SHORT SEA SHIPPING IN BRAZIL: POTENTIAL AND POLICY IMPLICATIONS

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Abstract

The current expansion of existing export markets is due, in most part, as a result of the growing economic and social development in emerging countries. The transportation system, however, has the challenge of developing an efficient and effective chain that can sustain economic growth and trade expansion.

It is known that interior and coastal navigation is also growing in Brazil, which is one of the biggest emerging countries. About 23% of Brazil's cargo was transported by waterways in 2009, according to the National Agency for Waterway Transportation – ANTAQ.

However, Brazil faces a transportation problem concerning an imbalance in the use of modes, with current excessive usage of road transport. Although road transportation carries Brazil's door-to-door services, traffic congestion, poor infrastructure, safety and environmental risks are among the main problems to be solved.

Also, the participation of alternative modes in the Brazilian transportation matrix needs to be significantly improved. The share of road, rail and waterway freight transportation in Brazil is very different from that found in other countries of continental dimensions. Compared to other countries such as China and Russia, Brazil uses less than 20% of waterway mode capacity. The further development of waterway operations is therefore considered necessary to sustain Brazilian market expansion.

As a possibility to solve the problem, Short Sea Shipping (SSS) could be the most sustainable and economically competitive mode of transport for Brazil. Moreover, there is an effort to review the National Logistics and Transport Plan – PNLT, which states that the goal of waterborne transportation participation in the overall Brazil transport matrix is expected to reach 25% in 2025.

In this way, the objective of this paper is to discuss the potential of SSS in Brazil, identifying the major difficulties in implementation. We carried out a literature review and meetings were held with shipping companies. The methodology applied reflects an exploratory type of research, comparing the European and Brazilian experiences and, from this, characterizing Brazil's potential market and discussing the main stakeholders' challenges and priorities.

The results of the study point to the need for a review of policy and regulatory mechanisms that could constitute a choice of the Brazilian Government to increase SSS operations, which concern also allocating subsidies for other companies to operate short-sea shipping in Brazil.

The paper is structured as follows. Section 1 is the introduction. Section 2 provides a literature review, focusing the gaps, characterization and infrastructure challenges of the sector. Section 3 considers the potentiality of SSS in Brazil. Section 4 presents the discussion about SSS in Brazil. Section 5 provides conclusions.

Keywords

Brazil, Short-Sea Shipping, modal shift

1. Introduction

Despite the economic crisis, which has spread throughout the world, especially in 2008, Brazilian exports have registered increases. When, in 2009, the most developed countries had a recession and financial risks, Brazilian exports peaked at $198 billion. According to the National Agency for Waterway Transportation – ANTAQ - about 23% of Brazil's freight was transported by sea/waterways; this is almost 20% higher than Brazilian exportats in 2008.

Much of this growth is due to the waterway transportation industry which, despite the economic difficulties, still managed to achieve significant increases. However, Brazilian shipping is still something of a 'sleeping giant', considering the possibilities of growth that can be obtained. In 2000, according to fluvial and sea ports administrations, shipping was responsible for handling 460 million tons of cargo. A year earlier, the waterway sector had 13.8% share of the national transportation, behind the railroads (19.5%) and highways (61.8%). For comparative purposes, in 1985, waterways handled 18.3%, compared with 23.6% for the railroad sector and 53.6% for the road. The high usage of road transport in Brazil leads to an imbalance in the transportation modal split. Although there is some Brazilian research concerning the potential and benefits of waterway/sea transportation, the road transportation, which carries Brazil's door-to-door services, faces many problems to be solved, such as: traffic congestion, poor infrastructure, safety and environmental risks.

The waterway mode of transportation is therefore essential to promote and integrate the country internally and externally. After all, Brazil has eight river basins with 48,000 kilometers of navigable rivers, meeting at least 16 ports and 20 inland waterways. Between 1998 and 2000, 69 million tons were handled in the rivers. In 2010, the 36 seaports contributed over 180 million tons, according to ANTAQ (2010).

The adoption of Short-Sea Shipping (SSS), as an efficient mode of transportation for long distances, over 1.500 km, is of fundamental importance for the transformation of the current transportation matrix. The benefits resulting from its adoption would help toward a substantial development of the country. In addition, there is a growing trend in the process of containerization of cargo, where standardization in packaging products translates into lower costs involved in its movement.

