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# **CO-OPERATION AND EXPANSION IN CONTAINER HANDLING: HOW ABOUT SOCIAL IMPLICATIONS?**

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Abstract

It is observed that cargo-handling companies get involved into various forms of expansion and co-operation, and that these may impact on employment at terminals. Two research questions are pursued in this paper: whether certain specific forms of co-operation are likely to have stronger or weaker impacts on a terminal's or port's social conditions. and whether a number of selected co-operation and expansion moves of some of the major specific container-handling companies may be beneficial or detrimental to employment. For testing the first respective hypothesis, a classification of forms of co-operation and expansion is developed. For the second, use is made of a self-composed record of co-operation and expansion moves effectuated by the world's major container handling companies. The results of this paper are useful from a policy as well as from an operational perspective. Employment is experienced as a source of welfare in policy matters, but rather as a cost element in operational issues.

## **CO-OPERATION AND EXPANSION IN CONTAINER HANDLING: HOW ABOUT SOCIAL IMPLICATIONS?**

### **1. RATIONALE AND SETTING**

It is well known that sea ports are important employment centres, and that cargo handling as an interchange between transport modes provides an important share of all port jobs. For instance, 105,488 people found a job inside the Flemish ports in 2004 and the port sector was indirectly responsible for an additional 136,740 jobs outside the port within Belgium (National Bank of Belgium, 2006). In Greece, 592 employees and dockworkers were active in the port of Thessaloniki itself, not taking account of indirect and private business. In the USA, sea ports generate 16 million direct and indirect jobs (AAPA 2005).

It is therefore not surprising that various governments, even in this era of deregulation, support protected labour systems (Asian Development Bank 2000). In Belgium for instance, the law Major (Bestuur van het Belgisch Staatsblad 1972) obliges port companies within the sea-port perimeter to use qualified labour supplied by a fixed pool system.

Labour relations in the port sector have traditionally featured frequent strikes and strong union control. European port workers' strikes against the proposed Port Package (European Commission, 2001) and similar strikes by their US counterparts made cargo-handling companies but also other chain actors incur large internal costs, indemnities and lost contracts<sup>1</sup>. Moreover, union strength has in some countries been more expressed than in others, scaring some cargo-handling companies to see some of their traffic diverted to competing ports in neighbouring countries where no strike was going on, with sometimes irreversible competitive damage.

In the meantime, it is clear that sea ports have changed dramatically over recent decades. Cargo handling for instance was initially performed by master stevedores and wharfingers, sometimes integrated with the port authority. Containerisation urged for better communication and changed 'berths' into 'terminals', the operators of which often perform a lot more functions than just moving cargo from ship to berth or the reverse way.

Governments also have to make choices for port organization, and the actual choices seem to be different from those in the past. Trujillo and Nombela (1999) and World Bank (2001) for the sea-port sector summarize the processes through which eventual reorganization can go: a choice can be made between modernization, liberalization, commercialization, corporatization and privatization. Asian Development Bank (2000) adds decentralization. Estache et al. (2001) add creating competition. Cass (1996) mentions selling operating concessions, setting up a joint public / private venture, creating subsidiaries under sea-port authority control but with private orientation. Asian Development Bank (2000) adds unbundling.

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<sup>1</sup> Anderson and Geckil (2002) value the reduction in earnings to US port and maritime companies due to 28 days strike at 48 mn USD, and the total cost to US society at somewhat less than 5 bn USD.

At the terminal level, Holland (1999) states that privatization of existing facilities usually arouses more opposition than awarding greenfield concessions. In Nigeria for instance, landlord port reform was delayed for some time by the government, but bids were eventually introduced (World Cargo News Online 2003 and 2005). According to Peters (2001), there is often reluctance to transfer the so called ‘regulatory functions’ to the private sector, so that often only the operational part shifts away from public involvement. A case contrasting to this view is the British ABP privatization, a unique but effective operation as shown among others by Haarmeyer and Yorke (1993). Indonesian sea-port reform went even further with a proposal to merge sea-port operators, shipyards and shipping companies (Fairplay 2005d).

