

## ASPECTS REGARDING WORLD ECONOMIC CRISIS IMPACT ON MARITIME TRANSPORT AND CONTAINER TERMINALS

Violeta POPESCU<sup>1</sup>

Hazel MENADIL<sup>2</sup>

<sup>1</sup> Ph. D. Assoc. Prof., Ovidius University of Constantza, Romania

<sup>2</sup> Lecturer, Ovidius University of Constantza, Romania.

**Abstract:** This paper aims to monitor the impact of global economic crisis on the container shipping and default on its elements (specialized ship, container terminal, shipping routes) and existing expectations on his recovery. Container shipping was in a continuous increase of nearly half a century as a result of globalization, global economic growth, global economic interdependence and the internationalization of the supply chain. Production crisis in 2008, in America, has a profound impact on all economic sectors worldwide and a severe impact on the container industry, particularly on container shipping lines. Decreased activity is observed over a year through poor profitability in all areas, as in 2009 Europe go into recession. Following a collapse of demand plus shipping fleet overcapacity worldwide. Under these conditions transport prices have dropped considerably and transport became unprofitable. To return comparable rate to reduce transport demand, by disarming vessels (landing crew, supplies, fuel, etc.) and stationary ships at anchor etc. Crisis is felt in ports by port traffic in decline, layoffs, and extension and refurbishment projects frozen etc. The crisis has continued in 2012. Expected changes in this area require terminal operators to find new solutions that could minimize the impact of the crisis on their business. Studies, statistics and research conducted by consultants and shipping companies for container transport future was optimistic: they show that at the beginning of 2010 traffic has gradually recovered and in Europe has reached the levels before the global recession.

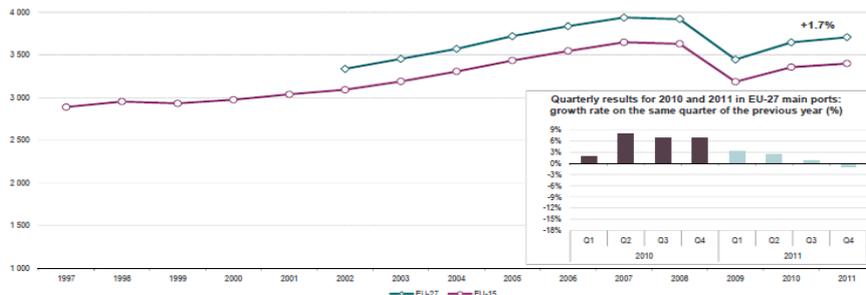
**Key-words:** crisis; shipping; container; container terminals, container ships.

### 1. INTRODUCTION

Began in 2008, the global economic crisis has caused a sharp decline in global shipping. However, the global economy recovered in 2010. World trade, in decline until the spring of 2009, has increased significantly since the summer of 2010. Thus, world trade fell sharply by 11.3 percent in 2009 but increased approximately 12 percent in 2010 (6.8 percent). Shipping container had a sharp decline in 2008, with the global economic crisis. AP Moller-Maersk A / S, owner of the largest container fleet in the world, estimated to handling containers decreased by 10 percent in 2009 - the first decline worldwide, of the appearance of containers on shipping routes in 1970!

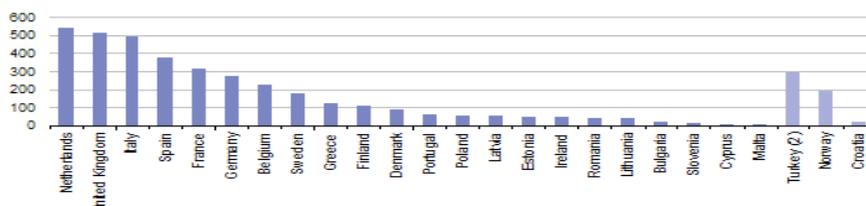
### 2. IMPACT OF THE CRISIS ON SHIPPING

The global economy is the driving force for transport in general and shipping in particular. Shipping - complex economic activity - developed with the global economy and followed upward trends and global trade falls. In turn, freight transportation has contributed to the development of the world economy enabling global economic cooperation. The EU maritime transport has a special importance as the main mode of transport for imports and exports Union (takes 40% of goods for domestic trade and 70% of goods for external trade), create jobs and bring significant revenue budgets of the Member States. The global economic crisis has severely affected global traffic of goods, which fell sharply as a result of reduced economic activity globally [6] – Fig.1.