This paper seeks to discuss the potential of short-sea shipping in Brazil, identifying the major difficulties in implementation. For this, we undertake a literature review, comparing the European and Brazilian experiences and, from this, characterizing Brazil's potential market with the focus in a description and characterization, and discussing the main stakeholders topics of interest. We also consider the efforts of companies to develop plans that help the logistical approach. Our main findings relate to the need to review the policy and regulatory mechanisms and the great possibilities for the increase of short sea shipping in Brazil.

Section 2 presents a Literature review, focusing on the gaps, characteristics and infrastructure challenges of the sector. Section 3 considers the potential for SSS in Brazil. Section 4 presents the discussion about SSS in Brazil. Section 5 provides conclusions.

2. Literature review

2.1 SSS literature review – European experience

One of the key motivations to expand short sea shipping (SSS) has been to counteract the rapid rise in road freight transport (Commission of the EU, 2004). If SSS is to penetrate this market, however, the challenge (for maritime transport) will be to offer the same overall service package as road transport. The European Commission defined SSS as:

"...the movement of cargo and passengers by sea between ports situated in geographical Europe or between those ports situated in non-European countries having a coastline on the enclosed seas bordering Europe" (Medda and Trujillo, 2010).

A major problem with SSS is that it is perceived to be too slow and therefore unattractive to road freight logistics demands. In their analysis of SSS, Paixao and Marlow (2002) identified weaknesses relating to the port environment and also to the quality of service that SSS can provide. Suggested advantages of SSS included environmental benefits, lower energy consumption, economies of scale and lower cost for expansion of infrastructure; however, SSS is perceived as slower and less reliable than trucking.

A follow on study (Paixao and Marlow, 2005) established that SSS was generally regarded as low quality and suffered from a poor image in the eyes of potential users. In terms of competiveness, Musso and Marchese (2002) concluded that SSS depended directly on the distance of the sea leg. Sea transport, it is claimed, is more competitive than trucking over longer distances. They further argued that any focus on 'costs' should include both internal and external costs.

Numerous other difficulties with SSS have been highlighted. Perakis and Denisis (2008) found that administrative and operational barriers have to be overcome, port charges reduced, and SSS needs to be integrated into intermodal transport networks. They suggested, albeit in reference to the USA, that alliances between trucking firms and port authorities would help. In Europe there is evidence of trucking firms starting to offer SSS services as an alternative to long distance trucking (e.g. the company UN RoRo in Turkey was established by trucking interests), as well as shipping lines setting up new services.

Brooks and Trifts (2008) identified three main aspects to consider when looking at the competitiveness of SSS:

- Service characteristics – i.e. transit time, price, reliability and frequency are key characteristics for any SSS service provider;
- Buyer requirements – i.e. the image of SSS is often already positive, however it does not tend to fit the needs of multi-stop en-route trucking operations;
- Situational variables – i.e. switching modes from road to sea can be induced by price incentives, such as an 'ecotax' imposed on truck fuel or a rebate on short sea shipping rates, by changes in the total cost of transport, or by access barriers such as worsening road congestion or security delays.

These findings regarding situational variables are similar to the outcome of an earlier study by Garcia-Menendez et al. (2004) which established that shippers' choice of short sea transport is more sensitive to changes in road transport prices than to changes in sea transport costs, concluding that modal switching to SSS could be induced by imposing an 'ecotax' on road transport.

In their survey of freight forwarders, Bergantino and Bolis (2008) found that freight rates are not the main determinant of modal choice. In modal choice decisions operators tend to rank other factors more highly. They found that reliability and frequency of service are the two most important parameters, even more so when it comes to the maritime alternative. And of these, in absolute terms frequency is the most relevant parameter, with valuations almost three times higher than for reliability. This does rather suggest that service frequency

will be of the utmost importance for any SSS service that is seeking to transfer cargo from road to sea.

Research has also identified a need to address port infrastructure and port facilities limitations in order to improve the efficiency of SSS, and to help minimize the negative impact of qualitative factors (Ng, 2009; Medda and Trujillo, 2010). Yet a degree of caution is suggested in any attempt to offer a generic solution for all markets as SSS is only likely to be effective in particular regions, in part due to geographic factors.

