Control of a network by a network coordinator

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For Xana and Luis, the foundations of my life
Biographic note

Luís Manuel Dionísio Marques is the husband of Xana and the father of Luís Afonso. He was born in Coimbra, Portugal, in 14 December 1971 and lives in Porto with his family.

Besides being a PhD student at the Faculty of Economics, University of Porto, he is the CFO of the Aveiro Port Authority and also of the Figueira da Foz Port Authority. He also teaches management control courses at Católica Porto Business School and Católica Porto School of Economics and Management, both schools belonging to the Catholic University of Portugal. He is a Certified Public Auditor and a former collaborator of PricewaterhouseCoopers and CFA - Cravo, Fortes, Antão e Associados, SROC. He holds an MSc in Business Science at the Faculty of Economics, University of Porto and a degree course in Accounting and Auditing at ISCA, University of Aveiro, all in Portugal. He has participated in several courses of executive education, including in Harvard Business School, United States of America and in the University of Porto Business School, Portugal.

Luís is a member of the following research associations: European Network for Research in Organisational and Accounting Change (ENROAC); European Accounting Association (EAA); Management Control Association (MCA); GOVCOPP – Research Unity in Governance, Competition and Public Policy; EIASM – European Institute for Advanced Studies in Management; and Portuguese Accounting Research Network (Grudis).

He has participated and presented communications in several seminars, organized by entities like ENROAC, EAA, EIASM and MCA. He has also published opinion articles in Portuguese newspapers and a research paper in Management Accounting Research.

A former young player of Football and Taekwondo, Luís spends its part-time (‘although not lately’) voyaging with his family and reading history and romance books.
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I also gratefully acknowledge the comments received on earlier versions of the second paper in the following colloquia: discussants Martine Cools and Paolo Quattrone and also other participants in the 5th Doctoral Summer School in Management Accounting, ENROAC – European Network for Research on Organizational and Accounting Change, Siena, 2010; from the participants in the 8th International Management Control Research Conference, Management Control Association, London, 2010; from the discussant Hernani Carqueja and other participants in the 10th Grudis Seminar, Porto, 2011; and from the participants in the 34th Annual Congress, European Accounting Association, Rome, 2011.
Finally, I also want to gratefully acknowledge the comments received on earlier versions of the third paper from the discussant João Oliveira and other participants in the 11th Grudis Seminar, Évora, 2012; and from Hernani Carqueja.
Abstract

This thesis addresses the issue of control of a network by a network coordinator that uses management control mechanisms to influence other organizations' cooperative behaviour in three different types of inter-organizational relationships: bilateral, multilateral and indirect relationships. A case study provides the basis for this thesis: the control of a network – a port – by a network coordinator – the Portuguese Port Authority in the Port of Aveiro, Portugal.

The first paper explores control in bilateral relationships and concludes that the nature and use of management control mechanisms by the network coordinator seems to be shaped by its assessment of motivations to cooperate and of the contribution to network performance of the various organizations involved in the network. Other more specific contributions are encapsulated in a ‘coordination framework’, which relates those assessments to specific features of the management control mechanisms.

The second paper explores control in multilateral relationships. In this type of relationship the network coordinator is concerned about the collective cooperative behaviour of two or more organizations. This paper contributes to understand the nature of collective management control mechanisms, to assess the consequences of the use of these mechanisms and to explore how their use is related to bilateral management control mechanisms.

The third paper explores control in indirect relationships, specifically the use of management control in networks that include third parties. This paper contributes both to systematize the understanding of the influence of the presence of third parties on the control of the network by a network coordinator, and to understand the actions and strategies conducted by the latter in order to keep the network under control in the presence of one, or several, organization(s) with whom that network coordinator does not establish a direct relationship.
Resumo

A presente tese aborda o tema do controlo de redes e de como um coordenador da rede utiliza mecanismos de controlo de gestão para influenciar o comportamento cooperativo de outras organizações em três tipos de relações: bilaterais, multilaterais e indiretas. Um caso de estudo está na base da tese: o controlo de uma rede – um porto – pelo seu coordenador – a Administração do Porto de Aveiro, em Portugal.

O primeiro ensaio explora o controlo em relações bilaterais, concluindo que a natureza e uso de mecanismos de controlo de gestão por um coordenador parecem ser influenciados pelas suas avaliações das motivações para cooperar e contribuição para o desempenho da rede das várias organizações nela envolvidas. Outras contribuições mais específicas são apresentadas num ‘quadro conceptual de coordenação’, que relaciona aquelas avaliações com características específicas dos mecanismos de controlo de gestão.

O segundo ensaio explora o controlo em relações multilaterais. Neste tipo de relacionamento o coordenador da rede está preocupado com o comportamento coletivo de duas ou mais organizações. Este ensaio contribui para compreender a natureza dos mecanismos coletivos de controlo de gestão, para avaliar as consequências do seu uso e para explorar como é que o seu uso está relacionado com o uso de mecanismos bilaterais de controlo de gestão.

O terceiro ensaio explora o controlo em relações indiretas, especificamente o uso do controlo de gestão em redes que incluem terceiros. Este ensaio contribui para sistematizar a compreensão da influência da presença desses terceiros no controlo da rede pelo coordenador e para compreender as ações e estratégias conduzidas por este último para manter a rede sob controlo, na presença de uma ou várias organizações com as quais o coordenador não estabelece relações diretas.
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Abbreviations

AGEPOR – Shipping Agents National Association

APOA – Aveiro Port Operators’ Association

EAA – European Accounting Association

EIASM – European Institute for Advanced Studies in Management

ENROAC – European Network for Research on Organizational and Accounting Change

ETP – Aveiro Dockers Pool

GOVCOPP – Research Unity in Governance, Competition and Public Policy

Grudis – Portuguese Accounting Research Network

IORs – Inter-organizational relationships

JUP – Port Single Window (Janela Única Portuária, in Portuguese)

MCA – Management Control Association

MCM – Management Control Mechanism

MCMs – Management Control Mechanisms

PAPA – Port of Aveiro’s Port Authority

PCA – Port Community Association
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Introduction

In recent years, practices associated with the “New Public Management” discourse have led to the gradual transfer of competences from the public to the private sector (Hood, 1995; Teisman and Klijn, 2002). New forms of partnership, such as public-private partnerships, have supported this movement. In public-private partnerships involving concessions, the public party assumes general functions relating to the provision of public services, leaving operational issues to private parties (Brooks and Cullinane, 2007) within a network of inter-organizational relationships (IORs). These general functions are usually related to the overall supervision of operations and the quality standards in the network. In such mixed-type networks a public organization, acting as the network coordinator, assumes a coordinating role which is aimed at stimulating cooperation within the network and ensuring that network members make adequate contributions to network performance (Torfing, 2005). As such, the network coordinator takes responsibility for key governance activities, while leaving other activities to the network members.

Network coordinators are in a position to select and use Management Control Mechanisms (MCMs) to exercise their responsibilities in coordinating the IORs in which they are involved. Network coordinators are involved in direct or dyadic and indirect relationships. The issue of management control in IORs has been extensively addressed in the past two decades (Caglio and Ditillo, 2008; Berry et al, 2009), with the unit of analysis varying from dyads to networks. However, some authors have recently pointed out that these studies focus mainly on one-to-one relationships, and only a few adopt a network perspective to analyse the deployment of MCMs in networks involving multiple interactions between organizations (Caglio and Ditillo, 2008; Berry et al, 2009). Even fewer studies have specifically tackled the use of these mechanisms in the context of mixed-type networks.

It should be noted that in a mixed-type network issues of cooperation and coordination are related to the network context. This means that the use of MCMs by a network coordinator is not restricted to securing cooperation between two organizations. Instead, the network coordinator is responsible for the performance of the network as a
whole and, consequently, the coordinator adopts a network perspective in selecting MCMs. That is, in order for the desired network outcomes to be achieved, it is not only cooperation with the network coordinator which is important, but also cooperation with and between all the other network organizations.

This thesis addresses the issue of control of a network by a network coordinator that uses MCMs to influence other organizations’ cooperative behaviour. Adopting a network perspective, the thesis studies the control of the network by a network coordinator in three different types of IORs: bilateral, multilateral and indirect relationships. The first two can also be considered as dyadic relationships. The thesis uses a case study conducted in the Portuguese Port of Aveiro. Today, most ports are mixed-type networks in which a port authority assumes a coordinating role. In this thesis case, I focused on the relationships established between the network coordinator – the Port Authority in the Port of Aveiro (PAPA) – and the various organizations operating within the port network.

In dyads we find bilateral relationships (one-to-one relationships, such as a joint-venture, a strategic alliance between two organizations or a supply-chain) or multilateral – also known as ‘multi-dyadic’ - relationships (one-to-many relationships, such as several counterparts working in one direction towards a mutual objective, or a seller and multiple customers) (Caglio and Ditillo, 2008; Lind and Thrane, 2010). Various studies have focused on the issue of control in the context of hybrid forms of organization, such as alliances, joint-ventures and supply-chains. The management control literature on dyadic relationships has adopted two different perspectives: a first one aims to identify the contingent variables that influence the use of MCMs; while the other one seeks to identify the consequences of the use of various configurations of MCMs (see Caglio and Ditillo, 2008; Berry et al, 2009).

Only a few studies, however, have adopted a network perspective with contexts characterised by multiple interactions between organizations (Caglio and Ditillo, 2008; Berry et al, 2009; Lind and Thrane, 2010). In fact, although suggestions for the adoption of a more systemic perspective when studying management control in IORs were made
almost two decades ago (Frances and Garnsey, 1996), only recently have a small number of researchers started to explore those suggestions. This gap seems to be problematic, mainly because a “...selective orientation in defining the unit of analysis has hindered the exploration of the impact that other actors and/or relationships have on the relationship(s) under analysis and on their differential influence, both on the relationship-specific cost accounting choices and on the overall cost and use of accounting controls at the network level” (Caglio and Ditillo, 2008, p. 885). Along the same lines, Berry et al (2009, p. 11) reinforce that “… only scant attention has been paid to how powerful external groups and institutions might also influence the design of hybrid control structures”. Even fewer studies have specifically tackled the use of these mechanisms in the context of mixed-type networks. These are the research gaps that the first paper aims to address. The case study allowed developing a theoretical framework which shows the linkages between the nature and use of MCMs by a network coordinator, and the assessments formed by this coordinator of other network organizations’ motivations to cooperate and contribution to network performance.

However, IORs can go beyond bilateral relationships and involve more than two participants in networks that have implications for network performance. Network coordinators are also involved in this type of IOR: multilateral relationships. These relationships are studied in the second paper which has three objectives: (i) to understand the nature of these collective MCMs; (ii) to assess the consequences of the use of these mechanisms; and (iii) to explore how their use is related to bilateral MCMs.

Multiple interactions between organisations can also occur in a more distant, yet still significant part of the network. For instance, there may be multiple counterparts interacting in multiple directions, as in the case where a coordinator simultaneously handles multiple suppliers and multiple customers, who, in turn, also establish dyadic relationships between themselves. At stake is the whole network, including third parties to a focal organization, i.e., organizations that do not establish a direct, dyadic, relationship with that focal organization, such as competitors, unions, regulators, customers’ other suppliers and suppliers’ other customers. The potential influence that the presence of third parties has on management control has been suggested by the
management control literature. However, such influence has, with the exception of a few recent studies, been neglected to a great extent (Caglio and Ditillo, 2008; Lind and Thrane, 2010). It is this gap in the management control literature that the third paper aims to address.

Each paper includes a detailed description of the qualitative research methodology adopted and a theoretical discussion of case study findings. I will not repeat all those contents in this introduction. Nevertheless, a brief overall description of the research methodology is of order at this point.

The case study research method was selected to focus on “how things work in a particular context” (Mason, 2002, p. 1). As Barretta and Busco (2011, 211) recently pointed out: “… there is a need to look inside management control practices, to explore what these practices are and, how and why they enable the cooperative “ideal” to become real…”.

The case study research method is also consistent with the holistic – network – perspective adopted in the research. Although the study of MCMs in networks requires an understanding of the relationships between the network coordinator and each organization, thereby involving a study of both dyadic and indirect relationships, these relationships are part of the larger network and, consequently, a network approach is adopted in this thesis. Furthermore, although I examine the IORs from the network coordinator’s viewpoint, my analysis extends beyond relationships with specific organizations. My approach combines network analysis and governance perspectives, as proposed by Provan and Kenis (2008). That is, I combine my analysis of the network as a set of actors, with a governance perspective that takes the network as my unit of analysis; in other words, I study the dyadic relationships – analytical perspective – in terms of the network coordinator’s view of the network – governance perspective.

The case study analyses the relationships between the Port Authority – which is a public organization that acts as network coordinator – and the various port organizations – both private and public – operating in the Port of Aveiro, Portugal. This
case study, which covers the period from 1999 to May 2012, was based primarily on
data collected from the Port Authority. In this case study, the Port is regarded as a
network (cf. van der Lugt and de Langen, 2008; de Langen, 2003) and I explore the role
of the Port Authority as the network coordinator of the port organizations (see also de
Langen, 2003; Olson, 1971). Port organizations are seen *lato sensu*, including not only
organizations that provide port services, but also organizations that contribute to the
overall port performance.

The preparation of the thesis followed a process that included paper presentations
and submissions to international journals. This process has provided some very useful
and relevant contributions from conference/seminars participants, discussants and
reviewers comments.

The first paper in this thesis was presented at the 7th Conference of the European
Network for Research in Organisational & Accounting Change (ENROAC, Dundee,
2009) and at the 5th Conference on Performance Measurement and Management
Control: Innovative Concepts and Practices (European Institute for Advanced Studies in
Management - EIASM, Nice, 2009). The paper was submitted in September 2009 for a
*Management Accounting Research* Special Issue – Management Control Innovations in
Public Sector Networks. During 2009 and 2011, three rounds of reviewers’ comments
helped to improve the theoretical message and case study findings that support the
proposed theoretical framework. An adapted version of this first paper was published in

The second paper was first presented at the 5th Doctoral Summer School in
Management Accounting (ENROAC, Siena, 2010). Contributions from participants and
discussants Martine Cools and Paolo Quattrone influenced a new version of the paper
that was presented at the 8th International Management Control Research Conference
(Management Control Association, London, 2010) and at the 10th Grudis Seminar
(Portuguese Accounting Research Network - Grudis, Porto, 2011). Contributions from
participants, from discussant Hernani Carqueja and further work on a new version of the
paper allowed another presentation at the 34th Annual Congress (European Accounting
Association - EAA, Rome, 2011). Useful comments from discussants and participants lead to the development of the second paper, which was the object of some profound changes in the last months of the thesis preparation.

The third paper of the thesis was presented at the 11th Grudis Seminar (Portuguese Accounting Research Network - Grudis, Évora, 2011). Contributions from participants, from discussant João Oliveira and also from Hernani Carqueja, led to the version of the paper included in the thesis. The same version was submitted in June 2012 for publication in an ISI-indexed international accounting journal.

The three papers follow a sequence based on: (i) the extension of the scope of relationships established by a network coordinator in mixed-type networks: starting with bilateral (one-to-one) relationships, then multilateral (one-to-many) relationships and finally indirect relationships; and (ii) the evolution through time of the learning process that influenced my interpretation of the case study material and that is reflected on the discussion and conclusions which are drawn. It is this rationale that underpins the presentation of the three papers to form a coherent whole in the thesis.

A very simple presentation of the thesis structure in the form of research questions addressed in each of the three papers can be presented as:

(i) How does a network coordinator use MCMs in bilateral relationships to control the network (Paper 1)?
(ii) How does a network coordinator use MCMs in multilateral relationships to control the network in (Paper 2)?
(iii) How does a network coordinator use MCMs in indirect relationships to control the network (Paper 3)?

