

Determining Factors in Port Competitiveness: The Case of Fresh Fruit and Vegetable Produce Traffic in Spanish Ports

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ABSTRACT

The aim of this study is to analyze the factors determining the competitiveness of ports with regard to horticultural produce traffic. A data panel including 27 port authorities over a period of nine years was used. The results show that for traffic of this kind the lower the shipping costs, the higher the level of container and Ro-Ro traffic, the higher the road haulage costs and the greater the dry port capacity the more attractive a port becomes.

KEY WORDS: Shipping, fruit and vegetable produce, intermodality, costs, port infrastructure.

JEL CODES: F1, R4.

¹ This work is part of the project *'The design of a short distance shipping network for perishable produce with its centre in south-eastern Spain and destinations on the Mediterranean and Atlantic coast (RedYMar)'*, dossier P10/08, approved in the 2008 announcement of aid to projects in Transport and Infrastructures within the National Plan of Research and Development 2008-2011 (Order FOM/3864/2008, 26th December, BOE n°4 of 5/1/09).

1. INTRODUCTION

Over the last few years the liberalization of economies, the creation and expansion of markets due to globalization with the consequent decentralization of the production process, have brought about a continuing increase in international trade and, consequently, in shipping and port activity.

In fact, as is shown by the statistics of Spanish State Ports (Puertos del Estado), in 2008 more than 80% of imports and 50% of Spanish exports, measured in tons, passed through our national ports, ratifying the economic importance of shipping and demonstrating Spain's need for efficient ports, capable of facing up to the fierce and growing competition at international level.

Aware that the income of each port depends on its volume of activity, port managers have attempted to enhance the ability of their docks to attract traffic by providing adequate value for money for the services offered and designing competitive strategies that enabling each port to find their own niche (Bergantino, 2002; Song, 2003).

As a consequence, it is obvious that in a competitive environment port authorities must make plans to stimulate port activity. In other words, they must increase their capacity to attract port traffic, whilst making sure that any improvement made will be truly effective. Therefore, they need to identify the reasons determining choice of port, establish why clients choose the facilities at their port rather than elsewhere and, consequently, define a plan of action that takes into account the determining success factors at inter-port competition to obtain traffic (García-Alonso, 2005).

In this study we intend to establish the factors determining choice of port for horticultural produce freight which is either sold or produced in Spain. To do so we produced a data panel of the 27 port authorities² of Spanish National Ports over a period of

² There are presently 28 port authorities. Nevertheless, we have decided not to include the Port Authority of Motril, given that for 6 of the 9 years used in our sample it belonged to the Almeria-Motril Port Authority.

nine years including a total of 243 observations. In our analysis we have chosen variables enabling us to measure the importance of the characteristics that influence the choice of a certain port, and that allow the effects of intermodality on port competition to be analyzed. These variables are purely economic and are also intended to quantify the effects of means of transport other than sea freight, such as road haulage, the latter being widely used in the case of fruit and vegetable produce. Being able to estimate the effect of this variable allows us to assess whether road haulage complements or substitutes sea freight.

The study has been structured as follows: In section 2 evaluation of existing economic literature on studies of competition between ports, in the third section we present the model used and provide interpretations of the results obtained from our estimates, and lastly, in the fourth section, our final conclusions.

2. THEORETICAL FRAMEWORK

The generic factors that affect competitiveness in general and those that determine port choice in particular are well documented in previous studies. Nevertheless, there is a wide variety of potential factors that determine choice of port which can be either qualitative or quantitative nature.

The advent of container traffic in the sixties is widely considered to be mainly responsible for this. This development not only helped to facilitate the handling of the a ship's freight but, at the same time, it stimulated the rise of intermodality and with that, inter-port competition to attract traffic. Prior to this this time shippers had opted to use installations that minimized the cost of road freight. This way the process of port choice for their commercial activities was simplified, as any advantages offered by those ports that were further away from the final destination of the freight were simply ignored.

Studies carried out in the seventies and eighties accepted the determining principle that volume of port activity was conditioned by the price of the services provided by the port and, above all, the general cost, defined as the total cost payable for the different services plus costs in terms of time, risks of losses, damage and delays. This coincides with the

synthesis made by Foster (1978) and Bobrovith (1982) that placed port costs as the main determinant, and Slack (1985) who concluded that the truly relevant factors for users of a port were the costs and the type of services offered by transport companies, both on land and sea, and not the characteristics of the port itself.

