Changes in Global Economy Influencing the Maritime Industry

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Abstract: The world economic situation has brightened in 2010. However, multiple risks threaten to undermine the prospects of a sustained recovery and a stable world economy – including sovereign debt problems in many developed regions, and fiscal austerity. These risks are further magnified by the extraordinary shocks that have occurred in 2011, which have included natural disasters and political unrest, as well as rising and volatile energy and commodity prices. Given that for shipping, all stands and falls with worldwide macroeconomic conditions, the developments in world seaborne trade mirrored the performance of the wider economy. After contracting in 2009, international shipping experienced an upswing in demand in 2010, and recorded a positive turnaround in seaborne trade volumes especially in the dry bulk and container trade segments. However, the outlook remains fragile, as seaborne trade is subject to the same uncertainties and shocks that face the world economy. This paper highlights some developments that are currently affecting maritime transport and have the potential to deeply reshape the landscape of international shipping and seaborne trade.

Keywords: shipping industry; maritime transport costs; container shipping; energy security; carbon emission

JEL Classification: L91; L95; L98; R41

1. Introduction

The world economic situation has brightened in 2010. However, multiple risks threaten to undermine the prospects of a sustained recovery and a stable world economy – including sovereign debt problems in many developed regions, and fiscal austerity. These risks are further magnified by the extraordinary shocks that have occurred in 2011, which have included natural disasters and political unrest, as well as rising and volatile energy and commodity prices. Given that for shipping, all stands and falls with worldwide macroeconomic conditions, the developments in world seaborne trade mirrored the performance of the wider economy. After contracting in 2009, international shipping experienced an upswing in demand in 2010, and recorded a positive turnaround in seaborne trade volumes especially in the dry bulk and container trade segments. However, the outlook

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remains fragile, as seaborne trade is subject to the same uncertainties and shocks that face the world economy.

This paper highlights some developments that are currently affecting maritime transport and have the potential to deeply reshape the landscape of international shipping and seaborne trade.

2. Emerging Trends Affecting International Shipping

The latest economic downturn and the subsequent recovery have highlighted new trends that are reshaping the landscape of international maritime transport and trade. While not an exhaustive list, the key issues set out below are emerging as very important. These include, in particular:

- a global new design;
- energy security, oil prices and transport costs;
- cutting carbon emissions from international shipping and adapting to climate change impacts;
- environmental sustainability and Corporate Social Responsibility;
- maritime piracy and related costs.

2.1. A Global New Design

With large emerging economies such as the Brazil, Russian Federation, India and China being the main engine of growth and trade expansion, the relative weight of advanced economies such as the European Union and the United States appears to be diminishing. The downturn has reinforced a shift of the economic influence from the North and the West to the South and East. This, clearly, is altering the shipping industry's operating context and can be expected to evolve further as cargoes; markets and trade patterns also change in response to the new global design. One recent study finds that China will overtake the United States and dominate global trade in 2030; China will feature in 17 of the top 25 bilateral sea and air freight trade routes (PWHC, 2011). The study also concludes that four key areas could potentially present significant opportunities for transport and logistics firms, including:

- increased intra–Asia–Pacific trade, developed–developing region trade (e.g. China and Germany);
- intra-emerging economies trade (e.g. China–Latin America);
- China–Africa trade.

These developments are likely to affect market segments differently and result in shifts in international transport patterns, with transport growing faster on some routes than others. This also raises the opportunity of opening new markets. In this

respect, one study assessing the routing flexibility of container shipping finds that the Cape of Good Hope route has the potential to emerge as a viable alternative to the Suez Canal route for 11 South–South trade lanes, including West Africa–Oceania, West Africa–East Africa, East Coast South America – Oceania and East Coast South America–East Africa (Notteboom, 2011). From the perspective of shipping, however, these trends raise crucial questions and uncertainties. For example, there remain questions with respect to the future and the shape of globalization in view of:

- a potential growth in regionalization;
- the Doha Round of multilateral trade negotiations;
- the proliferating trade agreements;
- the possible growth of trade protectionism;
- efforts of balancing global economic growth and trade flows;
- the complex nexus between energy security, oil prices, transport costs, climate change and generally environmental sustainability.

