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Summer 2016 | Issue 6

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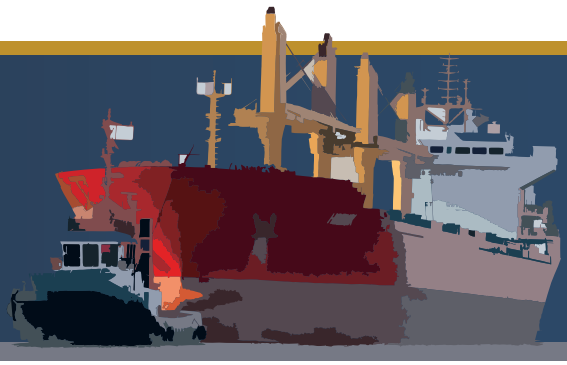

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Cover Design & Photo: Okan Duru

President's Message

Jan Hoffmann, President
president@IAME.info

"So you want to change policy?" read and write for ME Mag

In a recent blog post for LSE[1], James Lloyd proposes six steps to academics to help them have an impact on policy change. I believe his thoughts fit nicely with the special session we had at our 2015 IAME conference in Kuala Lumpur on the "impact" of our work as academics. The concepts also reflect what The Maritime Economist is about.

1) It's open access. Please spread the word: https://issuu.com/themaritimeeconomist

2) We specify the outcomes. For example, in articles on environmental externalities and maritime disasters, the authors help policy makers incorporate non-market values in their decisions (pg. 32) and mitigate an "arctic wicked problem" (pg. 8).

3) We work on a Theory of Change. Sharing recent and on-going research through our magazine helps ports and cities work together (pg. 14), improve port governance (pg. 8) and assess the impact of port automation (pg. 24).

4) We have stories to tell – with a truly global membership.

5) We network and find allies through IAME and our regional and global conferences.

6) Finally, we are patient. Preparing for next year's 25th IAME anniversary, we look forward to many more decades, and are happy to have The Maritime Economist as a channel and tool link academia, businesses, and policy makers.

Congratulations and thank you all to the editors, authors, IAME members and readers.

Jan Hoffmann

[1] http://blogs.lse.ac.uk/impactofsocialsciences/2016/08/08/so-you-want-to-change-policy-six-steps-for-academics-looking-to-achieve-policy-change/

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Editorial

New Normal(s)

Okan Duru, Editor-in-Chief
memag-editors@mar-economists.org

It is almost eight years till the last super cycle of the shipping business and global economic prosperity. In the first few years of the recession, we have begun reading 'new normal' scenarios, and these days normalization seems not finished yet. In addition to economic circumstances, maritime industry still experiences significant changes in both structural and technical bases. For example, fully automated ships and their challenges in terms of cyber security are some of the recent debates in the agenda.

Shipping freight rates are still around the borderline of survival, and 'counter-cyclical' investment narrative (asset play) is almost out of order. Shipping investors try to be patient and hope competitors give up the challenge finally and become completely desperate. Recent market data indicates a significant amount of ship breaking as well as a huge decline in new building orders (60-70%). Ship building industry faces a historical level of idle capacity. Through the period of recession, a number of upturn prospects have been sparked, and orderbook has been built in some periods while these attempts mostly negated potential of recovery. Considering those experiences, one may easily deduce that there is a vast amount of players in the market which in turn makes the market so sensitive and reactive to any information supposed to be positive. In forecasting, there is a very fundamental principle of herding. When a particular market status is well expected by majority of market players, predictions are also expected to fail since every player would position in a new sentimental trend (e.g. buy/sell preferences) which completely changes the 'pattern' and its dynamics estimated by any forecasting algorithm. That eventually negates all upturn prospects.

Therefore, it is more of an 'operation' age instead of asset play. It is time for building strong ties with customers, improving loyalty, but to be honest, it is actually time to take advantage of strong ties and cooperation built at the time of prosperity. Aggressive marketers and fluctuant investors (rapid shifters) will find it difficult to build loyalty due to their distrustful background. Another new normal of maritime industry will hopefully encourage the long-term thinking and prudential trading which feature the customer oriented business model.

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INPLAIN

Port Governance in Latin America

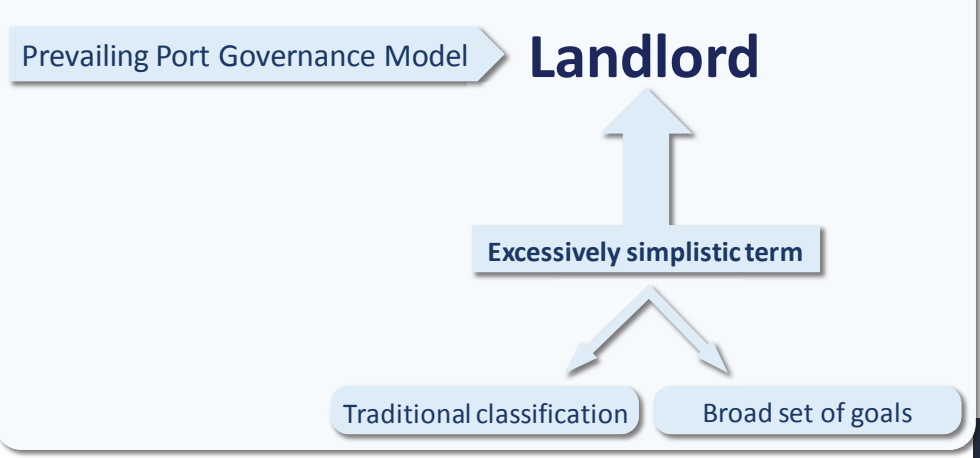
Ricardo J. Sánchez, Fernando González-Laxe, Lorena Garcia-Alonso

The assessment of port-maritime development and strategies demands, in forehand, a reflection upon the political stakes on the prioritization of such activities, taking the advantages and opportunities provided by the geo-economy. In this sense, port governance becomes one of the key instruments to maximize the contribution of ports to economic development, taking into account the global and barely regulated nature of the regular maritime transport services. On the concept of governance, Brooks and Cullinane (2007) refer to the compound of systems, structures and processes that organize groups of individuals with a common purpose, which might be perceived as constituting the structure of their governance, together with the norms and regulations that frame the public policies action that the government puts forth in the corresponding public and private venues. The structures and processes implemented through national laws, such as the requirements for processes of open biddings, control, monitoring, goals, restrictions, etc., conform the governance of a government. Similarly, although more synthetically, Gonzalez-Laxe structures governance in three fundamental axes: institutions, mechanisms and processes. As such, a profound reflection upon the port governance models becomes necessary, as we witness a world in constant change, with operational models that are particularly heterogeneous in maritime transport, and that are not always subject of a sustained scrutiny, evaluation and adaptation.

The prevailing model in port governance in Latin America is generally defined as landlord; however, in practice there are many different forms of use and implementation. In fact, a survey over 42 ports in nine countries of the world[1] has confirmed many interesting conclusions (Figure 1). The first is that the traditional classification (service, tool and landlord) is excessively simplistic and does not reflect the endless variety of forms adopted in practice in a competitive port world (Brooks and Cullinane, 2007). The second is that the appropriate governance models have not always worked as expected (Sánchez and Pinto, 2015). Among the possible causes are that: (1) governments lack an active ports policy; (2) governments have more than one goal and fail, at least partially, in what they intended with the reforms; (3) the disposed model of governance was compromised by subordinate political interventions; or (4) there was simply an amount of errors in the practical implementation of the reforms.