More recent analyses made in the current decade show that although costs and the availability of installations remain relevant, quality related factors are those that have the greatest impact on the choice of ports.

Along these lines, hierarchic analysis has provided a wider range of nuances in its results. The usual process in this form of analysis involves prior identification of all the potential elements that influence the choice of port, made on the basis of previous studies and consultation with experts and port operators. Some of the studies carried out using this methodology are listed below:

- **Tongzon (2002)** makes a broad classification of quantitative determinants in terms of factors of routes, costs and services. Qualitative factors are also considered, including influential elements such as flexibility and ease of use, marketing efforts made, tradition, personal contacts, and cooperation between port operators and port authorities, etc. Moreover, Tongzon (2008) considers that efficiency, shipping frequency, adequate infrastructure and location are the most important determinants in the ports selection process.
- **Song and Yeo (2004)** specify 73 factors in their study of competitiveness in Korean ports. They reduce this to twelve main components, which, in order of importance, are the following: 1) proximity to the hinterland, 2) port facilities, 3) efficiency of loading/unloading operations, 4) availability of routes, 5) port regulations, 6) location, 7) port congestion, 8) access to other forms of transport, 9) port costs, 10) customs duty, 11) security and 12) availability of information.
- **Lirn et al (2004)** in their study of transfer ports in Taiwan specify 47 choice

criteria that they finally resume in six principles: 1) port draughts, 2) local infrastructure and availability of a network of intermodal transport, 3) container storage space 4) the volume of freight handled in the port, 5) geographical advantage (proximity to main routes) and 6) port efficiency and handling costs.

- **Bergantino and Bolis (2004)** through a combination of Revealed Preferences and Adaptive Stated Preference Experiments conclude that reliability and frequency are very important in the decision to switch to maritime services.

In these studies we find some fundamental ideas about competitiveness and competition between ports: a) the determining factors of competitiveness differ according to a port's characteristics, b) factors such as distance and geographical location are beyond the management's control, whose attention is best concentrated on local conditions, c) any competitive strategy used needs to take into account the relation between the determining factors of a particular port and its clients, which provides a guide as to which aspects require improvement or change.

Each port is part of a system and its smooth running is conditioned by its political, economic and social setting (Bichou and Gray, 2005). The status of a port is also dynamic (Hoyle and Charlier, 1995), depending on the evolution of the factors conditioning its attractiveness in the port choice process, for which its management is required to act to enhance the appeal of its facilities, and, hence, its level of activity and capacity to generate wealth.

So far, we have concentrated on inter-port competitiveness. It is noteworthy that intra-port competition is also a desirable objective as it produces knock-on effects, such as reducing the power of existing monopolies. It also facilitates the access of users to more affordable prices, and stimulates innovation and specialization.

Both Meersman and Van de Voorde (1998) and Robinson (2002) adopted a different position on the problem of competition for traffic. According to these authors, competition

no longer takes place in unrelated fields of the transport market, but rather in the setting of logistic networks. The port is only responsible for one part of the successful functioning of the logistic chain it is part of, which is itself a competitive entity that attracts traffic.

There are three strategic planning areas governing the issue of competition between ports:

- 1) **Leadership in costs:** Emphasizing the need for lower costs than competitors, not only in terms of a lower financial cost for services, but also addressing issues such as the reduction of waiting times, operational efficiency and labor productivity, etc.
- 2) **Differentiation**, uniqueness or innovation in some aspect of the industry which enables one to be perceived as different from other competitors, for example, by providing specific port services, or better quality in market niches that are different to those found in other ports, thereby offering greater value to port users.
- 3) **Focus**, concentrating on maintaining a strategy aimed specifically at a target group of clients or market. Hayut (1993), Heaven (1995) and Fleming (1997) have questioned the value of a situation where rivalry between ports has led to *micro-geographic* competition. These authors point out that this has reached a level that favors an excess of port facility capacity when considered at a national level, leading to a waste of resources. As such, it is necessary and convenient to redirect the process of inter-port competition towards one of 'co-opetition', or 'cooperate to compete'.

This term, coined by Noorda (1993) and applied to the port sector by Avery (2000) and Juhel (2000), implies a mixture between competition and cooperation, in such a way that ports which share or have similar target markets opt for a win-win strategy, competing in

some aspects and cooperating in others, instead of following a strategy based uniquely on ‘destructive’ competition, that is to say, they suggest that ports should cooperate to compete as, in their opinion, this cooperation is the only way to avoid the mutual destruction of the weakest (Song, 2003) when faced with the increasing negotiating power of the shipping lines, the increase in the size of vessels and rising competition.