**Figure 1. Gross weight of seaborne goods handled in all ports (in million tonnes). 1997-2011. Source: Eurostat**

At the community level, according to Eurostat, the economic crisis has affected shipping in the first quarter of 2009, the amount of goods handled in EU ports fell by 12.9% over the same period of 2008 [8] – fig.2.



**Figure 2: Gross weight of seaborne goods handled in ports, 2010 (1) (million tonnes) Source: Eurostat**

Port activity grew in most European countries in 2011. The largest increases were recorded in Latvia, Lithuania and Slovenia. In general, more seaborne goods are unloaded than loaded in the majority of EU countries. Rotterdam, Antwerpen and Hamburg remain top ports in UE.

**3. CRISIS IMPACT ON CONTAINER SHIPPING**

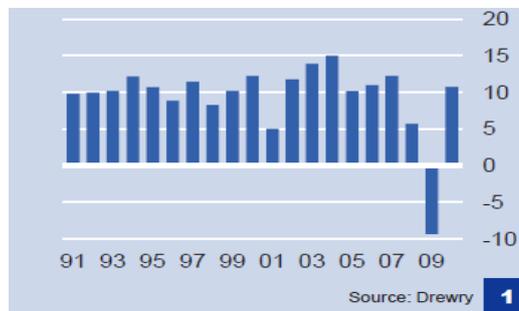
Containerization - modern technology for packaging, transport, storage and transshipment of goods - claimed specialized means of transport (container ship) and specialized terminals equipped with handling equipment, storage containers and good connections with other means of transport containers. The world economy globalization is a process of increasing integration of economic, social and cultural rights of nations, creating interdependence between them. It rests on the container (standardized unit loads) and information technology (IT). The Globalization increases the distance between the centers of production and consumption, thus increasing demand for container shipping.

Even though the years '60 in the U.S., held the first shipping container, it has extended the early '70 the main

maritime routes. Extraordinary development of the shipping container (a transport revolution in the 20th century) is motivated by the benefits:

- Allows transport of unit loads without releasing from sender to receiver;
- Allow full mechanization of filling and emptying containers and the loading-unloading containers to / from transport;
- Reduce transport costs by reducing packaging costs, handling, transport and storage of goods;
- Eliminate losses and damage to goods;
- Reduce the duration of loading-unloading vessels,.
- The ships, railway and articulated trucks are constructed According standard TEU container.

The global economic crisis in 2009 interrupted a growing container traffic by an average annual rate of 12.6% in 2002 ... 2007 [1] - Figure 3, but in 2010 the container traffic has seen an impressive recovery, with increase of 11% and outlook 2015 provide further growth but modest.



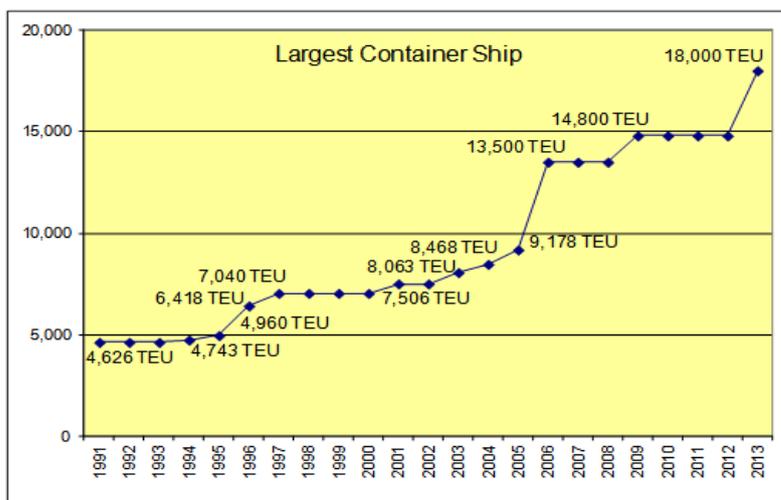
**Figure 3. Global container throughput, %**

In Asia, a stronger economic growth in 2011 causes significant container traffic. The world's largest exporter - China - has increased exports by 30% in 2010 [5], and other Asian countries supported the container transport sector. Asia is a major source of shipping demand. Chinese mainland ports maintained their share of

total world container. Maersk Line is the world's biggest container ship operator by volume.

