The Impact of Management Accounting Systems on International Markets: Theory and Evidence Using the Balanced Scorecard Approach

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Abstract

Information from the Port Authorities that make up the Spanish Port System before and after the implementation of the Balanced Scorecard has been used to analyse whether changes in management accounting play a role in international markets by means of analysing their effect on regional competitiveness.

This study makes three contributions to the literature. First, it is of great interest for the Spanish economy as a whole, due to the special importance of shipping as a way to access the main international markets. Second, it provides an unprecedented framework to relate research on management accounting with literature on international trade issues.

Finally, unlike previous studies, information on Annual Reports is used, allowing the comparison of performance measures over time in different organisational units.

Main results show that the improvement of the strategic and operational effectiveness of the Port Authorities has increased the competitiveness of Spanish regions.

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Introduction

This paper evaluates the impact on international markets of the introduction of tools to improve the management systems of public firms.

Successive regulatory laws in the Spanish Port System (SPS),[1] issued since the year 1992, have encouraged the port management model to be characterized by the needs of business criteria. In this sense, and in a first step, the foundations for a participatory model were allowed.[2] More recently, not only have the performance criteria and the overall objectives of the SPS been changed, but also the different planning instruments in each port.[3] In particular, greater functional autonomy of the Port Authorities (PA) has allowed them to become responsible for the development of their business model, through the definition of their own strategic objectives, allocation of resources and availability of the trace elements to achieve these objectives. In this context, the model of strategic management control has been based on the methodology of the Balanced Scorecard (BSC).

To analyse market reactions to the introduction of regulatory changes, as is the case of the introduction of a participatory model in the SPS, this paper focuses on a natural concern for policy makers: facilitating trade. The World Trade Organisation (1998) defined trade facilitation as the simplification and harmonisation of international trade procedures where trade procedures are the activities, practices and formalities involved in collecting, presenting, communicating and processing data required for the movement of goods in international trade. Nonetheless, no consensus has been reached in the trade policy discourse on the definition of trade facilitation.

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[1] The SPS includes 46 ports of general interest, managed by 28 PA. Coordination and control of efficiency corresponds to the State Ports Agency, which reports to the Ministry of Transport and is attributed the execution of port policy governing.

[2] Law 27/1992 and Law 62/1997.

[3] Law 48/2003, Law 33/2010 and the Spanish Royal Decree 2/2011.

In most cases, two ways of defining this concept have been used. On the one hand, trade facilitation in a narrow sense includes the so-called "at the border procedures", such as customs documentation or the time involved in crossing a border. On the other hand, trade facilitation in a broad sense also includes some "inside the border" elements, such as institutional quality, regulatory environment and service infrastructure (Martínez-Zarzoso and Márquez-Ramos, 2008).

This paper focuses on the latter definition, as trade facilitation, understood that in its broad sense might be of significant importance to increase competitiveness and international trade flows.

During the past two decades, the process of economic globalization has led to the opening of markets for goods and factors of production, which together with the emergence of technological innovations applied to maritime transport and the redefinition of public sector intervention in economic activity has contributed to the restructuring of port systems, which have significantly changed their business models.

Specifically, this process of globalization has been accompanied by the emergence of new public management, allowing a deep public sector reform aimed at achieving improved management efficiency and consequently, increasing national economic competitiveness. The traditional model of management was characterized by the active presence of a public central agent for planning infrastructure and facilities and port services, which was considered inadequate to meet the requirements of the port´s users. Therefore, central governments transferred the management of port facilities and services to regional or local public agencies or NGOs, user groups or private companies (Brooks and Cullinane, 2007).

Spanish ports have not been an exception to these changes, and since 1992, there has been a decentralisation of the management of port infrastructure in PA, as well as a process of privatisation of port facilities and the provision of essential port services. Within this context, the SPS has developed its activity in accordance with the guidelines of a strategic framework that allowed it to meet the challenges posed by the globalization of the

economy and trade. In particular, the basis of a participatory model were established in the SPS to allow an appropriate response to legal requirements and a better understanding, adaptation and development of future scenarios in order to meet efficiency and effectiveness objectives.

Shipping is the most important mode of transport in terms of international trade in Spain. In fact, this country has been ranked as fourth in the European countries which would benefit most if the United States and the European Union were to reach a free trade agreement (El vigía, 2013). This press release states that a removal of tariff barriers, which are currently very low, would increase exports only slightly. However, a deeper liberalisation and hence, higher trade facilitation, would not only increase exports to a significantly greater extent, but also would create a new logistics model on a global scale in which Spanish ports might play a key role. This presents a challenge to the SPS, as the competitiveness of the Spanish production system is conditioned by the effectiveness and efficiency of ports.[4] As such, the development of strategic plans by the SPS aimed at enhancing the development of maritime trade for the benefit of Spanish firms, is a means of improving the level and quality of life of the Spanish society (AECA, 2006). However, the effort made by the SPS in the definition of these strategic plans has led to the need to ensure proper deployment and monitoring, and improved organisational performance thereof (Malmi, 2001; Speckbacher et al., 2003; Braam and Nijssen, 2004).

This has resulted in the SPS developing a strategic implementation project based on the model of the BSC as a strategic management system (Kaplan and Norton, 1996; Nilsson and Olve, 2001; Speckbacher et al., 2003; Franco-Santos et al., 2012), and as a system of

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[4] The economic importance of the SPS is proved by the following figures: almost 60% of exports and 85% of imports pass through them, accounting for 53% of Spanish trade with the European Union and 96% with third countries (Puertos del Estado, 2011a). In addition, the state port system activity contributes about 20% of GDP in the transport sector, representing 1.1% of the Spanish GDP. It also generates direct employment for about 100,000 jobs and indirectly, for 175,000 jobs (Puertos del Estado, 2011b).

strategic performance measurement that describes the strategy by cause-effect (Abdel-Maksoud and Kawam, 2009).[5] Furthermore, this project implements the strategy of the organisation by defining the objectives, action programs and results, as well as linking incentives to strategic indicators of the BSC (Aparisi-Caudeli, 2008; Kaplan and Norton, 2008; Sundin et al., 2010).

Based on the economic nature of the activities of Spanish PA, ports are one important element for trade facilitation and serve to enhance the competitiveness of regions. Decentralised corporate and management structures have become increasingly popular in the global port sector and there has been a transformation from dominance of publicly owned, nationally managed ports to a system of more privately-owned and decentralised or corporatized ports (Cheon et al., 2010). Indeed, as the emergence of new management models in commercial ports has recently been noted to be a major global trend (González-Laxe, 2011), it is of great interest to study whether the introduction of tools to improve management systems[6] play a relevant role in the increase of regional exports.

It is important to highlight that knowledge about why organisations adopt the BSC is still scarce from a research point of view, but even more so is the understanding of the real consequences of their implementation (Lee and Yang, 2011). To fill this gap in the existing literature, this paper performs a quantitative study focused on four BSC perspectives and analyses the impact that the implementation of the BSC has had on regional exports by selecting those strategic indicators representing the identified prospects.

Methodologically speaking, the relationship between the adoption of improved accounting

instruments and international trade flows is analysed by using the gravity framework. The model is estimated by using bilateral exports over the period 2000-2008 from 19 Spanish regions to 45 countries.[7] To the best of our knowledge, no previous studies have focused on the role of the BSC on regional exports.