“Cooperation to compete” is a strategy that port clients have been developing for some time now (for example, strategic alliances and cartels are a common practice amongst shipping lines). Nevertheless, on the side of those offering the use of port infrastructure the practice of ‘co-opetition’ between ports sharing the same hinterland has been less frequent (Heaver et al, 2001). These authors point out the possibilities and types of cooperation strategies amongst all stakeholders in the port, clients and suppliers. Barzdukas et al (2000) relate the details of an interesting experiment in cooperation between the ports of Seattle and Tacoma.

3. THE MODEL

We have used a linear model with the aim of examining port competition using geo-economic variables. These variables describe port infrastructures, freight traffic and cover the degree of intermodality available to the port authority.

The period of time taken into consideration was limited by the availability and homogeneity of information. Even so, we were able to generate a data panel model for the period from 2000 to 2008. In this sense, the use of a data panel to study port competition determinants is a novelty, given that the majority of empirical studies use hierarchical analysis as a means of previously identifying all the potential elements that influence port selection. We were, therefore, able to analyze 243 observations for each of the variables used, given that we used a sample taken over a period of nine years in 27 port authorities.

A) Data

The variables used are resumed in the following table:

TABLE 1: TAXONOMY OF MODELED VARIABLES

NATURE	DENOMINATOR	DESCRIPTION
Port Factors	Fruit and Vegetable Produce Traffic	Dependant variable measured by the total tonnage of fruit and vegetables loaded and unloaded by each port authority. Source: <i>Ports of the State</i> .
	Containers	Total tonnage of freight in containers of 20 feet or more, loaded and unloaded by each port authority. Using this variable we attempt to measure the importance of container traffic to the port authority and how it influences the selection of ports for fruit and vegetable produce freight. Source: <i>Yearbook of Statistics of Ports of the State</i> .
	Ro-Ro traffic	Total tonnage, per port authority of freight loaded and unloaded in each port with regard to Roll-on Roll-off traffic (Ro-Ro traffic). Using this variable we attempt to measure the importance of this type of traffic to the port authority and how it affects port competition for the entrance and dispatch of fruit and vegetable produce. Source: <i>Yearbook of Statistics of Ports of the State</i> .

	Draught	Length of dock (in meters) with a draught of over 12 meters. This variable allows us to quantify the effect that the draught has on port selection. Source: <i>Yearbook of Statistics of Ports of the State</i> .
	Dock	Total meters of dock. This variable allows us to measure the importance of dock length on port selection. Source: <i>Yearbook of Statistics of Ports of the State</i> .
	Storage area	Area in square meters that each port authority allocates to storage. This variable allows us to measure the effect of this type of facility on port competition. Source: <i>Yearbook of Statistics of Ports of the State</i> .
	Dry Ports	Variable measured in terms of dry dock capacity in metric tons in each port authority. This allows us to assess the importance of this part of the logistics infrastructure in the choice of a port for fresh fruit and vegetable freight. Source: <i>Yearbook of Statistics of Ports of the State</i> .

	Investment	<p>Investments made by the corresponding port authority measured in thousands of euros. This variable allows us to evaluate if investments made by the port authorities are compensated by greater fresh fruit and vegetable freight. Source: <i>Yearbook of Statistics of Ports of the State</i></p>
	Fees 1	<p>A simplified estimate of the fees applicable to freight transported in containers of up to 20 feet, and in flat bed trucks of up to six metres in length. This rate is measured in euros per unit transported. Given the scarcity of information, we have used the last published rate. With this variable we measure if there is sufficient competition in price amongst Spanish ports for port fees to be a determining factor in the choice of port. Source: <i>Port Authorities</i>.</p>

	Fees 2	A simplified estimate of the fees applicable to freight transported in containers over 20 feet, and to semitrailers, trucks and articulated lorries of up to 12 metres in length. The rate is measured in euros per unit transported. Given the scarcity of information, the last published rate was used. This variable was used to measure competition in price amongst Spanish ports determine whether it was sufficient for port fees to be a determining factor in the choice of port. Source: <i>Port Authorities</i> .
	Fees 3	A simplified estimate of the fees applicable to freight transported by trucks with trailers (road trains). The rate is measured in euros per unit transported. Given the scarcity of information, we have used the last published rate. With this variable we measure if there is sufficient competition in price amongst Spanish ports for port fees to be a determining factor in the choice of port. Source: <i>Port Authorities</i> .
Intermodality	Rail connection	Dummy variable that takes the value of 1 if the port is connected to the railway and zero if not. With this variable we can assess if railway connection to the port is important or not in the case of traffic in fruit and vegetable produce. Source: <i>Yearbook of Statistics of Ports of the State</i> .