The majority of the countries, since the 80s and 90s, placed their bets on changing the model of governance and promoting ports investments. Since those days, many governments from around the world decided to step out of direct management of port operations and business, initiating a series of reforms in that direction, as was the case in many countries in Latin

Figure 1. The Landlord model

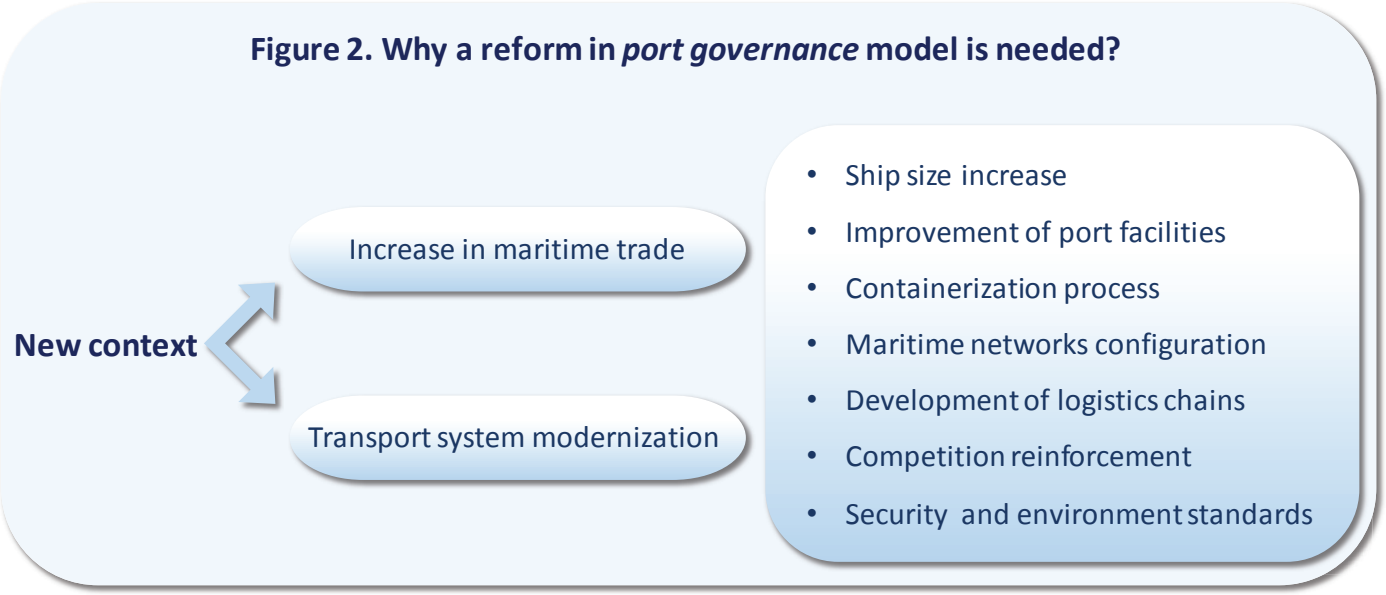


INPLAIN

America. This happened as a reaction to the marked increases in maritime trade and the transformations related to the transports systems, as well as to the configuration of the new global supply chains (Figure 2). These processes involved for instance an increase in the size of the ships, greater technical requirements from the ports facilities, a rapid and intense process of containerization, a greater international setting of maritime networks and a more intense insertion of ports and enterprises in them, an empowerment of the logistics conception, a bet for the reduction of costs and time-around in the terminals or an improvement of the security. As a consequence, political stakes were centered in enhancing port capacities for the purpose of admitting new traffics and goods and being able to offer new services. This new process was undertaken with the goal of rescuing ports from the inefficiency of their operations (at least in Latin America), diminishing the fiscal burden and improving the quality of services, which were low and uncompetitive at the time. Some authors have granted these reforms the title of devolution, defining this as "the transfer of functions or responsibility for the delivery of programs and services from the federal government to another entity", which may be "other governmental order or non-governmental organizations, community groups, customers associations, the market or the industry" (Rodal and Mulder, 1993). However, the main current definition is based on the "reduction of fiscal and administrative burden on the government, along with a simultaneous increase in duties and responsibilities of other actors" (Brooks and Cullinane, 2007).

It is necessary to put in question whether the ports institutions, structures and processes were scrutinized in order to assess their capacity for adaptation to the changes and new requirements. Four singularities have repeated through most of the surveys and consultations to the ports authorities: 1) changes are seen in the maritime routes due to the emergence of new economic areas and the changes of the relative importance among each of them; 2) they highlight the new changes in the dynamics of traffics specialization, which affect as much those who are captive and dependent of the industries that are close to ports with great difficulties of geographical delocalization, as the ports that are more integrated with the companies located in their hinterlands; 3) changes in ports leaderships, underlining new hierarchies and placements related to rankings as to the placing of the branches of logistics and services companies (the increasing presence of global companies and those companies that belong to regular lines should be a point of deeper analysis), and 4) the observed tendency towards mergers and alliances between shipping lines, which translates into more bargaining power in front of port terminals, networks adjustments, and less port calls.

Figure 2. Why a reform in *port governance* model is needed?



The greatest evidence is that no less than 25 years have passed since the reforms in ports governance, and both the fore mentioned changes and the learnt lessons call for a deeper revision.

Paradigm shift

Paradigm shifts have been decisive on the track records of port governance. Two main axis contemplate these transformations. First, the inherent dynamics of fore mentioned maritime transports revolutions are listed, including ships sizes, specialization of transport units, technical conditions of ports, and information systems. Second, the changes affect the prioritization of the criteria defined in the government programs or in the plans of the assessed company. They comprise concepts and ratios defined by: distance-cost; quality of the services, investment necessities, transports and services cost; scale economies, among others.

In consequence, the track records of ports governance are rooted on the different "waves institutional reforms" carried out by the most diverse countries. They commenced tentatively in the 80s and fully consolidated during the decade of 1990, initially aiming towards a higher efficiency of the defended functions in port areas and achieving a greater attractiveness for capturing more traffic and goods, and gradually shifted their focus towards governance modes and management tools, and towards the organization of activities.

There is no doubt that these trajectories are related to the adjustments conditioned by the pace of global and domestic economies. Such oscillations and conjunctures made a direct impact on the application of measures related to ports policies. In this sense, we are witnesses of a double acting. One, in reference to the public/private relations and the P&P partnerships; in other words, the context, nature and evolution of the major integration of private activities in the ports world. And a second one, to the distribution of the public/private functions as regards infrastructure and regulation as well as super-structure and exploitation.

The objectives of that wave of reforms were partially accomplished, in some aspects with considerable success; the competition, the incorporation of private capital and the decentralization of decisions boosted a phase of great progress in the modernization of ports facilities, with marked increases in productivity, which functioned as the major engine for port growth in most of Latin America and the Caribbean, centered in investment and the internal management of terminals, specially but not exclusively, of containers. Other aspects, however, were left partially unsolved, as in the case of investment levels, certain labor issues, the expansion mechanisms of the system as a whole, apart from each individual facility, as well as some aspects related to the legal or regulatory governance of concessions, and the competition (Figure 3).

Many recent academic papers (Verhoeven, 2010) insist on a new phase of "revitalization or renaissance" of ports, based on the three following dynamics: 1) those that tend to conform and define ports as service companies; and organized in networks with other institutions constituting a global chain of integral supply; 2) those that reinforce the necessity for coordination and synchronized complementarity between the different members of the ports community to achieve the main goals defined on their acting plans; and 3) those that seek the stablishing of a convergence of agents/actors of the ports community

Figure 3. Lights and shadows of the Latin American ports reforms

- ✓ Devolution
- ✓ Private capital entrance
- ✓ Improvement of port facilities

- ❖ Port investment management
- ❖ Labour and concession issues
- ❖ Competition

towards a single goal, defining, meanwhile, the stating of different roles, be them identical or opposed, but avoiding conflicts and rejection. In sum, we witness two different logics within the workings of ports acts, one of a protectionist nature, acting exclusively on public services; and the other, notoriously different, that refers to the adaptation of public services towards the basis of a competitive economy.