This research aims to increase the existing knowledge in the field of performance measurement systems, and supports evidence-based management initiatives.

The rest of the paper is structured as follows: sections 2 and 3 present the literature review and stylised facts of the implementation project of the BSC in the SPS, respectively. Section 4 presents the theoretical framework and describes the perspectives, objectives and indicators. The empirical analysis is presented in Section 5. Finally, Section 6 concludes.

Literature Review

There are two main streams of literature that have a bearing on the interdependences between changes in management accounting practices and international trade flows.

The first stream of literature relates to international trade flows. A series of papers analysing the effect of trade facilitation procedures reveal significant and positive effects on trade flows (Wilson et al., 2003 and 2005; Martínez-Zarzoso and Márquez-Ramos, 2008; Márquez-Ramos et al., 2012; Persson, 2012; Bernhofen et al., 2013). Table A.1 (Appendix) presents a summary of "narrow" trade facilitation variables frequently used in the international trade literature (see for example, Martínez-Zarzoso and Márquez-Ramos, 2008). Values of time to export, cost

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[5] Studies such as that of Brignall and Modell (2000) suggest that a key factor in the organisation of the successful implementation of innovations in management control, particularly in the public sphere, corresponds to legislative mandates, especially when innovations are implemented in response to them, as is the case in the SPS in relation to the BSC.

[6] This is the case of the BSC in Spanish PA.

[7] Regions: Andalusia, Aragon, Asturias, Balearic Islands, Basque Country, Canary Islands, Cantabria, Castile-La Mancha, Castile and Leon, Catalonia, Ceuta, Extremadura, Galicia, La Rioja, Madrid, Melilla, Murcia, Navarra, Valencia.

Countries: Algeria, Argentina, Australia, Austria, Bangladesh, Belgium, Brazil, Canada, Chile, China, Colombia, The Czech Republic, Denmark, Egypt, Finland, France, Germany, Greece, Hong Kong, India, Indonesia, Ireland, Italy, Japan, Jordan, Lebanon, Malaysia, Morocco, Mexico, The Netherlands, New Zealand, Pakistan, Poland, Portugal, Singapore, South Africa, South Korea, Sweden, Thailand, Tunisia, Turkey, The United Kingdom, The United States, Venezuela, Vietnam.

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to export, time to import and cost to import in different regions are shown.

The variation of costs across countries is large, for example, with an average cost for imports of $439 per container Singapore occupies the first position in the Doing Business ranking - "Trading across Borders", while with an average cost of $4,750 per container, Uzbekistan occupies the last position in the above ranking.[8] In terms of time, to comply with all procedures required to export goods only takes an average of 5 days in countries such as Denmark, Hong Kong or Singapore, whereas it takes more than 20 days in other coastal countries such as Bulgaria, China, Madagascar, Nicaragua, Pakistan or Vietnam.

With regards to "broad" measures of trade facilitation, ports are one of the key components of the logistics chain which weigh heavily on the final costs of many exported and imported products, so reforms that improve port efficiency are expected to reduce transport costs and improve competitiveness (Estache et al., 2002). In fact, ports might be considered the "backbone" of international trade, as they provide direct linkages from international to regional or local transport systems and trade chains (Cheon et al., 2010). In this vein, Wilson et al. (2003, 2005) considered port efficiency as an indicator of trade facilitation, quantifying its impact on trade flows among countries. Their results show that improvements in ports or regulations expand trade. Using a variable based on the World Economic Forum to measure port efficiency, Clark et al. (2004) indicate that port efficiency has a marked impact on international trade through transport costs.

Sánchez et al. (2003) measure port efficiency using data on efficiency in time, port productivity and vessel length of stay at port obtained from surveys sent to port terminals. These authors find that an increase in port efficiency reduces transport costs, and hence increases trade flows. Sánchez et al. (2003) state that, unlike most other relevant variables, port efficiency can be influenced by public policies.

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[8] The cost associated with all procedures required to import goods, including for documents, administrative fees for customs clearance and technical control, customs broker fees, terminal handling charges and inland transport.

The abovementioned studies focus on the links between port efficiency, transport costs and international trade flows (Wilson et al. 2003, 2005; Clark et al., 2004; Sánchez et al., 2003). However, the estimation of productivity and efficiency measures in ports is a relatively new approach (for a review see González and Trujillo, 2009 and Núñez-Sánchez and Coto-Millán, 2012).

A number of authors in this field have focused on the provision of infrastructure and cargo handling activities in different geographical regions (e.g. Liu, 1995; Barros, 2003; Rodríguez-Álvarez et al., 2007 for European countries – The UK, Portugal and Spain, respectively; Estache et al., 2004 for Latin America-Mexico; Cullinane et al., 2002 for Asia).

A line of the transport literature that has dealt with Spanish port efficiency (González and Trujillo, 2008; Núñez-Sánchez and Coto-Millán, 2012) uses data gathered from the Annual Reports of the State-Owned Enterprise of National Ports (Puertos del Estado, several years). Interestingly, Núñez-Sánchez and Coto-Millán (2012) calculate an index of technical efficiency for Spanish ports and prove that despite this index averaging 78.6% for the port system as a whole (for the period 1986-2005), there are considerable differences between ports. The ports of Valencia, Tenerife and Algeciras were found to be the most efficient, whilst those of Seville, Barcelona and Huelva were found to be the least efficient.

The second stream of relevant literature is that relating of management accounting. Management accounting is concerned with measuring and providing both financial and non-financial information that helps managers to take decisions in order to achieve the objectives of the organisation (Horngren et al., 2003). This information guides the action of the directors, motivates behaviour, and supports and creates the cultural values required to achieve the strategic, tactical and operational objectives of the organisation (Atkinson et al., 2004).

For this reason, innovative tools such as the BSC are required to improve the management, efficiency and flexibility to changes and for the measurement of resources, processes and outcomes (Ittner and Larcker, 2001, 2003; Ax

and Bjørnenak, 2005). Additionally, its actions must be supported by the development of decision-making processes based on the use of management practices that enable the measurement, management and implementation of strategies, towards the achievement of comprehensive strategic management (Laitinen, 2002; Davis and Albright, 2004; Chenhall, 2005). These must operate to improve efficiency achieved globally, as well as each of the different activities carried out and thereby resulting in improved organisational performance (Kloot and Martin, 2000; Malina and Selto, 2001; Ittner et al., 2003; Braam and Nijssen, 2004; Bryant et al., 2004; Davis and Albright, 2004; Crabtree and DeBusk, 2008; De Geuser et al., 2009).

According to De Geuser et al. (2009), previous research on the BSC can be structured around three main issues: the characteristics of the widespread diffusion, the assessment of the contribution of the BSC to firms' performance and the way the BSC generates this contribution.

The first issue has been studied by researchers interested in innovating social management processes. As for the other two questions ("how much" and "how" have contributed, respectively), they have been scarcely studied to date. The previous research focuses on the gap between the widespread use of the BSC and the lack of clear evidence of its effectiveness (Speckbacher et al., 2003, Davis and Albright, 2004).

This difference has led to major critical debates on the rationality of the diffusion of the BSC. The lack of concrete evidence of its usefulness has led to claims that the adoption of BSC is associated with a strong rhetorical argument developed by Kaplan and Norton (1996, 2001). This argument aimed to promote the BSC as an effective system for monitoring strategy.