	<p>Average price per kilometre</p>	<p>Average price per kilometer for the road haulage of freight. This variable allows us to analyze if road haulage is a complement or a substitute for shipping in the case of traffic in fruit and vegetable produce. Source: <i>Ministry of Public Works</i>.</p>
<p>Geo-economic Factors</p>	<p>GDP per capita</p>	<p>Provincial GDP per inhabitant. The estimation of this variable allows us to evaluate if the more developed provincial economies use ports for the traffic of freight other than fruit and vegetable produce. Source: <i>National Institute of Statistics</i>.</p>
	<p>Importance of the agricultural sector</p>	<p>Brute added value for agriculture at provincial level, measured in relation to the GDP of each province. With this variable we can evaluate whether there is a correlation between the importance of agriculture to the provincial economy and the traffic in fruit and vegetable produce passing through its ports. Source: <i>Compiled by authors from information provided by the National Institute of Statistics</i>.</p>

	Island port	Dummy variable that takes the value of 1 if the port is in one of the Spanish archipelagos, excluding Ceuta and Melilla, and zero if not. This variable allows us to quantify cases of traffic in fruit and vegetable produce where there is no alternative such as road or rail.
	Distance	Proxy variable of shipping costs, defined as the distance between the port in question and the national port with which it does most trade. Source: <i>Compiled by authors from information obtained from the Annual Records of the Spanish Port Authorities.</i>

B) The model

We have estimated a linear model using the estimators Feasible Generalized Least Squares (FGLS) and Panel Corrected Standard Errors (PCSE). At the moment of choosing this estimator a series of tests were made to determine which were most efficient with respect to the variables used. In the first place the *Lagrange multiplier test* for random effects was used. The value for chi squared (χ^2) led to a rejection of the null hypothesis, making it preferable to use Ordinary Least Squares (OLS) with grouped random effects in the regression, that is to say, the usual OLS estimator. In second place we made a similar test to determine if the estimator of fixed effects was also greater than the grouped model. The F test for the significance of fixed effects showed that, effectively, it was preferable to use the estimator of fixed effects. In third place the Hausman test was used to decide between random and fixed effects. The value of (χ^2) obtained allowed us to reject the null hypothesis, that is to say, the difference between the coefficients of random and fixed effects is systemic, making it convenient to use fixed effects. In fourth place the

Wooldridge test was made. This demonstrated that the model showed a problem of autocorrelation. Finally the modified Wald test showed that the model was also heteroscedastic. To resolve this the two best estimators are Feasible Generalised Least Squares (FGLS) and PCSE, so these estimators are the best choice³.

We have used a data panel which allows us to estimate all the port variables in conjunction, both those that describe the degree of intermodality and the geo-economic variables. The use of panel data is something of a novelty in this type of analysis, but it allows us to control individual heterogeneity, enter data with a higher degree of variation and a higher level of collinearity among the regressors, study dynamic processes of adjustment, identify and measure effects that are not detectable using time series or cross sectional data, and to construct and compare more complex behavior models than would be possible using simpler data.

We have made two distinct estimations according to the two estimators used. The model that we have estimated is as follows:

$$\begin{aligned} \text{TRAFFIC}_{it} = & \alpha + \beta_1\text{CONTAINERS}_{it} + \beta_2\text{RORO}_{it} + \beta_3\text{DRAUGHT}_{it} + \beta_4\text{DOCK}_{it} + \\ & \beta_5\text{AREA}_{it} + \beta_6\text{DRYPORT}_{it} + \beta_7\text{INVESTMENT}_{it} + \beta_8\text{FEE1}_i + \beta_9\text{FEE2}_i + \beta_{10}\text{FEE3}_i + \\ & \gamma_1\text{TRAIN}_{it} + \gamma_2\text{PRICEKM}_t + \lambda_1\text{GDPPC}_{it} + \lambda_2\text{AGRICULTURE}_{it} + \lambda_3\text{ISLE}_i + \lambda_4\text{DISTANCE}_i \\ & + \eta_i + \delta_t + \mu_{it} \end{aligned} \quad (1)$$

where,

TRAFFIC measures the total of fruit and vegetable produce loaded and unloaded in Spanish ports; *CONTAINERS* the total tonnage loaded and unloaded of containers of 20 or more feet; *RORO* measures the Ro-Ro traffic in Spanish ports; *DRAUGHT* measures the length of dockside with a draught of more than 12 meters; *DOCK* gives the total length of dockside