**4. CRISIS INFLUENCE ON THE CAPACITY CONTAINER SHIPS**

Container traffic growth before the crisis has increased the capacity of container vessels [2] – figure 4.



**Fig. 4 Developments in maximum size of containerships.**

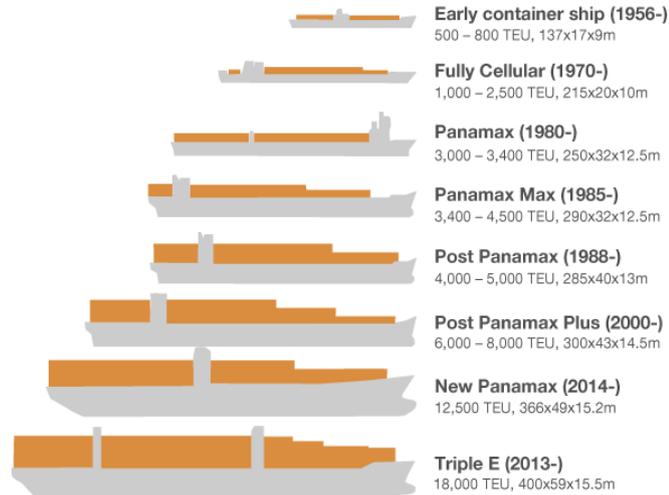
Surce: Ocean Shipping Consultants; Drewry Shipping Consultants

Development in maximum size of container ship [ ] expressed in number of container TEUs (twenty-foot equivalent unit, the standard container) of ship owners wish to achieve economies of scale as a result of the use

of bigger ships that can carry more containers, reducing fixed costs per unit. Then, on average, slot decrease costs by as much as 50 percent from the 2,500 TEU to 10,000 TEU of vessel-and the cost advantages of Triple-E vessels

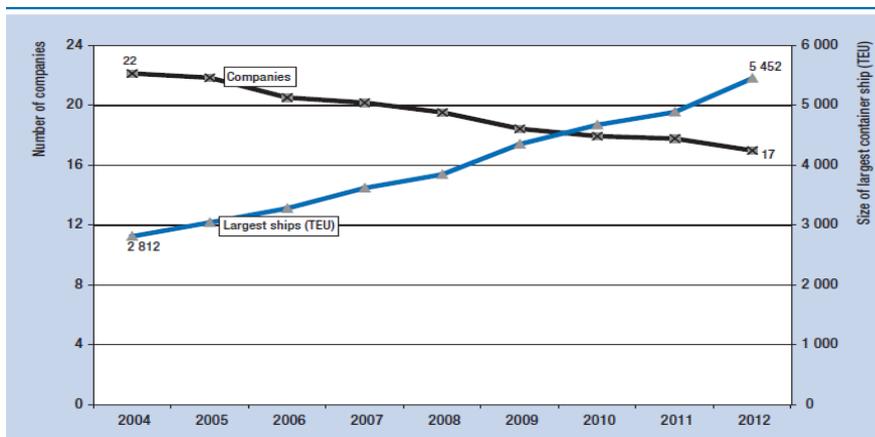
is even larger. The evolution of cellular container vessels with the capacity to structure and dimensions are reflected in six generations of ships: 1-Early; 2-Fully Cellular; Panamax; 4-Panamax Max; 5-Post Panamax; 6-Post Panamax Plus [2] - Figure 5. Newest ships are Post New Panamax.

By 2006, a new generation of containerships came online when the maritime shipper Maersk introduced a ship class having a capacity in the range of 11,000 to 14,500 TEUs, the Emma Maersk, ([E Class](#)).



**Fig. 5 Evolution of container ships in TEU. Source: Haralambides H.**

They are dubbed "Post New Panamax" since these ships are bigger than the expanded Panama Canal specifications and can handle up to about 18,000 TEU (Triple E Class).