With regards to how organisational performance is generated, the BSC measures performance in four perspectives: financial, customer, internal business process, and innovation and learning (Kaplan and Norton, 1996). Firstly, the financial perspective summarises the readily measurable economic consequences of actions already taken. Secondly, the customer perspective contains

measures that identify the customer and market segments in which the business unit will compete and the measures of the business unit's performance in these targeted segments. Thirdly, internal business process perspective measures the critical internal processes in which the organisation must excel. Fourthly, the innovation and learning perspective measures the infrastructure that the organisation must build to create long-term growth and improvement.

This framework enables a management team to execute the four key strategic management processes of the BSC theory, i.e. clarify and translate vision and strategy; communicate and link strategic objectives and measures; plan, set targets, and align strategic initiatives; and enhance strategic feedback and learning (Knapp, 2001).

In this line, a series of management accounting studies have focused on analysing the performance improvement through the use of the BSC in the public domain (Kloot and Martin, 2000; Irwin, 2002; Piotrowski and Rosenbloom, 2002, Cavalluzzo and Ittner, 2004; Chan, 2004; Phillips, 2004; Sundin et al., 2010). For example, Phillips (2004) stated that public transit systems support a mission composed of three different components: efficiency, effectiveness and impact. This author aims to adapt the BSC for use in the public sector in the appraisal of public transit system´s performance.

In particular, the conceptual model of the BSC adapted to the SPS, which is structured around four BSC prospects, might be defined as follows (AECA, 2006): (1) based on the economic nature of the activities of the PA, the prospect of an *economic* value, which implies that the maximum targets of PA are oriented towards economic development and regional government through the achievement of the objectives of growth, economic self-sufficiency, and optimisation of investments; (2) with regards to the *customer* perspective, one part is dedicated to business customers themselves, and the second part includes the socio-economic environment surrounding the PA; (3) the *process* perspective gathers those stages of the value chain of the PA that are key to achieving the goals of both the customer and the economic perspective; and (4) the *resource* perspective contains the basic elements that support the operation of the PA,

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internally (people, organisation, systems and technology) and externally (service providers and external providers), and port infrastructures themselves. It also includes key development objectives of the activity of service providers, which should enhance the competitiveness of the port (González-Barrios, 2005).

The Implementation Project of the BSC in the SPS

Following Aparisi-Caudeli et al. (2008), this section identifies four items: (1) justification of the implementation of the BSC, (2) origin of the BSC implementation project, (3) development of the BSC implementation project in "pilot" PA, and (4) extension of the BSC implementation process in the remaining PA.

First, the implementation of the BSC is not only justified by the introduction of a management model in each PA to improve their management systems, but also to provide a management information model for the entire port system. In particular, it provides consolidated information and enables learning in different organisational units through a collaborative benchmarking, allowing the use of general criteria, coordination and cohesion of the activity between different PA.

Second, the origin of the BSC implementation project was in the approval of Law 62/1997, when a new organisation and operating model was established for the SPS. The new framework allowed the integration of regional interests with the management of ports of general interest.

In the year 1998, a strategic framework was developed, as well as different management tools common to all PA (such as cost accounting, quality systems and statistical analysis). The appearance of these individual tools in different PA led to the need for one single methodology, thereby simplifying the process, and allowing comparison and coordination between the different business units.

In September 1999, a working group was constituted in order to find a tool that would align the major objectives of the strategic framework with the daily management of the

PA. This was primarily intended to improve the allocation of business plan objectives and measure their results. A first proposal of strategic objectives classified them into four groups: financial, customers, internal and personal.

In 2000, the possibility of introducing a methodology to support the port management was raised. Subsequently, the BSC methodology was selected. During the first months of 2001, a preliminary version of the BSC was designed and in July 2001, the suitability of the BSC as a tool to support existing management mechanisms was validated. As a result, a common strategic map for PA was defined, which presented four perspectives, five strategic lines and 27 strategic objectives, although, each PA developed its own strategic map.

Third, with regard to the development of BSC implementation project in "pilot" PA, it was decided to implement the abovementioned defined model in 4 "pilot" PA in June 2002, these being Balears, Castellón, Gijón and, Marin and Ría de Pontevedra.[9] Eventually, the BSC was implemented in the remaining PA between 2004 and 2005. This extension was done in blocks or gradually. In particular, each of these blocks was composed of a limited number of PA, ensuring thereby the supervision and control of the implementation process. The average duration of the implementation process of a block was 3-4 months, depending on the complexity of the PA. In this manner, the BSC was gradually implemented in the majority of PA during the period 2004-2005. An example of the process of implementing the BSC project in one AP can be found in Aparisi-Caudeli et al. (2009).

Aparisi-Caudeli (2008) reviews and categorises performance measures constituting the executive strategic map of the PA of Valencia, one of the most important Spanish PA in terms of sea traffic (see Table A.2 in the Appendix) and situated in the Spanish region

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[9] These four AP were selected for their lower level of complexity (for example, they have a single port, they are relatively small or most of their volume of port traffic is focused on a particular type of traffic...) and also by the high involvement and commitment of the internal teams members with the project and the ongoing support from their Presidents and Directors.

where the relative importance of port facilities has increased the most (see Table A.3 in the Appendix). In Aparisi-Caudeli (2008), the performance measures of the executive strategic map of the PA of Valencia are distributed according to the four abovementioned prospects (economic, customer, processes and resources), allowing the identification and association of the performance measures with their stakeholders as follows: in the economic perspective there are 5 indicators of a total of 48, which represent approximately 10%, in the customers perspective there are 19 indicators (40%), in the processes perspective there are 13 indicators (27%) and in the resources perspective there are 11 indicators (23%).[10]

Methodological issues

In the first part, this section describes the theoretical framework that relates bilateral trade with indicators in the four perspectives of the BSC, as a means of promoting trade facilitation. In the second part, these indicators are described, in addition to the rest of the variables used in the empirical analysis.

Theoretical Framework

The gravity framework is used to analyse the relationship between the adoption of improved accounting instruments, derived from a regulatory change in public transit systems (see footnote 5), and international trade flows.[11] Following Márquez-Ramos (2007), trade facilitation is introduced in a world with two differentiated products and two countries (Helpman and Krugman, 1985) by considering

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[10] See Table 9 in Aparisi-Caudeli (2008). Note that the high number of indicators in the customers perspective reflects the strategy of the PA of Valencia, which is based on the achievement of leadership at customer level, as the PA of Valencia attempts to become a leader as a regional distributor and as an intermodal logistics platform for the Western Mediterranean.

[11] To our knowledge, Márquez-Ramos (2008) is the first study focusing on the importance of improved accounting practices to encourage international trade flows in goods from a gravity framework. However, whether the implementation of a management accounting instrument that supposes an improvement on the management system leads to higher regional competitiveness has not been previously analysed in the related literature.

both trade conditions and technological innovation to affect the volumes of trade. The specification of the model is:

$$T = s\beta\, GDP * \frac{1}{\tau} + s * \beta * GDP \frac{1}{\tau *} \quad (1)$$

where T denotes bilateral trade and s (domestic) and $s*$ (foreign) country size measured as the share of the home (foreign) country in world income and spending; τ ($\tau *$) is a measure of trade costs; and β ($\beta*$) represent technological innovation in the home (foreign) country.[12]

Organisational variables related to the Spanish PA performance are introduced in equation 1 by means of τ and β. Therefore, improvements in economic, customer, process and resource perspectives are expected to increase regional exports, due to improved trade conditions or technological innovation (i.e. trade facilitation procedures).