³ Beck and Katz (1995) proved that the standard errors generated by the PCSE estimator are more precise than those of the FGLS, nevertheless, the debate about both estimators continues.

in each port; *AREA* is the total area each port has for storage; *DRYPORT* gives the dryport capacity of Spanish ports with said facilities; *INVESTMENT* is the investment made in Spanish ports for the year in question; *FEE1* gives the fees applied in each port to freight transported in containers of 20 feet or less or in trucks with up to six meters of load capacity; *FEE2* gives the rate applied in each port to freight transported in containers of more than 20 feet, and in semi-trailers, trucks, or in articulated vehicles with up to twelve metres load capacity; *FEE3* gives the rate applied in each port to freight transported in trucks with trailers (road trains); *TRAIN* is a dummy variable with the value of 1 if the port is connected to a railway and zero if not; *PRICEKM* is the average price per kilometre for freight transported by road; *GDPPC* is the provincial GDP per inhabitant; *AGRICULTURE* measures the importance of the agricultural sector in the provincial GDP; *ISLE* is a dummy variable with the value of 1 if the port is located in the Canary Islands, the Balearics, Ceuta or Melilla and zero if not; *DISTANCE* is a proxy variable of shipping costs. η_i stands for unobserved individual effects specific to each country but constant in time, and δ_t stands for unobserved temporal effects that vary with time but which are constant and identical amongst countries.

C) Results

Once this model was estimated using FGLS and PCSE and the global significance of the models used was checked, the following results were obtained:

TABLE 2: ESTIMATE RESULTS

VARIABLES	DEPENDANT VARIABLE: HORTICULTURAL PRODUCE TRAFFIC	
	FGLS	PCSE
CONSTANT	35,64 (0,35)	-23,43 (-0,91)
CONTAINERS = 20 FEET	0,02*** (5,13)	0,03** (2,18)
RO-RO TRAFFIC	0,01** (1,66)	0,009 (0,56)
DRAUGHT > 12	1,88 (0,51)	1,22 (0,39)
DOCK	0,60 (0,29)	-1,18 (-1,15)
STORAGE AREA	-0,0003 (-0,28)	-0,003 (-0,89)
DRY PORT	0,30*** (3,10)	0,44*** (3,49)
INVESTMENT	-0,003 (-0,03)	-0,15 (-0,32)
FEE 1	-1,66** (-2,10)	-4,06** (-1,81)
FEE 2	0,83** (1,93)	2,25** (2,01)
FEE 3	0,69 (0,79)	0,40** (1,73)
RAIL CONNECTION	-0,14 (-0,39)	-0,29 (-0,09)
AVERAGE PRICE PER KM	0,37 (0,97)	0,30* (1,59)
GDP PER INHABITANT	-2,02* (-1,30)	-1,18 (-1,25)
IMPORTANCE OF AGRICULTURAL SECTOR	1,83 (0,66)	-0,72 (-0,61)

ISLAND PORT	0,99* (1,34)	3,04** (2,22)
DISTANCE	-1,63 (-0,65)	-5,88** (-0,54)
NUMBER OF OBSERVATIONS	243	243
R²		0,27

* Significant to 10%.

** Significant to 5%.

*** Significant to 1%.

The first conclusion obtained from the two estimates made is that the results do not differ substantially, from which we can conclude that the model is robust.

With regard to the values obtained, in the majority of cases they were as expected a priori, though their level of significance indicates the importance that each one has on port competition with respect to fruit and vegetable produce. This indicates that port infrastructure is important. We find positive values for the variables ‘draught’ and ‘dry-port’, though only the latter is significant. Therefore, the existence of a logistics area for transporters of horticultural produce to operate has a very beneficial effect on shipping for this type of freight. The availability of high capacity, dry-port facilities is obviously a determining factor in port choice for fruit and vegetable produce freight. On the other hand, the availability of a high draught (contrary to the findings of Lirn et al, 2004), large docks and large areas for storage are not important in the port choice for horticultural produce. Investment carried out for this type of freight are not really relevant, given that improvements to port infrastructure were carried out with other types of freight in mind.