As regards the institutions, it is intended to include both the public and the private sectors, advocating the existent complexity, disaggregating the varying and different interests, including opposed or diverse processes. Likewise, governance reflects the processes of action/reaction of the agents in front of new situations of competition, specialization or staking, in different scenarios of the relations between agent and principal.

As regards the mechanisms, a point is made of the necessary technical and administrative issues of the regulations of utilization of surface of the port for different purposes; the required quality standards; the environmental prevention; the management functions and negotiation capacity; and the specific legal, financial and political structures. In other words, a wide range of items that requires a code of behavior of good practices and adequate reference frames. And as concerns the processes, it includes the determination of priorities, the business plans, and the answers to external conditions. In other words, a vademecum and a catalogue of orientations within a predetermined schedule.

Hence it can be asserted, in all certainty, that the structures of port governance (in the countries most jeopardized by maritime stakes) are being more dynamic in their adaptations, while remaining the subject of permanent adjustments and external conditionings. Meanwhile, it is possible to question whether a new institutionalism might be needed as well as new or more profound forms of association between the public and private sectors. This configures, in sum, a new set of systems, structures and processes in tune with the norms and regulations that determine the action of public policy, which is to say, a new port governance.

It could also be seen as the need for an integrated and sustainable port policy with clear goals that are consistent with the model of governance. Each one of them has its own set of goals and implicit incentives so that in the contrary –if governments impose intrinsically inconsistent models on ports- the performance will simply not be the best, regardless of intended outcomes and performances (Brooks and Cullinane, 2007). This is required not only of authorities, but demands the development of visions and leaderships that will lead to both greater levels of productivity and efficiency as well as to levels of coordination among all sectors.

For this reason, a more comprehensive vision of development and operation in ports is required that will include investments for expansion as well as improvements in productivity and in connectivity, ports community and logistics integration, among others, that are required to excelling in efficiency throughout the whole logistics chain. This new paradigm of port policy cannot, as in the past (at least as regards Latin America and the Caribbean), emerge as an isolated portion of the national logistics policy.

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Ports and Cities Working Towards Better Relations and a Healthy Environment

Tiziana Murgia

Ports and port areas have often been associated with a sort of destruction of the natural environment, like ugly old industrial areas, that only create pollution to the surroundings. Shipping being historically one of the first ways to transport goods, cities have traditionally developed themselves around the port area. (ESPO Code of Good Practices for Cruise and Ferry Ports – June 2016) In time, Port Authorities and port managing bodies have tried to create a better-looking port with the urban "Waterfront".

In some way, this work on port areas has helped better the image of ports in port cities. However, there are also other aspects that damage it and, over time, Port Authorities have had to tackle them. If we consider the environment aspect, issues like pollution, waste and noise are all perceived negatively. Numerous interventions have been carried out on National and EU levels (i.e. consider the directives regarding waste reception facilities - Directive 2000/59/EC, Directive 2002/84/EC, Regulation (EC) No 1137/2008 - or the CO^2 levels of ships - Directive 2012/33/EU). In this regard, Port Authorities usually have the responsibility of enforcing and controlling that environmental standards respect legislation provisions.

According to the European Sea Ports Organization (ESPO) which has been monitoring environmental priorities for the last 20 years, "relationship with the local community features as a number 4 environmental priority in the new top 10 released in March 2016" (www.espo.be/fact-and-figures).

Therefore, there is a need to include good port-city relations in port environmental planning.

Getting good relations and a healthy environment

Port Authorities face the challenge of getting the message through to citizens of why a port is an asset for a city, and not a negative damaging industry. This issue has been faced with the assistance of National, European and International Organizations. In this sense, publications like the Green Guide (ESPO), the Code of Societal Integration (ESPO) and Plan the city with the port – guide of good practices (AIVP). Moreover, conferences organized by local and national associations that regard port planning are other examples of this activity. During the launching of publications or the organization of conferences, stakeholders that go from Port representatives, to Mayors of the city, academics of local universities and private operators are invited, so as to create a dialogue venue for the exchange of points of view.

The education aspect is tackled in different ways. On the one hand, there is a typical method of addressing the issue by bringing the youth (mainly through schools and universities) to the port with their teachers or professors, and showing them how a port works, what it actually does as well as why it exists.

This is indicated as a good practice for ports: see ESPO Code of good practices for cruise and ferry ports – available at: www.espo.be/media/espopublications/Good%20Practices.pdf and Port-city governance published by Sefacil Foundation, available at the AIVP website. This brings people closer to ports and may stimulate interest in knowing how ports work and/or learning what type of professional background is needed to work in ports.

Profession & Practice

From this mix of activities, the notion of edutainment has been developed. This is sometimes quite difficult to implement, as it has to give information that may not be that interesting in an entertaining way. To enhance this, initiatives like the European Maritime Day have been created and are celebrated each year throughout Europe. To better implement information and experience of ports, in some countries a new concept has been developed – the creation of a Port Centre (or "center"). (http://www.aivp.org/portcenternetwork/port-center-concept/the-missions-charter-of-a-port-center/). The decision to build a Port Centre was first developed in Europe by Antwerp and Rotterdam. The aim is to give local communities the chance to live the port experience, that often is not possible directly for safety or security reasons. Even if in Northern Europe these centres were created 30 years ago, they are still new concepts in many communities and have to be explained to people and ports. The concept is that of experiencing and discovering ports through a centre that in some way reproduces port activities. In Italy, for example, that is the main cruise destination in the Mediterranean region most Port Authorities, with few exceptions, have tried to face the port perception aspect of its role through port visits and training. Sometimes, Port Authorities underestimate the importance of this role, convinced that other types of promotional activity or press-related meetings are sufficient to get the port message through to the general public. At the same time, the community of the port destinations are often unsatisfied with how the authorities manage port areas, and this was confirmed by clear statements made during the Pan European dialogue meeting in Brussels in February 2015.

In this direction, it is possible to observe that in the Italian City of Livorno, a lot has been done to try to create a link between the city and the commercial and industrial port.

This port is mainly dedicated to commercial traffic, and in recent years to cruise traffic flows. Consequently, the need to bring together the many activities that are carried out within the port has to take into consideration the environmental issues, in order to develop a strategic plan that includes the integration between port and territory.

Through this process, there was the opportunity to improve the relation of the city with the port and the sea. Indeed, the Old Fortress, that is located in the port area, has been promoted thanks to an innovative project developed with the cooperation between the Port Authority of Livorno, the Province and the University of Pisa. In this perspective of the essential link "port and city", in 2015 the Livorno Port Center was launched as an innovative and technological information point, available to citizens, scholars and tourists.

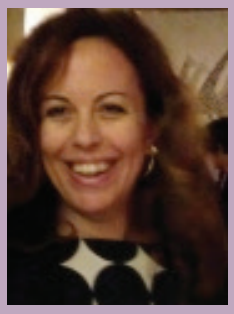
This project can be considered as a pilot project for the Italian Ports Association which is working closely with other ports to assist in the process of societal integration. Indeed, other ports that already advertise their social responsibility values (Trends in EU Port Governance 2016, ESPO) and within these societal integration, dialogue with local communities and employees are contained.

Final remarks

The operative experience within the Italian Port Association has enabled to the Author the development of knowledge and specific expertise regarding port-city relationship. This means that all members can use this information and can also give added value according to their experience in the local territory and with the local community. The concept that is important to consider is the fact that Associations like Assoporti are on a National level knowledge tanks, just like ESPO

can be considered thus on a European level.

In this regard, Assoporti should be seen as the Italian Port House where "house" means the place to go to for information, advice and assistance and where, at the time, knowledge and specific port experience which varies from city to city is collected for future reference. If we consider that Italian port authorities will soon be modified pursuant to the framework of the Italian Port Reform, this "house" may become the right place to gather and distribute information.