The implementation of the BSC in the SPS is related to "broad" measures of trade facilitation for at least three reasons. First, due to the three main sources of performance that are derived from the BSC implementation: a better translation of the strategy into operational terms, the fact that strategizing becomes a continuous process, and the greater alignment of various processes, services, competencies and units of an organisation (De Geuser et al., 2009). Second, the implementation of the BSC is expected to increase coordination and cohesion between the different units that compose the SPS (Granlund and Lukka, 1998; Cavalluzzo and Ittner, 2004), and also to allow learning through benchmarking (Hussain and Gunasekaran, 2002). And third, previous research has shown that port reforms based on the liberalisation and decentralisation of the port system facilitate not only the improvement of technical change through the adoption of new technologies (Estache et al., 2004) but also helps PA to reach closer-to-

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[12] τ and $\tau *$ include geographical barriers (such as distance, being landlocked or not being a coastal region, and not sharing a common border) and socio-political variables (such as the existence of trade agreements and sharing a common language). It is expected these geographical (socio-political) variables to have a negative (positive) effect on bilateral trade flows.

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optimum production scales (Núñez-Sánchez and Coto-Millán, 2012).

Perspectives, Objectives and Indicators

To quantitatively analyse the impact of the implementation of the BSC on regional competitiveness, a representative indicator is selected for each of the objectives that fall under each of the identified prospects (Aparisi-Caudeli, 2008).

This section relies on accounting data available in Annual Accounts for two reasons. First, time period ranges from 2000 to 2008,[13] a period in which there has been a change in the strategy of the Spanish PA. In particular, before the implementation of the BSC there were no specific indicators available to assess the performance in the four analysed perspectives. Therefore, as the present paper aims to investigate the period before and after the BSC implementation in PA, relying on actual indicators in the BSC of Spanish PA would not be an adequate strategy to follow. Second, the 28 Spanish national PA are considered in the analysis (see Table A.2 in the Appendix) and so, accounting information enables the comparison of performance measures in different organisational units, as PA have specific indicators for all perspectives; however, they are not directly comparable across PA.

Three objectives can be distinguished in the economic perspective. First, the increase of the volume of business (E1), second, to reach the level of profitability sufficient to enable, as far as possible, self-financing (E2), and third, to minimise the financial cost of the PA (E3).

The indicators used to observe the progress and achievement of the objectives are the net turnover (I01), the return on assets (I02) and the debt ratio (I03), respectively.

There are two fundamental objectives in the customers perspective: To increase and retain sea traffic and loyalty (C1), and to be competitive in price (C2). To determine the former, the port traffic is calculated as the sum of liquid bulk, dry bulk, general cargo, fresh fish, supplies and local traffic. The evolution of the total sea traffic of each port, *per se*, serves as an indicator of increased traffic and loyalty (I04). Finally, the ratio of net turnover and total tonnes moved serves as an indicator of price competitiveness (I05).

There are three main objectives in the process perspective: to increase Hinterland/Foreland through a proactive and focused commercial activity (P1); to improve productivity and operations services (P2), and to improve economic efficiency (P3). To determine the degree of compliance with the first goal of the process perspective, the indicator of other operating expenses (I06) is used. The productivity of the workforce is measured with the ratio net turnover/staff costs, which indicates the income that is able to be generated by every euro spent on the human resources by a PA (I07). Finally, the ratio of operating income/net turnover (I08) is calculated.

There are also three main objectives in the resource perspective: to align the organisation and people towards the implementation of the strategy (R1); to modernise and adapt the technology to the strategy (R2), and to make a strategic investment in infrastructure and port areas through balanced funding (R3). The indicators used in this perspective are the average expenditure per employee (I09), investments in new technologies: computer applications and information processing equipment (I10) and the indicator for R3, which measures the degree of compliance of infrastructure investments, is constructed by dividing the value of acquisition tangible fixed assets between the balance of tangible fixed assets at year end (I11). Table 1 presents a summary of the selected indicators in the four perspectives, the objective associated with each indicator, as well as the corresponding equation used for its calculation.

As a descriptive analysis, a t-test is performed to compare means of the indicators in Table 1, a first set covers the period of time prior to the implementation of the BSC (2000-2004) while the second set covers the period of time after the implementation of the BSC (2005-2008). The results obtained show that all the differences in means are statistically significant at conventional levels.

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[13] The effect of the last international financial crisis is reflected in the data from the year 2009 in the SPS and, hence, the most recent years are not considered in the present study.

Finally, the rest of data and variables used in this research come from different statistical sources, which are listed in the Appendix (Table A.4).

Empirical Analysis

This section is divided in three sub-sections. Firstly, the estimated equation is specified and the applied econometric technique is explained. Secondly, the main results are shown and described. Finally, a detailed discussion of the obtained results is provided.

Model Specification

Considering the theoretical model together with the empirical strategy of analysing regional exports within a country to a number of importing countries,[14] the obtained augmented gravity equation relates regional exports to income, distance, dichotomic variables, remoteness, and performance measures at PA in different Spanish regions and a trade facilitation measure in destination countries:

$$\ln X_{ijt} = \alpha_0 + \alpha_1 \ln Y_{ijt} + \alpha_2 \ln Yh_{it} + \alpha_3 \ln Yh_{jt}$$
$$+ \alpha_4 \ln D_{ij} + \alpha_5 Lang_{ij} + \alpha_6 BP_{ij} + \alpha_7 BF_{ij}$$
$$+ \alpha_8 Coast_i + \alpha_9 FTA_{ijt} + \alpha_{10} \ln rem_{it}$$
$$+ \alpha_{11} \ln rem_{jt} + \alpha_{12} port_{it-1} + \alpha_{13} port_{it-1}$$
$$\cdot BSC + \alpha_{14} port_{jt} + \upsilon_{ijt} \qquad (2)$$

where lnX_{ijt} denotes exports from a Spanish region i to an importing country j in year t; lnY_{ij} is the logarithm of the product of GDP for exporter i and importer j;[15] Yh_i (Yh_j) is GDP per capita in the exporting region (importing country); rem_i (rem_j) is the variable exporter (importer) remoteness based on Márquez-Ramos (2013). $Lang_{ij}$, BP_{ij}, BF_{ij}, $Coast_i$ and FTA_{ijt} are dichotomic variables that take a value of one when the same language is

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[14] For example, this empirical strategy is followed by Márquez-Ramos (2013) for regional Spanish exports and Hirose and Yoshida (2013) for regional Japanese exports.

[15] Although researchers normally use the economic size of the exporter and importer separately in gravity equations in applications that analyse the determinants of trade across countries, we follow Márquez-Ramos (2013), where the size of the market as a whole is used.

spoken in i and j, when they share a common border with Portugal (BP) or France (BF), when i is a coastal region ($Coast_i$) or they have signed a Free Trade Agreement in year t (FTA_{ijt}).