2.2. Energy Security, Oil Prices and Transport Costs

The rapid growth in global trade recorded over the past few decades was powered by easily available and affordable oil. Shipping, which handles over 80 % of the volume of world trade, is heavily reliant on oil for propulsion and is not yet in a position to adopt alternative energy sources (UNCTAD, 2010). However, as evidenced by the recent surges in oil prices and as highlighted by many observers, the era of easy and cheap oil is drawing to an end with the prospect of a looming peak in global oil production. It should be noted, however, that there could be some mitigating facts such as high oil prices and carbon emissions concerns that push the industry to consider alternatives such as natural gas and renewable energy sources.

Supply and demand fundamentals are the major driver of oil price hikes. According to the International Energy Agency (IEA), worldwide oil demand is outstripping growth in new supplies by 1 million barrels per year. China is leading the growth in demand and nearly 20 million vehicles will be added to roads in 2011. The IEA estimates that some $60 billion must be invested in global oil production capacity every year in order to meet global demand (Blair, 2011). Higher oil prices can impact on shipping and trade through both their dampening effect on growth – as it is estimated that $10 per barrel rise in the price of oil, if sustained for a year, can cut about 0.2 percentage points from GDP growth (EIU, 2011) – and the upward pressure on the cost of fuel used to propel ships – as higher oil prices drive up ship bunker fuel prices. As fuel costs can account for as much as 60 % of a ship's operating costs, a rise in oil prices will undoubtedly increase the transport cost bill for the shippers and therefore potentially undermine trade. A recent study by UNCTAD has shown that a 10 % increase in oil prices would raise the cost of

shipping a container by around 1.9 % to 3.6 %, while a similar increase in oil prices would raise the cost of shipping one ton of iron ore and one ton of crude oil would increase by up to 10.5 per cent and 2.8 per cent, respectively (UNCTAD, 2010). The study concludes that "the results of the investigation confirm that oil prices do have an effect on maritime freight rates in the container trade as well as in the bulk trade with estimated elasticities varying, depending on the market segment and the specification. Moreover, the results for container trade suggest the presence of a structural break, whereby the effect of oil prices on container freight rates is larger in periods of sharply rising and more volatile oil prices, compared to periods of low and stable oil prices". Bearing in mind the perspective of developing countries, another recent study estimated the impact of higher bunker prices on freight rates, as well as the impact of higher freight rates on consumers and producers (IMO, 2010.) The analysis, which was conducted for several markets – including grain, iron ore, and the container and tanker trades – finds that in the longer term, a change in fuel costs may alter patterns of trade, as the competitiveness of producers in different locations changes as a result of increased transport costs. In line with results of UNCTAD's own investigation, the elasticity of freight rates to bunker prices was found to differ across shipping routes and trades.

Another issue arising as important for shipping is regulatory driven and relates to the transition to low sulphur fuel. Tighter sulphur limits for marine fuels were introduced through amendments to the International Convention on the Prevention of Pollution from Ships, known as MARPOL 73/78. The MARPOL Convention includes Annex VI titled "Regulations for the Prevention of Air Pollution from Ships" and which sets limits on NOx and SOx emissions from ship exhausts, and prohibits deliberate emissions of ozone depleting substances. The limits set out in Annex VI can have far-reaching implications for the shipping and oil industry as they affect bunker fuel costs and quality[1], the future of residual fuel, oil refineries, as well as technologies such as exhaust cleaning systems and alternative fuels. Sulfur limits under MARPOL Annex VI will become effective for emission control areas (ECAs) such as the Baltic Sea, the North Sea, the United States and Canada in 2015. The limits will apply globally from 2020 or 2025.