It is argued that the inclusion of external costs is important to effectively change the financial and social position of SSS in relation to road transport (Medda and Trujillo, 2010). Road transport could maintain its competitive advantage (over SSS) unless external costs are internalised. Introducing subsidies such as the Italian 'Ecobonus' (i.e. a sea freight rebate for truckers) or the EU Marco Polo programme (i.e. start-up subsidy for shipping lines) would be expected to assist this process, the latter helping to develop a series of Motorways of the Sea (MoS) in Europe (Baird, 2007). However, it is also suggested that there needs to be added focus on investments in ports as the intermodal interchange for SSS.

These arguments nevertheless tend to obscure the fact that putting ships in service on a new route in order to compete against long-established and often subsidised or part state-funded road transport represents a major risk for the private operator concerned (i.e. typically a total operating cost of $10-20 million per ship/year would be expected). The start-up of SSS services can also be expected to take time to develop, to attract sufficient cargo to enable break-even or make a profit, thus adding to operator risk. It is this risk that policymakers in Brasil need to consider, taking into account the experience of pro-active SSS policies elsewhere, as in Europe, where SSS/MoS is now well established as an alternative to long-distance road trucking.

2.2 SSS literature review – Brazilian experience

Short sea shipping in Brazil seeks to cover eight thousand kilometers of coastline, with a concentration of economic activity along it, since the nation's largest cities and the capitals of most states enjoy access to sea ports. In the last few decades coastal navigation has increased in Brazil by more than 20% a year.

Reasons for the recovery of the coastal navigation include the reorientation of the activities of long-distance shipping companies and the modernization of processes, investments and expansion of general cargo handling facilities in ports. With market deregulation and the end of bilateral freight in foreign trade, these domestic shipping companies cannot compete with 'mega-carriers' that have large fleets of merchant ships, scale of production and lower costs. These companies generally have transformed into intermodal operators, responsible for cargo logistics and modal interfaces in a door-to-door system (FADDA, 2007).

Currently, there are four companies that undertake most of the short sea shipping in Brazil: Mercosul Line (Maersk group), Alliance (Hamburg-Süd group), Log-In and Maestra. Altogether these companies operate six dedicated ships for SSS, however they also operate feeder services, according to their market strategies, employing smaller vessels as used in large ports for transhipment.

According to Fadda (2007), the Brazilian coastal shipping sector includes 36 ports of public administration, 3 private managed ports and 46 private terminals. In terms of port terminals, the SSS system has 93 private use terminals and 87 public terminals. However, the participation of short sea shipping is low in terms of total transportation of cargo and feeder services are often more attractive, as SSS needs proper integration between the points of loading and unloading, as well as intermediate points for distribution. Future prospects are for bilateral trade growth that can bring an increase in the use of feeder

operations at developing hub ports, and so other national ports would specialize in short sea shipping operations.

During this research it was confirmed most of the shipping companies are optimistic about a greater use of coastal shipping in Brazil, but the many limiting factors need to be discussed and solved first. Based on our interviews with industry stakeholders these limiting factors are presented and discussed below.

2.3 Brazilian Short-sea shipping characteristics

Among the main advantages of developing a new model for Brazilian SSS are: managing door-to-door cargo integrity, added security, agility in customer delivery, competitive cost, integration across all Brazilian regions, using containers, and frequent service based on a predictable transportation with weekly departures and arrivals, or better.

In addition, there are other advantages such as reduced use of road transport, reduced congestion in port access, lower pollutant emissions in port areas and the consequent decrease in the levels of greenhouse gas emissions in the country. Also, with the entry of new vessels to serve the domestic market, through the growth of the Brazilian shipbuilding industry, the trend is that the volume of cargo transported in short-sea shipping will develop greater impetus in the coming years.

However, the lack of government policy to develop the Brazilian waterway system, the long distances from ports connecting to production centres, less flexibility with SSS, slower transport, port infrastructure close to saturation and access restrictions from the sea (depth) and land (road and rail) all present obstacles against the use of SSS, generating significant deviations in loads and users and causing a poor reputation and image for the industry.

A survey by the National Confederation of Transport - CNT in 2002 showed that 'the main advantage of short-sea shipping, according to the customers is the cost of freight (88.5% of respondents), followed by safety (64.6%) and finally the reliability of the deadlines and the level of damages, both with 37.7%' (CNT, 2006).