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FreshMINDS

Cooperation Among Stakeholders for a Preventative and Responsive Maritime Disaster System: The Mitigation of an Arctic Wicked Problem

Lawrence Cliff Ghoram, Joan Mileski, Wyndylyn Von Zharen

The Arctic ice is receding at a faster rate than expected. According to the National Snow and Ice Data Center (NSIDC) and National Aeronautics and Space Administration (NASA) researchers, the length of the melting season has been growing and continues to grow by several days each decade since roughly 50 to 100 years (Bond et al 2015). As the Arctic ice melts, more maritime opportunities are presented to travel across the region, extract resources, and impact the local populations. Further, as these events increase, competition among stakeholders is triggered creating disputes (Hong 2012).

For the maritime industry, shorter shipping routes from Europe to Asia mean reduced inventory costs for shippers and fuel savings for shipping companies (Keil 2014). As the Arctic becomes more easily accessible, tourism and fishing traffic is predicted to exponentially increase (UNEP 2007). The most significant industry with the largest potential impact on the Arctic region is the oil and gas industry. The US geological survey in 2008 estimated that nearly one-quarter of the world's oil and gas reserves lie beneath the Arctic waters (Harsem et al 2011).

As the maritime traffic increases as many pursue natural resources, so does risk of disaster in the fragile Arctic marine environment and an unknown magnitude of consequences (Huntington et al 2015). Effective planning and improved techniques are needed in order to effectively prevent and respond to disaster.. Developing plans and techniques to best manage these Arctic risks require action and cooperation locally, nationally, and internationally (Cunningham 2012).

Literature Review

The Arctic Unique Maritime Environment

The Arctic environment is considered the most unique ecosystem on the planet (The Arctic Environment 2014 The Arctic region includes of parts of Alaska (United States), Canada, Finland, Greenland (Denmark), Iceland, Norway, Russia, and Sweden (Nsidc.org 2015). Further, disaster from maritime activities can result in ripple effects, impacting the indigenous populations, the environment and other stakeholders as well as raising other social, political, economic, and legal concerns.

A social concern created by increased maritime activities within the Arctic region is overcoming challenges involving the indigenous people. For example, the nomadic culture of some indigenous people can be significantly change by large vessels maneuvering in their natural habitat (Huntington et al 2015). The large commercial ships competing for the same water routes with small boats may impact the peoples' ability to hunt and fish safely. This may impact their economic viability as a culture.

From a legal and political perspective, the disappearance of the Arctic sea ice raises sovereignty issues among the circumpolar states. The United Nations Arctic Council, primary international governing body, consists of eight Arctic States: Canada, Greenland (Denmark), Finland, Iceland, Norway, Russia, Sweden, and the United States (and includes non-circumpolar states such as Denmark (Hong 2012) and is a non-legally binding declaration formed to foster cooperation and dialogue (Koivurova and Molenaar 2009).

FreshMINDS

The International Maritime Organization (IMO) has produced guidelines for maritime traffic in Arctic waters. The International Code for Ships Operating in Polar Waters (known as the Polar Code) was adopted in November, 2014 as an amendment to the International Convention for the Safety of Life at Sea (SOLAS) to protect seafarer and passengers in the harsh environment of the waters surrounding the two poles. The provisions of the Polar Code include both safety and environmental related provisions.

Wicked Problems and Working in the Arctic

A wicked problem is one that is difficult or impossible to solve because of incomplete, contradictory, and changing requirements that are often difficult to recognize. Wicked problems are influenced by many economic, social, and political factors, and the cause and effect of these factors are difficult to determine (Batie, 2008; Koelsch, 2014). For example, the wicked problem of the disaster prevention and response in the Arctic may be due to a lack of communication among stakeholders, a lack of research in the Arctic environment, a lack of organization or infrastructure, all the above, or none of the above.

So, one of the steps toward mitigating a wicked problem is to involve stakeholders, document opinions, and communicate (Robert 2000). The wicked problem of prevention and response to a maritime disaster in the Arctic can be met through collaboration and cooperation of its stakeholders.

Art and Strategy of Cooperation

Axelrod (1980), in his Art of Cooperation, suggests that a cooperative strategy is necessary in facing a dilemma when groups face ongoing interaction and each party receives mutual gains from cooperation. A disaster could also be considered a dilemma for the maritime stakeholders working in the Arctic. The ongoing interaction between nations is working in the same Arctic waters.

The assumption of Axelrod's theory contends that parties will pursue their own self-interest in favor of cooperation without the aid of a central authority to force them to corporate with each other. Currently, there is no central authority for enforcement of policy in the Arctic. The Arctic Council, the United Nations, and the International Maritime Organization all have some authority; however, there is no one authority over all maritime industry parties for all current and potential activities in the Arctic.

Cooperation among involved Arctic stakeholders plays a vital role in increasing collective benefit (Sandler 2008). If there is a collective benefit, then there will be an increase in maritime effectiveness; thus, increasing the speed of maritime disaster response (Mileski and Honeycutt 2013). Further, cooperation strategies free up resources (Pfeffer and Salancik 2003), which can be used to address aspects of bettering the wicked problem such as creating a plan for disaster prevention and response.

Free Riders

How are free riders addressed in cooperation efforts? Groups that sanction such free riders stabilize cooperative behavior (Henrich, 2006). Conditional cooperation from selfish and rational actors is sometimes feasible in repeated encounters, which is supported by the norm of reciprocity (Abell and Reyniers 2000).

Strategies and the Model for Cooperation

In a complex system of environmental, social, political, and legal concerns and a marine environment including Arctic stakeholders, the framework of a wicked problem fits well. The first step towards mitigating a wicked problem is to understand its complexity. In doing so, we must recognize that wicked problems will constantly change.

Managing the complexity through breaking down the problem into smaller, more manageable parts mitigates wicked problems. Further, the mitigation of wicked problems faced in the Arctic requires a more hands on, interactive approach.

First, stakeholders are identified. The Arctic Council can be used as the starting population of stakeholders.

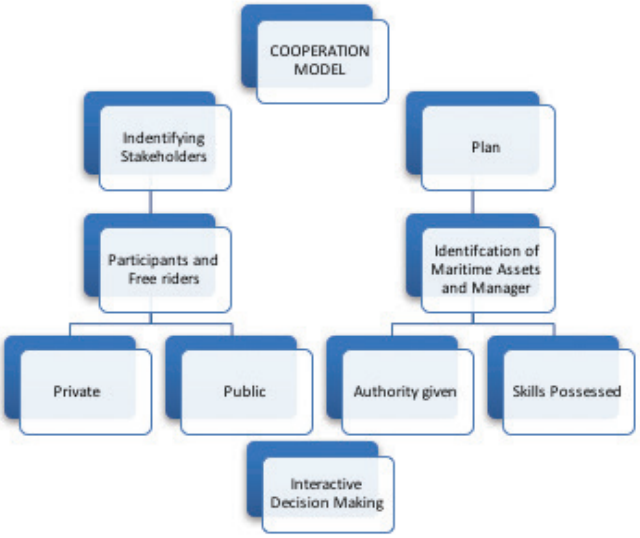

Fig. 1: Model of cooperation

Members of the Arctic Council can be approached to identify the Council's stakeholders. Once stakeholders are identified, a request to cooperate through a common disaster plan of response should be made. Cooperation should be on a voluntary basis.

Next, a plan must be prepared. Mileski and Honeycutt (2013) state that an accounting for maritime assets available to respond to a disaster. Further, a designated manager or management team must assess the use and deployment of the assets. The manager must be given authority of the asset used by the various stakeholders in the plan across all countries.

Once stakeholders are identified and the plan is in place, interactive decision-making among all stakeholders should be anticipated during any response to an Arctic disaster.