2.3. Cutting Carbon Emissions from International Shipping and Adapting to Climate Change Impacts

The discussion on energy security and sustainability is closely tied to the current debate on addressing the climate change challenge, since energy can be viewed as both the root cause of the problem and the potential solution. Carbon emissions from international shipping result from the burning of heavy oil in ships' bunkers. Consequently, addressing the issue of bunker fuel through, for example,

technology or operational solutions and economic instruments or other measures that provide incentives and/or deterrents can help cut emissions and therefore solve the carbon emissions problem. However, recent estimates by the IEA indicate that greenhouse gas (GHG) emissions increased by a record amount in 2009, to the highest carbon output in history, jeopardising the likelihood of reaching manageable carbon concentration levels (Harvery, 2011). The IEA estimates that if the world is to mitigate the worst impacts of climate change, annual energy-related emissions should not exceed 32Gt by 2020. If the 2010 emissions level is sustained, the 32Gt limit will be exceeded a full nine years ahead of schedule (Blair, 2011).

Like other economic sectors, international shipping is facing a dual challenge in relation to climate change. International shipping relies heavily on oil for propulsion and generates at least 3 % of global carbon emissions and these emissions are projected by the International Maritime Organization (IMO) to treble by 2050. International shipping is now the subject of negotiations under the auspices of the IMO and the United Nations Framework Convention on Climate Change (UNFCCC). Current discussions are guided by a number of proposals that aim to introduce a variety of measures that could help curb carbon emissions from international shipping. Relevant measures being considered include operational and technological as well as market-based instruments, such as emissions trading scheme and a levy on ships' bunker fuel. However, international shipping and more broadly maritime transport is also facing the challenge of adapting to the current and potential impacts of climate change.

One recent study has estimated that, assuming a sea level rise of 0.5 m by 2050, the value of exposed assets in 136 port mega-cities will be as high as $28 trillion (Lenton, Footitt, Dlugolecki, 2009). The challenge is thus significant, and raising awareness and improving understanding of the impacts of climate change on maritime transport and the associated adaptation requirements, including funding needs, are fundamental. Accurate information on the likely vulnerabilities and a good understanding of relevant climatic impacts – including their type, range and distribution across different regions and industries – are required for the design of an effective strategy for adequate adaptation measures in transport. Mobilizing requisite resources to finance adaptation action in maritime transport is important, particularly for developing regions. Yet, so far, resources generally allocated to adaptation remain inadequate, especially when compared with the significant adaptation costs estimated in various reports and studies. It is against this background that the High-level Advisory Group on Climate Change Financing (AGF) – established by the Secretary-General of the United Nations in February 2010 to consider, among other things, the potential sources of revenue that will enable achievement of the level of climate change financing that was promised during the UNFCCC in Copenhagen in December 2009 – recommended imposing

a price on carbon emissions from international transport as a potential source for important funding for climate action.

To help fill the prevalent information gap, raise awareness and contribute to shaping effective adaptation action in transport, UNCTAD is increasingly devoting attention to dealing with "the climate change challenge on maritime transport". Earlier related work by the UNCTAD secretariat includes the Multi-year Expert Meeting on Transport and Trade Facilitation, held 16–18 February 2009, whose theme was "Maritime Transport and the Climate Change Challenge". The meeting, held in Geneva, brought together around 180 delegates from 60 countries, including representatives from 20 international organizations, as well as the international shipping and port industries. The three-day meeting was the first of its kind to deal with the multiple challenges of climate change for the maritime transport sector in an integrated manner, focusing both on mitigation and adaptation, as well as on related issues, such as energy, technology and finance. Experts at the meeting highlighted the urgent need to reach agreement in the ongoing negotiations on a regulatory regime for GHG emissions from international shipping. They noted then with great concern that so far, insufficient attention had been paid to the potential impacts and implications of climate change for transportation systems, and in particular for ports, which are key nodes in the supply chain and vital for global trade. The central role of technology and finance was highlighted, as was the need for international cooperation among scientists and engineers, industry, international organizations and policymakers in relation to the preparation and design of adequate adaptation measures.