According to equation 1, trade costs might differ depending on the facilities in the destination country, therefore, equation 2 also includes a variable representing the quality of port facilities in the importing country ($port_j$) that is based on the Global Competitiveness Report of the World Economic Forum (see Table A.4 in the Appendix).

Finally, the standardised values of the four perspectives of the BSC in Spanish PA are considered: economic, customers, processes and resources. Then, $port_i$ represents every indicator of the four different perspectives of the PA existing in each Spanish region (see Table 1).[16] The interaction of the variable $port_i$ with a dummy that is equal to 1 from 2005 onwards and 0 otherwise ($port_i \cdot BSC$) allows the effect on exports to vary with the time period, and then to study whether the various indicators used in each of the four prospects have a differential impact on exports before (2000-2004) and after the implementation of the BSC (2005-2008).

It is important to highlight that the relationship between trade volumes and port performance might be bidirectional. In order to take into account the direction of the causality in regressions, a common approach in the literature is followed (Wooldridge, 2009) and the effect of the lagged port performance indicators on trade volumes is analysed (note that $port_{it-1}$ and $port_{it-1} \cdot BSC$ are used in the estimated equation instead of $port_{it}$ and $port_{it} \cdot BSC$).

Finally, before estimating the model, the pairwise correlations among independent variables are studied. As a number of the indicators in the four prospects are considered to be closely related, they are included separately in different regressions.

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[16] The performance indicators are equal to zero for landlocked regions. The sum of each indicator is considered in those regions where there is more than one port facility.

Table 1: Indicators Considered in the Four Perspectives of Organisational Performance in Spanish PA					
Perspective	Code (objective)	Description (objective)	Code (indicator)	Description (indicator)	Equation (indicator)
Economic	E1	Increase of the volume of business	I01	Net turnover	Port taxes + other business income
	E2	To reach the level of profitability sufficient to enable, as far as possible, self-financing	I02	Return on assets	Profit for the year (excluding Interport Compensation Funds) / average net operating assets
	E3	To minimise the financial cost	I03	Debt ratio	Total Debt / (Equity + Total Liabilities)
Customers	C1	To increase sea traffic and loyalty	I04	Evolution of total sea traffic	Liquid bulk + Dry bulk + General cargo + Fresh fish + Supplies + Local traffic
	C2	Being competitive in price	I05	Net turnover per tonne moved	Net turnover / Total tonnes moved
Processes	P1	Increase Hinterland / Foreland through a proactive and focused commercial activity	I06	Other operating expenses	Spending on external services + Taxes + Losses, impairment and changes in trade provisions + Other operating expenses + Contribution of the PA to the State Ports System
	P2	Improve productivity and operations services	I07	Productivity of labour	Net turnover / Staff costs
	P3	Improve economic efficiency	I08	Operating income on net turnover	Operating income / Net turnover
Resources	R1	Guide the organisation and the people to implement the strategy	I09	Average expenditure per employee(a)	Staff costs / Average number of employees in 2005
	R2	Modernise and adapt the technology to the strategy	I10	Investment in new technologies: Computer applications and information processing equipment	Computer applications + Information processing equipment
	R3	Make a strategic investment in infrastructure and port areas through a balanced funding	I11	Degree of compliance of infrastructure investments	Value of acquisition of tangible fixed assets / Balance of tangible fixed assets at 31/12

Source: Own elaboration and Aparisi-Caudeli (2008). Note: (a) Due to data availability, the average number of employees of every AP in the year 2005 is used.

Main Results

Equation 2 is estimated by using maritime exports over the period 2000-2008 from 19 Spanish regions to 45 countries. A total of 7,695 bilateral trade flows are obtained (19 exporting regions x 45 importing countries x 9 years). The presence of missing/zero values reduces the sample to 5,944 observations.

Special estimation techniques are required to estimate a panel. The presence of unobserved heterogeneity could be modelled as being random or fixed (Wooldridge, 2009). A Hausman test indicates that fixed effects are preferred and, then reported results are those on fixed effects estimates.

Studies of the BSC (Hoque and James, 2000; Kloot and Martin, 2000; Malina and Selto, 2001; Ittner et al., 2003; Braam and Nijssen, 2004; Bryant et al., 2004; Davis and Albright, 2004; Crabtree and DeBusk, 2008; De Geuser et al., 2009) suggest that the use of the BSC when it is aligned with the company strategy influences performance significantly and positively.

Crabtree and DeBusk (2008, p. 10) point out that "Kaplan and Norton (2001) cite examples of improved operating performance occurring two to three years after implementation of the BSC. Hence, a long-horizon event study is appropriate because it allows for the lag effect between adoption of a strategic initiative and performance gains (Haka et al., 1985; Easton and Jarrell, 1998; Kennedy and Affleck-Graves, 2002; Kinney and Wempe, 2002). A three-year event window was chosen after considering the case evidence and previous research".

As in Crabtree and DeBusk (2008), the methodology used in the present paper enables us to consider a three-year event window in order to analyse whether after implementation of the BSC in the SPS, and its continued use to fulfil not only the PA strategies, but also those of the SPS as a whole, leads to improved performance. To this end, firstly, equation 2 is estimated by taking into account that the BSC was implemented and used in the whole SPS in the year 2005 (the BSC dummy is equal to 1 from 2005 onwards). Secondly, equation 2 is estimated to isolate the effect of the use of the

BSC in the SPS from the year 2006. Then, to exclude the effect of the BSC implementation on the previous year, data in year 2005 is dropped from the regression. Finally, data in both years 2005 and 2006 are dropped from the regressions, to exclude the effect of the BSC implementation and use on 2005 and use of the BSC on 2006, and to isolate the effect of its use from the year 2007. Columns 1, 2 and 3 in Table 2 show the obtained results, respectively.

Table 2 presents the results of the coefficient of interest ($port_{it-1} \cdot BSC$).[17] The interpretation of the results shown in Table 2 is twofold. On one hand, a vertical analysis of the obtained results enables conclusions to be drawn about the use of the BSC in each of the years following its implementation in the SPS. The implementation of the BSC might lead to a performance improvement on regional exports, which is understood as the existence of a positive and significant effect on those indicators previously established in the four perspectives of the BSC (Table 1). On the other hand, a horizontal analysis of the results enables us to draw a number of conclusions about how the use of the BSC in successive years, following the implementation of the BSC in the SPS, produces a performance improvement. As in the vertical analysis, this performance improvement is understood as the existence of a positive and significant effect of the indicators defined in the four perspectives of BSC on regional exports.

Column 1 shows that $port_{it-1} \cdot BSC$ has, *ceteris paribus*, a positive effect on regional exports and is significant in the case of indicators related to the objectives E1 (increasing turnover), E2 (achieving an adequate level of profitability), C1 (increasing sea traffic and loyalty), P1 (increasing Hinterland/Foreland through a proactive and focused commercial activity), P2 (improving productivity and operations services), P3 (improving economic efficiency), R1 (guiding the organisation and the people to implement the strategy), R2 (modernising and adapting the technology to the strategy) and R3 (making a strategic investment in infrastructure and port areas through a balanced funding).

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[17] Full results are omitted to save space, however they are available upon request from the authors.

These results provide evidence that the BSC implementation in the SPS has led to increased regional competitiveness by means of improvement of the strategic and operational effectiveness of PA in economic, customer, process and resource perspectives.