The main contribution of the thesis is a better understanding of the use of MCMs to the control of mixed-type networks. This includes an understanding of the factors that influence the use of MCMs by a network coordinator (Paper 1), the consequences of its use (Paper 2), and the influence of other organizations on the control of the network.
(e.g. third parties in Paper 3). By expanding the scope of relationships to include both direct and indirect relationships, and by adopting a network perspective where relationships are not seen in isolation, but as part of a wider network of relationships, this thesis contributes to a more comprehensive understanding of the control of networks.
First Paper: The use of management control mechanisms by public organizations with a network coordination role: a case study in the Port Industry

Abstract

The first paper addresses two gaps in the literature on management control mechanisms in the context of inter-organizational relationships. Firstly, several studies have focused on one-to-one relationships, but few take a network perspective which analyses the deployment of management control mechanisms in the context of networks involving multiple interactions between organizations. Secondly, even fewer studies have specifically tackled the use of these mechanisms in the context of mixed-type networks, where a public organization acts as the network coordinator responsible for key governance activities. This is the position in Ports, which are collectives of several related organizations and in which one organization – the "port authority" – assumes the role of network coordinator. In this paper I report the results of a case study, the aims of which were: to identify the management control mechanisms deployed, or relied upon, by the Portuguese Port Authority in the Port of Aveiro in the exercise of its coordinating role; and to discern - on the basis of theoretical reasoning and empirical evidence - the factors explaining the nature and use of these mechanisms.

Several conclusions emerged from the study. A general conclusion was that my prior literature-based theorization is generally consistent with the case observations. That is, in mixed-type networks, the nature and use of management control mechanisms by the public organization acting as a network coordinator seems to be shaped by its assessment of motivations to cooperate and of the contribution to network performance of the various organizations involved in the network. Other more specific conclusions are encapsulated in a ‘coordination framework’, which relates those assessments to specific features of the management control mechanisms. Crucially, my results provide insights into the roles of public organizations acting as network coordinators in the context of mixed-type networks, and, in general, on the nature of the numerous such public organizations in today’s economy and society.
1. Introduction

In recent years, practices associated with the “New Public Management” discourse have led to the gradual transfer of competences from the public to the private sector (Hood, 1995; Teisman and Klijn, 2002). New forms of partnership, such as public-private partnerships, have supported this movement. In public-private partnerships involving concessions, the public party assumes general functions relating to the provision of public services, leaving operational issues to private parties (Brooks and Cullinane, 2007), within a network of inter-organizational relationships (IORs). These general functions are usually related to the overall supervision of operations and the quality standards in the network. In such mixed-type networks a public organization, acting as the network coordinator, assumes a coordinating role which is aimed at stimulating cooperation within the network and ensuring that network members make adequate contributions to network performance (Torfing, 2005). As such, the network coordinator takes responsibility for key governance activities, while leaving other activities to the network members.

The issue of management control in IORs has been extensively addressed in the literature. Various studies have focused on the issue of control in the context of hybrid forms of organization, such as alliances, joint-ventures and supply-chains. However, some authors have recently pointed out that these studies focus mainly on one-to-one relationships, and only a few adopt a network perspective to analyse the deployment of MCMs in networks involving multiple interactions between organizations (Caglio and Ditillo, 2008; Berry et al, 2009). Even fewer studies have specifically tackled the use of these mechanisms in the context of mixed-type networks. These are the research gaps that the current paper aims to address.

In this paper I report on a case study conducted in the Portuguese Port of Aveiro. Today, most ports are mixed-type networks in which a port authority assumes a coordinating role. In this case, I focused on the relationships established between the network coordinator – the Port Authority in the Port of Aveiro – and the various organizations operating within the port network. The case study allowed to develop a
theoretical framework which shows the linkages between the nature and use of MCMs by a network coordinator, and the assessments formed by this coordinator of other network organizations’ motivations to cooperate and contribution to network performance.

The paper is structured as follows: I start by briefly describing the main characteristics of mixed-type networks and, more specifically, the functions of a public organization acting as a network coordinator in such a setting. In section 3 I review the use of MCMs in IORs in mixed-type networks, and in section 4 I explore the factors which shape the use of MCMs in this context. This is followed in section 5 by the case description and theoretical discussion, leading to my proposed coordination framework in section 6. This is then elaborated in section 7, which also concludes the paper.

2. Networks and network coordinators

Networks can be seen as “modes of organizing economic activities through inter-firm coordination and cooperation” (Grandori and Soda, 1995, p. 183), in which more than two organizations are involved and, consequently, there are multiple relationships in potentially many different directions (Nootenboom, 2004). Such relationships include IORs at various levels, from the more simple – i.e., dyadic – to the more complex – where three or more organizations are involved. At the dyadic level relationships are shaped by formal structural arrangements as well as various informal (unstructured) means of ensuring that there is cooperation between all pairs of organizations within the network (Nootenboom, 2004; Van de Ven and Walker, 1984). According to Ring and Van de Ven, “cooperative IORs are socially contrived mechanisms for collective action, which are continually shaped and restructured by actions and symbolic interpretations of the parties involved” (1994, p. 96). Furthermore, cooperation implies interaction and interdependency between organizations (Dekker, 2004), and this requires some form of coordination. Malone and Crowston (1994, p. 90) define coordination as “managing dependencies between activities”. Consequently, coordination in networks is needed
when an organization’s action is connected to and dependent on the action of another network organization (Nooteboom, 2004).

Network coordination has been proposed, in both the private and public sectors, as a way of increasing performance through the more efficient use of resources, greater competitiveness and improved customer service (Child et al., 2005; Provan and Kenis, 2008). Such coordination can be achieved by means of an appropriate governance structure (Grandori, 1997). However, several factors make network governance particularly complex: there is usually no hierarchy or ownership structure (Williamson, 1985); there may be different degrees of commitment to the goals of the network (Ring and Van de Ven, 1994); and there may be issues related to the voluntary compliance with rules and procedures (Grandori, 1997).

A number of different models of network governance can be distinguished: the self-organized model whereby all network organizations interact with every other organization in governing the network; the mandated or contracted model where there is an internal or external organization that governs the network; and the mixed or mid-range model in which one organization acts as a network coordinator and is responsible for some key governance activities, leaving the more operational activities to the other organizations in the network (Provan and Kenis, 2008). This last model of network governance – the mixed-type network – has become quite common in public management in recent decades, reflecting their growing importance in the provision of public services (Hood, 1995; Provan and Kenis, 2008).

In mixed-type networks a public organization assumes the role of network coordinator, while the network services are provided mainly by private organizations. Typically, the public organization has to cope with social concerns and pressures, while the private organizations are more concerned with market pressures (Klijn, 2003). The network coordinator is generally responsible for the network’s economic development, by facilitating the activities of the network organizations (Provan and Kenis, 2008) and by using coordination mechanisms to govern the network (Grandori, 1997). The public organization can obtain its resources from the network organizations or through
governmental funding. The role of the public organization is usually mandated by the
government, although mixed-type networks can also emerge in certain horizontal
networks, where the public organization has sufficient resources and legitimacy to act as
the network coordinator (Provan and Kenis, 2008). In recent years many public services
have gradually been transferred to private organizations, although coordinators may still
be needed in order to “occupy structural holes” in the network (Burt, 1992). For
example, economic bottlenecks can occur where structural holes are created due to parts
of the network not being sufficiently developed to operate under market conditions and,
consequently, they need to be filled by the government, either directly or through
public, private or non-profit organizations (Brown and Potoski, 2003).

Several studies have identified other functions and roles of network coordinators,
including public ones. For instance, network coordinators may be regarded by the
network organizations as mutually trusted information intermediaries, capable of
bridging informational asymmetries, establishing a common set of expectations and
aligning diverse goals (Ebers, 1997). Other functions of network coordinators include
coordinating activities, resolving conflicts, regulating access to the network and
applying sanctions. Network coordinators can also act as intermediaries between
network organizations, by becoming involved in things like: arbitration or mediation;
assessing the value of information before it is traded; creating mutual understandings;
monitoring information flows; building trust; helping in a timely way to sort out of
relationships issues; and providing reputational mechanisms (Nooteboom, 2009).

In relationships between a public organization, acting as network coordinator, and
the other network organizations, there is likely to be a legal framework which defines
the formal context within which the public organization has to work, but this does not
necessarily mean that the network coordinator has the legal authority to impose rules or
to dictate the actions to be taken by the other network organizations (Torfing, 2005).
Where the legal framework mandates some or all of the roles of the public organization,
the other network organizations will have to comply. However, in the absence of such
legal mandates, network coordination means influencing other network organizations to
take actions that enhance the performance of the network (Phillips et al, 2000). Here,
political issues may be at stake (Nutt, 2000). For example, in a political context where there is a heavy reliance on state regulation, the emphasis will be on the enforcement of state regulations. In contrast, in a more liberal, competitive, market-oriented political environment – as in New Public Management (Rethemeyer and Hatmaker, 2008) – the emphasis will be on rules and procedures which stimulate free competition (Torfing, 2005). Nevertheless, as Teisman and Klijn (2002, p. 191) argue, governments, although gradually engaged in more and more public-private partnerships, “still seem to be dedicated to their own procedures, rules and principles of control; for this reason, they try to fit partnerships into the mould of traditional policy-making procedures”.

In general, the objective of the network coordinator is to ensure that the actions of the various network organizations are consistent with the network’s goals. The achievement of such an objective clearly involves issues of control. Thus, a question emerges at this point: what are the mechanisms that can be deployed by a network coordinator (whatever its political orientation – traditional or liberal) to control the network? This topic will be tackled in the next section, where I provide a definition of MCMs and explore their use by network coordinators in IORs in mixed-type networks.

3. The use of MCMs by network coordinators

In the context of IORs, MCMs can be seen as instruments or processes deployed by an organization with the purpose of influencing another organization’s behaviour in order to achieve desirable or predetermined outcomes (Das and Teng, 1998; Dekker, 2004). Following Dekker (2004), MCMs in IORs can be one of three types: outcome, behavioural or social. Outcome controls involve the use of performance measures to assess and monitor the outputs of operations and other actions. Behavioural controls involve the specification and direct monitoring of the expected behaviour (Langfield-Smith, 2008). Taken together, outcome and behavioural controls can be classified as formal controls (Ouchi, 1979; Dekker, 2004). In contrast, the third type – social controls – are informal controls that imply a reliance on self-regulation (Ouchi, 1979) and are grounded in shared norms, values and beliefs (Langfield-Smith, 2008). In line with
Langfield-Smith (2008, p. 349) I adopt a *lato sensu* view of social controls that include “activities such as frequent interactions, meetings, negotiation of disputes, codes of conduct, senior management attitudes and style, and rituals”. Additional examples of the three types of controls in the context of IORs are (i) goal-setting, incentive systems and performance monitoring (outcome MCMs); (ii) rules and operational procedures (behavioural MCMs); and (iii) informal interactions, joint decision-making, and social ties and events (social MCMs). Different sets of MCMs are likely to be deployed by the network coordinator in each IOR. Here I will use the term “package of MCMs” to indicate the balanced set of MCMs (Malmi and Brown, 2008) used by the network coordinator. Balance, in this sense, is achieved by adapting the scope – i.e., higher or lower intensity of use – of each type of MCM in the MCM Package.

Two different perspectives have been adopted in the literature on management control in IORs (see Caglio and Ditillo, 2008; Berry *et al*., 2009). One aims to identify the contingent variables that influence the use of MCMs, while the other seeks to identify the consequences of using the various MCMs. Drawing mainly on transaction cost economics and organizational theory, the *contingent variables* literature has concluded that the level of interdependence and trust at various stages in the relationship life cycle influence the type of controls that are deployed (Tomkins, 2001). Furthermore, both the coordination of tasks (influenced by the degree of interdependence and task uncertainty) and appropriation concerns (influenced by asset specificity, uncertainty and frequency) influence the design and implementation of formal and social MCMs in IORs (Dekker, 2004). The *consequences* literature, on the other hand, suggests that MCMs can stimulate cooperation in IORs (Zajac and Olsen, 1993; Coletti *et al*., 2005; Mahama, 2006), increase the level of trust in cooperative IORs (Coletti *et al*., 2005), and, when supported by adequate information systems, tighten inter-organizational ties and reduce costs throughout the system (Frances and Garnsey, 1996).

As indicated earlier, management control studies have tended to focus on dyadic IORs, such as alliances, joint-ventures and supply-chains; very few have taken a network perspective and analysed the nature and use of the dyadic MCMs in contexts
characterised by multiple interactions between organizations (Caglio and Ditillo, 2008). Berry *et al* (2009, p. 9) review some notable exceptions; i.e., studies that analyse management control in “…dyadic relationships as but one element in a wider network of interconnections”. In one of those studies, Mouritsen and Thrane (2006) draw on actor-network theory to classify management controls in horizontal networks, distinguishing between self-regulation and the orchestration mechanisms which establish coherence and complementarity within the network. For them, “Self-regulating mechanisms allow interaction and exchange to occur unobtrusively, while orchestration mechanisms involve structuring these interactions” (Mouritsen and Thrane, 2006, p. 241).

Self-regulating mechanisms are, thus, network controls that require only minimal active intervention by the public organization. In another study, Håkanson and Lind (2004) explore the relationship between Ericsson and Telia Mobile, and identify the use of MCMs in three different forms of inter-organizational coordination: hierarchy, market and business relationship or cooperation. They argue that these different forms of coordination are not necessarily alternatives; they can be used in combination and further research is needed to study “how the forms of coordination can be combined” (Håkanson and Lind, 2004, p. 68). Furthermore, Berry *et al* (2009) observe that while there are only a few studies of MCMs from a network perspective, there are even fewer that have specifically tackled the use of MCMs by public organizations in mixed-type networks.

Arguably, in mixed-type networks, the network coordinator, as a public organization, is in a position to select and use MCMs to exercise its responsibilities in coordinating the IORs in which it is involved (which, as I pointed out above, does not necessarily imply a legally enforceable mandate). It should be noted that in a mixed-type network issues of cooperation and coordination are related to the network context. This means that the use of MCMs by a network coordinator is not restricted to securing cooperation between two organizations – as in a dyadic relationship. Instead, the network coordinator is responsible for the performance of the network as a whole and, consequently, the coordinator is likely to adopt a network perspective in selecting
MCMs. That is, in order for the desired network outcomes to be achieved, it is not only cooperation with the network coordinator which is important, but also cooperation with and between all the other network organizations. Therefore, it seems reasonable to suggest that the use of MCMs in mixed-type networks will focus on cooperation and performance in very broad terms – i.e., at the level of the network as a whole. Thus, in this paper, where I’m studying mixed-type networks in which a public organization acts as a network coordinator, I conceptualise MCMs as instruments or processes which are deployed to influence the other network organizations to cooperate in achieving the desired or predetermined network performance.

At this point, it is necessary to theorize about the nature of such MCMs, and about how and why they are used by a public organization acting as a network coordinator. From the very early stages of my research in the Port of Aveiro (see below), I noticed that different MCMs were used through time (i.e., in different periods) and across space (i.e., in relationships with different port organizations). Understanding these differences became the central issue in my research.

4. An exploration of the factors shaping the nature and use, by network coordinators, of MCMs

As we saw above, in the context of mixed-type networks, the network coordinator has several functions which together aim to achieve the desired or predetermined level of network performance. For the purpose of this paper, network performance is considered to be the network coordinators’ view of the desired or predetermined objectives of the network (cf. Child et al, 2005). However, while network performance depends on the contribution of all organizations involved in the network (Brignall and Modell, 2000), each organization is likely to make a different contribution – in its nature and reach – to that performance (Child et al, 2005). Thus, to control network performance, the network coordinator must, first of all, recognise the necessary contribution of each network organization (Nooteboom, 2009). Network coordination then comprises the actions taken by the network coordinator to ensure that each
organization realizes its expected contribution to the network. As cooperation is necessary to achieve network performance (Smith, et al, 1995; Child et al, 2005), the network coordinator will seek to influence cooperative behaviour to achieve the desired or predetermined network performance. However, “motivational factors are (...) prerequisites of cooperation” (Smith, et al, 1995, p. 8), and each organization has its own motivations to (or not to) cooperate with the network coordinator and/or with the other organizations in the network. It thus seems reasonable to expect that, in a mixed-type network, the public organization acting as network coordinator will exercise its coordinating function taking into account its assessment of each network organization’s motivation to cooperate, and the potential contribution to the network performance of each network organization. I now turn to these two concepts.