According to the BNDES (1997), in comparison with maritime transport, road freight door-to-door is mainly based on the cost of the truck, because there are implicit incentives for this mode, since the Brazilian roads offer free use, the diesel fuel receives subsidies, and working hours of truck drivers are not controlled/regulated. The reality is different for shipping companies, in that the cost of capital, represented by the vessel, and operating costs (insurance, maintenance, crew, food, etc.) are actually fixed costs, whether the ship is operating or not. Travel costs (fuel and port charges) are mostly defined externally to the company, with no subsidies

On this basis it is possible to list the main obstacles for the development of SSS in Brazil as follows:

a) On Vessels:

High cost of bunker fuel: the fuel for short-sea shipping is about 30% more expensive because of the incidence of taxes such as PIS – social contribution tax (1.65%), COFINS – contribution for social security (7.6%), VAT – value added tax (17% on average) in the case of bunker, and diesel adds CIDE – contribution for petroleum and its derivatives market (5.5%);

Delayed compensation AFRMM - freight surcharge for the renewal of the marine market: due to the budgetary restrictions of the Marine Fund, this compensation has been paid with significant delays, which are up to two years;

Likelihood of completion of construction of boats: most yards do not have the possibility to guarantee compliance with the contract. Furthermore, they claim they are unable to accept new contracts due to high demands from the bulk sector;

Ship financing: in this case there are problems related to delay in approval of contracts by BNDES and the limit of credit for financing of ships. The delay for approval is, in some cases, because funding will eventually be applied to expenses incurred as occurs when the ships are ready and operating. The limit is calculated based on industrial projects and is incompatible with the merchant shipping industry;

Differential costs: operating costs of Brazilian vessels is higher relative to convenience flags vessels;

High cost of crew social charges: the labour costs in Brazil are known for their high level reflected in the wage paid to workers.

b) On Seaports:

High port costs assessed on the freight value, which is basically a tax on goods;

Low priority access to ports: the domestic cargo, as it generates smaller amounts of revenue compared to deep-sea traffic, this has consequences due to lower supply of vessels, and in ports where there is an occurrence of congestion;

Pilotage: domestic cargo, as it generates a lower volume of revenue compared to long distance cargo, this has consequences due to lower supply of vessels, in ports where there is an occurrence of congestion;

Low productivity of all the Brazilian ports: Some Brazilian ports have established restrictions exclusively for handling certain types of goods in the terminal;

Long waiting time for berthing of bulk solids and liquids: congestion occurring in some ports due to lack of investment in the expansion of terminals;

c) Concerning routine administrative and bureaucratic controls:

Various authorities have different routines and visits to survey and control the order of entry and exit of vessels;

ANVISA rules: some rules are established for short-sea shipping that is more consistent with long distance transport because it prevents crews coming from other countries;

Bureaucracy SISCOMEX: short-sea shipping cargo must be registered with the Federal Reserve system;

Frequency: the short-sea shipping transport suffers criticism because of the unreliability of the service, because it presents no regularity and that makes the cargo owner become less interested in this mode.

According to Moura et al. (2007), referring to a survey carried out with companies and operators, one problem for the short sea shipping sector in Brazil is the lack of national shipyards to build new vessels, but the most significant factors cited was the high port/dockage charges followed by price of bunker fuel.

In addition, some companies interviewed pointed out reasons not to develop Brazilian SSS market including the strong policy and priority given to export cargo, which is higher taxed and brings more financial benefits to operators.

2.4 Short-sea shipping development in Brazil

Traditionally, the concept of Brazilian Short-Sea Shipping is not connected to the logistics chain and intermodality. The under-representation of intermodality in Brazil exposes the low use of waterways despite the dissemination and awareness of the benefits to the Brazilian public transport network.

According to Jones et al (2000), intermodal transportation should be generally defined as 'the shipment of cargo and the movement of people involving more than one mode of transportation during a single, seamless journey'. As Yevdokimov (2000) argued, 'intermodal transport requires the physical transfer of cargo between different modes, in a systemic perspective of the transport chain, from collection to distribution, minimizing downtime of goods in their handling between origin and destination'. Even with the prospects for growth in cargo handling in Brazilian ports, although some companies have adopted logistics solutions that address the use of waterways, the country is still undergoing political and regulatory reforms. The result is slow progress in the dissemination of intermodality, combined with limited use of short sea shipping, which represented less than 23% of cargo handling in the country in 2010.