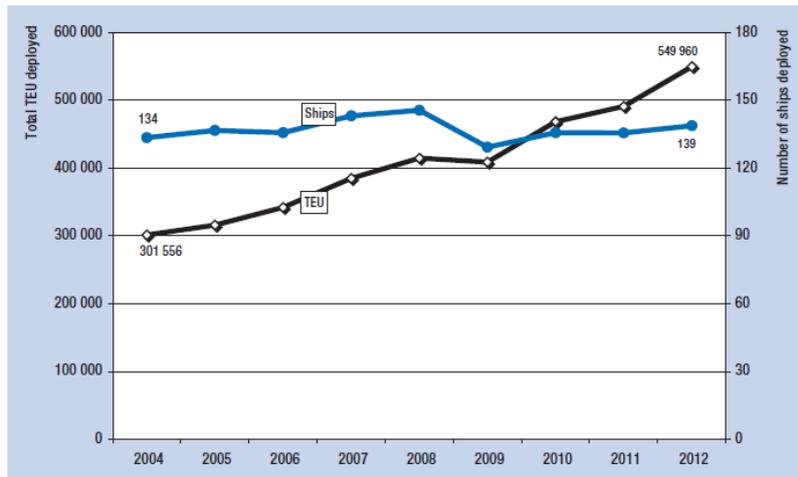


Source: Calculations by the UNCTAD secretariat, on the basis of data supplied by Lloyd's List Intelligence.

**Figure 6. Trends in container ship fleet deployment: number of companies and size of ships deployed**

MARCO POLO, currently the largest container ship in the world, launched November 2012, it having been put into the service by French container carrier CMA CGM (length 396 m and 16000 TEU container capacity) [7]. During the crisis almost 12% of the world fleet was taken

out of operation and shipbuilding orders for new and greater ships was delayed. However the size of container ships in 2004 ... 2012 continued to grow at an average of 2.8 TEU in 2004 to 5.4 in 2012 [9], figure 6, while the number of container shipping companies decreased.



Source: Calculations by the UNCTAD secretariat on the basis of data supplied by Lloyd's List Intelligence.

**Figure 7. Trends in container-ship fleet deployment: number of ships and their total TEU carrying capacity**

Figure 7 illustrates another trend [9]: total carrying capacity expressed in TEU increase by 82% in 2004 ... 2012, while the number of vessels remained almost constant.

The world container ship capacity reached 16.335 million 20-foot equivalent units on Jan. 1, 2013, an increase of 6 percent from a year ago, according to industry analyst Alphaliner.

Another important factor that shapes the shipping industry is the price of bunker fuel oil, which is a major operating cost. Currently, the fuel is almost eight times more expensive than ten years ago (Notteboom and Vernimmen, 2008). One response to the high cost of fuel and the abundance of ships has been cutting speeds from around 20 knots to around 17...15 knots or less to save fuel.

The reduction of the speed, also means a decrease of the fuel consumption with an immediate *environmental* benefit. Several carriers also received massive cash injections from owners and governments.

#### 5. CRISIS IMPACT ON CONTAINER TERMINALS

Classification of container terminals in the current period provides two main groups of marine terminal:

1) *Gateway ports* (small ports – destination of feeder ships). This ports are well known ordinary container terminals, existing from the first period of the containerization to now. They are:

- ◀ Direct call ports;
- ◀ Feeder ports;
- ◀ Niche ports – small ports as local monopolies;

2) *Hub ports* (transshipment ports), which may be of importance:

- Global hubs
- Regional hubs

The “hub” container terminals are the new generation ports (terminals), where is conducted “transshipment of containers”:

a) - Containers are unloaded from mother vessels, stored and loaded on board of different number smaller feeder container ships to be transported to the final recipient.

b) - And back - the feeder container ships are carrying other containers, which are unloaded in the transshipment ports, grouped according their destination and loaded on the board of mother vessels.

The development of transshipment terminals is reclaimed de following facts [3]:

a) The increase of the ship's size in recent years – the container ships from last generation can't operate in the national port calls;

b) The operating costs in the direct call ports increase versus these in the transshipment ports;

c) The transshipment ports offer more attractive opportunities to the carriers and the line operators: greater storage capacities, rapid processing, modern equipment etc. The global hubs are the greater existing container terminals. They usually are located close to the main maritime routes.