Assessment of the motivation to cooperate is the assessment, formed by the network coordinator, of each network organization’s motivation to undertake the expected level of cooperative behaviour (Smith et al, 1995). Such motivation is a prerequisite for cooperation and it determines the cooperative behaviour which is actually undertaken (Ring and Van de Ven, 1994; Smith et al, 1995). Drawing on Ring and Van de Ven’s (1994, p. 96) definition of cooperative IORs, the assessment of a higher or lower motivation to cooperate depends on the likelihood that the network organization will engage in future collective actions, i.e., joint actions involving two or more network organizations, that contribute to the network’s objectives. Therefore, the network coordinator’s assessment of each organization’s motivation to cooperate indicates the extent to which it expects the organization to cooperate with the other organizations in the network. As such, that assessment is likely to affect how the network coordinator attempts to influence the behaviour of the organization and the extent to which the network coordinator involves the organization in the various activities of the network.

As suggested by Nooteboom (1996), motivations to cooperate can derive from four types of sources: material interest, coercion or fear, bonds, and ethics. The network coordinator’s view of the importance of each of these four types of motivation will influence its assessment of the motivations to cooperate (see Williams, 1988). For the
purposes of this study, *material interest to cooperate* involves a network organization’s economic and/or strategic advantage (material advantage) in being cooperative (Williams, 1988). In other words, the network coordinator assesses whether the network organization believes (i) it can benefit from cooperating in a specific IOR or in the network as a whole, and (ii) that the benefits will outweigh the costs. The existence of *coercion or fear* means that the network organization is likely to engage in cooperative behaviour because of the sanctions or penalties which could be incurred for not doing so (Williams, 1988). In other situations, the network coordinator may form its assessment of the other organization’s motivation to cooperate based on existing *bonds* of friendship, kinship, or empathy (Williams, 1988; Nooteboom, 1996). Motivation due to *ethics* arises where cooperative behaviour is based on values and norms of proper conduct (Williams, 1988; Ring and Van de Ven, 1994; Nooteboom, 1996) and the network coordinator assessment will depend on whether it expects the network organization will behave in accordance with these values and norms.

In table 1, I propose an operationalisation of Nooteboom’s four sources of motivation to cooperate. According to transaction cost economics, behavioural problems, such as bounded rationality and opportunism, coupled with transaction characteristics (asset specificity, uncertainty and frequency) may, in some circumstances, lead to contractual problems. In particular, incomplete contracts due to information asymmetries can give rise to appropriation concerns – i.e., because one of the transactional parties might engage in opportunistic behaviour (Williamson, 1985). The possibility of opportunistic behaviour by network organizations will probably influence the network coordinator’s assessment of motivations to cooperate: “appropriation concerns produce negative expectations about future behaviour” (Vosselman and van der Meer-Kooistra, 2009, p. 270). For instance, if one network organization captures excessive relational rents, at the expense of other network organizations, there will be disequilibrium in the sharing of network benefits (Dyer *et al*, 2008), and consequently the network coordinator’s assessment of motivations to cooperate may be negatively affected.
Type of motivation to cooperate | Network coordinator assessment based on:
--- | ---
Material interest | Appropriation concerns (bounded rationality and opportunism coupled with asset specificity, uncertainty and frequency); disequilibrium in sharing network benefits.
Coercion or fear | Fear of authority (including situations in which the network coordinator, as a public authority, has the legal mandate to impose laws and to enforce cooperative behaviour); coercion stemming from contract-based sanctions and penalties.
Bonds | Non-egotistic past history of cooperation; close relationships (proximity); social ties, including interpersonal ties.
Ethics | Past history of good faith, good intentions, integrity, reputation for fair behaviour and concern about network organization welfare (goodwill trust); organizational culture (organizational values and norms); previous evidence of not behaving opportunistically (even where it was possible).

Table 1: Behaviour patterns that inform a network coordinator’s assessments of motivation to cooperate

Every IOR will have its own combination of behavioural problems and transactional characteristics which may lead to different assessments of motivations to cooperate by the network coordinator. Without being exhaustive, some examples can be given. Investments in specific assets by a network organization – thereby giving rise to asset specificity (Williamson, 1985) – could lead to a higher assessment of motivation to cooperate. This is because the network organization would find it difficult to adapt such specific investments for other activities, and consequently it would be dependent on the network for the utilization of those assets. But the opposite can also occur. For example, in situations of monopoly (where there is only one producer of a particular good or service), asset specificity could lead to appropriation concerns and, consequently, to a lower assessment of motivation to cooperate (Brown and Potoski, 2003). In both examples, appropriation concerns contribute to the formation of the network coordinator’s assessment of material interests, which in turn lead to specific assessments of motivation to cooperate.
Although transaction cost economics helps us understand and operationalize the way a network coordinator forms its assessments of motivation to cooperate based on material interests, along with Nooteboom (1996) I argue that coercion, bonds and ethics are also important sources of motivation, which the network coordinator has to assess in numerous (probably most) situations. Coercion is, in a sense, related to the power that network organizations recognize as being encapsulated in the laws and norms, which not only define proper conduct, but also establish structures that provide for the enforcement of that proper conduct. The network coordinator’s assessment of motivations to cooperate will be based on its expectation that the other network organizations will act out of a desire not to be sanctioned. In other words, if the network organizations are aware of the legal sanctions available to the network coordinator, they may be expected, whatever their material interests, whatever their bonds with other network organizations, and whatever their ethical stance, to see cooperation as the best— if not the only— course of action. There could also be situations in which a network coordinator might expect other network organizations to fear the sanctions or penalties that would accrue, if they do not adopt cooperative behaviour, even if such behaviour is not strictly required by law. For instance, an organization with a concession contract approaching the end of its agreed term will probably tend to adopt cooperative behaviour for fear that the public authority will not renew its contract. Power is also at stake here—i.e., the network coordinator has dispositional power accruing through a set of “circuits of power” (Clegg, 1989), and other network organizations will recognize that it has the power to dispose, or not, as it chooses.

Trust is another potentially relevant concept; especially in view of the bonds and ethics involved in relations between network organizations. Das and Teng (1998) consider trust as a bond, while Nooteboom (1996) argues that trust – specifically goodwill trust – can be either a bond or an ethical motivation. While a discussion of these arguments is beyond the scope of this paper, it is relevant to note that “although research has identified many determinants of cooperation, virtually all scholars have agreed that one especially immediate antecedent is trust” (Smith, et al., 1995, p. 11). Here I will follow Das and Teng’s definition (2001, p. 14): “goodwill trust is about one’s good faith, good intentions, and integrity. It is about whether a firm has a
reputation for dealing fairly and caring about its partner firm’s welfare in alliances. With such a reputation, a focal firm feels more assured that the partner firms will cooperate in good faith, rather than behave opportunistically.” Consequently, I will treat goodwill trust as a form of ethical motivation.

The foundations for bonds are located in the behavioural routines that support a non-egotistic past history of cooperation. A shared history characterized by frequent cooperative relationships can lead to the development of social ties of friendship, kinship, and empathy. In comparison with the ethical motivation described above, bonds tend to be more personal as they are based on interpersonal familiarity and mutual understanding (Nooteboom, 1996). In IORs, bonds can also be formed between organizations as a result of the close relationships that can emerge through the frequent sharing of information and complementarity of objectives.

It is the mix of these four types of motivation that shape the network coordinator’s assessments of the other network organizations’ motivation to cooperate. As Nooteboom (1996, p. 991) notes, these assessments “…may have a strong or weak basis, ranging from assurance from objective facts and logical reason, through belief which is less firmly based on experience and argument, to unsubstantiated faith.”

**Assessment of contribution to network performance** is the network coordinator's assessment of the extent to which a network organization's actions will contribute to the achievement of the desired or predetermined objectives of the network (Child *et al.*, 2005). These objectives “…may include many dimensions such as: efficiency, development capability, flexibility, adherence to specifications, network position, value as a source of learning, international presence, continuity” (Nooteboom, 1996, p. 995). Although network organizations may benefit individually, network performance is assessed at the network level by the network coordinator (Provan and Kenis, 2008). When the network coordinator is a public organization, the contribution of the various network organizations may be measured on several dimensions (Brignall and Modell, 2000). For instance, funding bodies have a financial and resource dimension, whereas service providers have a quality dimension.
The contribution to network performance will be assessed by the network coordinator as lower or higher according to the relative contribution that each network organization makes to the performance of the network as a whole. Thus, when the provision of public services is allocated to a private network organization, for instance, by means of a concession contract, the network coordinator will probably assess its contribution to network performance as higher than when that provision is performed under a public service licence (Brown and Potoski, 2003). This is because licences are usually issued on a relatively short-term basis, while concessions imply a long-term commitment and, furthermore, concessions tend to be exclusive, whereas multiple licences are often issued simultaneously. This example is based on the recognition that the concept of *contribution to network performance* relates to the contribution of organizations individually. When a group of organizations operate under a licence, and together have an important role in the network, their contribution to network performance as a group might be assessed as high. However, the contribution of each individual organization in that group might be assessed as low, as any one organization could be replaced by another organization in the group or by a new organization to which a licence could be granted.

To sum up, the discussion so far suggests that the exercise of the coordinating function, by a public organization acting as a network coordinator, is likely to be shaped by its assessment of the motivation to cooperate and of the contribution to network performance of the various organizations involved in the network. As I pointed out earlier, MCMs are the means deployed by the network coordinator in the exercise of its coordinating function. This leads to the specific questions which shaped my case research:

(i) Are the nature and use of MCMs by a public organization acting as a network coordinator related to its assessment of the motivation to cooperate and of the contribution to network performance of the organizations involved in the network?

And, if the answer to the first question is positive, I also ask:
(ii) How are the nature and use of MCMs by a public organization, acting as a network coordinator, shaped by these two assessments?

I attempted to find answers to these questions through a case study conducted in the Port of Aveiro in Portugal, which is described in subsequent sections of this paper.

5. The Case Study: Port of Aveiro, Portugal

5.1. Introduction

The case study research method was selected to focus on “how things work in a particular context” (Mason, 2002, p. 1). In addition, this research method is consistent with the holistic – network – perspective adopted in the research. Although my study of MCMs in mixed-type networks requires an understanding of the relationships between the network coordinator and each organization, thereby involving a study of dyadic relationships, these dyadic relationships are part of the larger network and, consequently, a network approach is adopted in this paper. Furthermore, although I examine the IORs from the network coordinator’s viewpoint, my analysis extends beyond dyadic relationships with specific organizations. My approach combines network analysis and governance perspectives, as proposed by Provan and Kenis (2008). That is, I combine my analysis of the network as a set of actors, with a governance perspective that takes the network as my unit of analysis; in other words, I study the dyadic relationships – analytical perspective – in terms of the network coordinator’s view of the network – governance perspective.

Prior to this study I had conducted earlier research in the Port of Aveiro, and so I had access to preliminary information from which I could identify the characteristics of a mixed-type network in this setting. Importantly, that earlier research also gave me virtually unlimited access to the study of the relationships between the Port Authority –
which is a public organization that acts as network coordinator – and the various port organizations – both private and public – operating in the Port of Aveiro. This case study, which covers the period from 1999 to May 2009, was based primarily on data collected from the Port Authority. In this case study, the Port is regarded as a network (cf. van der Lugt and de Langen, 2008; de Langen, 2003) and I explore the role of the Port Authority as the network coordinator of the port organizations (see also de Langen, 2003; Olson, 1971). Port organizations are seen lato sensu, including not only organizations that provide port services, but also organizations that contribute to the overall port performance. I start by presenting the port characteristics and its evolution during the period of analysis. Then some aspects of the case study research method are discussed, before I proceed to the presentation and discussion of my results.

5.2. The port sector

Changes in the port industry in recent decades seem to be in line with trends in public management more generally. Many governments are no longer in the business of port operations. Instead, they are now focusing on more general functions, such as providing a level playing field for commercial activities (Brooks and Cullinane, 2007; Baltazar and Brooks, 2007). In Continental Europe, for instance, we now witness a predominance of the landlord port model (Notteboom and Winkelmans, 2001). Landlord ports have a mixed character and aim to strike a balance between public (port authority) and private (port industry) interests. Port authorities provide the port infrastructure (e.g. maritime access, intra-rail and road connections) and the private sector is responsible for the port services (e.g. transhipment, storage and warehousing), including investments in superstructure (e.g. equipments and pavements). In this landlord model the port authority is responsible for the safe, sustainable and competitive development of the port (see van der Lugt and de Langen, 2008).

Also, most port authorities have recently lost the enforcement role that had previously underpinned their authority to determine the behaviour of other port organizations. Legal changes have created a new situation in which port authorities have
to act in a more persuasive and market-oriented way – based on *consensus-oriented decision making* (Ansell and Gash, 2008) – and use a wide variety of mechanisms to influence the behaviour of the port organizations (van der Horst and de Langen, 2008). Nevertheless, the port authority usually retains the position of the network leader, primarily because of its central role in the management of certain key resources. Consequently, ports can be viewed as sets of IORs, in which the port authority acts as the network coordinator (Teisman and Klijn, 2002).

Port authorities play an important role in the creation of core competences and thus focus on the development of the port network (Notteboom and Winkelmans, 2001; Notteboom, 2007; van der Lugt and de Langen, 2007), including the entire logistic value chain (Robinson, 2002; Notteboom, 2007). As network coordinators, port authorities are in the best position to solve problems arising from collective action (Olson, 1971; de Langen, 2003). In ports, collective action can give rise to problems surrounding innovation, training and education, internationalisation, marketing and promotion, and hinterland access – including co-investment, between the port authority and port organizations in the port (de Langen, 2003). All port organizations both contribute to, and benefit from, a competitive port service, which comprises various services provided by many different organizations (Nijdam and de Langen, 2003). Competitive port service is one dimension of contribution to network performance. Examples of other dimensions that can support this assessment in ports include: the number of providers *per* type of port service which reflects the objective of internal port competition; the relative quantity of each port organization in the total cargo handled in the port; the relative price of the services provided each port organization in total price of port services; and the importance of quality of the services of each port organization in attracting customers to the port.

The Port Authority in the Port of Aveiro (henceforth, PAPA) is a public organization that was legally transformed from a public body into a state owned company in 1998. This change implied a new strategy for the Port, the implementation of which required new private investment and the award of concessions for port services to private organizations. As a result, the PAPA adopted a new role. Previously, it had
been a traditional public body and its main legal functions were to regulate the port organizations; specifically it was responsible for such issues as security, access to operations, environment and infrastructural investments. But in 1998 it was transformed into an organization responsible for all aspects of the economic development of the Port. Nevertheless, public law still applies to procedures concerning the granting of licences and the signing of contracts, and the Port Authority must reconcile its legal obligations with the commercial prerequisites that are necessary for its interactions with the port organizations. This has led to a process of change within the PAPA in an attempt to achieve a balance between complying with public law and responding to the demands of port organizations. Some of the issues which have arisen in this process will be outlined below, after a brief description of my research methods.