Suykens and Van de Voorde (1998), ECLAC (1999) and World Bank (2001b) summarize a number of socio-economic and technological pressures which induce governments to change sea-port organization. Society in general, and therefore also transportation as a derived economic activity, is tending towards less public involvement in operational matters. This trend is strengthened by for instance European transport policy, which aims at abandoning state aid which distorts competition, also in the domain of transportation. Technological changes are partly imposed by the rise of a global economy, which forces container-handling activities to increase productivity in order to remain competitive. Heaver (1993) refers to five technological forces.

- Other cargo-unit types: replacement of conventional break bulk by neo-bulk and containers, and specialisation in liquid and dry bulk.
- Changing sea-port layout: larger terminals and larger throughput per running metre.
- Capital-intensive investments: infrastructure and superstructure require large amounts of capital, which often only the private sector can offer, given the changed role of governments in society (Cass 1996; Piodi 1999; Sommer 2001; Wiegmans *et al.* 2002; Mongelluzzo 2003). Even for the private sector, raising the necessary capital can be a problem.<sup>2</sup>
- Increasing share of railways and inland navigation in hinterland transport flows.
- Differentiated sea-port employment, increasing productivity and job specialisation.

In part, technological evolutions are also internal to the sector, since they can allow container handlers to materialize cost savings.

Specific reasons for a shift away from predominant public involvement in cargo-handling operations are that public port operators usually are hardly cost-effective, use old technologies, do hardly respond to customer requirements, provide only limited services, have small capacity and show low labor discipline (Asian Development Bank 2000).

In addition to the previous evolutions, it can be observed that cargo-handling companies get involved into various forms of expansion and co-operation, and that these may impact to a larger or lesser extent on the supply and demand conditions at their terminals, and therefore also on employment. Large cargo-handling players like Hutchison Port Holdings (HPH), Port

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<sup>2</sup> In Antwerp e.g., PSA’s takeover of HesseNoordNatie in 2001 was partly inspired by the need for capital for supplementary and replacement investments in order to cope with increased demands (quantity and quality). In part, also the strategy of Compagnie Maritime Belge (CMB) to cash-in its precious subsidiary contributed to the speed at which the takeover was concluded.

of Singapore Authority (PSA), APM Terminals and Dubai Ports World have expanded and attained decision power over cargo-handling activities in a network which covers ports in all continents.

The aim of this paper is to analyze how co-operation and competition in container handling in particular may affect a port's social situation.

## **2. RESEARCH QUESTIONS, METHODOLOGY AND LIMITATIONS**

Two research questions are pursued in this paper. First, the paper wants to assess whether certain specific forms of expansion or co-operation are likely to have stronger or weaker impacts on a terminal's or port's social conditions. Second, it is analyzed whether a number of selected co-operation and expansion moves of some of the major specific container-handling companies may be beneficial or detrimental to employment. These two research questions translate into respective hypotheses.

As to the methodology for testing the first research hypothesis, a classification of forms of co-operation and expansion is developed based on the main distinguishing criteria as well as on their occurrence in container-handling practice. A broad definition of co-operation is employed, which encompasses all forms ranging from pure contractual agreements towards full integration. In the paper, it is further analyzed which forms of co-operation are likely to have the strongest impact on employment in container handling from a qualitative point of view.

With respect to the evaluation of the second research hypothesis, use is made of a self-composed record of co-operation and expansion moves effectuated by the world's major container handling companies. For a selected number of those moves, it is shown how social conditions at terminals may be affected positively or negatively. Special attention is drawn to the situation of the Greek ports. Container handling in those ports is not directly affected yet by an integratory move of any of the major players, but expansion of those majors in neighbouring ports may change competitive conditions under which Greek ports operate, and may therefore impact also on employment.

A first input in the research process was a literature review, assessing both port-economic and broad industrial-economic literature, theoretical as well as applied to comparable business sectors. The aim of the literature review was to check how previous research has approached questions similar to our research questions. Translation to the cargo-handling sector requires sufficient creativity. Further on, a review of literature dealing with the operational and economic characteristics of cargo handling was used for gaining knowledge about the sector.