The National Transportation Confederation (CNT, 2006) Waterway Survey 2006 – Maritime Ports and Cabotage, presents important data, which along with the data ANTAQ (2010) show that the current fleet involved in short-sea shipping is 115 vessels, divided into 37 tankers, 25 barges, 17 cargo, 16 bulk carriers, 13 container ships, 5 roll-on/roll-off and 2 multipurpose. According to ANTAQ data from January-February 2010, there were 21 companies operating a regular liner transport fleet with an average ship age of 19 years. According to the Bulletin of the CNT in January 2011, the Brazilian flag merchant fleet amounts to 1,197 vessels and the long-distance fleet and short-sea shipping is 139 vessels, highlighting that 77% of the Brazilian short-sea shipping cargo are related to oil and its derivatives.

The Superintendent of Maritime Navigation and Support (SNM, 2010) stated that in 2010 the Brazilian coastal fleet consisted of 147 vessels operated by 32 companies, with a total deadweight tonnage of 2,929,073 DWT and an average of 19,926 DWT, with average age of about 19 years.

According to the ANTAQ Bulletin for the 3rd Quarter of 2010, the accumulated total cargo handling in ports was 31,812,577 tons, and for private used port terminals of 103,355,632 tons for the coastal shipping.

Since the early 1930s SSS in Brazil has been restricted by ongoing investments in new roads, and new types of vehicles for heavy loads providing for direct service to the final customer. The greatest period of industrial growth in Brazil, between 1940 and 1980, was also marked by high growth of road transport, which now competes strongly with SSS. This growth took place via the technological development of vehicles, maintenance and construction of new roads and fuel subsidies, which were happening successively over those years.

Studies have already been undertaken with the objective of diagnosing coastal shipping in Brazil. Some of these studies, such as Moura et al. (2007) and CGEE (2009), present major obstacles and difficulties for short-sea shipping implementation in Brazil and a diagnosis of the waterway industry and shipbuilding in Brazil, respectively. Year after year, Brazilian SSS has registered some growth, but in quite short steps. It may be noted (Figure 1) the small growth in the use of SSS in Brazil, between 1998 and 2010.

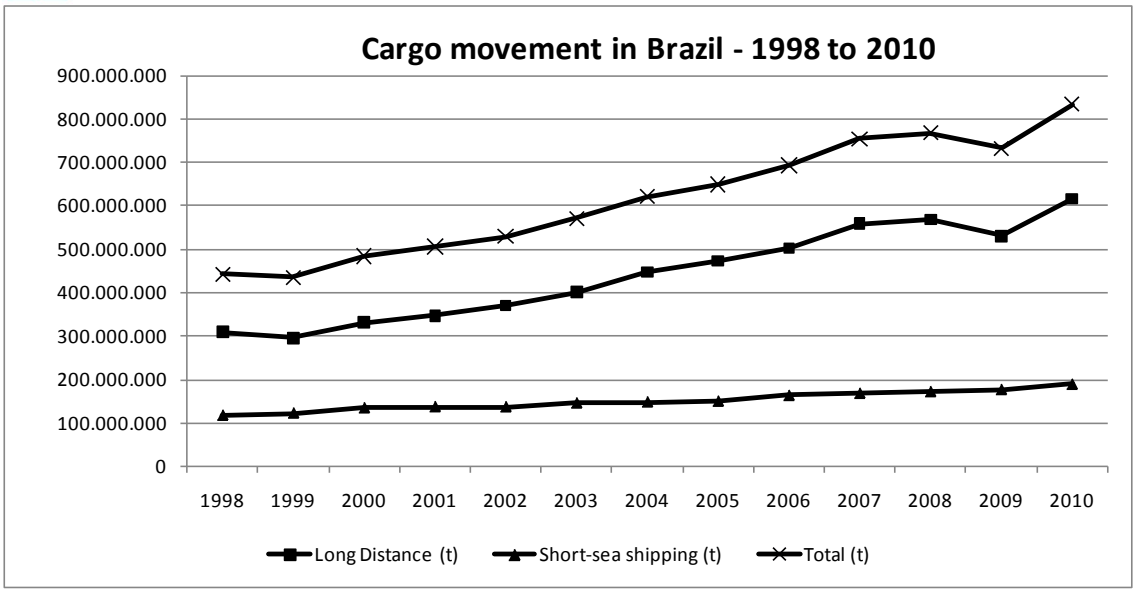

Figure 1 – Cargo movement in Brazil between 1998 and 2010

Source: ANTAQ annual statistical report of ports, 2010

In fact, the percentage share of SSS in the cargo movement in Brazil fails to reach the level of 23%, and by contrast, often shows declines, such as the 4% reduction between 1999 and 2009 (Figure 2).