A new trend in current development hub container terminal is to build them “offshore” to eliminate the adverse effects of application of increasing depths in ports. Ports face always with us gigantism requirements of the trends in the construction of container ship: port infrastructure expansion, improving connections with other modes of transport containers, upgrading etc., which require huge investments.

On the other hand, the economic crisis has reduced container port traffic, so the ports of Europe and North America have been hard hit by the recession: in 2009 contracted traffic in Northern Europe 16% and North America 13% . The largest decrease has experienced traffic ports in Eastern Europe (the Baltic Sea, Black Sea and Eastern Mediterranean). Hierarchy of European ports by volume of containers handled in 2011 is shown in [9] - Table 1.

| Rank 2011                                | Port                           | *  | 2004          | 2005          | 2006          | 2007          | 2008          | 2009          | 2010          |                | 2011          |                | Growth rate 2010-2011 (%) |                |
|--|--------------------------------|----|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|---------------|----------------|---------------------------|----------------|
|  |                                |    | Total         | of which empty | Total         | of which empty | Total                     | of which empty |
| 1  | Rotterdam (NL)                 | =  | 8 242         | 9 195         | 9 575         | 10 773        | 10 631        | 9 579         | 11 017        | 984            | 14 730        | 1 129          | +33.7%                    | +14.7%         |
| 2  | Hamburg (DE)                   | +1 | 7 004         | 8 064         | 8 878         | 9 914         | 9 767         | 7 031         | 7 906         | 1 234          | 9 035         | 1 386          | +14.3%                    | +12.3%         |
| 3  | Antwerpen (BE) <sup>(2)</sup>  | -1 | 5 065         | 6 221         | 6 718         | 7 879         | 8 379         | 7 014         | 8 144         | 1 120          | 8 317         | 1 031          | +2.1%                     | -7.9%          |
| 4  | Bremerhaven (DE)               | =  | 3 501         | 3 896         | 4 479         | 4 884         | 5 451         | 4 552         | 4 858         | 501            | 5 911         | 754            | +21.7%                    | +50.4%         |
| 5  | Valencia (ES) <sup>(3)</sup>   | =  | 2 156         | 2 415         | 2 615         | 3 049         | 3 606         | 3 654         | 4 211         | 945            | 4 338         | 952            | +3.0%                     | +0.7%          |
| 6  | Algeciras (ES) <sup>(3)</sup>  | +2 | 970           | 3 184         | 3 262         | 3 420         | 3 298         | 2 953         | 2 777         | 472            | 3 584         | 769            | +29.1%                    | +62.9%         |
| 7  | Gioia Tauro (IT)               | -1 | 3 170         | 3 123         | 2 835         | 3 464         | 3 165         | 2 725         | 3 897         | 465            | 3 307         | 367            | -15.1%                    | -21.1%         |
| 8  | Felixstowe (UK)                | -1 | 2 717         | 2 760         | 3 030         | 3 342         | 3 131         | 3 021         | 3 415         | 915            | 3 249         | 829            | -4.9%                     | -9.4%          |
| 9  | Le Havre (FR)                  | =  | 2 158         | 2 144         | 2 119         | 2 685         | 2 512         | 2 257         | 2 369         | 377            | 2 222         | 353            | -6.2%                     | -6.4%          |