A second research input was meetings with cargo-handling stakeholders, which include cargo-handling operators as well as shippers, shipping companies, hinterland transporters, and other related chain actors. Furthermore, a number of maritime and port experts and industry-watchers were consulted. The aim here was again to get a better understanding of the functioning of the cargo-handling sector.

The perspective taken in this thesis is that of the decision maker in cargo handling. Objectives of other chain actors and of activities other than cargo handling are only dealt with in as far as they influence cargo-handling supply and / or demand. The decision maker can be the management of a cargo-handling terminal itself, as well as for instance a shipping company owning and directing a cargo-handling business unit. Decisions evaluated in this thesis deal with expanding cargo-handling activities, and consider other decisions only as conditions which may alter the expansion decision's outcome. In that respect, the cargo-handling activity for which expansion decisions are taken needs to be a separable product.

Further on, the focus in this paper is on sea ports, not on inland ports, and of course not in airports, where cargo handling also occurs, be it of a totally different nature. Sea ports are defined as *"areas within which sea-going ships are loaded with and/or discharged of cargo, and which include the usual places where sea-going ships wait for their turn or are ordered or obliged to wait for their turn, no matter the distance from that area; usually, sea ports have an interface with other forms of transport and in so doing provide connecting services"* (definition adapted from Branch 1986 1). This is a first constraint on the ports considered.

A third constraint is on the sea-port activities which compose the cargo-handling product. Paelinck (2001, p. 11) defines cargo handling as *"The act of loading and discharging a cargo ship"*. As a synonym, the author mentions *"stevedoring"*. In the course of time however, with evolving technologies and changing relationships within the transport chain, the content of the concept 'stevedoring' has broadened from what it originally was. Until the mid 1900s, there used to be a distinction between the actual (un-)loading (done by stevedores) and warehousing (done by 'natives' in Antwerp for instance). Nowadays, both are comprised in what is called 'stevedoring' or 'cargo handling', and also paid for as part of the same product. Unfortunately, there is no existing reference which defines what activities cargo handling at present exactly involves. A review of literature on sea-port activities<sup>3</sup> and on which actor in the transport chain pays for what product, reveals that in most contracts and locations 'cargo handling' involves (un-)loading cargo, storing it and delivering it to or receiving it from a hinterland mode. In case of transshipment, inter-modal delivery / receipt as a second move is of course replaced by a supplementary ship (un-)loading move.

A fourth and last constraint deals with the type of commodities: containers are the focus of this paper. A container is defined as *"a van, flat rack, open top trailer or other similar trailer body on or into which cargo is loaded and transported without chassis aboard ocean vessels; a large rectangular or square container/box of a strong structure that can withstand continuous rough handling from ship to shore and back. It opens from one side to allow cargo to be stacked and stowed into it"* (Paelinck 2001 16). Containers are usually distinguished from general cargo, dry bulk and liquid bulk (Stopford 2002). Motivations for focusing on containers are that it is the fastest growing cargo type, and that it is a cargo-handling sector with considerable growth and merger and acquisition activity. That some operators deal with several commodity types may imply the need to analyze the existence of economies of scope with an impact on container-handling supply and demand.

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<sup>3</sup> Appendix A.2 assesses and categorizes literature summarizing sea-port activities.

### **3. FORMS OF CO-OPERATION AND EXPANSION AND THEIR SOCIAL EFFECTS**

Expansion of cargo-handling companies assumes two major forms: at own strength or through some form of co-operation. Expansion at own strength can be internal as well external. Internal expansion at own strength occurs through organic growth of a terminal. It is observed that many terminals can hardly keep pace in expanding their terminals' capacity in an enduring way in reaction to rising demand. External expansion at own strength incorporates greenfield investments as well as the start-up of a subsidiary in cargo handling. PSA and P&O's terminal developments at the new Deurganckdock, Antwerp, are two recent examples of greenfield investments. Contship Italia sa set up La Spezia Container Terminal Sp.A as a cargo-handling subsidiary, which itself can set up or take a stake in other terminals or businesses.

