12/09/2001

ELEKTROWATT-EKONO, JAAKO PÖYRY GROUP (2002), Estimation of Marginal Environmental Emission Costs of Maritime Transport. pilot study based on the ExternE-methodology. Study commissioned by the Swedish Maritime Administration and the Swedish Institute for Transport and Communications Analysis, May 2002.

FRIEDRICH, R AND BICKEL, P, (EDS.) (2001), Environmental External Costs of Transport, Stuttgart 2001, Springer Verlag.

JANSSON, J.O. Swedish sea port case study, unite wp 5.5, working paper, January 22, 2002

JANSSON, J.O. Transport System Optimization and Pricing, Bath 1984.

LINDBERG, GUNNAR, Recent progress in the measurement of external costs and implications for transport pricing reforms. Draft paper presented at the Imprint seminar in Brussels, May 14-15, 2002

MATROS, Consortium, A common strategic framework for maritime transport in the Baltic sea region from a spatial development perspective. Final report part 1. SIKa and Boverket, Sweden 2001.

MATROS, Consortium, Maritime transport and best practice in hinterland planning. Case studies, October 2001. Final report part 2. SIKa and Boverket, Sweden 2001.

MEERSMAN, H, VAN DE VOORDE, E AND VANELSLANDER, T, Port pricing issues. Considerations on Economic principles, Competition and wishful thinking., University of Antwerp

RICCI, ANDREA, Pricing of intermodal transport. lessons learned from RECORDIT. ISIS, Rome

ROY, RANA, The fiscal impact of marginal cost pricing, The spectre of deficits or an embarrassment of riches? Abstract for a paper presented at the Imprint seminar in Brussels, May 14-15, 2002.

SIKA and BANVERKET , Nya Banavgifter. Analyser och förslag. (New railway charges? Analysis and proposals. SIKA Rapport 2002:2 (in Swedish)

SIKA Report 2000:10 Översyn av förutsättningarna för marginalkostnadsbaserade avgifter i transportsystemet. Slutredovisning. (Review of the potential for marginal cost based charges in the transport system. Final report, in Swedish). SIKA 2002.

SOU2001:61 Godstransporter för tillväxt. (Goods transport for growth; final report of the Freight Transport Commission.) July 2001.(in Swedish)

SWAHN, HENRIK, Environmentally differentiated fairway charges in practice – the Swedish experience, Discussion paper presented at the Imprint seminar in Brussels, May 14-15, 2002.

SWEDISH MARITIME ADMINISTRATION, Sjöfartens Externa kostnader. 2002-01-09. Report to the Swedish Marginal Cost Study 2001.

SWEDISH MARITIME ADMINISTRATION, The Baltic Strategy, Issued in April 1999.

TURNER, R.K, PEARCE D., AND BATEMAN, I, Environmental Economics. An elementary introduction. 1994.