| 10                                       | Barcelona (ES) <sup>(3)</sup>  | =  | 2 084         | 2 071         | 2 315         | 2 606         | 2 565         | 1 846         | 1 928         | 453            | 2 006         | 517            | +4.0%                     | +14.2%         |
| 11                                       | Piraeus (EL)                   | +7 | 1 551         | 1 401         | 1 413         | 1 384         | 437           | 667           | 850           | 195            | 1 681         | 290            | +97.7%                    | +48.2%         |
| 12                                       | Southampton (UK)               | -1 | 1 435         | 1 384         | 1 502         | 1 905         | 1 617         | 1 385         | 1 567         | 447            | 1 591         | 472            | +1.5%                     | +5.6%          |
| 13                                       | Las Palmas (ES) <sup>(3)</sup> | +1 | 1 111         | 1 222         | 1 303         | 1 319         | 1 312         | 1 006         | 1 118         | 273            | 1 284         | 352            | +14.9%                    | +29.0%         |
| 14                                       | La Spezia (IT)                 | -1 | 879           | 916           | 1 086         | 1 130         | 1 186         | 840           | 1 181         | 170            | 1 205         | 203            | +2.1%                     | +19.3%         |
| 15                                       | Zeebrugge (BE)                 | -3 | 458           | 682           | 895           | 1 191         | 1 401         | 1 467         | 1 437         | 264            | 1 157         | 236            | -19.4%                    | -10.5%         |
| 16                                       | Marseille (FR)                 | -1 | 920           | 911           | 950           | 1 058         | 901           | 943           | 1 031         | 149            | 1 095         | 143            | +6.2%                     | -3.8%          |
| 17                                       | Göteborg (SE)                  | =  | 722           | 772           | 812           | 841           | 864           | 824           | 891           | 189            | 914           | 189            | +2.5%                     | -0.3%          |
| 18                                       | Genova (IT)                    | -2 | 1 437         | 1 038         | 1 146         | 1 230         | 1 462         | 1 311         | 1 020         | 14             | 910           | 0              | -10.8%                    | -99.0%         |
| 19                                       | London (GB)                    | =  | 966           | 765           | 743           | 858           | 983           | 646           | 733           | 219            | 737           | 249            | +0.6%                     | +13.6%         |
| 20                                       | Gdansk (PL)                    | +5 | 18            | 63            | 76            | 95            | 183           | 233           | 510           | 87             | 685           | 183            | +34.3%                    | +110.2%        |
| <b>Total top 20 ports <sup>(4)</sup></b> |                                |    | <b>47 352</b> | <b>53 032</b> | <b>57 003</b> | <b>64 491</b> | <b>64 495</b> | <b>54 312</b> | <b>61 012</b> | <b>9 523</b>   | <b>67 957</b> | <b>10 405</b>  | <b>+11.4%</b>             | <b>+9.3%</b>   |
| <b>EEA-IS+HR (main ports)</b>            |                                |    | <b>61 616</b> | <b>69 463</b> | <b>74 400</b> | <b>83 858</b> | <b>82 922</b> | <b>70 408</b> | <b>78 333</b> | <b>13 737</b>  | <b>87 286</b> | <b>14 948</b>  | <b>+11.4%</b>             | <b>+8.8%</b>   |