More recently and drawing on its mandate and this work, UNCTAD and the United Nations Economic Commission for Europe (ECE) jointly convened a one day workshop on 8 September 2010 with a focus on "Climate Change Impacts on International Transport Networks". The workshop aimed in particular to help raise awareness of the various issues at stake, with a view to assisting policymakers and industry stakeholders, including transport planners, operators, managers and investors, in making informed adaptation decisions. The workshop provided a useful platform for considered discussions and set the pace for future work on how best to bridge the knowledge gap relating to climate change impacts on transport networks and effective adaptation responses for both developed and developing countries. Work on these important considerations continues with the establishment in March 2011 of an international group of experts under the auspices of the ECE to help advance understanding of climate change impacts on international transport networks and related adaptation requirements. The first meeting of the international Expert Group was held on 5 September 2011. It approved the work plan of the Expert Group and its key deliverables, which will include a substantive report on relevant issues as well as an international conference to disseminate the results of its findings.

Following up on the abovementioned work, UNCTAD organized on 29-30 September 2011 an Ad Hoc Expert Meeting on "Climate Change Impacts and Adaptation: A Challenge for Global Ports". The meeting aimed to provide policymakers, key public and private sector stakeholders, international organizations as well as scientists and engineers with a platform for discussion and an opportunity to share best practices relating to climate change impacts on ports and associated adaptation requirements.

2.4. Environmental Sustainability and Corporate Social Responsibility

Greater public awareness is driving demand for industries to adopt the principles of corporate social responsibility (CSR) including environmental sustainability.[5] This pressure about the socioeconomic as well as environmental sustainability is being felt among the shipping community from both individuals and corporate customers, and there is an increasing call for the shipping industry to adopt as part of its strategic planning, business and operations increased levels of CSR, especially as it applies to environmental sustainability. In adhering to these principles, the shipping community is expected to achieve efficiency, effectiveness and quality of service, while at the same time taking into account the cost generated by any potential negative externalities generated by their activities, including environmental and social. This is particularly illustrated by the growing demand for greater transparency which means that customers and business throughout the supply chains, whether internal or external to the shipping industry, are demanding that social and environmental targets be set and fulfilled to ensure better performances. New technology enables real-time monitoring and assessment of the degree to which shipping is demonstrating leadership in terms of complying with environmental and social targets. The shipping industry can be expected to demonstrate the quality of its performance by allowing customers, regulators and other potentially interested parties to review their performance records. The shipping industry – through the Case for Action paper, which looks ahead to 2040 – recognizes this emerging trend and is considering ways in which it can best respond to these shifting demands. The Case for Action Paper was released under the Sustainable Shipping Initiative (SSI) which brings together leading companies from across the industry and around the world. The goal of the SSI is to transform the global shipping industry and the wider maritime sector by establishing a new, sustainable approach as the norm.

This is illustrated by the liner operators who are increasingly adapting their market strategies to emphasize the ecological and social dimensions as factors of competitiveness business. An example is the ordering by Maersk Line of the triple E-class 18,000 TEUs ships. The design of the 18,000 TEU ships is named triple E-class, reflecting three principles: economy of scale, energy efficiency and

environmental improvement (*IHS Fairplay*, 2011). The ships are expected to be deployed on the Asia–Europe route. This trend is likely to step up competition as few other carriers could potentially be in a position to also order larger ships with a view to enhancing economic and resource-use efficiency, environmental sustainability as well as safeguarding market shares. For instance, CMA CGM announced in May 2011 that three of its 13,830 TEU ships on order are to be increased in size to a super-post-Panamax 16,000 TEU class, i.e. potentially the largest ships afloat if received before Maersk's 18,000 TEU ship. Germanischer Lloyd, a leading classification society for large vessels, maintains that the technology is available for the building of 18,000 TEU ships, although the port infrastructure required for the handling of such ships may be lacking. As these ships are expected to be delivered in 2014, it can be expected that ports will be modified to adapt to the new ship sizes. However, ports that rely on tides may be facing more challenges in handling these super-post-Panamax ships (Beddow M, 2010).