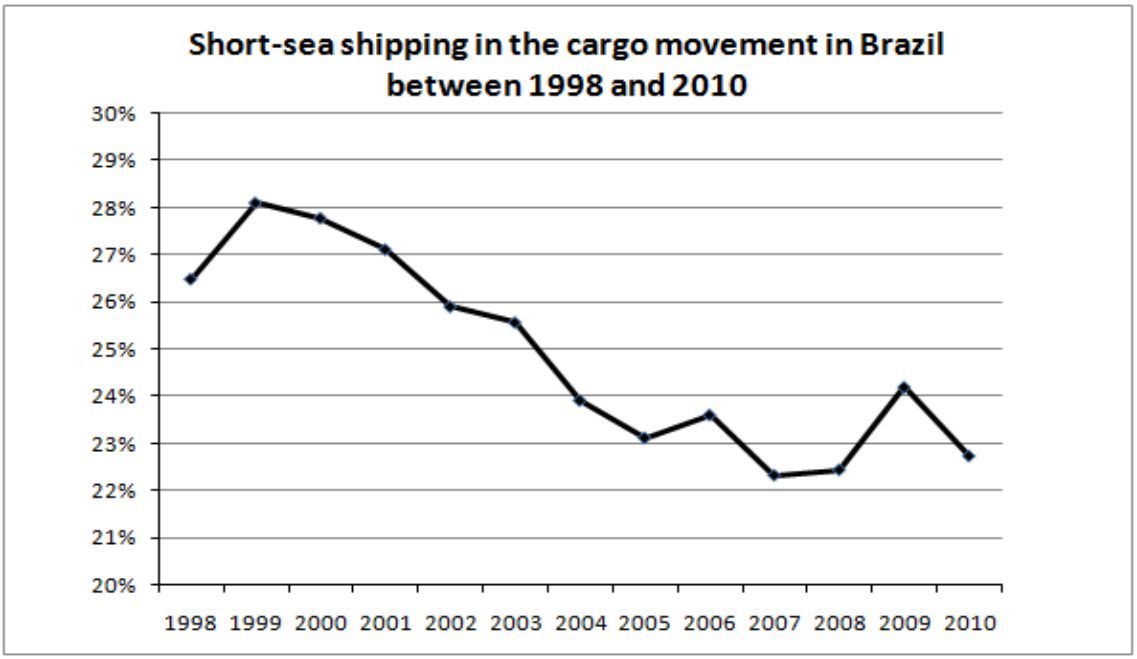

Figure 2 – SSS share in the cargo movement in Brazil between 1998 and 2010

Source: ANTAQ annual statistical report of ports, 2010

Thus, several barriers to short sea shipping in the maritime sector may be listed as follows: observed gaps in regulatory issues; lack of Government incentives; increased rates in ports; fleets with aged vessels; the need for more modern equipment in various Brazilian ports; and new investments for the integration of the transport logistics chain.

One of the other problems faced by coastal shipping, according to Moura et al (2007), is the imbalance that exists in the flow of cargo between the regions of the country. The irregular distribution of goods is also caused by the disparity between modes of transport, especially because most cargo is transported by road, with roughly a 63% stake in the array of cargo transportation modes. Studies for the National Logistics and Transport - PNLT claim that the goal of participation of water transport in Brazil must overcome the mark of 25% in the transport matrix, by 2025. One way to improve this situation would be to provide a different vision for the use of short sea shipping, with appreciation of the various spheres of society and, therefore, as part of intermodal transport chains for cargo movement.

2.5 Shipping market in Brazil

The geographical features of Brazil and the distribution of income among Brazilian regions pose challenges for the logistics sector, which is still dependent on road transport for long distances. According to the National Logistics and Transport of the Federal Government, a balanced array of transportation is recommended so that road transportation accounts for 33% and 29% by waterway. Currently, these modes account for 58% and 12% respectively.