5.3. Research methods

The transformation of the PAPA, which took place in 1998, was a change from a service port to a landlord port model, and this required the organization to become more actively involved in coordinating the port’s activities. This event provided an obvious time-frame for my study: 1999 to May 2009. I started with a detailed analysis of various aspects of the network governance model, including the PAPA’s legal competences, the different types of port organizations involved in the Port, and the IORs between the PAPA and other port organizations. Two objectives were pursued at this stage. The first was to understand the formal context and the consequent use of licences and contracts in certain IORs. The second was to explore the functions and the network position of each type of organization, and to try to identify the PAPA’s assessments of the motivation to cooperate and the contribution to network performance of each organization involved in the Port. The ultimate objective was to fill the boxes in table 2; i.e., turning it into table 3 (see below) by positioning each of the relevant network organizations within my theoretical framework.
Table 2: Factors shaping the nature and use of MCMs by a public organization acting as a network coordinator

To identify the PAPA’s assessments of the motivation to cooperate and the contribution to network performance of each network organization, I gathered information from documents, and through interviews and informal discussions with organizational members. I also observed meetings, both internal and external (i.e. between the PAPA and other port organizations). Various types of “hard data” were collected from the PAPA: contracts, licences, internal memos, reports, communications between organizations and other agreements. These are all public documents that can be consulted on request. Due to its legal status as a state owned company, every decision of the PAPA must be supported with an internal memo (Informação) or a report prepared by a manager and approved by the Board. These documents became a crucial source of data for my study as they contained assessments of the other port organizations and proposals for the structure of the IORs, including the MCMs to be employed. As the focus of my research was on the use of MCMs by the network coordinator, two open-end interviews and five informal discussions (with an average duration of two hours) were held between August 2008 and July 2009, with two Board Presidents (period of board membership: 1999-2002 and 2005-present) and with one manager (period of managerial activity: 1994-present). These interviewees were selected due to their direct involvement in the PAPA’s decisions and in the relationships with other port organizations, and their most relevant parts were transcribed. The main purpose of these interviews and discussions was to confirm my analyses and interpretations of the various documents. The interviews also contributed to a deeper understanding of the reasons for diversity in the nature and use of MCMs in IORs. The informal discussions
with the manager included a detailed discussion of specific clauses in the contracts and of the arrangements made with port organizations, as he had designed them.

A key issue in my research was the absence of a totally objective way of locating the PAPA’s assessments in the typology set out in table 2. In some instances, this was relatively straightforward, as formal assessments were necessary for the approval of, say, a contract or a licence, and those formal assessments often had a direct ‘fit’ with my framework. In other situations the fit was not so direct, but still reasonably objective. For instance, the existence of a direct connection between a port organization’s business and the achievement of the port objectives readily suggests an assessment of high contribution to network performance. Another example is where the cargoes that a port organization can bring to the port can be easily estimated; here the assessment of contribution to network performance can, in a sense, be calculated. Still another example is when the environmental norms followed by a port organization conform to the PAPA’s environmental policy, and so I can infer an assessment of an ethical motivation to cooperate. And a final example occurs when a port organization is subject to legal regulations, and so there is coercive motivation to cooperate. In other instances, however, I had to use proxies for the PAPA’s assessments, based on the specific circumstances and on the available evidence. For instance, a long-standing relationship with no (or few) recorded problems was interpreted as indicating the presence of bonds between the PAPA and the port organization concerned. I subsequently used my discussions with the interviewees (mentioned above) to test positioning of network organizations in the framework set out in table 2, and in general my inferences were confirmed.

The PAPA’s Strategic Plan (drawn up in April 2006) was also an important source of evidence to support my inferences. This Strategic Plan documented planned actions in a table which, where relevant, set out the contributions of each port organization. It also contained a figure which indicated the importance of each type of port organization for the port’s strategic objectives. When questioned about this document in August 2008, the Board President explained that all port organizations had contributed to, and agreed with, the strategic objectives. In addition, the PAPA produces, on a monthly
basis, a table which analyses, for each port organization, information on the type of service provided, the cargo services in tonnes and the relative position in the total cargo handled by the port. The information contained in the Strategic Plan and these monthly tables allowed me to estimate the PAPA’s assessment of the contributions to network performance of the various port organizations in the light of the port’s strategic objectives.

The process of collecting and analysing the information contained in the various documents used in the study was greatly facilitated by the administrative system which the PAPA uses to internally manage documents. This system comprises a clearly defined set of rules for the internal flow of specific documents. For instance, every external communication received by the PAPA (e.g. letter, fax, email) has to be registered chronologically in an administrative IT support system. This system contains, among other information, the date of receipt of the communication, its subject, and the organization that sent it. The communication is then dispatched, usually by the (office of the) President of the Board, to the department responsible for the subject concerned. The ensuing action by the PAPA is recorded, usually, in one of two ways: on the external communication itself, by writing in the top right corner a description of what action has been taken; or by an internal memo (Informação) to the Board, with a detailed proposal for the action to be taken. In the weekly Board meetings, these internal memos are discussed, and this can result in an answer (communication) from the PAPA, a contract, a licence, or even further internal memos and reports. These documents are also recorded in the PAPA’s administrative IT support system. Particularly helpful for my research was the fact that all these documents are archived and kept by the PAPA in ‘paper’ files, organized by name of the port organization or by subject. This allowed me to analyse, in chronologically order, all documents concerning a particular port organization for the whole period between 1999 to May 2009, and to trace any subject in the paper files. I could also request searches by a specific word(s) in the PAPA’s administrative IT support system. For instance, by searching the name of a particular port organization, the system showed all the records with that name, including all communications from and to that port organization, and also related internal memos, reports and other documents. This provided me with a reliable method for accessing and
indexing all the relevant documents in the period of analysis (Miles and Huberman, 1994; see also Yin, 2003).

The availability of PAPA’s administrative system enabled me to analyse the ‘hard data’ and to generate the information I needed to support the case study. The sorted and ordered data contained in the paper files allowed me to use extended cross-sectional or categorical indexing (Miles and Huberman, 1994). It also facilitated the process of identifying particular issues in relationships between the PAPA and the port organizations included in the case study. For instance, a categorization by type of document (e.g. concession contracts) enabled me to identify the reasons why the PAPA was using concession contracts for some port organizations and not for others. As the data was so well organized I could identify patterns and extract information about one relationship and compare it with other relationships (Yin, 2003). This method provided a holistic view of the information (Ryan et al, 2002), albeit one that was framed by the theoretical dimensions presented in table 2 above.

One final methodological note is needed. I was appointed as the Chief Financial Officer of the PAPA in April 2005. In my view this does not constitute a crucial problem, as much of the analysis was based on documents which were produced before that date and relate to activities and decisions outside my areas of responsibility. Furthermore, I attempted to support my analyses and interpretations through comparisons of the various documents and by confronting the documents with the interviewees’ explanations. It should also be noted that my position in the PAPA had some very real advantages. For instance, it allowed me to be present in a number of meetings between representatives of the various organizations under study, during the period April 2005 to May 2009. At these meetings notes were taken which contributed to my interpretations and supported my conclusions.
5.4. Port organizations and the Port Authority’s assessments

In this section I will describe the dyadic IORs that the PAPA established with the following port organizations, all of which are private organizations: the Tugs Concessionaire, Dredging Companies, the TGS-Agro Concessionaire, TGL Land User Concessionaires, the South Terminal Concessionaire, Industrial Customers, Shipping Agents, Port Operators under a Licence, Waste Reception Providers and Fuel Providers. My objective is to locate each of these port organizations in the framework set out in table 2 above. In some instances these ‘organizations’ are groups of organizations (e.g., the dredging companies and fuel providers) and in other instances they are individual organizations (e.g., the Tugs Concessionaire and the South Terminal Concessionaire).

Table 3 locates these organizations in four boxes based on their motivation to cooperate and their contribution to network performance according to my interpretation of the assessments made by PAPA. I will discuss my interpretations and the PAPA’s assessments in the following section. Before doing so it is important to point out that my interpretations of the PAPA’s assessments of the motivation to cooperate and the contribution to network performance as ‘high’ or ‘low’ should be seen in both general and relative terms. In other words, the discussion set out below suggests, for example, that the assessment of the Tugs Concessionaire’s contribution to performance is higher than that of the shipping agents, and that the assessment of its motivation to cooperate is higher than that of the industrial customers. As such, the terms high and low do not have an ‘absolute’ meaning.
<table>
<thead>
<tr>
<th>Assessment of motivation to cooperate</th>
<th>Organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High</strong></td>
<td>BOX 2 – low-high</td>
</tr>
<tr>
<td></td>
<td>Shipping agents</td>
</tr>
<tr>
<td></td>
<td>Port operators under licence</td>
</tr>
<tr>
<td></td>
<td>BOX 4 – high-high</td>
</tr>
<tr>
<td></td>
<td>Tugs Concessionaire</td>
</tr>
<tr>
<td></td>
<td>Dredging Companies</td>
</tr>
<tr>
<td></td>
<td>TGS-Agro Concessionaire</td>
</tr>
<tr>
<td></td>
<td>TGL Land User Concessionaires</td>
</tr>
<tr>
<td></td>
<td>South Terminal Concessionaire (at time contract was signed)</td>
</tr>
<tr>
<td><strong>Low</strong></td>
<td>BOX 1 – low-low</td>
</tr>
<tr>
<td></td>
<td>Waste reception providers</td>
</tr>
<tr>
<td></td>
<td>Fuel providers</td>
</tr>
<tr>
<td></td>
<td>BOX 3 – high-low</td>
</tr>
<tr>
<td></td>
<td>South Terminal Concessionaire (nowadays)</td>
</tr>
<tr>
<td></td>
<td>Industrial customers</td>
</tr>
</tbody>
</table>

Table 3: Case study illustrations - Organizations and the PAPA’s assessments

*Shipping agents* are private companies that represent the shipping companies. They are responsible for all the contracts between the shipping companies and other port organizations. In a conversation between the PAPA’s Board President and the manager in charge of relations with shipping agents (witnessed by me in October 2008), the activities of these agents were described as “cheap” (as they charge a relatively low fee for their services) and totally driven by the shipping companies’ decisions. However, shipping agents are seen as having high motivation to cooperate, due to their material interest in the port activity and their past history of close bonds with the PAPA. As one interviewee put it:
“[Shipping agents’] activity depends on port activity. Their revenues depend, almost 100%, on the port giving them conditions to contract the highest number of ships possible. They have been willing to cooperate with us in the past: [for instance] whenever we needed the contact details of some ship owner or any information about demand, they usually gave us the information” (PAPA’s Board President, 1999-2002).

An example of the shipping agents’ cooperative attitude was seen in 1999 when the PAPA needed to bring a new tugs organization into the port. The number of ships was growing and a more stable tugs fleet was necessary for both commercial and security reasons. The maintenance of a permanent tugs fleet in the port was in the shipping agents’ material interest, since it would facilitate the operation of more ships (and this was their source of revenue). But to do so it was necessary to clarify the tugs operating rules and to share information, namely information on projections of the number of ships in future years. Rules were necessary to define tugs’ operating costs and projections were necessary to draw up a financial plan. An example of such a rule was the daily time-limit for a shipping agent to request a tug and be able to expect the tugs organization to have one ready for operations. Another example was the rule which specified the characteristics of the tugs fleet which should always remain in the port – a rule that was not in place prior to 1999. Meetings were held between representatives of the PAPA, shipping agents and tugs organizations. These meetings helped to create bonds between those organizations and also strengthened the PAPA’s assessment of shipping agents as having a high motivation to cooperate. At the end of these meetings an agreement was signed by all parties. This agreement benefited every organization in the port, as it contributed to an increase in the quantity of both ships and cargo. The attitude of the various parties was clearly one of collaboration, something which is reflected in the following statement:

“We were aware that shipping agents had an economic interest in maintaining a permanent tug fleet in the port. In this way they could contract more ships to the port. And we also had a good relationship with them in the past. My main responsibility
was to bring the parties together in a process that would lead to the creation of an agreement” (PAPA’s Board President, 1999-2002).

This assessment of a high motivation to cooperate was reinforced by the responses to a survey sent by the PAPA in 2003 to all 24 shipping agents that worked in the port\(^1\). When asked about their willingness to work actively to increase the number of shipping lines (i.e. container lines) in the port, 68% of the shipping agents answered positively, and a further 26% also answered positively, *provided* the PAPA made specific investments in new maritime accessibility infrastructures. Consequently, shipping agents are assessed as having a high motivation to cooperate, although their contribution to network performance is assessed as low as no individual shipping agent can make a significant contribution on its own. Hence, they are located in box 2 –low-high – in table 3.

*Port operators*, also known as dockers or stevedores companies, are also located in box 2. These are the private companies that transfer cargoes from ships to land and vice-versa. They can also be responsible for warehousing and cargo control activities. Some of these organizations operate under a *licence* granted by the PAPA\(^2\). To grant such a licence, the PAPA must assess the financial and technical capacity of the organization. This is done when an organization makes a request to become a port operator, or when there are changes in the national law requiring the initial assessment to be confirmed. In the Port of Aveiro the last reassessment of this type was conducted in 1989. The licence is a unilateral authorization to operate that is valid for a period of one year. The PAPA can set operational rules and cancel licences; it can also provide port operators with access to future business opportunities. Consequently, port operators probably have a genuine fear of sanctions which, together with their material interest, point to a high motivation to cooperate. Significantly, port operators exchange information with other port organizations on a daily basis, something which is essential for the efficiency of port operations. The fact that this was mentioned several times by my interviewees

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\(^1\) Source: Port Authority report *Shipping Agents Activity Study*, dated July 2003.

\(^2\) There are also port terminals which, after a period as port operators operating under a *licence*, become a unique type of port operator that operate under a *concession*. These will be analysed later.
seems to suggest that the port operators’ high motivation to cooperate is recognised by the PAPA.

The contribution to network performance of the port operators under a licence is assessed as being low. These operators are numerous, they compete with each other, and they can be easily replaced. This competition is regarded as essential to maintain price competitiveness, but no one of these operators – in isolation – has a significant impact on that competitiveness. Furthermore, the total quantity of cargo handled by port operators under a licence is considerably lower than the cargo handled by port operators under a concession.

*Waste reception providers* and *fuel providers* are located in box 1 – low-low – in table 3. These are the private organizations that receive waste from, and provide fuel to, the ships. In the case of the waste reception providers a licence must be granted by the PAPA. Their contribution to network performance is assessed as low, as the market is open to any company that satisfies the legal conditions for providing such services. This assessment was stated explicitly in the working papers used to prepare the PAPA’s Strategic Plan, as they were included in the group of organizations – designated as “Support services”[^3] – in relation to which no specific action was needed, as an improvement in their level of service would not make a significant contribution to the port’s strategic objectives. Furthermore, these organizations are assessed as having a low motivation to cooperate as they do not fundamentally depend on the Port; it is just one of their customers and not the most important one. Fuel providers, for instance, are the big oil companies whose main business is clearly not the provision of fuel in Ports.

*Industrial customers*, also known as cargo owners, are the private organizations that import and/or export their cargoes through the port. They are port users and the competitiveness of the port affects their own competitiveness. For instance, if the port does not have competitive prices, they could suffer price disadvantages in their product markets. Generally, the PAPA assesses industrial customers as high contributors to the port’s performance, not least in view of the annual quantities of cargo that each

[^3]: This designation is also used in the *Environment Management System* of the Port Authority. In that document, the port’s main services are designated as “Operational services”. 
industrial customer contracts with other port organizations. Representatives of the PAPA have often commented that industrial customers could transfer significant quantities of cargo (more than 100,000 tonnes) from other ports to the Port of Aveiro. An assessment of a high contribution to the port’s performance was expressed in the internal management reports that were used to prepare the 2007 commercial plan. These internal reports contained tables, setting out the total cargo of each industrial customer, which were used to identify those industrial customers that could increase cargoes – one of the key objectives in the port’s Strategic Plan.