Expansion through co-operation involves a wide spectrum of agreements between one or more cargo-handling companies and one or more horizontal or vertical transport chain partners or non-related investors. Common forms of horizontal co-operation aiming at expansion are the following.

- Mergers/acquisitions: DPI for instance took over all activities of CSXWT through its subsidiary Dubai Ports International (Manoj 2004).
- Joint ventures: Shanghai Container Terminals Ltd for example was set up as a 50/50 joint venture between Shanghai Port Container Co. Ltd and Hutchison Ports Shanghai Ltd. (Port of Busan 2005).

Vertical expansionist co-operation occurs when upstream or downstream transport actors are involved, the most frequent types of which are the following.

- Joint ventures with port authorities: in Guangzhou for instance, PSA formed a joint venture with the local Harbour Bureau for the operation of the Guangzhou Container Terminal (Maritime Global.Net 2001).
- Joint ventures with shipping lines: Stevedoring Services of America (SSA) for example set up a Long Beach container terminal company together with China Ocean Shipping Company (COSCO) (SSAMarine 2003).
- Joint ventures with hinterland transporters: Hessenatie for instance, which merged into HesseNoordNatie within the PSA-group, set up Ocean Container Terminal Hessenatie Zeebrugge in joint venture with Inter Ferry Boats, a subsidiary of the Belgian Railways (Le Lloyd, 2000).

Also co-operation for expansion with non-transport partners occurs: PSA at Incheon for instance set up a terminal in joint venture with Samsung Corporation (Informare, 2004b). Finally, combinations of the previous structures occur: in Shekou, P&O Ports and Modern Terminals are in a joint venture together with China Merchant and Swire Pacific (Informare, 2002c).

All of the previous forms of expansion focus on expansion in cargo handling. Other directions of expansion for cargo-handling companies are in vertically-related or non-related sectors. The former is also named vertical integration. An example is Eurokai KGaA, which,

like many other cargo-handling companies, started up or took a stake in shipping agencies, hinterland transporters, shipping companies,...

Many of the previous forms of cargo-handling expansion are found in other business sectors too, but there are three main complexities that make decision making on expansion for cargo-handling companies particular and that imply the need for specific methods of analysis: the volatile chain environment, a number of local terminal specifics, and the extensive policy impact.

A dimension to distinguish among the social effects of cargo-handling expansion moves, is the agreement's mission. Hagedoorn (1993) distinguishes among a short-run, cost-economizing and / or a strategic, long-term positioning aim. The degree to which certain forms of co-operation enable the participant to reach a certain aim is established in Table 1.

Table 1: Mission-dimension for expansion agreements

Agreement \ Mission	Joint venture, research corporations	Joint R&D	Technology exchange	Direct investment	Customer-supplier relationships	One-directional technology flows
Cost economizing	-	-	+++	-	+++	+++
Mixed strategy	-	+	+	+	+	+
Long-term positioning	++++	+++	-	+++	-	-

Source: Hagedoorn 1993

Copeland *et al.* (2000) detail the cost-economizing mission into sharing upstream risks, sharing development costs, leapfrogging product technology, increasing capacity utilization and exploiting economies of scale, whereas long-term positioning missions are detailed into filling product-line gaps, developing new product markets and penetrating new geographic markets. The extent to which certain forms allow the container-handling operator to reach a certain mission is shown in Table 2. There is no gradation.

Most agreements in container handling involve some technology component, so that Hagedoorn's (1993) characteristics can be applied. Development and production or core-business joint ventures, mergers, acquisitions, direct investments and customer-supplier relationships are often found in container handling. Joint R&D, technology exchange and one-directional technology flows hardly occur due to the competitive nature of the business. Sales joint ventures and production licenses, as stated higher, just like product swaps and development licenses, are not encountered in container handling. This observation, according to Hagedoorn's (1993) and Copeland *et al.*'s (2000) classification, implies that the focus of



the limited companies started up or acquired is on long-term positioning rather than cost-economizing.