Column 2 shows that $port_{it-1} \cdot BSC$ is significant and the magnitude in the economic, customers and resources prospects is higher in

2006 than in 2005 (the elasticity of one of the indicators in each of these perspectives is higher in at least one indicator, see coefficients in bold on Table 2). Therefore, the effect of the BSC implementation, and in particular in the three abovementioned perspectives, on international trade increases as its duration of use increases, while it decreases in the processes perspective (two indicators in 2006 are not significant, and for one of them elasticity decreases).

Table 2: Main Results for the Variable of Interest ($port_{it-1} \cdot BSC$)

Perspective	Code (objective)	Results BSC==2005 (1)	Results BSC==2006 (2)	Results BSC==2007 (3)
Economic	E1	0.163*** (3.926)	**0.362*** (5.329)**	0.340*** (4.128)
	E2	**0.052** (2.328)**	0.044 (1.539)	0.011 (0.293)
	E3	0.065 (1.403)	0.062 (0.942)	0.028 (0.405)
Customers	C1	0.154*** (3.546)	**0.274*** (3.819)**	0.237*** (2.957)
	C2	0.038 (1.619)	0.024 (0.830)	-0.006 (-0.182)
Processes	P1	**0.074** (2.071)**	0.095 (1.568)	0.015 (0.194)
	P2	**0.071*** (3.155)**	0.068** (2.504)	0.044 (1.278)
	P3	**0.051** (2.095)**	0.045 (1.563)	-0.013 (-0.361)
Resources	R1	0.147*** (3.996)	**0.239*** (4.439)**	0.197*** (3.043)
	R2	0.087*** (2.594)	**0.105** (2.086)**	0.063 (1.140)
	R3	0.064*** (2.818)	0.060* (1.952)	0.023 (0.636)

Notes: ***, **, *, *indicate significance at the 1%, 5% and 10% levels, respectively. T-statistics are displayed in brackets. The dependent variable is maritime exports in value (in logs). Not reported: constant term, income, income per capita, remoteness, distance, $port_i$, quality of port infrastructure at destination and dummies. Fixed-effects estimates.*

This could be due to management improvements on the processes perspective being reflected on international exchanges of goods immediately after the BSC implementation. In column 3, when the use of the BSC from 2007 is isolated, although positive and significant coefficients are found in the economic, customers and resources perspectives, the effect is lower to the ones obtained in 2006.[18] Overall, results point towards the idea that the most important consequences of the BSC on Spanish regional competitiveness were mainly reflected in 2006. Interpretation of results in Table 2 is discussed in depth in the next sub-section.

[18] It is important to note that the start of the Spanish economic crisis might have an impact on these figures.

Discussion

Going deeper into the horizontal interpretation of Table 2, and regarding the resources perspective, it is in the first two years of use of the BSC when the largest effects on regional exports were achieved, diluting, in part, this effect in the third of the analysed years. Specifically, two of the three indicators that define this perspective reached their greatest magnitude in 2006 (column 2 in Table 2).

Therefore, results obtained are consistent with the theoretical foundations of BSC (Kaplan and Norton, 1992, 1996, 2001), as a short period of time is required after the implementation of the BSC to build a solid and adequate infrastructure

that enables the achievement of the necessary alignment of organisational resources in which the organisation has focused in order to achieve three critical aspects: 1) a proper management of human resources aimed towards strategic implementation, 2) an optimal set of technology and information systems that enable the support that this implementation requires and 3) a strategic development of infrastructure to enable the excellent provision of port services.

In regard to the processes perspective, the three indicators that make up this perspective achieved the greatest levels in the first of the analysed years. Therefore, also in this perspective, the results are consistent with that stated by Kaplan and Norton (1992, 1996, 2001), as once the BSC has been implemented, a number of changes have been carried out in a short period of time. These changes are aimed at achieving effective activities and tasks that constitute the basic processes of PA, focused on three organisational areas: 1) business, 2) operations and 3) social responsibility. In this vein, greater effectiveness and efficiency of the different links that make up the value chain of the PA is achieved. This allows the empowerment of those aspects related to the resources perspective and, therefore, that might be controlled inside the organisation. Obviously, these aspects are reflected externally, in particular, in the relationship with customers of the PA as well as in economic and financial issues.

Regarding the customers perspective, it shows a significant and positive effect on regional exports when the effects of the BSC in 2005, 2006 and 2007 are analysed in one of the two selected indicators. Nonetheless, this effect is greater in the second and third years of use of the BSC. This result might be due to changes experienced in the internal perspectives, which generate positive effects on the customer perspective with a certain delay. Specifically, this delay could be considered to be a year in the present study, as the indicator associated to objective C1 is higher in magnitude in 2006 and 2007 than in 2005. The results obtained are consistent with that indicated by Kaplan and Norton (1992, 1996, 2001), since the effects on the perspective of customers have been designed to enable a series of changes aimed at satisfying customers of PA. These changes are based on

offering a proposition of value to port customers that fits their needs and makes an improvement in the economic perspective of the organisation possible. In this sense, the customers perspective has led to the realisation of a series of efforts to improve those attributes that constitute the essence in the process of selection by customers of different port services.

Finally, as to the economic perspective, the indicator associated to objective E1 presents a positive and significant effect on regional exports when the effects of the BSC in 2005, 2006 and 2007 are analysed. In addition, this effect is greater in the second and third years of use of the BSC. This result might be explained by the changes in internal perspectives of the BSC, as well as from the perspective of customers, which results in a certain delay in the economic perspective, that, in the present study, is quantified to be equal to a year. Therefore, the results obtained are consistent with that indicated by Kaplan and Norton (1992, 1996, 2001), since the PA have to achieve a series of changes aimed at increasing their economic and financial indicators and thereby generate adequate financial resources, required to develop their resources perspective as provided in their Strategic Plans and, more specifically, in their Business Plans.

Going deeper into the vertical analysis of Table 2, as for the year 2005 internal perspectives (resources and processes) the largest positive and significant effects on regional exports are experienced, such that all the indicators in the resources perspective are positive and significant at the 1% level. In relation to the processes perspective, positive and significant coefficients are also obtained, although two of them are only significant at the 5% level. The high level of meaningfulness reached by internal perspectives of the PA and, taking into account the existence of important links between their different perspectives (cause and effect), are expected to lead to improved external performance as shown by Abdel-Maksoud and Kawam (2009). One of the two objectives of the customer perspective achieves a level of significance of 1% -C1 (to increase sea traffic and loyalty), while two of the three selected indicators in the economic perspective are significant. In particular, the indicator associated with objective E1 (increase

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of the volume of business) is significant at a level of 1%, and with objective E2 (to reach the level of profitability sufficient to enable, as far as possible, self-financing) is significant at a 5% level. Nonetheless, the improvement in the external perspectives might be seen as a result of a series of changes in internal perspectives, as the number of significant coefficients in external perspectives (60%) is significantly lower than that obtained in internal perspectives (100%). This might be due to the fact that the effects of performance improvement at the level of resources and processes improve the customers and the economic-financial indicators in the short-term. Otherwise, the greatest effect on the external perspectives occurs in the medium term as has been shown previously in the related literature (Haka et al. 1985; Easton and Jarrell, 1998, Kennedy and Affleck-Graves, 2002; Kinney and Wempe, 2002).