Implementation and Contents of the Arctic Maritime Disaster Plan

All of these plan provisions, regardless of when and what type of disaster takes place, should be as a result of the interactive decision making process of cooperation among the stakeholders.

First, as indicated above the plan should designate a manager. The designation should be given to a manager based the combination of his/her experience in the industry, leadership ability, coordination skills and his/her experience handling any previous disasters rather than on mere legal or governmental authority (Mileski and Honeycutt 2013).

Second, the plan should clearly state stakeholder responsibilities and required actions during and after a disaster as well as agreed upon actions to be taken by the designated response manager or managers. During a disaster, implementation of the plan requires flexibility. Communication from the designated manager to and from the stakeholders and Arctic Council is first priority.

Third, the plan must contain an inventory of maritime assets, capabilities and competencies owned by both public and private Arctic stakeholders. The plan should contain contingency provisions to acquire the needed inventory for the disaster particularly if needed response assets.

Fourth, if an incentive system is in place, the manager should have authority from all stakeholders participating to enforce the system.

Conclusion and Managerial Implications

The interconnectivity of services and assets needed in an Arctic maritime disaster response and prevention confirms the need to address a wicked problem. Gathering information on maritime assets, capabilities and competencies across all Arctic stakeholders can be a challenge. However, each member of the Arctic Council can contribute to overcoming this challenge.

Additionally, the Arctic indigenous people are asking maritime industry firms to pay large amounts for entering their environment in exchange for growing their local economies (Nuttall 2000). However, if Arctic stakeholders are able to properly communicate

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through a plan to respond with coordinated mitigation local economies will benefit.

Implications for Managerial Practice

Although maritime disasters are rare, more can be done to plan for response and mitigation. Clearly, the stakeholders need to create a plan and evaluate implementation options. However, more research is needed to pinpoint what motivates stakeholders to join in a cooperative plan without global regulation interventions. Given the increasing importance of the Arctic environment for the maritime and related industries, the results of this study can be useful to policymakers and industry decision makers.

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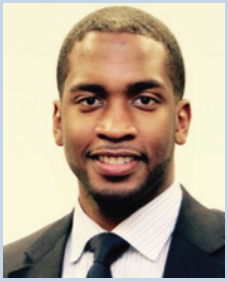

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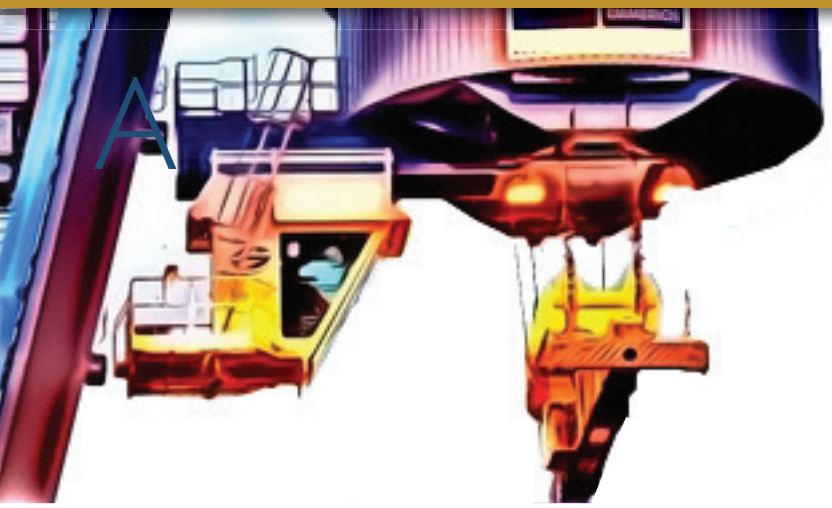


A Dynamic Cost Model to Evaluate the Impact of Increasing Automation in Container Terminals on Transport Chain Cost

Chiara Ridella, Alice Consilvio, Andrea Conca

Nowadays many intermodal terminals are moving towards more automated solutions in order to improve the efficiency of freight transport chain. These automation solutions concern: yard management, quay scheduling, land-side loading/unloading, stowage planning and sequencing, automated recognition systems, etc. Hence, the automation of intermodal terminals has effects/impacts on the inland transportation costs.

Usually, the models developed in freight transport cost research are static (Feo-Valero et al., 2011; Liu et al., 2009; Liu et al., 2012) and not consider the variation of costs over time. In this regard, Ferrari (2014) has

made an important contribution. He introduced a dynamic model based on a dynamic cost function. This function considers the variation over time of costs due to technological and organizational changes in transport modes. Nevertheless, the models identified in literature review analyze transport cost on a particular inland corridor, whereas the variation of transport costs at a port hinterland network level seems to be neglected. Conca et al. (2016) introduces a dynamic model to evaluate the modal shift (road/rail) in a port hinterland network considering the level of automation of intermodal nodes. Therefore, starting from the assumptions of Conca et al. (2016), this paper has the objective to define a dynamic transport cost model for road and rail that considers the role of automation developments at a port hinterland network level.

The paper is structured as follows: problem description; case study, with a detailed description; application and results, in which the models are applied to case study; conclusion.

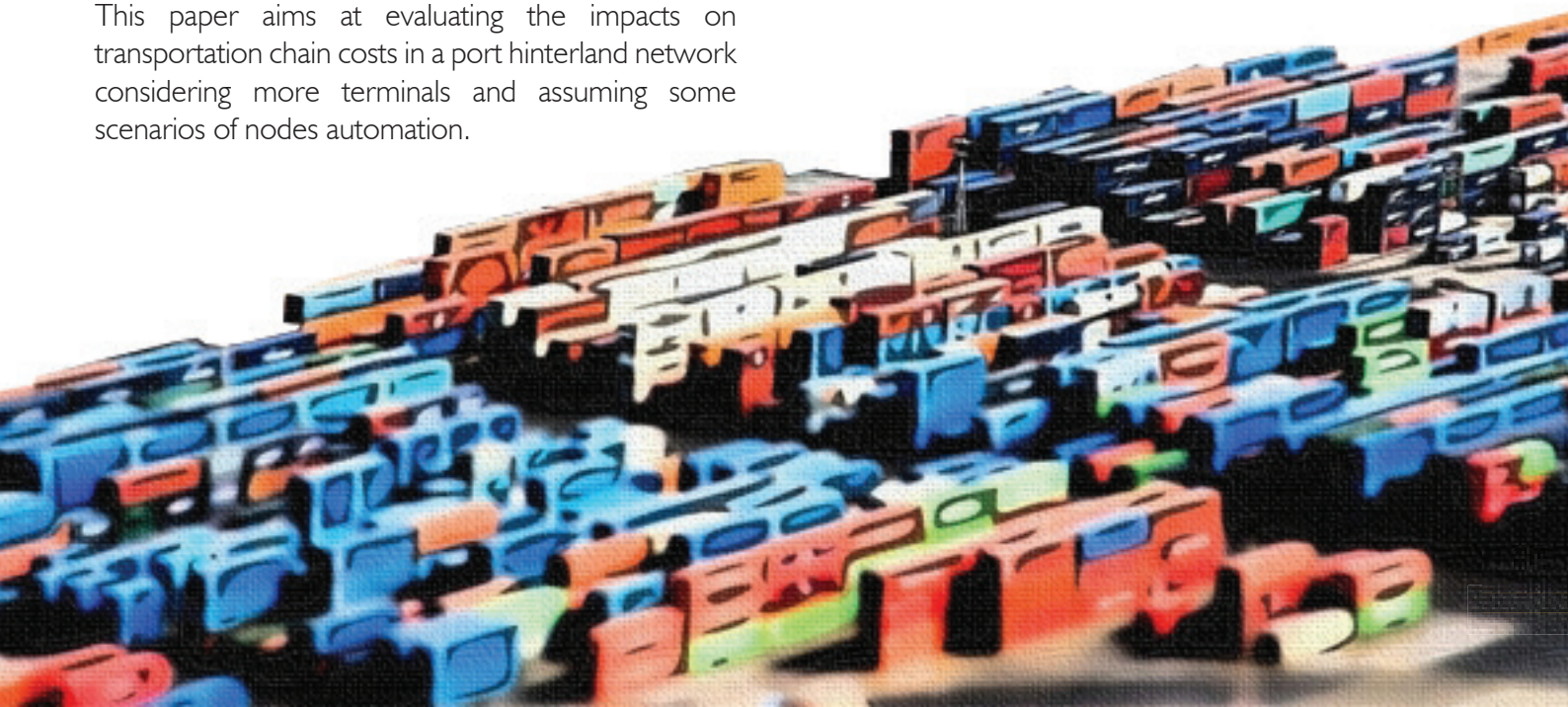
I. Problem description

This paper aims at evaluating the impacts on transportation chain costs in a port hinterland network considering more terminals and assuming some scenarios of nodes automation.