\* This column indicates the number of positions lost or gained compared to 2009

- (1) TEU = Twenty-foot Equivalent Unit (unit of volume equivalent to a 20 foot ISO container).  
 (2) Partial data up to 2nd quarter 2004.  
 (3) Data for 2004 are underestimated.  
 (4) Total figure for the ports being part of the top 20 ports during the reference year concerned.

**Table 1. Top 20 container ports in 2011 – on the basis of volume of containers handled in 1000TEUs. Source: Eurostat.**

Instead, the ports of Asia were less affected by the crisis, as the economic environment was more favorable. The most important and fastest growing container seaports occurred in Asia. In 2009, of the 10

largest container ports in the world in September were from Asia, and in 2000 only five. China is in first place in the ranking with 6 port among the 10 ports in the world [9] – Table 2.

| Port Name           | 2009               | 2010               | Preliminary figures for 2011 | Percentage change 2010-2009 | Percentage change 2011-2010 |
|---------------------|--------------------|--------------------|------------------------------|-----------------------------|-----------------------------|
| Shanghai            | 25 002 000         | 29 069 000         | 31 700 000                   | 16.27                       | 9.05                        |
| Singapore           | 25 866 400         | 28 431 100         | 29 937 700                   | 9.92                        | 5.30                        |
| Hong Kong           | 21 040 096         | 23 699 242         | 24 404 000                   | 12.64                       | 2.97                        |
| Shenzhen            | 18 250 100         | 22 509 700         | 22 569 800                   | 23.34                       | 0.27                        |
| Busan               | 11 954 861         | 14 194 334         | 16 184 706                   | 18.73                       | 14.02                       |
| Ningbo              | 10 502 800         | 13 144 000         | 14 686 200                   | 25.15                       | 11.73                       |
| Guangzhou           | 11 190 000         | 12 550 000         | 14 400 000                   | 12.15                       | 14.74                       |
| Qingdao             | 10 260 000         | 12 012 000         | 13 020 000                   | 17.08                       | 8.39                        |
| Dubai               | 11 124 082         | 11 600 000         | 13 000 000                   | 4.28                        | 12.07                       |
| Rotterdam           | 9 743 290          | 11 145 804         | 11 900 000                   | 14.39                       | 6.77                        |
| Tianjin             | 8 700 000          | 10 080 000         | 11 500 000                   | 15.86                       | 14.09                       |
| Kaohsiung           | 8 581 273          | 9 181 211          | 9 636 289                    | 6.99                        | 4.96                        |
| Port Klang          | 7 309 779          | 8 871 745          | 9 377 434                    | 21.37                       | 5.70                        |
| Hamburg             | 7 007 704          | 7 900 000          | 9 021 800                    | 12.73                       | 14.20                       |
| Antwerp             | 7 309 639          | 8 468 475          | 8 664 243                    | 15.85                       | 2.31                        |
| Los Angeles         | 6 748 994          | 7 831 902          | 7 940 511                    | 16.05                       | 1.39                        |
| Tanjung Pelepas     | 6 016 452          | 6 530 000          | 7 500 000                    | 8.54                        | 14.85                       |
| Xiamen              | 4 680 355          | 5 820 000          | 6 460 700                    | 24.35                       | 11.01                       |
| Dalian              | 4 552 000          | 5 242 000          | 6 400 000                    | 15.16                       | 22.09                       |
| Long Beach          | 5 067 597          | 6 263 399          | 6 061 085                    | 23.60                       | -3.23                       |
| <b>Total top 20</b> | <b>220 907 422</b> | <b>254 543 912</b> | <b>274 364 468</b>           | <b>15.23</b>                | <b>7.79</b>                 |

**Table 2. Top 20 container terminals and their throughput for 2009, 2010 and 2011, in TEU and percentage change. Source: UNCTAD secretariat and Containerisation International Online (May 2012)**

## 6. CONCLUSIONS

World container port throughput increase by 5,9%TEUs in 2011. This increase was lower than the 14,5% increase of 2010. After passing through a tough year in 2011, the container shipping industry is going to continue a hard time in 2012, order that the crisis has continued in this year.

The high oil price of recent years has been an additional problem. The launching of the new 18,000 TEU ships, the increase of the partnerships of global alliances and the raising of the bunker costs are only some of the issues the shipping industry has to face in the present and in the next future as well.

Therefore, fleet capacity will continue to rise during the next few years. Increasing ship capacity in 2012-2014 will intensify competition.

**REFERENCES:**

1. Eric Heymann, Container shipping: Successful turnaround, March 28, 2011, Deutsche Bank Research
2. Haralambides Hercules , Ports: Engines for Growth and Employment. EUROPEAN PORTS POLICY REVIEW, Brussel, 25 September 2012
3. Tororin Nedyalkov; Teodora Andreeva, Trends in the container shipping and need of a new generation container terminals and container vessels, Technical University of Varna, Bulgaria
4. Tourret Paul, Note de synthese nr.120, *La crise maritime internationale*, 2009. Institutul Superior d'Economie Maritime
5. Tourret Paul, Note de synthese nr.154, *Conteneurisation : changement de paradigme*, Avril 2013, Institutul Superior d'Economie Maritime
6. Vidar Lund, EUROSTAT, Statistics in focus, 7/2013; Continued recovery in volume of goods handled in EU ports
7. William Kremer, News Magasine, How much bigger can container ships get? , BBC World Service
8. \*\*\* Maritime ports freight and passenger statistics, Data from March 2013. Most recent data: [Further Eurostat information, Main tables and Database](#)
9. \*\*\* REVIEW OF MARITIME TRANSPORT 2012, *Chapter 4*, UNITED NATIONS, New York and Geneva, 2012
10. \*\*\* [http://www.trisrating.com/en/rating\\_information/rating\\_criteria.html](http://www.trisrating.com/en/rating_information/rating_criteria.html)