In relation to 2006, the second year of use of the BSC, the behaviour of internal perspectives is quite different to that obtained in 2005. In this regard, the resource perspective shows that in 2006 the three indicators selected in the R1, R2 and R3 objectives are significant, although two of them reduce their significance levels compared to 2005. However, the coefficients of two of these objectives in 2006, R1 and R2, reached their maximum importance in terms of magnitude. By contrast, in the processes perspective only one of the selected indicators, associated to objective P2 (to improve productivity and operations services) is significant at 5% level, and the magnitude of two of the three objectives in this prospect are below those obtained in 2005. These results might be justified by the fact that in this second year of use of the BSC, efforts in internal perspectives have a lower impact on regional exports in comparison to the previous year, as improvements were already initiated in the year 2005. However, the result of a higher effect in the perspective of resources than in the perspective of processes might be explained by the nature of changes associated to these perspectives. In particular, changes at the level of infrastructure of the organisation are often more complex and slow, although their effects may be greater even to those generated at the processes level. The decrease in the effects, in general terms, in internal perspectives in 2006

compared to 2005 was offset by increases in the effects that occurred in the external perspectives of the organisation. Specifically, in the perspective of customers the indicator associated to objective C1 (to increase sea traffic and loyalty) reaches the maximum value in the magnitude of its coefficient in 2006. This result is also obtained in the economic perspective, and in particular, in the indicator associated to objective E1 (increase of the volume of business). Therefore, there is a further intensification of the importance of the objectives corresponding to the external perspectives in comparison to the internal perspectives in the second year of use of the BSC. The effort of internal perspectives in this second year, and specially the occurred in the first year, has brought significant improvements in the external perspectives through the causal relationships inherent to internal-external perspectives.

Finally, with regard to 2007, the third year of use of the BSC, a decrease in the magnitudes of coefficients is observed in all the objectives of internal perspectives (compared to those obtained in 2006). In this sense, the objective R1 (to guide the organisation and the people to implement the strategy) is the only objective that is positive and statistically significant at 1% level. As observed in the year 2006, only two objectives (C1 and E1) are significant in external perspectives at the 1% level. The fact that lower magnitudes of the coefficients are obtained in 2007 than in 2006 in the objectives in the external perspectives might be motivated, at least in part, by the starting of the Spanish economic crisis.

Conclusions and Policy Implications

The geographical position of Spain requires the adoption of measures to improve the management and efficiency of ports, increasing their competitiveness in a context of globalization and international competition. Furthermore, their location in relation to large transoceanic routes can present the opportunity for important centres of maritime traffic and goods distribution to be formed in southern Europe and North-Africa.

The atomisation of the SPS has favoured the formation of different commercial nodes and industrial concentrations in the country, contributing to economic and social cohesion, industrial location and regional planning, thus enhancing the consolidation of large integrated logistics distribution chains.

It is important to note that sea shipping is the largest in terms of capacity freight (in tons per km), and presents the lowest transportation costs per unit transported. In addition, it contributes effectively to sustainable mobility, given the low external costs generated in relation to other modes of transport. These advantages justify the empowerment of the "motorways of the sea" in the EU.[19] Nonetheless, only effective and efficient ports, endowed with adequate rail access, can produce this modal shift. To advance this goal, the SPS might be considered as a facilitator of economic activity and competitiveness.

This paper evaluates the impact that the systematic use of BSC has had on regional competitiveness and proves that the diffusion of the BSC is not so much a rhetorical argumentation of strategic and operational effectiveness. Specifically, a response is provided to answer "how much" and "how" Spanish regional competitiveness has been improved since BSC implementation in the SPS. More generally speaking, the answer to the question whether regulatory changes on management accounting play a role on international markets is affirmative, and then, from this paper important policy implications are derived.

This study has focused on four BSC prospects adapted to the SPS: economic, customers, processes and resources perspectives and the quantitative impact that the implementation of the BSC has had on Spanish PA is analysed by selecting those indicators representing each of the identified prospects. To do so, information provided in Annual Reports by the 28 PA that makes up the SPS is used. Firstly, objectives in the economic perspective are related to the

generation of more competitive PA that are able to create new revenue and get adequate levels of profitability. Secondly, the objectives in the customers perspective relate to the increase of port market share and the commitment to the reduction of prices of services offered to clients, to reduce total logistics costs and increase the competitiveness of PA. Thirdly, the objectives in the processes perspective are related to an improvement of processes that should reduce costs of activities in PA through higher efficiency. Finally, the objectives in the resources perspective relate to the achievement of leadership and excellence, to be able to attract private operators, as well as making a strategic investment in infrastructure and port areas through balanced funding. Each objective is associated to a particular indicator (see Table 1), and unlike previous studies that examine the effect of the BSC based on case studies, surveys, quasi-experiments and experiments (Franco-Santos et al., 2012), accounting data are used. Therefore, although this methodology could also be extended and adapted to the specific problems of public and private companies located in other industries and countries, a shortcoming is that actual indicators of a BSC are not used. That said, one of the advantages of using surrogate measures from the Annual Reports is that following the process of accounting harmonisation that were derived from the widespread adoption of International Financial Reporting Standards (IFRS), comparability and transparency of accounting information has increased worldwide (Márquez-Ramos, 2011).

Overall, results show that improving the strategic and operational effectiveness and achieving the economic (E1, E2, E3), customer (C1, C2), process (P2, P2, P3) and resource (R1, R2, R3) objectives in organisational units of a public transit system, at least when analysing the SPS as a whole, facilitates an increase in regional exports.

It is important to note that results obtained allow for the comparison of not only the effect of the four perspectives of the BSC on regional exports (vertical interpretation), but also their effect by year after BSC adoption (horizontal interpretation), as the methodology introduced in this paper enables us to isolate the consequences

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[19] The concept of "motorways of the sea" aims at introducing new intermodal maritime-based logistics chains in Europe (see European Commission, 2013)

of the BSC implementation due to its use over time.

In summary, there is a clear and strong positive link between the use of the BSC in the SPS and improved PA performance, as a positive and significant effect has been found on regional export growth over the period 2005-2008 compared to the period prior to the implementation and use of the BSC (2000-2004). Thus, these results provide evidence that the implementation and use of the BSC in the SPS as a strategic management tool has led to increased regional competitiveness by improving strategic and operational efficiency of the PA based on economic, customers, processes and resources perspectives. Obtained results show that the improvement of management in the prospect of processes has had more immediate consequences on international trade, and that internal perspectives of the BSC (resources and processes) have had a fairly similar effect on regional exports, as their major effects were provided in the first two years and mitigated in the third year. Moreover, external perspectives of the BSC (economic and customers) have also had a very similar behaviour as their greatest effects on regional exports were given in the second and third years, being significantly lower in 2005. The slight decrease experienced in the results of the third year (2007) in comparison to the second year (2006), against what is expected to happen *a priori*, might be justified by the beginning of the Spanish economic crisis.