However, the PAPA’s assessment of industrial customers is one of low motivation to cooperate. This is because they are loyal only to the extent that their material interests are protected (i.e., to the extent the port has competitive prices), and the majority use the port through intermediaries, such as logistic organizations. Consequently, their interest is limited to receiving general information and communicating with the port only when necessary. For instance, in responses to a survey in 2003, which the PAPA sent to 200 industrial customers, 72% indicated that they had no knowledge of the new terminals that were being built (some almost finished) at that time. A PAPA manager commented:

“[It was] strange that companies with big quantities of cargo handled in ports [did] not know of Port of Aveiro’s new terminals”.

A report produced after the survey reasoned that this apparently strange finding was due to the fact that industrial customers usually work through intermediaries. But in the same survey, when asked if they were interested in receiving information about the new terminals, 85% of the industrial customers answered positively. Although problems of communication were clearly at stake, the PAPA manager quoted above suggested that industrial customers that use ports are largely uninterested in information about new port infrastructures. In conclusion, industrial customers are located in box 3 – high-low – in table 3.

The South Terminal Concession public tender process was launched in 2000 and ended when a contract was signed at the end of 2001. This was the first contract of its
type to be signed after the changes that took place in 1999. These changes had important consequences for the terms of the contract, as discussed below. The tender process comprised the submission of proposals, followed by evaluation and negotiation stages. A terminal concession contract gives a private organization – a former port operator under licence – the right to handle cargoes in a specific port terminal. The 2001 South Terminal concession involves exclusivity, which means that other port operators cannot provide services in this terminal until the end of the concession (in 2026). The contract was signed with a port operator which had been operating in the port since 1984, and had established strong bonds with the PAPA. The material interests of that port operator – who clearly wanted to win the concession – meant that the PAPA assessed its motivation to cooperate as high. When the concession started, the terminal was operating at around 300,000 tonnes per year. This volume, together with the exclusivity of the concession, obviously meant that the contribution to network performance was assessed as high.

However, the importance for the port of the South Terminal was regarded as lower than the importance of the so-called “North Terminal”, whose public tender process was being planned in 2001. The South Terminal came first because there was government pressure for a rapid increase in port activity, something that could not be achieved in the North Terminal, as substantial investments were needed before the tender process could be launched. The solution was to proceed with the much smaller South Terminal concession in order to respond to the government pressure. Importantly, the South Terminal Concession was seen by the PAPA’s Board as a first step in establishing, in the short-to-medium term, a stronger relationship and a new kind of contract with the port operator that won the tender. This port operator was seen as a strong potential competitor for the North Terminal, whenever the tender process was launched:

“The real value of the South Terminal Concession was the North Terminal Concession. The port operator that won the South Terminal could have total port operations in their hands if it could win the North Terminal Concession.” (PAPA’s Board President, 1999-2002)
In table 3 I indicate that the PAPA’s assessment of the South Terminal Concessionaire’s motivation to cooperate has changed through time. This was due largely to events surrounding the North Terminal concession. As a result of a change of government in 2002, the tender process for the North Terminal was suspended – and it has not been re-launched since. As a consequence, the South Terminal Concessionaire invested substantially in the South Terminal and by 2004 one million tonnes per year were being handled, rather than the projected 300,000 tonnes. This has created an appropriation concern as significant benefits are now being secured by the Concessionaire. However, and despite the PAPA’s concerns, the South Terminal Concessionaire is not willing to share these benefits:

“To catch more revenues the concessionaire needs to align new investments with the ones made by us [PAPA], but they are not willing to share benefits” (PAPA’s Board President, 2005-present).

The South Terminal Concessionaire no longer has a high motivation to cooperate. The end of the concession (2026) is still far off, and the ‘carrot’ of the North Terminal Concession no longer exists. Apparently, bonds which were once seen as strong were not strong enough. One interviewee complained:

“They are only interested in their profit. They do not look at the port as a whole. [They] do not have an integrated view.” (A PAPA’s Manager)

Consequently, the South Terminal Concessionaire, which was initially located in box 4 – high-high – in table 3, has moved to box 3 – high-low – through time.

In 2006, the PAPA contracted with a private port organization – the TGS-Agro Concessionaire – for the use of land as an agro products logistical operation. The contract allows the concessionaire to use port land for a certain number of years as the Agro Dry-Bulk Terminal (TGS-Agro). As this terminal was expected to increase significantly the cargo volumes handled in the port, the PAPA assessed the contribution to network performance as high. The current Board President commented that:
“This is the type of project we need for the Port of Aveiro; big private investment and big tonnes for the port.” (PAPA’s Board President, 2005-present)

Initial meetings with the concessionaire led the PAPA to form an assessment of a high motivation to cooperate:

“Along with [the TGS-Agro Concessionaire’s] economic interest in the project, in the first meetings they gave us plenty of information about the advantages of the project and also about its high business risks. We concluded that they were open and willing to share a planning process with us and, consequently, we immediately trusted them” (PAPA’s Board President, 2005-present).

Between 2006 and 2008, the PAPA also contracted, with a number of private organizations (TGL Land User Concessionaires) which were current industrial customers, the lease of land where these organizations could construct and operate new facilities. The project is located at the new Liquid Bulk Terminal (TGL). The contract included clauses that specified the land available, the rent to be paid and the cargo objectives. As these cargo objectives were considerable – more than 25% of the planned port growth – the PAPA’s assessment was of high contribution to performance. In addition, the motivation to cooperate was also assessed as high, at least up to a certain point:

“We were aware that [TGL Land User Concessionaires] would cooperate with us if necessary, but only to fulfil their own projects” (A PAPA’s Manager).

A **tugs concession** contract was signed in 2004, following a public tender process that opened in 2002. From 1999 to 2004 two port organizations operated tugs under a licence. As the operation of tugs and the prices changed are very important for port competitiveness, the tugs concession was seen as a means of increasing port investments and attracting new cargoes. Therefore, as explicitly stated in the internal documents used in the process of granting the concession in 2004, the PAPA assessed
contribution to network performance as high. In addition, as strong bonds existed with the organization which won the concession, given its history of cooperation in resolving problems, the PAPA assessed the organization’s motivation to cooperate as high.

Finally, as dredging work is very important to maintain navigability in ports, the PAPA assessed the contribution to network performance of Dredging Companies as high. However, as the dredged sand has a commercial value, the PAPA, which is ultimately responsible for the dredging work, contracts with these companies on the basis of a financially sustainable model. This means that the dredging companies can sell the sand, but they have to make a payment per tonne to the PAPA. The PAPA’s assessments of these companies’ motivations to cooperate are high, as they are materially dependent on the price set by the PAPA. This has led to the ongoing renewal of contracts and to strong bonds with the managers of these organizations. In conclusion, the Tugs Concessionaire, the Dredging Companies, the TGS-Agro Concessionaire and the TGL Land User Concessionaires are all located in box 4 – high-high – in table 3.

Table 4 summarizes the rationales for my identification of the network coordinators’ assessments:

<table>
<thead>
<tr>
<th>Network organization</th>
<th>Motivation to cooperate</th>
<th>Contribution to network performance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Material interests</td>
<td>Coercion</td>
</tr>
<tr>
<td>Shipping agents</td>
<td>High: increasing port activities will increase individual revenues.</td>
<td>High: long history of close cooperation.</td>
</tr>
<tr>
<td>Port Operators under licence</td>
<td>High: increasing port activities will increase individual</td>
<td></td>
</tr>
<tr>
<td>Network organization</td>
<td>Motivation to cooperate</td>
<td>Contribution to network performance</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-------------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td></td>
<td>Material interests</td>
<td>Coercion</td>
</tr>
<tr>
<td></td>
<td>revenues (specific investments in the port).</td>
<td>agents due to specific investments in the port)</td>
</tr>
<tr>
<td>Waste reception and fuel providers</td>
<td>Low: port activity is not significant in their total revenues.</td>
<td></td>
</tr>
<tr>
<td>Industrial customers</td>
<td>Low: individual material interest is their primary concern.</td>
<td>Low: they use the port through intermediaries.</td>
</tr>
<tr>
<td>South Terminal Concessionaire</td>
<td>High (when contract signed): material interest in winning the concession.</td>
<td>High (when contract signed): history of cooperation.</td>
</tr>
<tr>
<td></td>
<td>Low (nowadays): interested only in financial benefits, without concern for other port organizations.</td>
<td>Low (nowadays): history no longer important.</td>
</tr>
<tr>
<td>TGL Land User</td>
<td>High (to an extent):</td>
<td></td>
</tr>
</tbody>
</table>
### Network organization

<table>
<thead>
<tr>
<th>Network organization</th>
<th>Motivation to cooperate</th>
<th>Contribution to network performance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Material interests</td>
<td>Coercion</td>
</tr>
<tr>
<td>Concessionaire</td>
<td>focuses on achieving port objectives, but only insofar as it also achieves its own objectives.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High: economic interest in project depends on port decisions.</td>
<td>High: fear of sanctions as licence allows PAPA to fix price.</td>
</tr>
<tr>
<td>TGS – Agro Concessionaire</td>
<td>High: economic interest in project depends on port decisions.</td>
<td></td>
</tr>
<tr>
<td>Dredging Companies</td>
<td>High: recouping specific investments requires revenues from port activity.</td>
<td>High: fear of sanctions as licence allows PAPA to fix price.</td>
</tr>
<tr>
<td>Tugs Concessionaire</td>
<td>High: recouping specific investments requires revenues from port activity.</td>
<td></td>
</tr>
</tbody>
</table>

Table 4: Summary of the network coordinators’ assessments

### 6. A Coordination Framework

Having identified the PAPA's assessments of the motivation to cooperate and the contribution to network performance of the various port organizations, I can now
examine the MCMs used by the PAPA to accomplish its role as network coordinator. I structure the analysis on the basis of the boxes identified in table 3.

6.1. Boxes 1 and 2: the nature and use of MCMs when contribution to network performance is assessed as low

As described above, in 1999 the shipping agents entered into an agreement, with the PAPA and the tugs organizations, which was intended to provide a more stable tugs fleet in the Port. The agreement did not include any quantified penalties if a shipping agent did not follow the rules and the PAPA did not use their authority to unilaterally set such penalties. In general, the PAPA considered it a non-legally binding agreement, and the shipping agents were simply monitored by the other organizations with which they interacted. However, the PAPA had an indirect monitoring role, as it knew that any exceptions to the agreed rules would be reported to it by the port tugs organization, and solutions would then be reached through social processes. Thus, in the case of the shipping agents, the PAPA's concern was to ensure a sufficient level of network control which, in the circumstances, was achieved through mutual or self-control among the port organizations and by social controls which could find solutions to problems, if they emerged.

Similar observations were made regarding the IORs between the PAPA and the other organizations located in boxes 1 and 2. For instance, in the case of port operators under a licence, the licences granted between 1999 and 2009 (4 in total) did not include any specific MCMs. This was despite the fact that: (i) the PAPA could decide which MCMs to use; (ii) the licence is a unilateral administrative decision which must be accepted by port operators; and (iii) the law allows for the inclusion of MCMs in such licences. Instead, the PAPA relied on the normal functioning of the port organizations, knowing that it would be informed of problems/issues when necessary. During the period of my analysis some problems which required intervention were reported to the PAPA. These were mainly customers’ complaints and labour problems. The PAPA organized meetings and encouraged a sharing of information which resulted in mutual
understandings between the parties in dispute. As such, it acted as a conciliator, facilitating and contributing to the resolution of network problems.

Also, in the case of the waste reception providers and the fuel providers, the PAPA monitored activities in a quite general manner. It might be argued that, since the waste reception and fuel providers have a relatively low motivation to cooperate, it would be difficult to apply formal controls. As such, the explanation for the absence of formal controls in the case of waste reception and fuel providers would seem to lie on the vertical axis (low motivation to cooperate) rather than the horizontal axis (low contribution to network performance). However, it should be recalled that an assessment of ‘low’ motivation to cooperate has to be seen in relative terms; i.e., as lower than the shipping agents and port operators under a licence. Thus, low motivation to cooperate does not necessarily mean there is no motivation to cooperate. Although not vital to these organizations, the port is a relevant customer, and so they would probably not resist the introduction of control procedures that directly monitored the quality of their service. However, the absence of such controls was due to the fact that the PAPA did not feel a need to use them. Assessment of low motivation to cooperate, including the sources of the motivation, is less important in face of low contribution to network performance.

In general, my evidence seems to indicate that network control prevails in situations of (assessed) low contribution to network performance. Rather than actively deploying direct MCMs, the PAPA relies on mutual controls between the various organizations in the network. Problems with the cooperative behaviour of one organization will be brought to the attention of the PAPA by the other organizations which suffer those problems. Importantly, this general concern with a network control seems to be explained by the (assessed) low contribution to network performance. For instance, when some port operators under a licence became port concessionaires (see below) specific formal MCMs were included in the concession contracts and were actively and regularly applied by the PAPA. Also, I found that when problems emerged, solutions were based on social processes, such as persuasion and reconciliation between the parties.
6.2. Box 3: the nature and use of MCMs when contribution to network performance is assessed as high and motivation to cooperate is assessed as low

The PAPA strives to maintain regular communication with relevant industrial customers, as a way of obtaining information about their forecasts of future cargo quantities and of providing information about the PAPA’s investment plans. This exchange of information is considered very important, not least because some of these industrial customers can invest in the port and, eventually, become land users. The PAPA clearly aims to create strong ties with its industrial customers; thus, social MCMs are important for this type of IOR.

These social MCMs, however, are different to the ones described in the previous sub-section. Here, the attitude of the PAPA is much more proactive. The PAPA regularly promotes meetings and events in which industrial customers can participate and share information. Examples include the annual Port Day (organized from 2005 to 2009); the PAPA’s invitation to certain industrial customers to participate in discussions concerning the port’s Strategic Plan (which took place in 2005 and 2006); the active promotion of the Port Community Association (from 1999 onwards); the annual meeting with the cargo owners association (from 1999 onwards); the PAPA’s marketing meetings (from 2006 to 2009) and periodic meetings with specific industries (agro-foods: from 2005 to 2009; automotive spare parts: from 2006 to 2009; ceramics: from 2008 to 2009; among others). This proactive attitude in relation to the industrial customers contrasts sharply with the essentially reactive attitude I witnessed in IORs involving organizations with a low contribution to network performance – i.e., although social MCMs were also used in those IORs (see above), the PAPA relied primarily on the normal functioning of the port network and on the network control, and it deployed social MCMs only ‘as-needed’.

This suggests that when an organization is assessed as having a high contribution to network performance but a low motivation to cooperate, social controls will be used more intensely in order to provide a better balance in the MCM package. Neither
outcome nor behavioural MCMs are included in the control package. Although network organizations in this box will most probably be willing to take part in practical arrangements for organizing/controlling their activity in the network, they will have their own objectives which will not necessarily be aligned with the objectives of the network.

6.3. Box 4: the nature and use of MCMs when contribution to network performance is assessed as high and motivation to cooperate is assessed as high

I found that formal MCMs (outcome and/or behavioural) are present when there is an assessment of high motivation to cooperate. The contract underpinning the TGS-Agro Concession, for instance, included a financial model. During the negotiating phase this model was the basis for discussions about the sharing of project risks and benefits. The length of the contract was calculated to provide a fair Internal Rate of Return (IRR) for each party. The PAPA considered the ‘fairness’ of the IRR in relative terms, using available financial information about other concessions in the port. Mutual actions and individual (but compatible) goals were discussed and agreed during the planning stage, and performance targets to be achieved by the concessionaire were included in the contract. This process was facilitated by a considerable amount of information sharing, which clearly demonstrated that both parties had substantial interests in the IOR as a means of achieving their individual objectives.

Although the PAPA’s analysis of the TGL Land User Concessionaires’ business plans was different to the case of TGS-Agro, formal controls were also present. In the TGL case the businesses are vertically integrated and they use the port to obtain competitive access to the international market for raw materials (for bio-diesel production) or for final products (gasoline, diesel and gas) to feed their own distribution networks. The PAPA’s main concern was to assess the project's financial viability and to establish the number of years the project would need to achieve a fair IRR. This number was to be used in the concession contract – subject to a maximum of twenty
five years, which was set by law. The business plan included the cargoes expected over the economic life of the project and the investments to be made.