2.5. Maritime Piracy and Related Costs

Despite international efforts to address the problem of maritime piracy, IMO reports that a total of 489 actual or attempted acts of piracy and armed robbery against ships occurred in 2010. This represents an increase of 20.4 % over the 2009. Consequently, 2010 is marked by the IMO as the fourth successive year that the number of reported incidents increased. The scale of the attacks and the size of the vessels targeted are raising further concerns in the international community. This threatens to undermine one of the world's busiest shipping routes (Asia–Europe) and chokepoint (the Suez Canal).

While shipping has in many cases avoided the piracy affected area in the Gulf of Aden and off the coast of Somalia by rerouting via the Cape of Good Hope, this alternative is not without costs. These costs are likely to be passed on to shippers in the form of higher freight rates and surcharges. Piracy activities raise insurance fees and ship operating costs, and generate additional costs through rerouting of ships. It is argued that if piracy attacks increased 10 times, it would lead to a reduction of 30 % in total traffic along the Far East–Europe trade lane, and that only 18 % of the total traffic would sail through the Cape of Good Hope. Existing studies provide a wide range of cost estimates depending on the methodology and the cost items considered. One recent study has estimated the total cost of maritime piracy in 2010 at $7 billion–$12 billion per year, including the ransoms, insurance premiums, rerouting ships, security equipment, naval forces, prosecutions, piracy deterrent organizations and the cost to regional economies (Bowden, Hurlburt, Aloyo, Marts & Lee, 2010). Re-routing ships, insurance premiums, naval forces and security equipment account for the bulk of the costs.

It is estimated that a rerouting through the Cape of Good Hope results in a diversion which lengthens the voyages, and generates costs in addition to the opportunity cost of being unable to make more voyages in a given time period. Additionally, in view of the geographical concentration of recent piracy activity, Africa is likely to be directly affected. In 2010, the macroeconomic costs for four selected African countries and Yemen amounted to $1.25 billion, with Egypt incurring largest loss per year ($642 million) followed by Kenya ($414 million), Yemen ($150 million), Nigeria ($42 million) and Seychelles ($6 million). In Kenya, for example, the costs of imports are estimated to increase by $23.9 million per month and the costs of its exports by $9.8 million per month due to the impact of piracy on the supply chains (Tsolakis, 2011). However, another report shows that – based on a case study of a 10,000 TEU ship sailing from Rotterdam to Singapore – insurance risk premiums and the Suez Canal transit fees offset to a great extent the additional fuel and opportunity costs of going through the Cape of Good Hope (Bendall, 2009).

3. Conclusion

Together, the new developments are expected to cause a shift in global trade away from advanced economies toward emerging developing countries as these continue on their urbanization path, growing consumer demand, and a relocation of lower value manufacturing toward new locations (e.g. from China to Indonesia).

These issues need to be better understood and their implications duly considered and assessed, and to the extent possible, incorporated into the decision-making process involving shipping (e.g. planning, investment, ship design, expansion, market locations, etc.).

The costs pass-through of increased freight rates into product prices also varied across product and market from nearly zero to over 100 %: this meant that in some cases the increased costs were effectively paid for by the consumer, and in other cases by the producer. In this context, a good understanding of the interplay between transport costs, energy security and oil price levels is fundamental, especially for the trade of developing countries.

Apart from the impact on transport costs, sustained high oil prices raise a number of questions for international shipping. These include, for example, how to deal with related implications for capital–intensive newly built ships of any changes in fuel type and fuel technology requirements; and the potential for a modal shift when feasible from other modes of transport in favour of shipping, given the relative energy efficiency of ships as compared with other modes of transport.