Therefore, it should be noted that the improvement in the degree of strategic alignment of resources has led to a synergistic effect between the different objectives of the BSC, and the strengthening of the cause-effect relationships between them. In fact, it might have been favoured by the adequacy of the binding process between strategic and operational areas of the PA, and encouraged by their linkage with the budget. In particular, the implementation and use of the BSC in PA has ensured that not only projects and initiatives, but also budget, have become aligned with the strategy. These complex interrelationships have involved the integration of Company Plans in Spanish PA and thus, a better use of the available resources, as Spanish PA focus on maximizing organisational performance.

Starting from 1992 the SPS was transformed from a public system based on administrative criteria to a commercial understanding of port services. Within this framework, the SPS has been based on the self-sufficiency of PA and ports of general interest are intended to respond to the landlord model (Núñez-Sánchez and Coto-Millán, 2012). Recently, one of the main changes introduced by the Spanish Royal Decree 2/2011 is the concept of ports as companies, which have to submit transparent and consolidated financial, social, environmental and territorial results. This law introduces the principles of financial self-sufficiency, not depending on the State Budget, and the obligation to achieve a return of 2.5% annually, and further it establishes a financial commitment for all PA. This is intended to demonstrate that the SPS is able to take on the challenges that the global economy presents and, therefore, to search for higher levels of efficiency in the management of PA. Although the results achieved by the SPS have been based on previous laws, the concept of ports increasingly resembles that of any other private company and consequently, the role of the BSC in the management process is increasing in importance.

Finally, although macroeconomic objectives are pursued by the port sector in a number of continental countries (Liu, 1995; Barros, 2003) (e.g. generation of employment, economic and local development), as is the case of Spain, this paper provides evidence in line with the argument raised in previous research that state that ports can behave efficiently, as do private ones in similar market conditions (Liu, 1995). The improvement of port efficiency might be channelled through the implementation of management accounting techniques that are already widely used in private companies, i.e. BSC, as a consequence of the deregulation and liberalisation of the SPS.

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APPENDIX

Table A.1. Trade Facilitation Indicators

Economic region	Time to export (days)	Cost to export (US$ per container)	Time to import (days)	Cost to import (US$ per container)
East Asia & Pacific	21	923	22	958
Eastern Europe & Central Asia	26	2,134	29	2,349
Latin America & Caribbean	17	1,268	19	1,612
Middle East & North Africa	19	1,083	22	1,275
OECD high income	10	1,028	10	1,080
South Asia	32	1,603	33	1,736
Sub-Saharan Africa	31	1,990	37	2,567

Source: Doing Business (The World Bank, accessed 2 April 2013, http://www.doingbusiness.org)

Table A.2. Spanish Sea Ports

Sea Ports	Province (NUTS3)	(a) Sea Traffic (%)	Autonomous Region (NUTS2)
A Coruña	La Coruña	2.97	Galicia
Alicante	Alicante	0.76	Valencia
Almería	Almería	1.43	Andalusia
Avilés	Asturias	1.16	Asturias
Bahía de Algeciras	Cádiz	15.46	Andalusia
Bahía de Cádiz	Cádiz	1.50	Andalusia
Baleares	Palma de Mallorca	3.03	Balearic Islands
Barcelona	Barcelona	10.64	Catalonia
Bilbao	Vizcaya	8.28	Basque Country
Cartagena	Murcia	4.98	Murcia
Castellón	Castellón	2.72	Valencia
Ceuta	Ceuta	0.55	Ceuta
Ferrol-San Cibrao	La Coruña	2.29	Galicia
Gijón	Asturias	4.30	Asturias
Huelva	Huelva	4.53	Andalusia
Las Palmas	Las Palmas	5.53	Canary Islands
Málaga	Málaga	1.32	Andalusia
Marín y Ría de Pontevedra	Pontevedra	0.41	Galicia
Melilla	Melilla	0.17	Melilla
Motril	Granada	0.57	Andalusia
Pasajes	Guipúzcoa	1.05	Basque Country
Santa Cruz de Tenerife	Santa Cruz de Tenerife	4.11	Canary Islands
Santander	Cantabria	1.30	Cantabria
Sevilla	Sevilla	0.99	Andalusia
Tarragona	Tarragona	7.48	Catalonia
Valencia	Valencia	11.09	Valencia
Vigo	Pontevedra	1.14	Galicia
Vilagarcía	Pontevedra	0.25	Galicia

Notes: (a) Relative importance of port facilities by region in 2007 (% of sea traffic over total sea traffic in Spain). NUTS is a French acronym for Nomenclature of Territorial Units for Statistics used by Eurostat. In this nomenclature NUTS-1 refers to European Community Regions and NUTS-2 to Basic Administrative Units, with NUTS-3 reflecting smaller spatial units most similar to counties in the USA.

Table A.3. Relative Importance of Port Facilities by Region –NUTS2 (% of Sea Traffic Over Total Sea Traffic in Spain)

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	% increase
Valencia	11.33	12.10	12.68	12.81	12.81	13.22	13.97	14.57	16.07	41.94
Murcia	5.13	5.83	6.03	5.60	5.69	6.12	5.55	4.98	5.44	6.03
Catalonia	17.06	16.80	17.12	16.98	17.28	17.33	17.13	18.12	17.93	5.12
Andalusia	25.18	26.15	25.34	26.13	25.75	25.61	26.02	25.80	24.94	-0.94
Canary Islands	9.80	10.05	9.79	10.34	10.31	10.16	9.91	9.64	9.32	-4.92
Basque Country	9.84	9.10	8.64	8.96	9.49	8.98	9.54	9.33	9.32	-5.28
Balearic Islands	3.12	3.12	3.08	3.11	2.92	3.02	3.15	3.03	2.84	-9.04
Galicia	7.92	7.55	7.77	7.66	7.50	7.30	7.00	7.06	7.09	-10.47
Cantabria	1.58	1.48	1.50	1.43	1.46	1.52	1.28	1.30	1.16	-26.47
Asturias	7.07	6.58	6.74	6.30	6.13	6.09	5.73	5.46	5.12	-27.58
Ceuta	0.86	0.69	0.66	0.49	0.48	0.46	0.53	0.55	0.60	-30.45
Melilla	1.11	0.55	0.66	0.20	0.18	0.19	0.18	0.17	0.16	-85.39

Source: Annual Accounts from Port Authorities (2000-2008)

Table A.4. Variables and Data Sources Used

Variable	Description	Source
Exports	Maritime bilateral exports in thousands of euro	Datacomex
Regional income	Nominal income of Spanish Autonomous Regions (in millions of euro)	Eurostat (2012), http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home/
Regional population	Number of inhabitants	Eurostat (2012), http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home/
Country income	GDP (current US$)	The World Development Indicators (World Bank)
Country population	Population, total	The World Development Indicators (World Bank)
Distance	Distance between regional capitals (km)	http://www.indo.com/distance/
Common border	Dichotomic variable that takes a value of 1 when the origin region neighbours France (BF) or Portugal (BP)	Own elaboration
Common language	Dichotomic variable that takes a value of 1 when the destination country speaks Spanish	Own elaboration
Coastal region	Dichotomic variable that takes a value of 1 when the origin region is on the coast	Own elaboration
Free trade agreement	Dichotomic variable that takes a value of 1 when Spain and the destination country belong to the same trade agreement	Own elaboration
Destination port facilities	Standardised values of quality of port infrastructure (1=extremely underdeveloped to 7=well developed and efficient by international standards)	WEF- World Economic Forum's Executive Opinion Survey (2007 and 2008)