In the illustrations of the TGS-Agro Concessionaire and TGL Land User Concessionaires, the motivation to cooperate and the contribution to network performance were both assessed as high, and consequently formal MCMs are used. As well as these formal MCMs, output controls and performance measures are used to achieve the agreed objectives. For instance, in both cases the financial plan, produced in a joint planning process, was used for benefits sharing. The use of IRR in a shared financial model and the PAPA’s assessment of its fairness in comparison with other organizations in the network suggest that the MCMs are used to monitor the appropriation of relational rents.

Similar MCMs were observed in the contract and licences established with the tugs concessionaire and the dredging companies, respectively. The contractual process for the tugs concession included a selection, proposal, and an optional negotiation stage. The process started with a public announcement which included the selection and evaluation criteria. Information about past experience, financial capability and technical capability was exchanged in the selection phase. In the proposal phase the global business model was presented. This model included operating rules, prices and the financial model. The negotiation phase was necessary to reduce the prices that were initially proposed. The tugs concession contract includes conditions dealing with information sharing, benefit sharing, risk sharing, investment sharing and the approval of prices, amongst others. Importantly, such conditions were not part of the licences issued in the context of the former system used for the operation of tugs under a licence. This reinforces my conclusion that formal MCMs are used where the (assessed) contribution to network performance is high.

The Dredging Companies’ licences mean that they must manage their operations by balancing the dredging costs and the revenues from the sale of sand. The risk is formally taken by the dredging companies, which are all private companies. In the Port of Aveiro the dredging licences are valid for 20 years and setting the price for the rights
to sell sand is the administrative responsibility of the PAPA. The licences state that the price should be fixed on a yearly basis, following formal communications between the parties. It might be expected that the PAPA would fix the price so as to maximize its own return. However, according to the interviewees, the price is set at a level which ensures the financial sustainability of the licensees; where financial sustainability is expressed mainly in terms of annual net income. As dredging works must be performed as a continuous operation, the PAPA arranges regular meetings with the licensees to share information, including financial information about dredging costs and market prices for sand. The dredging companies have accepted a model that shares the benefits from rising market prices with the PAPA and, consequently, also shares the risks from falling market prices. Here, the price of the rights to sell sand is an MCM which is written into the licence and, thus, formal MCMs are clearly at stake.

6.4. Box 4: further evidence and considerations

The analysis of box 4 in table 3 – i.e. where there is both a high motivation to cooperate and a high contribution to network performance – may be extended a little further. Until now, I have shown that in these situations the control package tends to include formal MCMs, and also that such MCMs are not present in the other boxes. However, this should not be taken to mean that only formal MCMs are included in the control package in this box. I found evidence of a complementary use of formal and social controls, and it appears that they are used to reinforce each other. Such reinforcement was observed where formal contracts were used as the basis for discussions about changes in the Port, but the existence of social ties between the PAPA and other port organizations turned the formal contracts into quite flexible arrangements and a source of solutions for problems that might arise.

The following example illustrates this point. In 2007, due to various expansions in the port, a new tug was needed. These expansions would benefit from the operation of bigger ships, but they needed a more powerful tug. Port organizations asked the PAPA to arrange for the tugs concessionaire to invest in such a larger tug. The process started
with a very ‘social’ meeting in 2007 and there was a good atmosphere during the negotiations due, to a large extent, to the strong social ties that the PAPA had established over time with the Tugs Concessionaire. Consequently, the PAPA was able to make use of the resulting social controls:

“We knew that in the past they had always arranged a way of solving port problems. Dialog was the key.” (PAPA’s Board President, 2005-present)

However, the use of social controls did not mean that the negotiations were somehow ‘soft’. On the contrary, the social controls were complemented by the use of ‘hard facts’ that had been collected through the formal controls which were in place. Prior to the negotiations the PAPA estimated the benefits in financial terms both for the port (as a network) and for the tugs concessionaire (as an organization), by comparing the expected increases in revenues and margins against the contractual financial model. This preliminary exercise indicated that the IRR in the financial model was to be a reference point for the subsequent negotiations. From the beginning of the concession, the PAPA had received information from the concessionaire, and approved its prices and operational rules. These MCMs, which were included in the concession contract, allowed the PAPA to assess the impact of the new investment the concessionaire had to make. The financial model was used by the PAPA in the negotiations:

“The rule is to negotiate until we reach the same internal rate of return as in the initial financial model” (Member of the PAPA’s team in charge of renegotiation, in a meeting held in October 2008).

The tugs concessionaire’s argument was that the quantity of ships was not increasing as the contract had initially predicted and that was the responsibility of the PAPA, because it was the PAPA that had included market provisions in the bidding process. However, through an analysis of the financial model the PAPA concluded that, although the predicted quantity of ships had not been reached, the actual IRR was close to the one used in the contract. The PAPA was able to estimate the actual IOR as a contractual obligation required the tugs concessionaire to share information, including
its profit and loss accounts. Based on this information, the PAPA argued that as the contractual IRR had been achieved to-date, it could also be achieved in the future as the new investment would enable bigger ships to use the port. The renegotiation process ended in March 2009, with the signing of a revised tugs concession contract, which included not only the new tug but also new market provisions concerning the bigger ships. Thus, in the end the complementary and mutually reinforcing use of social and formal controls enabled the PAPA to achieve its desired outcome.

However, the package of MCMs for the IORs in box 4 is not always characterized by such use of social controls. In particular, I also found evidence of important differences between the control packages in the IORs with the former industrial customers – the TGL Land User Concessionaires and, especially, the TGS-Agro Concessionaire – and those in the IORs with the other organizations in box 4 – i.e., the Tugs Concessionaire and the Dredging Companies. Specifically, the former seemed to rely more heavily than the latter on formal controls, and social controls appeared to have little relevance in the case of the former industrial customers. The PAPA uses outcome and behaviour MCMs in situations where it is particularly concerned about the problem of how the benefits will be divided. This is indicated in the following statement about the land user concessionaires:

“They want the land concession contract. But they have to make movements into the port. One of the biggest risks in this time of concessions is that after the contract signature the concessionaire forgets that he is in a port and does not make efforts to bring cargo to the port. Contract objectives are thus much needed.” (A PAPA’s Manager)

A probable explanation is that the contracts with these former industrial customers are very recent and strong social ties have not yet been developed. In the conceptual terms discussed earlier, the assessment of a high motivation to cooperate is, in these cases, based more on the material interests of the organizations concerned, and less on the social bonds or ethical values which gradually emerge in a long-term relationship (as in the case of the Tugs Concessionaire and the Dredging Companies). My evidence
thus seems to suggest that the nature of the motivations (material interest, bonds, ethics and coercion) which inform the PAPA’s assessments of the various port organizations’ motivation to cooperate has an impact on the composition of the control package used in each IOR.

6.5. The case of the South Terminal Concessionaire

The illustrations discussed above suggest several conclusions about the nature and use of MCMs by the PAPA in its IORs with the various port organizations. However, so far my analysis has been rather static; that is, I have not examined any situation in which the PAPA’s assessments changed such that the organization concerned ‘moved’ from one box to another in my framework. However, I do have an example of such a situation: the South Terminal Concessionaire. Although, arguably, this is a special case, caused by a very specific and somewhat contingent set of events (political changes, problems with planned investments and, possibly, errors of judgment), it nevertheless provides an opportunity to take a more dynamic view of my theoretical framework.

Under the contract signed in 2001 with the South Terminal Concessionaire, the PAPA’s main contractual responsibilities are the approval of prices and operational rules. In addition, PAPA has to approve, on an annual basis, the 3-year plan for the terminal. A point to note, which is quite consistent with my earlier analysis, is that formal controls were established at the outset; i.e., when the PAPA assessed the South Terminal Concessionaire as having both a high contribution to network performance and a high motivation to cooperate. However, they were behavioural controls, rather than outcome controls and, importantly, there were no mechanisms for sharing the benefits. The absence of such mechanisms was due, firstly, to the conviction that the South Terminal Concession was only a first step (and a less important one) towards the (all important) North Terminal Concession and, secondly, to the need to respond to short-term governmental pressures. These two factors meant that the contract was entered into very quickly and insufficient attention was given to its terms:
“We designed the best tender process that we could in the time that was given to us. We had an objective: to launch the concession.” (A PAPA’s Manager)

Over time, however, the conditions surrounding the South Terminal Concession changed and, as I described above, the PAPA’s assessment of the Concessionaire’s motivation to cooperate also changed in the process. The Concessionaire’s unwillingness to adapt the terms of the concession contract was interpreted as opportunistic behaviour which gave rise to an appropriation problem. The Concessionaire was securing huge benefits from the South Terminal – much higher than originally expected – but was unwilling to share them with the rest of the port. As a result, the PAPA changed its assessment of the Concessionaire’s motivation to cooperate:

“The fact is that they do not want to renegotiate the contract. They are having high gains. That is not bad. What is bad is that part of these gains should be used to finance port general investments, like the new maritime entrance. […] As they do not want to touch the contract we try to press them to change the situation. We talk about it with them in our meetings and we make sure that they know that we are not satisfied with the current situation.” (PAPA’s Board President, 2005-present)

The important point to note is that this change in the (assessed) motivation to cooperate was associated with changes in the PAPA’s control package. Although the initial contract is still in place and its behavioural controls remain important, the control package has gradually changed as the PAPA has attempted to introduce more social controls into the control package. There is now a situation (again consistent with my earlier analysis) in which social controls are deployed together with the formal controls set out in the initial contract.

It is of particular interest to note that the case of the South Terminal Concessionaire was the only one where ethics, as a source of motivation to cooperate, was assessed as lower. The more intense use of social MCMs in this situation may be due to the network coordinator’s objective of influencing the behaviour of the South Terminal
Concessionaire. By building goodwill trust, the network coordinator intends to encourage the South Terminal Concessionaire to be more cooperative, and to include ‘benefits sharing’ clauses in the concession contract. This seems to reinforce my previous conclusion that the source of the motivations to cooperate has an impact on the composition of the control package.

6.6. Recapping

Table 5 sets out the sources of (assessed) motivation to cooperate and contribution to network performance (see table 4) together with the related details of the MCMs in the control package deployed by the PAPA in its relationships with each organization involved in the Port (which were described in the present section). This table provides a systematic view of the types of MCMs used by the network coordinator in each relationship and, consequently, facilitates the identification of patterns through the comparison of different control packages.
<table>
<thead>
<tr>
<th>Network organization</th>
<th>Motivation to cooperate</th>
<th>Contribution to network performance</th>
<th>Management control mechanisms found in case study</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Material interests</td>
<td>Coercion</td>
<td>Bonds</td>
</tr>
<tr>
<td>Shipping agents</td>
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<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Port Operators under licence</td>
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<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Waste reception and fuel providers</td>
<td>Low</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industrial customers</td>
<td>Low</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>South Terminal Concessionaire</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>- when contract signed</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
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<tr>
<td>- nowadays</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>TGL Land</td>
<td>High</td>
<td>High</td>
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</table>

Network control and social MCMs ‘as-needed’ (meetings, informal interaction whenever needed and social processes, such as persuasion and reconciliation between the parties).
<table>
<thead>
<tr>
<th>Network organization</th>
<th>Motivation to cooperate</th>
<th>Contribution to network performance</th>
<th>Management control mechanisms found in case study</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Material interests</td>
<td>Coercion</td>
<td>Bonds</td>
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<tr>
<td>User Concessionaire</td>
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<td>High</td>
<td>High</td>
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<tr>
<td>TGS – Agro Concessionaire</td>
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<td>High</td>
<td>High</td>
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<tr>
<td>Dredging Companies</td>
<td>High</td>
<td>High</td>
<td>High</td>
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<tr>
<td>Tugs Concessionaire</td>
<td>High</td>
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Table 5: Nature of motivations to cooperate, contribution to network performance and the MCMs in the control package
<table>
<thead>
<tr>
<th>Assessment of motivation to cooperate</th>
<th>Management Control Mechanisms</th>
</tr>
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<tbody>
<tr>
<td>BOXES 1 and 2</td>
<td>BOX 4 – high-high</td>
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<tr>
<td>low-low and low-high</td>
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<tr>
<td>High</td>
<td>Assessment of high motivation</td>
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<tr>
<td></td>
<td>based mainly on material interest</td>
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<tr>
<td>Network Control</td>
<td>Package of MCMs: Outcome and Behaviour (High); Social (Low).</td>
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<tr>
<td>BOX 3 – high-low</td>
<td></td>
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<tr>
<td>Low</td>
<td>Assessment of high motivation</td>
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<td></td>
<td>not based mainly on material interest</td>
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<tr>
<td></td>
<td>Package of MCMs: Outcome and Behaviour (High); Social (High).</td>
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<tr>
<td>Low</td>
<td>BOX 6: Coordination Framework</td>
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<tr>
<td>High</td>
<td></td>
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<tr>
<td>Low</td>
<td>Assessment of contribution to network performance</td>
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Table 6: Coordination Framework
The conclusions of the analysis conducted in the present section are summarized in table 6, in which my proposed coordination framework is presented schematically. When the (assessed) contribution to network performance is (relatively) low (boxes 1 and 2), network control is seen as adequate. However, when the assessed contribution to network performance is high, the control package is, in a sense, more intensive, in both its nature and use. Where possible, (i.e., when the assessed motivation to cooperate is high – as in box 4) formal controls – including outcome controls – will be present in the control package. In those situations where the assessed high motivation to cooperate is based on the material interests of the network organization, the control package will be composed almost entirely of formal controls. But when the assessed high motivation to cooperate is based on bonds and/or ethics arising from a long standing relationship, the use of formal controls will be supplemented and reinforced by, and will also reinforce, social controls. Finally, when the (assessed) motivation to cooperate is low (box 3), formal controls will be difficult to use or less effective, and consequently there will be more intensive and proactive use of social controls. My conclusions concerning the right-hand side of the framework (boxes 3 and 4) are quite consistent with what I observed in the case of the South Terminal Concessionaire, an organization that, during the time of my study, ‘moved’ from box 4 to box 3.

7. Discussion and concluding remarks

As I argued above, ports are gradually becoming mixed-type networks and, accordingly, their study can enhance our knowledge of this type of network. My study of the Port of Aveiro, together with the coordination framework I have developed, provides several insights which contribute to our understanding of control in networks in general, and specifically in situations in which a public organization acts as the network coordinator. In this section I discuss my findings and confront them with the (rather scarce) available literature on the subject.

A first implication of my study is that MCMs in dyadic IORs can be used by the network coordinator as a means of managing the network as a whole. For instance,
information sharing allows the network coordinator to identify the value chain of
network organizations and to measure their performance, and this can contribute to
greater visibility and to a better understanding of the effects and desirability of potential
actions within the network. This seems consistent with Mouritsen and Thrane’s (2006)
notion of orchestration mechanisms; i.e., mechanisms that “help develop the network as
an entity with a common objective” (p. 268). My framework, however, takes a further
step by proposing two contingent variables that can be added to the conceptualization of
MCMs in the context of a mixed-type network: the assessment of motivation to
cooperate and the assessment of contribution to network performance. My conclusions
also suggest that the study of dyadic IORs, when conducted from a network perspective,
can contribute to an understanding of the multiple interactions between network
organizations, and thereby provide a more systematic view of network relationships.