With regard to container traffic, we observe that the positive value of the estimated coefficient for this variable indicates that where there is a high volume of container traffic in fruit and vegetable produce is also high. As such, those ports with adequate container parks are an incentive for use in the transport of this type of freight. This is in

line with findings of Lirn et al (2004), for whom the availability of container storage space constitutes the third determining factor in port competitiveness.

Intermodality, that is to say, the connection of a port with other means of transport, has been indicated elsewhere as a main determining factor in port choice (Song and Yeo, 2004; Lirn et al, 2004). Nevertheless, our study reveals no conclusive results on this. The very low significance of the regressor of the variable “train” allows us to state that the rail connection of a port is not a determining factor in the choice of port for the import and export of fruit and vegetable produce. As such, road haulage would seem to be the ideal means for combination with shipping for this type of freight. The positive value of the estimated coefficient of the variable “ro-ro” confirms this hypothesis, that is to say, those ports better prepared for Ro-Ro traffic are more attractive to the distributors of fruit and vegetable produce. Nevertheless, even though the complementary nature of road and shipping is necessary for fruit and vegetable traffic, these means are substitutive, as is indicated by the regressor sign on the variable “pricekm”. This positive value shows that when road haulage is more expensive there is greater shipping in fruit and vegetable produce. The positive value of the estimated coefficient for the variable “isle” supports this idea. Given that traffic in fruit and vegetable produce increases when sea transport is the only option available we observe once again that sea and road transport substitute rather than complement each other.

The importance of the agricultural sector in the economy of the province where a port is located has a low impact on the choice of said port for the transport of fruit and vegetable produce. The low significance of the regressor of the “agriculture” variable and the changing sign according to the estimator that we are using makes it impossible to reach any type of conclusion. Nevertheless, a negative value that is relatively significant for the variable “gdppc” was obtained, that is to say, the higher the GDP per capita and economic development of the province, then, indirectly, the lower the importance of the agricultural sector produce shipped.

Lastly, it is necessary to answer the question of how both port and transport costs affect

the traffic of fruit and vegetable produce. The results obtained show that the fee applied by ports to containers of 20 feet or less and lorries with trailers of up to six meters have a negative effect on port choice, that is to say, the greater the fee applied the less attractive the port for the import and export of fruit and vegetable produce. Nevertheless, the positive value of the regressors of the variables “fee2” and fee3” indicate the opposite, that is to say, the greater the price for containers of over 20 feet, semitrailers, trucks and articulated vehicles with trailers of up to 12 meters, and lorries with even longer trailers, the greater is the traffic in fruit and vegetable produce. This result is due to the limited leeway which port authorities have had regarding price competition until now. However, from June 2010 onward the new law permits more competitive pricing and greater flexibility in the setting of port fees. With regard to the approximate cost of shipping with respect to the national port with which each port does most trade, the value is negative, indicating that the greater the distance the higher the cost, and consequently, the less attractive the port is for the shipping of fruit and vegetable produce. This result agrees with the findings of Tongzon (2002) and Lirn et al (2004).

4. CONCLUSIONS

Which factors make a port more attractive than other ports or other means of transport for the fruit and vegetable produce traffic? The aim of this study is to answer this question. With our analysis complete we can confirm that road and sea freight of fruit and vegetable produce are more substitute rather than complement each other. Even so, the greater Roll-on Roll-off traffic is the higher the use of ports for the shipping of this type of freight. As such, it is necessary to promote the development of intermodality as a means of allowing greater cooperation between ports and road haulage. In fact, road freight is limited by the existing infrastructures and European legislation. In consequence, sea freight must be promoted. The incorporation of sea freight into the logistics chain could mean a great comparative advantage for the agricultural sector of any Spanish province.

Port infrastructures are important, especially the availability of high capacity dry ports

as well as adequately equipped container terminals. With this in mind, ports wishing to specialize in shipping fruit and vegetable produce should invest in the creation or expansion of logistics areas where distributors of this type of freight can operate, providing sufficient services for this type of traffic.

Port costs are not a decisive factor in port choice, owing to the narrow margin for competition that port managers have had due to fixed freight loading and unloading fees. Nevertheless, the costs of shipping, measured in the distance that ships have to travel, is indeed important when it comes to choosing a port for shipping of fruit and vegetable produce, and even in the decision as to which means of transport to use. As already mentioned, ports are part of a logistics chain and, as such, we believe that cooperation, rather than competition, amongst them for fruit and vegetable produce freight could be beneficial for all.

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