The considered handling system is the automated multilevel handling system developed within the RCMS EU project (www.rcms-project.eu, an ongoing project). It's a multi-story storage building provided with omni-directional electric AGVs, remote controlled elevators and remote controlled ceiling cranes. This new automated equipment allows a significant reduction of containers loading/unloading time to/from trucks and train. Nevertheless, the rail is the transport mode that will have the main benefits from the introduction of this new technology, due to the simultaneously loading/unloading containers to/from the wagons of the train, directly under the structure.

This paper considers only the import cycles, and thus the transportation costs between seaport and inland terminals. In this context, it is very important the trucks/train loading. The export cycle will be studied in the next work steps.

The analytic expression of transportation costs can be defined differently for highly automated terminals and traditional "manual" terminal, and for rail and road transport, taking into account the following terms:



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- transport time for moving containers from seaport to inland terminal;
- loading time in seaport (origin of transport in import cycle);
- unloading time in inland terminal (destination of transport in import cycle);
- cost for moving the container from seaport to inland terminal;
- loading cost at seaport;
- unloading cost at inland terminal.

In the cost function, only the terms related to the nodes themselves (handling costs and times) depends by terminal automation and freight flow. In particular, for what concerns the analytic expressions of handling times, it is supposed that they can be expressed by a linear function of freight flow, whereas the monetary handling cost can be expressed with a quadratic function of freight flow (Ballis et al., 2002). For analytical details of model consult Conca et al. (2016).

Logical architecture of dynamic model is defined in Fig.1. It is possible to note that it is a cyclic process with feedback. The freight flow grows over time with a consequent variation of modal split and transportation chain costs. When automation is introduced, the transportation chain costs using rail decrease and the modal split shifts towards the rail mode. When the percentage of freight moving by rail achieves a certain threshold, the congestion phenomenon produces an increasing of rail handling cost and the percentage of road mode utilization begins to grow again. Nevertheless, some of losses due to congestion are regained through rail economy of scale, although this evaluation is out of the scope of this paper.

The present study does not consider the multimodal transport mode because it concerns only the transport chain from seaport to inland terminals. Another important assumption of this paper is that the railway infrastructure has the sufficient capacity for receiving the increased number of trains related to the new rail attractiveness.

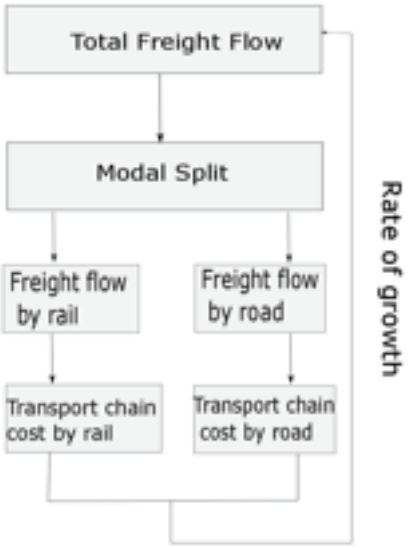

Fig. 1. Logical architecture of model

II. Case Study

The case study is La Spezia seaport and the main transportation network (road/rail) in Northern Italy, defined in Fig.2.

La Spezia seaport is connected with inland terminals of six Italian regions (Lombardy, Emilia Romagna, Veneto, Piedmont, Liguria and Tuscany), where there are the main origins and destinations of the freight flows. The inland terminals can be reached via rail or road. The distances from La Spezia seaport to the destinations are reported in Tab. 1.

La Spezia seaport has handled 1.3 million TEUs in 2015, of which 652.665 TEUs in import (about 50% of the total freight flow). The inland destination distribution of import freight flows and the current modal split is reported in Tab.2.

Fig. 2. La Spezia seaport hinterland

Table 1. Average distances from La Spezia to national destinations

Destination	Distance by road (km)	Distance by rail (km)
Lombardy	221	250
Emilia Romagna	170	163
Veneto	292	328
Piedmont	162	151
Liguria	156	156
Tuscany	150	150

Table 2. Import freight flow destinations and modal split (source: La Spezia Port Authority, SPPA)

Destination	TEUs import	%	TEUs imported by rail	TEUs imported by road	% road	% rail
Lombardy	176.872	27.1	68.450	108.423	61	39
Emilia Romagna	193.189	29.6	58.729	134.459	70	30
Veneto	76.362	11.7	16.418	59.944	79	21
Piedmont	16.317	2.5	6.853	9.464	58	42
Liguria	84.846	13	0	84.846	100	-
Tuscany	73.751	11.3	0	73.751	100	-
Other	31.328	4.8	0	31.328	100	-
Total	652.665	100	150.439	502.226	77	23

III. Application and Results

In this section the theoretical model is applied to the real case study. In particular, we study the evolution of transportation costs for each of the six destinations previously defined.

Three scenarios are analyzed:

- Scenario 0: no automated handling systems;
- Scenario 1: automated handling system is introduced in the seaport;
- Scenario 2: automated handling system is introduced both in the seaport and in the inland terminal.

For the development of this study it assumes that the new automated handling system produces a growth of 35% container handling with the same terminal size (source RCMS project).

The loading/unloading costs in a traditional terminal and in an automated terminal can be expressed in function of freight flow as described in Fig. 3 and Fig. 4, whereas, the expressions of loading/unloading time in function of freight flow for traditional terminal and automated terminal are assumed as depicted in Fig. 5 and Fig. 6.

Fig. 3. Loading/unloading cost - rail

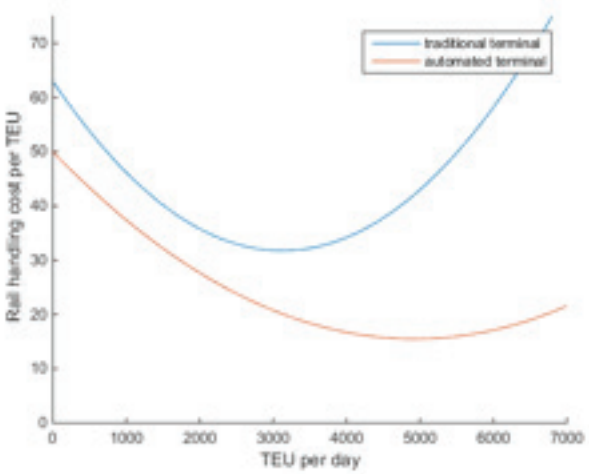

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Fig. 4. Loading/unloading cost - road