Table 2: Mission-dimension for general agreements

<div> <div>Mission</div> <div>Agreement</div> </div>	Sharing upstream risks	Sharing development costs	Leapfrogging product technology	Increasing capacity utilization	Exploiting economies of scale	Filling product-line gaps	Developing new product markets	Penetrating new geographic markets
Acquisition	-	-	+	+	+	+	-	+
Merger	-	-	+	+	+	+	-	-
Core-business joint venture	-	-	+	+	+	+	-	+
Sales joint venture	-	-	+	+	-	+	-	+
Production joint venture	-	-	+	+	+	-	-	+
Development joint venture	-	+	-	+	-	+	-	+
Product swap	-	+	+	-	+	+	-	-
Production license	-	+	+	+	+	-	+	-
Technology alliance	+	-	-	-	-	-	+	-
Development license	+	+	-	-	-	-	+	-

Source: Copeland *et al.* 2000

Root (1988) states that in co-operation agreements, firms may go behind more than one mission. However, they will normally have one principal mission. Partners in a co-operation agreement will usually have to deal with different missions, which requires elaboration of a balanced solution which satisfies all partners in order for the agreement to be sustainable.

Focusing on a mission does however not impede other effects than the intended, main effect to occur. The cost-economizing aspect can still be substantial, also when the focus is on market motives. Merger and acquisition effects in general can mainly be categorized as economic, financial or market-related (Azevedo 1999). For the economic effects, Farrell and Shapiro (2000) distinguish among transaction and size effects. They denote the first type of effects as synergies, the latter as efficiencies. Beddow (2001) illustrates that labour efficiency effects in cargo-handling do exist and can be substantial. Similar effects can be observed for vertical integration, joint-venture formation and contractual agreements.

#### 4. CO-OPERATION AND EXPANSION IN PRACTICE

For an applied analysis of the observations from the previous section, the expansion and co-operation track records of HPH, PSA, APM Terminals, P&O Ports, Eurogate and DPW are composed. The analysis is done up to June 2005, this means before P&O Ports was acquired by DPW. Dealing with these six operators implies also considering the co-operation history of ICTSI and ECT, whose international division respectively full activities were acquired by HPH; HesseNoordNatie and Sinport Sinergie Portuali, which were both acquired by PSA; Sea-Ro Terminal nv, acquired by HesseNoordNatie; Sea-Land, acquired by the A.P. Møller Group which also APM Terminals is part of; Egis Ports, acquired by P&O Ports; BLG Logistics and Eurokai, which jointly created Eurogate; Carl Tiedemann GmbH & Co, which was acquired by Eurokai; Contship Italia sa, acquired partly by Eurokai and partly by EUROGATE; CSXWT, which was acquired by DPA.

Our analysis results in the figures from Table 3, which learns that limited companies have been started up co-operatively as well as non-co-operatively, and often they have also been acquired or subject to merger. Container-handling companies have started up or acquired limited companies in container-handling as well as in other related or non-related sectors. Table 3's figures pack together container-handling and non-container-handling limited companies. Figures between brackets show the numbers of limited companies started up or acquired by companies or business units which were at some point in time acquired by one of the six major container-handling companies. Those figures between brackets are not included in the figures before the brackets. Figure 1 summarizes the figures from Table 3.

Table 3: Container-handling operators' limited companies over their life time

	Operator	Start-up co-operatively	Start-up non-co-operatively	Merger / acquisition
1	HPH	25 (16)	2 (5)	26 (4)
2	PSA	83 (27)	35 (20)	18 (10)
3	APM Terminals	11 (3)	17 (1)	15
4	P&O Ports	22	2	16 (4)
5	Eurogate	34 (7)	60 (11)	19 (13)
6	DPA + CSXWT	2 (7)	8 (5)	(3)

Figure 1: The major six container-handling operators' relative position

[illegible]

From Table 3 and Figure 1, it can be observed that HPH, PSA and P&O Ports have started up far more limited companies co-operatively than non-co-operatively, whereas APM Terminals, Eurogate and DPA/CSXWT have started up more companies non-co-operatively. Table 2 learns that APM Terminals, Eurogate and DPA/CSXWT, through their mainly non-co-operative, direct investments, clearly focus on long-run market positioning goals, whereas HPH, PSA and P&O Ports, through mainly co-operative investments, also leave room to some short-run cost-economizing goals, of which labour cuts may be one. The number of limited companies started up (co-operatively as well as non-co-operatively) outweighs the number of mergers and acquisitions for all of the operators. Some of the co-operative start-ups are minority investments and / or are research corporations.