Little attention has been paid so far to the impact of climate change factors such as sea-level rise and extreme weather events on maritime transport, especially ports –

the crucial nodes of the global chains linking together buyers and sellers, importers and exporters, and producers and consumers. While mitigation action in international shipping is crucial to curb carbon emissions, building the resilience of the maritime transport systems and strengthening their ability to cope with climatic factors are equally important. Adaptation in transport involves enhancing the resilience of infrastructure and operations through, inter alia, changes in operations, management practices, planning activities and design specifications and standards. The extended timescale of climate change impacts and the long service life of maritime infrastructure, together with sustainable development objectives, imply that effective adaptation is likely to require rethinking freight transport networks and facilities. This may involve integrating climate change considerations into investment and planning decisions, as well as into broader transport design and development plans.

The shipping operators must increasingly adapting their market strategies to emphasize the ecological and social dimensions as factors of competitiveness business, while at the same time taking into account the cost generated by any potential negative externalities generated by their activities, including environmental and social.

Last but not least, in addition to the security risk involved in sailing through piracy ridden areas and related direct costs (e.g. loss of life, injury, loss of ship or cargo, etc.), transiting through the Suez Canal or rerouting via the Cape of Good Hope both entail other significant costs (e.g. delays, higher insurance premiums, opportunity costs, fuel costs, revenue loss for the Suez Canal Authority/Egypt, etc.) which pose a burden to the shipping industry and will ultimately be borne by global trade.

Notes

1. Annex VI (Regulations for the Prevention of Air Pollution from Ships) was added to the International Convention for the Prevention of Pollution from Ships (MARPOL) in 1997, with a view to minimizing airborne emissions from ships (SOx, NOx, ODS, VOC) and their contribution to global air pollution and environmental problems entered into force on 19 May 2005 and was amended in October 2008. Two sets of emission and fuel quality requirements are defined by Annex VI: (a) global requirements, and (b) more stringent requirements applicable to ships in Emission Control Areas (ECA). An Emission Control Area (ECA) can be designated for SOx and PM, or NOx, or all three types of emissions from ships, subject to a proposal from a Party to Annex VI. Existing Emission Control Areas include: the Baltic Sea; the North Sea; the North American ECA, including most of United States and Canadian coast (NOx & SOx, 2010/2012).

2. A summary of the proceedings of the meeting was published in December 2009 (publication No. UNCTAD/DTL/TLB/2009/1) and submitted to the United Nations Framework Convention on Climate Change (UNFCCC) secretariat ahead of the Copenhagen Conference to provide reference material, including a substantive background note prepared by the UNCTAD secretariat. Additional information about the workshop including a joint UNECE-UNCTAD background note and other relevant meeting documentation are available at http://www.unctad.org/Templates/meeting.asp?intItemID=2068&lang=1&m=2010 1

3. For additional information visit www.unctad.org/ttl/legal or http://live.unece.org/trans/main/wp5/wp5_workshop4.html. The Terms of Reference of the expert group are available at http://live.unece.org/fileadmin/DAM/trans/doc/2010/wp5/ECETRANSWP548e.pdf

4. Additional information about the Ad Hoc Expert Meeting, including related documentation, presentations and the report of the meeting are available at www.unctad.org/ttl/legal under "Meetings and Events".

5. See, for example, "Global Shipping Leaders Call for Sustainable Industry". (2011). Press Release. 17 May; Meade R, (2011), "Sustainable Shipping Gets More Industry Clout". Lloyd's List. 23 May.

6. The Case for Action paper can be downloaded from http://www.forumforthefuture.org/project/sustainableshippinginitiative/more/ssicase-action.

7. Post-Panamax container ship moulded breadth > 32.31 m**;** Panamax container ship moulded breadth < 32.31 m**.** *Source*: IHS Fairplay.

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