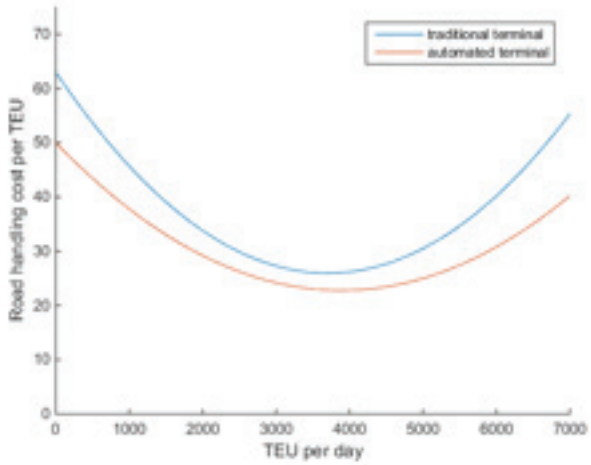


Fig. 5. Loading/unloading time - rail

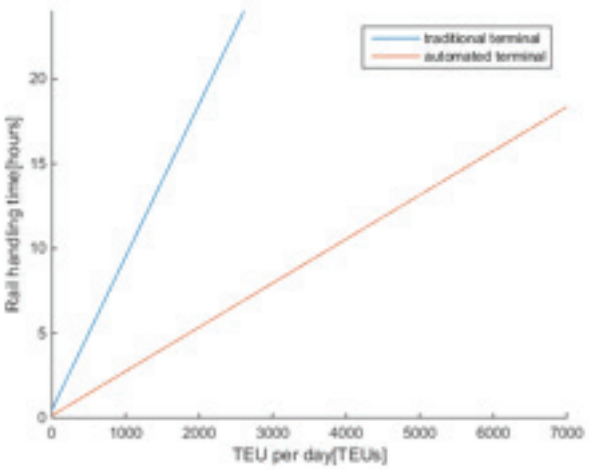
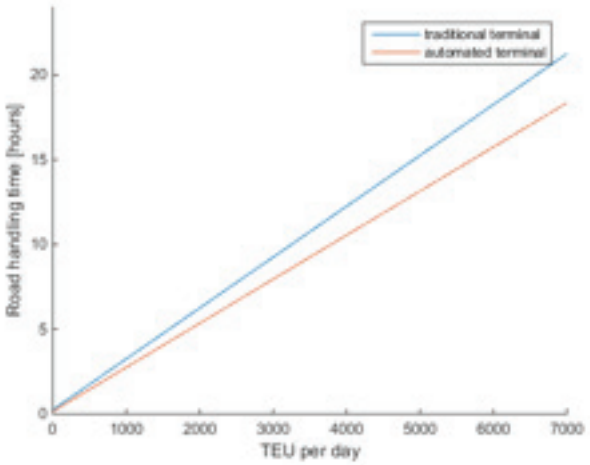


Fig. 6. Loading/unloading time - road



The travel costs (€/km per TEU) for rail and road modes are assumed equal to 0.125 and 1.25 respectively (RCMS, 2016) whereas the travel time costs (€/h per TEU) are known from literature (Marzano et al., 2004).

Below some interesting results are described, with a focus on the more distant destination (Veneto, Fig. 7) and for the destination with the highest initial rail modal split (Piedmont, Fig. 8). In all scenarios, the introduction of automated handling system in the seaport guarantees a significant reduction of transportation chain cost, particularly for rail mode. Moreover, the diffusion of automated handling system also in destination terminals contributes to the cost reduction. The transport cost variation with the increase of the destination distance, after ten years, is defined in Fig. 9 for the three scenarios.

Fig. 7. Transport cost for Veneto

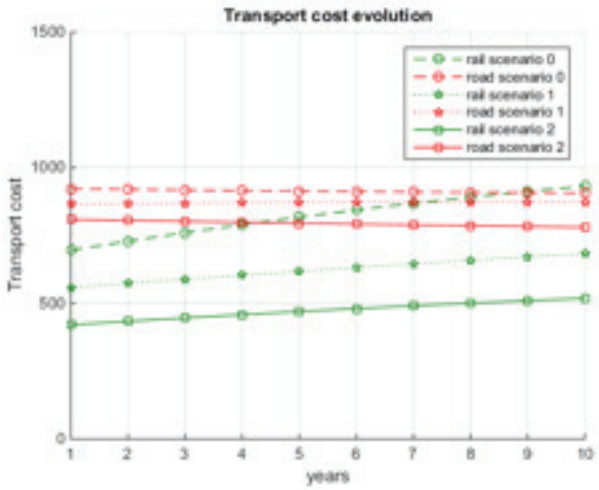


Fig. 8. Transport cost for Piedmont

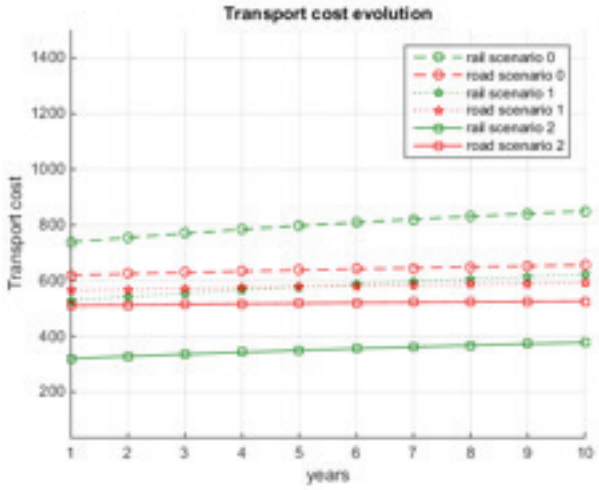
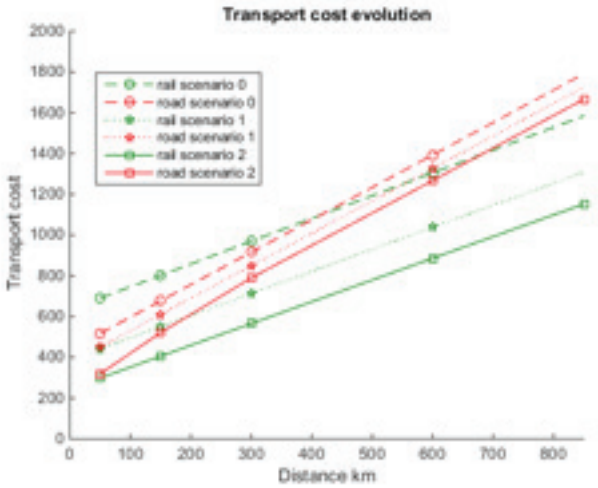


Fig. 9.Transportation cost for increasing destination distance in scenario 0, 1 and 2 after ten years



Therefore, the threshold distance between seaport and inland terminals that makes rail mode less expensive than road is significantly reduced by the introduction of automation.

IV. Conclusion

Freight transport in a port hinterland is a dynamic system, whose characteristics vary over time as a consequence of the evolution of freight flow, as well as of the changes in technology and organization of the various transport modes. The introduction of automation in container terminals has great consequences in freight transport system, in particular on costs.

In order to study this kind of phenomena, this paper has presented a dynamic model of transport chain costs based on a dynamic cost function, dependent on the variation of freight flow.

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The model forecasts the future evolution of transport chain cost for different terminals of destination, in the successive epochs of the time period, taking into account the changes in the equipment technology. Moreover, the threshold distance between seaport and inland terminals, that makes rail competitive, is evaluated. Work is in progress to integrate this study with an evaluation of the effects of the economy of scale.

This paper shows how an automation increase of an intermodal terminal determines a significant reduction of transport costs. Automation is an optimal solution if it is not possible to increase quay and/or yard size. In addition, the increase of automation in a terminal produces an increase of competitiveness of terminal itself, reducing the terminal costs and the loading/unloading times. The main economic impact of the automation of a terminal occurs on short-distance transport.