My study also enables us to reflect on the role of a public organization acting as a
network coordinator. One reflection is prompted by my observation that the network
coordinator did not seek to apply rules and procedures in some strictly legalistic or
bureaucratic way. I found considerable diversity in the use of legal instruments, such as
contracts and licences, and also in their contents. Clauses in contracts were very diverse,
even where administrative law prescribed the principle of equal treatment. To achieve
its objectives, the public organization opted for the use of MCMs based on its
assessments of the particular situation. General rules were applied to the network as a
whole, but different MCMs were used to influence cooperative behaviour in specific
situations on an ‘as needed basis’. This conclusion would seem to be consistent with
network and organizational theory, but not with assumptions about the legal basis of
administrative actions in public organizations. However, the flexible (as distinct from
legalistic) use of MCMs was crucial for achieving both network and public objectives.
Here, there seems to be a tension between the expectation of strictly law-abiding and
impartial behaviour by public organizations, and the practicalities of situations in which
public organizations are responsible for the coordination of multiple (private)
organizations in the pursuit of social goals. My observations seem to challenge Teisman
and Klijn’s (2002) contention that governments and their representatives, even when
involved in public-private partnerships, tend to adopt their traditional policy making and control procedures.

Another reflection stems from my observation that, although the public organization I studied had the legal means to enforce control solutions and to impose formal MCMs, in some situations it opted to use more persuasive and/or social mechanisms. Despite remaining a public organization, with the authority and responsibility that such a position entails, in recent years the PAPA has undergone a process of organizational learning and change in which its previously hierarchical and directing stance has progressively been replaced by a more low-profile, ‘softer’, influencing posture. This use of MCMs is consistent with the tendency towards more consensus-oriented decision making in mixed-type networks (see Ansell and Gash, 2008).

This low-profile posture was, for instance, visible in situations where the PAPA relied on the “credible replacement” (Brown and Potoski, 2003), which emerged from either competition or coordination between the network organizations. In the IORs with organizations in boxes 1 and 2, the PAPA (as the network coordinator) did not deploy specific MCMs aimed at ensuring particular behaviours. In such situations a certain level of network control ‘will do’, as organizations monitor each other and any deviation from the expected functioning of the network will be reported to the PAPA. My labelling of such a posture as ‘network control’ develops Mouritsen and Thrane’s (2006) conclusion that MCMs are used as self-regulating mechanisms in mixed-type networks, thereby limiting the public organization’s active intervention. I can add that such self-regulating mechanisms are more likely in IORs with low contribution to network performance, and in market-based networks (see Håkanson and Lind, 2004). I should also recognise, however, that as a public organization the PAPA has to apply a minimum level of formal controls to all network organizations (e.g. a common set of rules, regulations and procedures). Such formal controls constitute an essential backbone for the functioning of the network (Dekker, 2004), and underpin the often intensive use of social MCMs.
As I noted in section 6, the different sources of the PAPA’s assessments of motivations to cooperate led to different control packages. When the assessments of a high motivation to cooperate were based mainly on material interests, the MCMs tended to be rather formal, but in IORs where similar assessments of (high) motivation to cooperate were based on bonds and ethics, social MCMs were used more intensively. This observation is consistent with Nooteboom’s (1996) argument that the formation of bonds and the assessment of ethical values require at least some minimal experience and familiarity with the other organization. Nevertheless, even where there is such experience and the assessment of high motivation to cooperate is based on bonds and ethics (i.e., goodwill trust), the simultaneous presence of a strong material interest is likely to imply the use of mainly formal MCMs. This conclusion allows me to extend Dekker’s (2004) conclusion that goodwill trust (or reputation) can mitigate the (need to) use of formal controls. My case study suggests that, where there is a strong material interest, this mitigation will only be effective if the goodwill trust is based on a solid history of past relationships.

The existing literature also suggests that where the motivation to cooperate is assessed as high, it is not essential, nor expected, that benefits will be distributed equally. What is essential is a belief, and a demonstrated commitment (grounded in bonds and ethics), that there will be an equitable distribution. As Miles et al (2005, p. 42) put it:

“Because of the shared belief that equitable (fair) outcomes will always be pursued, collaboration does not require continuous cost-benefit calculations”.

In such circumstances, there are likely to be social MCMs based on joint (or mutual) objectives (Dekker, 2004). Some have argued that trust and commitment among the parties in situations of high motivation to cooperate will lead to a higher reliance on informal MCMs based on social controls (Langfield-Smith, 2008; Miles et al, 2005). My case findings do not seem to support such arguments. It could be argued that in IORs in which the PAPA assessed the contribution to network performance as high, it sought to include formal MCMs in contracts and other formal agreements whenever possible. Social MCMs were complementary to the formal MCMs. This is consistent
with the conclusions of authors in the fields of strategic management (Poppo and Zenger, 2002), and management control (Tomkins, 2001; Mouritsen and Thrane, 2006). In some IORs in my box 4, the network coordinator developed the package of formal and social MCMs over time. The formal MCMs created the stability necessary for reaching agreements and for establishing guidelines for the relationship. Subsequently, social MCMs were used together with the formal MCMs in order to handle change situations and to resolve problems created by the incompleteness of the formal agreements. In a sense, this contradicts existing literature that suggests that social MCMs, based on trust, have a moderating effect on the use of formal MCMs (Dekker, 2004). I found that the (pre-)existence of stable formal MCMs can contribute to higher trust and to commitment among the network organizations. Furthermore, the complementary use of social MCMs is a dynamic and interactive process that reinforces both trust and the formal MCMs.

Regarding the reasons for the network coordinator’s use of MCMs, the paper provides evidence that, in the context of mixed-type networks, coordination and cooperation are key objectives, taking into consideration the network coordinator’s role in such networks. While coordination and cooperation are crucial for the entire network, the PAPA’s appropriation concerns appear on the right hand side of Coordination Framework (boxes 3 and 4). As we saw, when the PAPA formed assessments of low motivation to cooperate, but high contribution to network performance, appropriation issues became a major concern. In such situations I observed the intensive use of social MCMs which were aimed at influencing behaviour and achieving a *fair* distribution of benefits within the network. On the other hand, when there was an assessment of a high motivation to cooperate, it was the formal MCMs which were used to address the appropriation concerns. Therefore, the same objective – to minimize appropriation concerns – can be pursued using different types of MCMs. The concepts of trust and power may help to shed light on this issue. The use of formal MCMs in box 4 was particularly intensive in those instances where the assessment of a high motivation to cooperate was based primarily on material interest; i.e., where trust was arguably lower. This supports the management control literature which argues that, in the absence of trust, appropriation concerns should be addressed through a more intensive use of
formal MCMs (Dekker, 2004; 2008). In my case, where the assessed motivation to cooperate was low, the PAPA had to use social MCMs due to its lack of power. Both the South Terminal Concessionaire and the industrial customers were empowered by the circuits of power which were in place; namely, the rigid long-term contract and the ability to divert cargoes to other ports, respectively. Here, the deployment of social MCMs can be interpreted as an attempt to re-establish a balance of power through the management of meanings, which is a potentially important dimension (or circuit) of power in its own right (Lukes, 1974; Clegg, 1989).

The idea that opportunistic behaviour and appropriation concerns can be managed using hierarchical controls to align incentives through appropriate monitoring mechanisms (see Langfield-Smith, 2008, p. 362) is debatable in situations where there is no explicit hierarchy. Consequently, the claim in transaction cost economics that governance structures can be used to manage opportunistic behaviour may not be appropriate in IORs where organizations cannot select their partners, but must accept and deal with the existing members of a network. In such IORs a different control package – with more social mechanisms – may be needed to support the relationships. This conclusion provides an alternative perspective on Dekkers’ (2004) ex-ante and ex-post phases – i.e., before and after partner selection. Where there is no explicit partner selection process, the network coordinator has to assess the various partners and then choose an appropriate control package. This lends support to Langfield-Smith's suggestion that “TCE prescriptions need to be interpreted in the light of the broader control mechanisms which contribute to the overall control package” (2008, p. 362). And, it stresses the adaptability which public organizations need in mixed-type networks.

A package of formal and informal MCMs is needed in IORs where motivation to cooperate is not based primarily on material interests. The control package is used by the network coordinator to coordinate the tasks of the various members of the network. This is consistent with Dekker's (2004) conclusion that, even where there is a high level of goodwill trust, extensive use is made of formal MCMs to coordinate of tasks. According to Dekker (2004), the use of MCMs for task coordination is related to task
interdependence and uncertainty. Although I have not specifically addressed these two issues, I have implicitly assumed that the network coordinator’s main function is task coordination. By ensuring cooperative behaviour the network coordinator aims to achieve the desired or predetermined network performance. Therefore, in the mixed-type network that I studied task interdependence was a structural characteristic, and so my ‘coordination framework’ implicitly addresses the need for task coordination in mixed-type networks.

Finally, I need to reflect on the definition of social MCMs that I have used in this paper. Although I have worked with a *lato sensu* definition of social MCMs (see section 3), I have nonetheless described different uses of social MCMs. In IORs which are assessed as making a low contribution to network performance, social MCMs are used only inasmuch as network control is not effective. Basically, the PAPA used meetings with network organizations to address problems and to resolve conflicts, thereby ensuring the re-establishment of the ‘normal’ functioning of the network. As such, the network coordinator was passive and acted as an arbitrator only when needed, using its social MCMs to deal with problems. However, when the contribution to network performance was assessed as high, the network coordinator adopted a more proactive stance and made more intensive use of its social MCMs. But even on the right-hand side of my ‘coordination framework’ (see table 6) I detected variations in the nature and use of social MCMs. Where the PAPA assessed the network organizations’ motivations to cooperate as low, it used information sharing, both formal and informal meetings and social events to stimulate cooperative behaviour or, at least, to build the social ties which would facilitate more cooperative relationships in the future. In contrast where both motivation to cooperate and contribution to network performance were assessed as high, the PAPA deployed its social MCMs to identify common goals, to encourage joint decision making and to agree the sharing of benefits, and through these mechanisms to consolidate the generally already strong cooperative relationships. Thus, my case suggests that the specific mix of social MCMs can also vary depending on the assessments formed by the network coordinator.
My study suggests several possible directions for further research. One direction concerns the availability and nature of performance measures which can be used to assess the contribution to network performance of the individual network organizations. In the port sector, for instance, cargo quantities are a collective measure of network performance and of the contribution to network performance of the various port organizations. Such a collective measure allows each organization to assess how network benefits are distributed among the network organizations. In my study the network coordinator collected, processed and published information about cargo quantities which were accepted and used by the various port organizations. The definition of such a commonly accepted measure of performance may be more difficult in other types of networks, and it is possible that this difficulty may have an impact on the coordination framework that I have proposed in this paper. Another direction for research lies in the adoption of a more processual approach. In this present paper my approach has been relatively static, as my aim was to show the linkages – at a point in time – between the MCMs and the network coordinator’s assessments of motivation to cooperate and contribution to network performance. My discussion of the change surrounding the South Terminal Concession does little more than confirm my static framework. A study of the processes leading to changes in the use of MCMs could provide further valuable insights.

It should be noted that in this paper I have focused on the network coordinator’s dyadic IORs. However, as we saw, networks extend beyond dyadic relationships (in Ports, they certainly do) and, therefore, a third direction for further research would be to study the MCMs used by a network coordinator in more complex relationships. This could involve a study of, say, the introduction an information system that defines a set of requirements and responsibilities that affect organizations with which the network coordinator has no direct relationship. Finally, further research could be conducted in other mixed-type networks in which a public organization is the network coordinator. Such research could reinforce, amend, develop and (even possibly) refute the coordination framework proposed in this paper.
In general, this first paper contributes to the development of our understanding of the use of MCMs in networks and, more specifically, their use by a network coordinator in the mixed-type networks that are becoming increasingly common in the public sectors of many countries. The paper proposes a ‘coordination framework’ which describes the nature and use of the MCMs deployed by the network coordinator, and the factors that explain their nature and use. The framework assumes a holistic view of the network, and thereby helps to fill gaps in the management control literature concerning management controls in IORs.
Second Paper: Collective action problems and the use of collective management control mechanisms by a network coordinator

Abstract

When facing a common objective, organizations in networks may need to take joint actions and act collectively as a group. In mixed-type networks, where a coordinator is responsible for the achievement of the network’s goals, the presence of groups of organizations extends the types of relationships in which that coordinator is involved. Besides bilateral (one-to-one) relationships, the network coordinator establishes multilateral (one-to-many) relationships with those groups. Arguably, when network performance depends not only on the cooperative behaviour of a single organization, but on the collective cooperative behaviour of two or more organizations, there may be consequences for the mechanisms through which the coordinator controls the network. Specifically, my research departed from a recognition that a network coordinator uses collective management control mechanisms in its multilateral inter-organizational relationships along with bilateral management control mechanisms.

The objectives of this second paper are (i) to understand the nature of these collective management control mechanisms; (ii) to assess the consequences of the use of these mechanisms; and (iii) to explore how their use is related to the use of bilateral management control mechanisms. Regarding the nature of collective management control mechanisms, the paper develops a theoretical conceptualization based on existing literature and uncovers collective practices of network performance measurement, network cost management and social rewards (political and public recognition). Also, several consequences of the use of collective management control mechanisms are identified, including the creation of a sense of community, trust, commitment, inclusiveness, public accountability and an expansion of the network of control. Finally, and based on paper 1’s theoretical framework, I conclude that collective management control mechanisms are used complementarily to bilateral ones. However, the preference for one of these types of mechanism depends on the network
coordinator’s assessments of other organizations motivations to cooperate and contribution to network performance.

1. Introduction

The issue of management control in inter-organizational relationships (IORs) has been extensively addressed in the past two decades (Caglio and Ditillo, 2008; Berry et al, 2009), with the unit of analysis varying from dyads to networks. Research on dyads has tackled one-to-one relationships (e.g. a joint-venture or a strategic alliance between two organizations), a series of one-to-one relationships in a chain (e.g. a supply-chain) and one-to-many relationships (e.g. several counterparts in one direction, like a seller and multiple customers) (Caglio and Ditillo, 2008; Lind and Thrane, 2010). Management control literature on dyadic relationships has, in its turn, adopted two different perspectives: a first one aims to identify the contingent variables that influence the use of MCMs in these contexts; while the other one seeks to identify the consequences of the use of various configurations of MCMs.

However, existing literature on management control in the context of IORs has tended to focus on the study of bilateral, one-to-one relationships involving two parties. Of course, IORs can go beyond bilateral relationships and involve more than two participants, something that may well have implications for network performance and the governance of relations. Further studies on multilateral relationships that include integrated models to understand network effects on governance are needed (Provan et al, 2007; Nooteboom, 2009). Also scarce is the literature on management control in networks that include a coordinator who is responsible, or accountable, for the achievement of the network’s goals – i.e., mixed-type networks (among the few examples is paper 1, whose adapted version was published as Marques et al, 2011). Together, these gaps underlie the objectives of the present paper: (i) to understand the nature of the MCMs deployed by a network coordinator in the context of multilateral relationships – i.e., collective MCMs; (ii) to assess the consequences of the use of these
mechanisms; and (iii) to explore how their use is related to the use of MCMs deployed in one-to-one relationships.

The paper is structured as follows: in section 2, I review the literature which outlines the concept of collective MCMs, points out the possible consequences of their use, and suggests the relationship between the use of collective MCMs and the use of bilateral MCMs. The case study presented in section 3 allows me to discuss and develop the concepts advanced in previous sections. Section 4 summarizes and concludes the paper.

2. Collective MCMs

In networks several types of relationships can be established between organizations. From a focal organization’s viewpoint, a dyadic (or direct) inter-organizational relationship (hereafter designated as a bilateral relationship) can be illustrated as shown in figure 1.