Many harbour operations in Brazil are hindered by the critical conditions of the Brazilian ports and weather events that are happening during recent years. In 2010, for example, with the low level of water in the Amazon River, plus intense winds and waves from Argentina along the southern coast of Brazil, many operations were badly affected. The cost of waiting time for berthing of ships and port expenses for loading and unloading of containers also generated dissatisfaction regarding the use of coastal shipping.

Due to the limited number of ships in operation and restrictions on the use only of vessels built in Brazil, many companies cannot offer regular services for coastal shipping. The problems associated with the queue of ships waiting to dock in the ports caused a decline in billing and consequently lower capacity utilization.

Nevertheless, 2010 was the year of some new container operations in Coastal Navigation. Some companies operating with smaller vessels, found new alternatives to serve new regions and to meet the growing strategic markets in the country. Manaus, a city in Northern Brazil, was an example of growing cargo flows with emphasis on the exploration of long-haul routes (maximizing the movement of cargo between the areas of industrial production and consumption). Another area that has gained in favour was the flow of cargo in the Northeast, with Atlântico Sul yard operations, in the state of Pernambuco, which is involved in the shipbuilding market. These vessels will boost coastal shipping, with larger ships being more efficient, and this will take from each of the Brazilian highways about 2,800 trucks, reducing CO2 emissions into the environment.

According to Log-in navigation company, with reference to Paulinia Intermodal Terminal, in São Paulo, the expansion works started in January and will encompass the container yard and internal roadways, general cargo yard, reception, support areas and maintenance workshops. The operations at this terminal will then allow cargo capture from/to the port of Santos, integration with the rail route of São Paulo - the Midwest and the PSC - Dry Port of Cerrado, and may also be used as a container depot for Coastal Shipping.

In 2011, the country's economic growth and available offerings of short-sea shipping should be even more positive, especially in developing the market in the North and Northeast of the country with the consequent need to move industrialized freight for these regions.

3. Potentiality of SSS in Brazil

3.1. Potential Market for Short-sea Shipping

Few studies have been conducted on the potential for attracting SSS cargo in Brazil. An initial estimate can be constructed based on the size of the transport market. According to the Brazilian transportation sector (Figure 3) in 2010, about 1.2 million tons of various types of cargo were moved on Brazilian highways. Excluding bulk cargo and intrastate or interstate non-competitive cargoes from this volume, this means that nearly 36 thousand tons of cabotage scope cargo was handled during the year in trucks. This corresponds to approximately 2.2 thousand TEUs that could be transferred from road to sea.

If this cargo has been extracted from traffic that is distant from ports, small businesses that do not have regularity in their shipments and market of cargo split, the potential market for SSS not served by this mode, in 2010, would amount to 1.2 million TEUs. It is estimated that companies providing SSS in Brazil handled 348,000 TEUs in 2010, so 23% of the total potential SSS market for the country. This indicates that there is a large market, about three times the current level, not yet met, or as yet undeveloped, which presents opportunities to capture market share from road transportation. Obviously, this kind of analysis ignores the potential development caused by the provision of a new transport system, but it serves as a starting point for an initial estimate such as the 25% that Brazil's government intends to reach with SSS in a few years time, according to the Transportation and Logistics National Plan - PNLT.