The improved performance of a terminal with automation also produces significant benefits in terms of externalities. Indeed, the automation generates a variation of the modal shift in favor of rail mode that reduces the impact of road traffic with obvious positive effects on air pollution, GHG emissions and congestion. The reduction of trucks flow in and out the seaport gates implies the minimization of the mutual city-port impacts, improving the level of service of urban roads and the citizens' quality of life.

Acknowledgement

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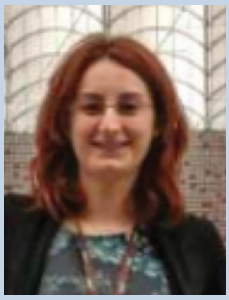

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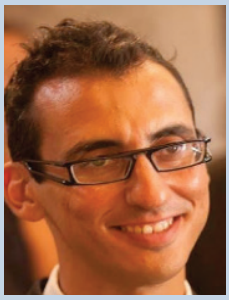

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CHALLENGE

The Challenge of Valuing Port Environmental Externalities

Salvador del Saz-Salazar

With an increasing environmental awareness, one of the major challenges facing ports today is how to value the environmental externalities, both of positive and negative nature, stemming from their daily activity and affecting nearby residents. Addressing such a challenge is crucial to inform appropriately port decision-making since otherwise policy decisions in the port arena that ignore these nonmarket values could be incomplete or even misleading.

As a consequence of the current process of globalization and the technological breakthroughs experienced by the shipping industry in the lasts decades of the twentieth century, the relationship between ports and cities has taken a new meaning since the economic valuation of the effects that these changes have on the surrounding environment should be addressed for sound environmental policies related to port areas.

These changes have brought about two different phenomena that can be considered the two sides of a same coin. On the one hand, the expansion of ports relocating facilities to more peripheral areas in order to meet the current standards of ship size and hinterland connections, and, on the other hand, the urban renewal of waterfront sites that have become vacant following both the introduction of modern cargo-handling facilities and the demand for waterfront revitalization (Del Saz-Salazar et al, 2016). Both phenomena, as they can have an important impact on the surrounding environment, are referred to as environmental externalities. However, while the first is a negative externality (or external cost) since it has a negative impact on the environment as is the case of air and water pollution, noise, land reclamation, odours, etc., the second one can be considered as a positive externality (or external benefit) since transforming vacant port sites into open-access recreational areas can unequivocally increase environmental quality while having a positive effect on public health and wellbeing.

In the past, with an environmental movement in its infancy, ports were more concerned about the potentially negative effects of the environmental regulation on their own economic performance rather than on the impact that port activity could

have on the surrounding environment and nearby residents. Thus, port expansion took place in order to accommodate increases in cargo volume handled. However, recently in many ports this tendency seems to be changing since the environmental movement have taken a leading role in delaying or even stopping the construction of new port facilities that impose external costs on neighbours.

The problem is that under the presence of externalities, market prices do not reflect the full costs or benefits resulting from producing port services, thereby leading to a no-desirable outcome, i.e., because the producer, in this case the port, does not take into account the external costs of its activity to the nearby residents, the level of pollution could be excessive from a social perspective. Likewise, if there are external benefits, too little of the good (or service) will be produced since the producer does not take into account the external benefit of its activity to others. Thus, in both cases, there is no monetary compensation for the damage caused or for the benefit produced to a third party.

To inform port decision-making appropriately, the challenge facing port authorities today is to estimate the economic value of these external costs and benefits and to incorporate them into a cost–benefit framework. However, considering their nonmarket nature, this is not an easy task. In order to overcome this obstacle, economists has developed in the last fifty years methodologies that rely upon survey responses, as is the case of the Contingent Valuation Method (Mitchell and Carson, 1989). Under this methodology, individuals are asked about their willingness to pay (WTP) for a policy aimed at improving the environmental quality, or their willingness to accept an economic compensation (WTA) in the case that this policy worsens the environmental quality. Later, in order to obtain an approximate measure of the damage (or benefits) caused to others, these values (WTP or WTA) are aggregated by the population affected by this policy.

While there is a considerably body of literature addressing the issue of nonmarket valuation with regard to the protection of marine resources, this is not the case of the environmental externalities stemming from port expansion. In fact, the application of this valuation technique to this context is a relatively new and rare occurrence. For example, recently Del Saz-Salazar and Menéndez-García (2016) have estimated that the external costs borne by local residents in the city of Valencia (Spain), as a consequence of its port expansion in the last thirty years, amounted from a minimum value of € 64.4 million to a maximum value of € 107.4 million depending of the aggregating criteria chosen and the discount rate used. In the same way, in a previous work, Del Saz-Salazar and Menéndez-García (2003) estimated that the increase in citizens' wellbeing resulting from the recovery of some old and vacant port areas for recreational and leisure purposes in the city of Castellón (Spain) amounted to € 7.3 million assuming that these new recreation facilities had a 25-year useful life and using a discount rate of 5%. The idea behind this redevelopment project was to improve the physical environment while changing the image of the waterfront from a derelict wasteland to an interesting and inviting place, in line with previous urban renewal experiences carried out in other port cities around the world as San Francisco, Boston, London, Singapore, Yokohama, Sidney, etc. More recently, Lee and Yoo (2016), also applying the contingent valuation method, have carried out an ex ante valuation of the recreational benefits stemming from the construction of a new marina port in South Korea. Although they do not aggregate by the number of potential beneficiaries, they obtain that the representative household is willing to pay around USD 1.6 per year for the developing of this marina.

CHALLENGE

Finally, whatever the feelings about the contingent valuation method, it is obvious that is not a flawless methodology, there is no doubt about the fact that policy decisions in the port arena that ignore nonmarket values are at least incomplete and at worst even misleading. Thus, a comparison of all costs against all benefits of any policy, whatever their nature, is the decision-making criterion that distinguishes economics from other disciplines as civil engineering.

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Submission Guidelines

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InPlain section is dedicated to academic research performed by both scholars and professionals in the maritime economics and business research. Scholars can briefly present a research which will be published shortly in an academic journal or an already published one. In such case, author should refrain using same text and should rewrite in ME Mag's concept of easy-to-read and concise style. Therefore, it should be a kind of executive summary of the upcoming/published academic paper.

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Section 2: PROFESSION & PRACTICE

Profession and Practice section is dedicated to industry professionals for presenting innovative solutions, created knowledge and R&D results in the practice. Authors should refrain from telling success stories and focus on the drivers and requirements for successful results. This section promotes research activities at non-academic institutions and encourages to present research achievements as well as core concepts and created knowledge. Authors should present some evidences for supporting arguments.

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Submission Guidelines

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FreshMINDS section is dedicated to young scholars and professionals (early in their [research] career) for presenting their research results, novel concepts and innovative findings or thoughts. This section promotes young scholars and professionals to express their opinions and/or criticism about the conventional concepts with proper theoretical and/or practical evidences to support their arguments.

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CHALLENGE section is dedicated to draw attention to critical problems in the maritime industry as well as academic research. Both scholars and professionals can submit a short article dealing with the problem and draw attention of readers to that challenging topic. Articles in this section should be written in plain language excluding jargons and using limited number of technical terms with brief and simple descriptions.

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CASE STORIES section is dedicated to both maritime professionals and practice-oriented scholars for presenting case stories that draw readers' attention to real world challenges and thought provoking situations and ideas. What is a case story? Without overly-specifying the content or the format, a good case story usually:

- addresses a relevant topic that arouses the readers' interest,
- is about an actual event or situation that has recently happened,
- includes real characters, quotations, dilemmas, and decisions, and
- can be generalized to most organizations or individuals, helping to learn from others experiences.

Case stories should be written in plain language excluding jargon and using a limited number of

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- A bionote for each author of 80 to maximum 100 words length should be inserted at the end of the case story.

If the case story focuses on specific organizations or individuals, the names may be disguised to maintain anonymity. However, any information and quotations should be factually accurate and permission should be granted to the authors for using information that is not publically available.

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