Contracts are used by container-handling operators to an even larger extent than limited companies, be it rather vertically than horizontally: in order to acquire inputs (labour, IT services, leasing, maintenance, know how, etc.), where they often function as R&D agreements, or in order to bind customers (shipping lines), where they are pure customer-supplier relationships, or in order to provide additional services to customers, like for instance shuttle services from sea ports to inland terminals from where further dispatching occurs. In each of these cases, there can be information exchange or one-directional information flow agreements.

It should be noted that Greek ports have largely been unaffected by the previous types of moves by the major container-handling operators, except for Cosco's interest in taking a stake in Piraeus and Thessaloniki (World Cargo News Online 2005b). As the next section will show, this does however not mean that Greek container terminals will experience any changes in their operating conditions, even under *ceteris paribus* condition: changes in environments in competing terminals may impact on traffic and therefore labour requirements in Greek ports.

## **5. IS LABOUR COST SAVING POSITIVE OR NEGATIVE?**

It has been shown that some forms of expansion and co-operation can induce cargo-handling operators to materialize some short-run cost savings, either intentionally, or as a side-effect of some other strategy. This could appear to be a negative evolution from a labour force point of view, although it need not be negative, but rather positive from a welfare-economic perspective.

Observing that in container-handling markets, like assessed for instance in Vanelslander (2005), a limited number of terminals are competing, who do not differ too much in size, and observing that there is no real trace of collusion, a combination of within-market Cournot competition and between-market Bertrand competition seems to occur. In a one-stage, static game, container-handling terminals simultaneously determine the amount of output to produce, given supply and demand conditions within the market, whose eventual tendency to change may be observed and anticipated, and they determine prices taking into account possible reactions at other product markets.

It should be noted that the type of traffic which a terminal qualifies for, is a function of demand and supply characteristics. On the demand side, shippers' and shipping companies' preferences for instance will determine willingness-to-pay for a certain container-handling service. Shipping companies' decision for setting up a hub-and-spoke system will have a particularly large impact on demand for container-handling. On the supply side, choices made by governments and container-handling companies among others will determine the attractiveness of a certain container terminal. For a terminal, demand and market structure will be substantially influenced by government's decision to assign the port a domestic, transit or hub role, and plan and design the port accordingly. But also the choices made by the terminal operator itself are important.

On the demand side, one should not only deal with number of players and concentration. Gale and Branch's (1982) observation, that market share rather than concentration is crucial for explaining performance, deserves due attention however, also in the case of container terminals. Landes and Posner (1981) moreover state that market share is an important determinant of market power, next to market demand elasticity and fringe supply elasticity.

Different market share in Cournot and Bertrand settings may be the consequence of differing cost structures between terminals. In container handling, it is indeed not the case that all terminals have identical constant average costs. One reason may be different technologies. Moreover, there are fixed costs. These are not directly observable, but they can be derived when terminal technology is analysed. The presence of fixed costs implies that there is no fixed proportion of outputs to inputs. Container handling is in a situation where inputs are distinct from outputs. Furthermore, terminal capacity is lumpy: new capacity additions are usually large compared to market demand. Capacity also involves a large amount of sunk investments. Labour can be fixed as well as a variable, and consequently cost structures and market shares will be determined.

Choices with respect to the level and the cost of labour are therefore important: bringing down the fixed cost of labour, and bringing down the variable costs of labour used per unit of output, may increase the terminal's market share. This will usually imply that more cargo is to be processed, and therefore that overall more labour input is needed. The increased demand will therefore compensate for the loss of labour volume per unit of output.