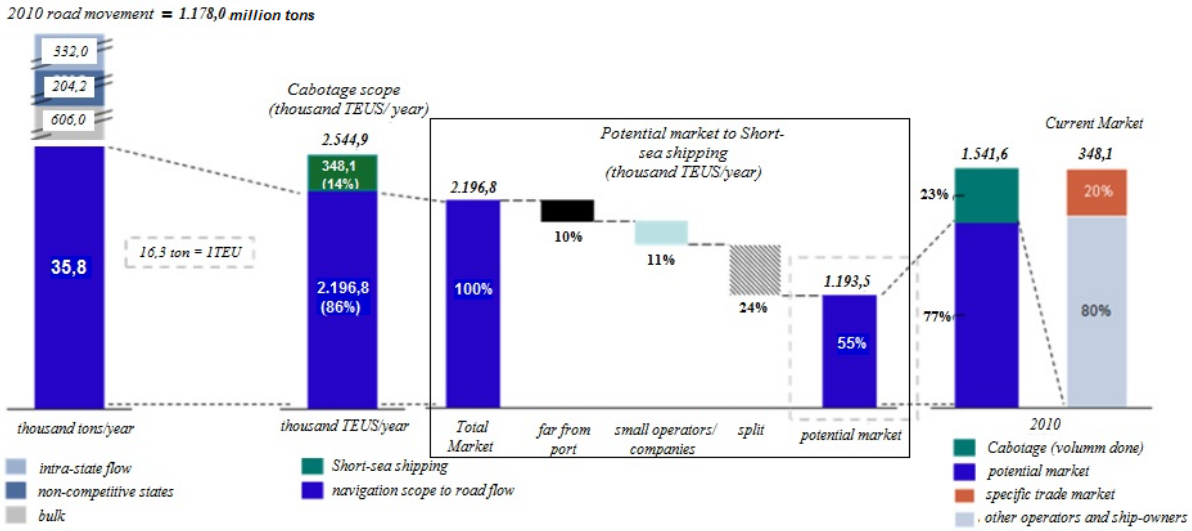

Figure 3 – Estimated potential to Short-sea shipping cargo movement

Source: IDET/FIPE, Datamar, Log-In Analysis, 2010

4. Discussion

The methodological procedure applied in this study began with a literature review on the subject, as an exploratory type of research. The literature review analysed specific journals, proceedings of congresses and other publications and reports covering the subject, as well as books that address the topic. Several meetings were also held with shipping companies to explore further some of the constraints, challenges and opportunities relating to SSS potential in Brazil.

The focus of the literature review was to describe and discuss the short sea shipping theme. Then characterize Brazil's potential market, discuss the main companies' interest and offer a logistical approach and solution to the SSS concept in Brazil.

The main findings are the need to review the present policy and regulatory mechanisms that could represent a way to increase Brazilian short-sea shipping. This concerns also the need to apply subsidies to permit companies to operate short-sea shipping in Brazil, this being a necessity in order to increase SSS operations and help overcome market distortions favouring road transport.

Some shipping companies have already developed plans for a shift of transportation modes, from long distance road transportation to short sea shipping, with greater reliability and lower costs, but to succeed this depends, among other factors, on a change in the logistical strategy of those companies and a real consideration of policy changes by the Brazilian government.

The competitiveness of Brazilian companies tends to be hampered by inadequate provision of transport infrastructure and logistics existing in the country, particularly given the situation of bottlenecks at ports. Investments that have been undertaken in the sector, essential for expanding the economy, cannot cope with the increase in economic activity. While the economy grew by about 7.5% in 2010, the increase in container traffic in Brazil was at least 40%. There is discouragement for the renovation and expansion of the fleet due mainly to the prices of vessels that are on average 30% higher than in foreign markets, and the longer construction period for the same type of vessel built in Brazil compared with other shipyards. According to Fadda (2007), "Moreover, it is added in the specific case of Brazil' short sea shipping, another limiting factor, i.e., the price of fuel is 20% greater than in long-distance navigation, depending on the tax charged in the country, which carries a large weight in the operational costs of Brazilian shipping companies".

5. Conclusion

To achieve the target predicted in the waterway transport sector in Brazil, about 25% in 2025, there is much to be done at ports, in terms of access and linkages with road and rail transport, maritime transport in terms of more suitable laws and especially in the awareness of ports, agents in shipping companies, storage and cooperation with carriers in other modes (i.e. integration). Shipping can reduce internal distances and be decisive in the consolidation of Brazil's export market, increasing trade with other continents as has been achieved to fit the requirements of a globalized world.

Based on this research, it is possible to see that most of the navigation companies which operate in Brazil intend to expand their business in the short term. However, they made clear that this will depend on the development of port terminals and via the modification of policies and practices, notably in ports, but also as applying to SSS operations more generally within Brazil itself. The conditions must therefore be created to allow SSS to succeed. This means that Brazil, in order to foster large-scale modal shift, needs to develop a distinct SSS/MoS policy. Such a policy must consider ports, integration, regulation, and market distortion/equalisation measures to enable SSS to succeed.

It is also confirmed that to be viable, Brazil's short-sea shipping needs more research as well as strategic investments by the government to continue seeking the most optimal use of short-sea shipping.

There is clearly a large potential market for the growth of Brazilian short sea shipping and, despite the complexities and limitations that still exist, the increased interest of new players (with increased fleet results in an optimistic view of some port authorities to turn their facilities into hub ports, with greater capacity and container handling growth in the number of

shipping lines. There are significant opportunities to increase container handling and therefore to increase coastal shipping in Brazil.

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