If we focus on the consequences for Greek ports, which have themselves experienced few direct efficiency effects from expansionist or co-operative moves as no major container-handling players undertook moves in their ports, a market analysis learns that effects may be expected from what goes on in competing ports with respect to expansion and co-operation. Starting from Ocean Shipping Consultants' (2003) analysis, which groups ports into sub-continents, most of which include several ranges, an idea can be given of the effects that may be expected.

We should make abstraction of two simplifications in Ocean Shipping Consultants' (2003) market split-up. First, their analysis primarily deals with ports, whereas container-handling competition in practice evolves around terminals. Second, there is a major distinction between container-handling product types. Take as an example the Mediterranean sub-continent and focus on the Western-Mediterranean range. In Ocean Shipping Consultants'

(2003) analysis, this range includes terminals in Mediterranean Spain and Southern France on the European continent as well as Moroccan and Algerian terminals on the African continent.

It is clear that the Western-Mediterranean range does not cover the correct players for container traffic which is bound for Eastern Spain through domestic delivery, since the Northern-African terminals and also the non-Spanish terminals in Southern-Europe do not fit there. Neither will the range cover the correct players for traffic which is bound for Southern Europe through regional delivery, since the Northern-African terminals do not fit there. Moreover, terminals in the Atlantic and Hamburg-Le Havre range are most probably competitors which are not taken into account in Ocean Shipping Consultants' (2003) analysis. For transshipment traffic, the Western-Mediterranean range will most probably not be sufficiently large to cover all competing terminals: also terminals from other Mediterranean ranges will compete for this type of traffic.

Making abstraction from the previous limitations, the resulting range structure is one where Greek container terminals compete with ports in the East Mediterranean / Black Sea region, which includes ports from Turkey, the Black Sea countries (Bulgaria, Romania, Ukraine, Russia and Georgia), Cyprus, Syria, Lebanon, Israel and Egypt.

As it can be observed that in Egypt HPH has acquired stakes in Alexandria and El Dekheila terminals through joint-ventures (World Cargo News Online 2005c), and APM Terminals in Suez Canal Container Terminal through an acquisition (World Cargo News Online 1999), it can be assumed that Egyptian ports may feature cost savings in terms of labour, and maybe also in other operational aspects, which may be detrimental to Greek terminals' traffic if they cannot compensate with other efficiency gains. In Lebanon, DPW obtained a management contract for a terminal at Beyruth port (World Cargo News Online 1999b), and in Turkey, it acquired a site to build a new terminal in (World Cargo News Online 2005d). Earlier, P&O Ports, eventually acquired itself by DPW, had obtained a concession for Derince International Container Terminal in Turkey (World Cargo News Online 1999c). Therefore, also Lebanese and especially Turkish container terminals may gain competitive advantages versus Greek terminals, unless the latter compensate with other savings, or unless the competitors experience higher costs for other terminal inputs, which would then nullify the positive effect from labour cost savings.

## **6. CONCLUSIONS**

It has been shown that specific forms of expansion and co-operation may indeed lead to savings on the labour side. The main mission of most forms of expansion – except for direct investment at own strength – often turns out to be longer run and market-related, but in practice, often also savings, among others in labour, show up.

Applying the observations to the major container handling operators, it turns out that especially APM Terminals, Eurogate and DPA/CSXWT often aim at longer run goals in their expansionist moves, whereas HPH, PSA and P&O Ports often obtain – intentionally or as a side effect – cost savings, among others in labour inputs. None of these majors has made any

move into Greek ports yet, so that labour cuts as a consequence of international co-operation have not yet been an issue there.

Yet, labour cuts should not be judged negative from a welfare-economic perspective: labour cuts lead to lower fixed and variable operational costs, and this efficiency increase may, *ceteris paribus*, attract more traffic, so that overall, more labour will be needed. Greek ports may experience the reverse effect from the side of their competitors: as international co-operation with some of the major operators has been the case there, it can be assumed that those may gain efficiency advantages compared to Greek ports, so that traffic in Greek terminals may decrease, with possible consequences on the volume of labour needed.

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