![Figure 1: Bilateral relationship](image)

The key issue in such a context is how a focal organization manages a one-to-one relationship to achieve its objectives (Lind and Thrane, 2010). Objectives can be defined by a focal organization using performance measures and, if a network perspective is adopted, using network performance measures. Network performance measures “…may include many dimensions such as: efficiency, development capability, flexibility, adherence to specifications, network position, value as a source of learning, international presence, continuity” (Nooteboom, 1996, p. 995). However, the multiplicity of dimensions characterises the complexity involved in the study of network performance (Kenis and Provan, 2009) and therefore it is not surprising that
recent management control literature has called for further research to develop the concept of network performance and the role of management control in measuring it (Barretta and Busco, 2011). A common base can nevertheless be established: network performance, as a whole, depends on the individual performance of each organization (Provan and Kenis, 2008) and in networks where a focal organization assumes the role of network coordinator, network performance can be used to assess each organization’s contribution to the network as a whole.

For simplicity of illustration and for the purposes of this paper, we can assume that the arrow in the above figure represents the MCMs used by the focal organization to influence the cooperative behaviour of the other organization. Previous research has studied the use of MCMs in bilateral relationships (Caglio and Ditillo, 2008; Lind and Thrane, 2010). Bilateral MCMs are instruments or processes used by a focal organization which is acting as a network coordinator in bilateral inter-organizational relationships to influence the other organization to cooperate in achieving the desired or predetermined network performance (Das and Teng, 1998; Dekker, 2004).

However, dyadic inter-organizational relationships can also be multilateral (hereafter designated as multilateral relationships) and can be illustrated as shown in figure 2.

![Figure 2: Multilateral relationships](image-url)
Here the issue is how a focal organization manages the multiple relationships simultaneously in order to achieve its objectives (Lind and Thrane, 2010). In networks where the network coordinator is responsible for the economic development of the whole network, it will not always be in a position to establish bilateral IORs with all organizations that contribute to network performance. In situations where two or more organizations must engage in collective cooperative behaviour in order to contribute to network performance, it can be expected that the network coordinator will also take actions to influence this cooperative behaviour (Nooteboom, 2009). In these circumstances, the objective of network performance will only be achieved if all organizations behave collectively. In other words, network performance cannot be achieved by each organization acting individually, but only by acting collectively as a group. The concept of group is not restricted to a set of organizations formally belonging to a specific group. For the purposes of this paper, a group will be any set of organizations identified by the network coordinator as contributors to a predetermined or desired network performance. Each individual contribution is needed, but network performance will only be achieved if joint – i.e., collective – action is taken. In this sense, and from the network coordinator’s viewpoint, the group is a ‘unique’ entity which is the network coordinators’ object of control.

As stated, the management control literature has already explored how a focal organization can use bilateral MCMs to manage relationships simultaneously, or even in a network context. However, in such cases, the simultaneous use of bilateral MCMs is linked to one-to-one relationships; i.e., the MCMs are used ‘one at a time’. In multilateral relationships, however, it may be expected that focal organizations will deploy specific MCMs in order to directly affect all the organizations that participate in a relationship. This paper is particularly interested in the situations where a focal organization has to simultaneously manage multiple organizations in a multilateral relationship using a specific MCM, which I label collective a management control mechanism. An illustration is presented in figure 3.
The control problems that a focal organization faces in multilateral relationships can arise from issues of collective action. Collective action is the cooperative behaviour of a set of organizations to achieve a common goal. However, collective action does not always develop spontaneously and individual organizations can free-ride on the cooperative efforts of others, as a number of organizations are involved in multilateral relationships (Olson, 1971). Management control problems, like coordination requirements and appropriation concerns (Dekker, 2004), can arise as a consequence of collective action problems. And “… unless there is coercion or some other special device to make individuals act in their common interest, rational self-interested individuals will not act to achieve their common or group interests” (Olson, 1971, 2). Therefore, in the viewpoint of a focal organization collective action problems became the object of control in multilateral relationships. In an analogy, I expect collective MCMs to be ‘special devices’ that can be used by focal organizations to solve collective action problems in multilateral relationships, i.e., instruments and processes deployed in order to influence collective action. This expectation gains even more relevance in networks where a focal organization is responsible for the achievement of common goals, as is the case of network coordinators.
Management control literature has already presented some studies about specific collective MCMs, although not using this specific designation. Frances and Garnsey (1996) illustrate how a supplier-retailer system was used to influence multiple organizations, including labour agencies, international suppliers and consultants. Adopting a system perspective, they argued that MCMs can, when supported by adequate information systems, tighten inter-organizational ties and reduce costs throughout the system. Miller and O’Leary (2005; 2007) used the term ‘mediating instruments’ to refer to “those practices that frame the capital spending decisions of individual firms and agencies, and that help to align them with investments made by other firms and agencies in the same or related industries.” (Ibid, 2007, p. 702). Their research focused on the use of a technology roadmap mechanism in the establishment, coordination and change of network organizations’ investments and business expectations. Kajütter and Kulmala (2005) studied open-book accounting in multilateral relationships between a focal organization and multiple suppliers in a supply-chain. The main objective was to identify cost reduction opportunities, and a Value Chain Flow Chart was used to support inter-organizational cost management in the whole supply-chain. From a similar perspective, Tomkins (2001) argued that the level of shared information can influence trust between organizations in multilateral relationships.

Other research points to additional examples of collective MCMs, such as restrictions of access to exchanges, macro culture, collective sanctions and reputation (Jones et al, 1997). Finally, other collective MCMs can be reasonably suggested: network strategic objectives, multilateral incentives and sanctions, network access rules and regulations, multilateral communication rules, joint multilateral decision making and task groups.

Collective MCMs found in the literature can be classified into different types. Classifying MCMs has the practical advantage of providing a better understanding of the use of each type. For instance, using Dekker’s (2004) criteria, MCMs used in IORs can be divided into three types: outcome, behaviour and social. Outcome collective MCMs involve the use of performance measures to assess and monitor the outputs of organizations. Behaviour collective MCMs involve the specification and direct
monitoring of expected behaviour (Langfield-Smith, 2008). Taken together, outcome and behavioural controls can be classified as formal controls (Ouchi, 1979; Dekker, 2004). Social controls are informal controls that imply a reliance on self-regulation (Ouchi, 1979) and are grounded in shared norms, values and beliefs (Langfield-Smith, 2008). Examples of collective MCMs using Dekker’s (2004) criteria are presented in Table 7. Different and balanced sets of MCMs – packages of MCMs – are likely to be deployed by a focal organization in each relationship (Malmi and Brown, 2008). Balance, in this sense, is achieved by adapting the scope – i.e., higher or lower intensity of use – of each type of MCM in the MCM Package.

<table>
<thead>
<tr>
<th>Nature of collective MCMs</th>
<th>Examples of collective MCMs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outcome:</strong></td>
<td>value chain flow chart, prices, network coordinator fees, joint network strategic objectives, multilateral incentives and multilateral sanctions.</td>
</tr>
<tr>
<td><strong>Behaviour:</strong></td>
<td>technology roadmap, network access rules, network procedures, network quality standards, general network rules and regulations and multilateral communication rules.</td>
</tr>
<tr>
<td><strong>Social:</strong></td>
<td>macro culture, collective sanctions, reputation, social network events, joint network associations, joint multilateral decision making and joint multilateral task groups.</td>
</tr>
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Table 7: Examples of collective MCMs, following Dekker’s (2004) typology

Another criterion for classifying MCMs used by focal organizations in multilateral relationships is provided by Mouritsen and Thrane (2006), who propose the concepts of self-regulating and orchestration mechanisms. For the authors, “self-regulating mechanisms allow interaction and exchange to occur unobtrusively, while orchestration mechanisms involve structuring these interactions” (Mouritsen and Thrane, 2006, p. 241). Examples of such self-regulating mechanisms are transfer prices and fees to the network centre. Orchestration mechanisms are exemplified as segmentations of network organizations into groups to smooth away internal competition and social events, like fairs and bazaars. Mouritsen and Thrane’s (2006) typology is very helpful as it provides us with insights into the role of management control in networks and how a network coordinates itself (self-regulating mechanisms) or is coordinated by a specific organization (orchestration mechanisms).
Table 8 uses both Dekker’s (2004) and Mouritsen and Thrane’s (2006) typologies of collective MCMs to systematize the contributions of the management control literature and to summarise what we already know about what collective MCMs are and the consequences of their use.

<table>
<thead>
<tr>
<th>References</th>
<th>What they are?</th>
<th>Typology following Dekker (2004) and Mouritsen and Thrane (2006)</th>
<th>Consequences of use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frances and Garnsey (1996)</td>
<td>Supplier-retailer system</td>
<td>Formal and Orchestration</td>
<td>Tighten inter-organizational ties and reduce costs throughout the system</td>
</tr>
<tr>
<td>Miller and O’Leary (2005)</td>
<td>Technologic roadmap: a mediation instrument</td>
<td>Social and Orchestration</td>
<td>Coordination of network organizations investments and business expectations</td>
</tr>
<tr>
<td>Tomkins (2001)</td>
<td>Information sharing system</td>
<td>Formal and Orchestration</td>
<td>Influences trust</td>
</tr>
</tbody>
</table>

Table 8: Collective MCMs found in management control literature

Even though the work of Frances and Garnsey (1996) dates from almost two decades ago, important gaps still seem to persist in the literature. A first gap relates to the type of relationships that has been studied in management control literature, and is directly addressed by this paper: while most previous studies on multilateral relationships have focused on supply-chains (Lind and Thrane, 2010), this paper studies a network which is not limited to buyer and seller activities. The second, and arguably main, gap lies in the lack of a systematization and conceptualization of what collective MCMs are and the consequences of their use. Understanding these aspects has recently been referred as a research opportunity in the context of networks (Barretta and Busco, 2011, 211): “… there is a need to look inside management control practices, to explore what these practices are and, how and why they enable the cooperative “ideal” to become real…”. This second gap underlies the first two objectives of this paper: (i) to understand the nature of collective MCMs: what are collective MCMs?; and (ii) to
assess the consequences of the use of these mechanisms: what are the consequences of the use of collective MCMs?

The third gap lies in the fact that the relation between the use of collective MCMs and the use of bilateral MCMs has hardly been explored in holistic manner. Caglio and Ditillo (2008) seem to support this view when they call for contributions that take a more systematic perspective on the network of relationships. That is, contributions that are not restricted to the study of MCMs use in one type of relationships (e.g. bilateral or multilateral), rather expanding the study of MCMs use to the network of relationships (e.g. bilateral and multilateral). This leads to the third objective of this paper: (iii) to explore how their use is related to the use of bilateral MCMs: how does the use of collective MCMs relates with the use of bilateral MCMs? Specific related questions can be suggested: are collective MCMs used together with bilateral MCMs? Is the use of collective MCMs preferred to the use of bilateral MCMs, or vice-versa? In what conditions?

The few studies that do provide clues to the relationship between the use of collective and the use of bilateral MCMs can be found in the literature on social rewards and punishments. Social rewards and punishments are present in Ouchi’s (1979) concept of clan control and even on Merchant and van der Stede’s (2012) concept of cultural control which includes codes of conduct and group rewards. Merchant and van der Stede (2012, p. 92) defined group rewards as “providing rewards or incentives based on collective achievement”. Some fields of literature (like social exchange and management control) argue that social rewards and punishments can influence collective action. However, there is some discussion arguing that social rewards and punishments may not be sufficient to influence cooperative behaviour, or, in other words, to reduce free-riding as a collective action problem (Olson, 1971; Gächter and Fehr, 1999; Takács et al, 2008). Thus, in a multilateral relationship a network coordinator will probably use collective MCMs, including social types of control such as social rewards and punishments. However, if such use becomes insufficient (or ineffective), other MCMs to influence individual organizations’ cooperative behaviour – such as bilateral ones – may also be used.
To understand the use of collective MCMs in relation to the use of bilateral MCMs, this paper draws on paper 1’s theoretical framework. That framework adopts the same network setting and perspective as the present paper, albeit being focused on bilateral MCMs. Based on existing literature, paper 1 presents a theoretical framework (which I label ‘Coordination Framework’) that shows possible linkages between the use of bilateral MCMs by a network coordinator and two ‘explanatory factors’: the assessment, by that coordinator, of (1) the motivation to cooperate and (2) the contribution to network performance of organizations involved in the network.

When the (assessed) contribution to network performance is (relatively) low, the use of network control is seen as adequate. In these situations network coordinator relies on the mutual control, which emerges from either competition or coordination between the network organizations. Organizations monitor each other and any deviation from the expected functioning of the network will be reported to the network coordinator. Network control develops Mouritsen and Thrane’s (2006) conclusion that MCMs are used as self-regulating mechanisms in mixed-type networks although, still, the network coordinator has to apply a minimum level of formal controls to all network organizations (e.g. a common set of rules, regulations and procedures).

However, when the assessed contribution to network performance is high, the bilateral control package is more intensive, in both its nature and use. Where possible, (i.e., when the assessed motivation to cooperate is high) formal bilateral controls – including outcome controls – will be present in the control package. In those situations where the assessed high motivation to cooperate is based on the material interests of the network organization, the control package will be composed almost entirely of formal bilateral controls. But when the assessed high motivation to cooperate is based on bonds and/or ethics arising from a long standing relationship, the use of formal bilateral controls will be supplemented and reinforced by, and will also reinforce, bilateral social controls. Finally, when the (assessed) motivation to cooperate is low, formal controls will be seen as difficult to use or less effective, and consequently there will be a more intensive and proactive use of bilateral social controls.
To identify what collective MCMs are, the consequences of their use by a network coordinator and the relation with the use of bilateral MCMs, I will explore a case study that has the characteristics of the setting and perspective to be explored: this is the case study of a Port, the Port of Aveiro in Portugal.

3. The case study

Ports are networks where collective action problems arise. Cooperative behaviour does not always emerge spontaneously and individual organizations often free-ride (de Langen, 2003). Coordination by Port Authorities is required to solve collective action problems. Ports are, therefore, an appropriate network setting for my study.

The case study research method was selected due to the research focus on “how things work in a particular context” (Manson, 2002, p.1). Also, the research method is consistent with the network setting adopted in this type of research. In their recent literature review, Caglio and Ditillo (2008) use three dimensions to classify management control research in inter-organizational relationships. First, the unit of analysis, i.e., the number of relationships considered in the study: from dyads (a single relationship between two organizations or between one organization and a certain category of counterparts) to networks (more than one relationship in a significant subset or in the whole network). Second, the viewpoint: from a consideration of the viewpoint of only the focal organization to the consideration of the viewpoints of the other counterparts in the relationship. Thirdly, the number of parties included in the relationship: from bilateral (only two parties) to multilateral (more than two in one-to-many or many-to-many relationships). Following Caglio and Ditillo’s dimensions, this paper's unit of analysis is the network; the viewpoint is that of a focal organization which has the role of network coordinator; and the type of relationship is multilateral.

This case study will focus on two particular multilateral relationships which are part of a larger network, and consequently a network approach is adopted in this paper.
Furthermore, although I examine the IORs from the network coordinator’s viewpoint, my analysis extends beyond dyadic relationships and combines network analysis and governance perspectives, as proposed by Provan and Kenis (2008). I combine my analysis of the network as a set of actors, with a governance perspective that takes the network as my unit of analysis. In short, the network is the network coordinator’s object of control.

Prior to this study I had conducted an earlier research project in the Port of Aveiro and this had given me access to preliminary information from which I could identify the characteristics of the network. Importantly, it also gave me virtually unlimited access to study the relationships between the Port of Aveiro’s Port Authority (henceforth, PAPA) – which is a public organization that acts as network coordinator – and the various port organizations – both private and public – operating in the Port of Aveiro.

This case study, which covers the period from 1999 to 2011, was based primarily on data collected from the PAPA. In the case study, the Port is regarded as a network (cf. van der Lught and de Langen, 2008; de Langen, 2003) and I explore the role of the Port Authority as the network coordinator of the port organizations (see also de Langen, 2003; Olson, 1971). Port organizations are seen lato sensu, including not only organizations that provide port services, but also organizations that contribute to the overall port performance.

3.1. Research methods

One initial methodological note is in order. I was appointed Chief Financial Officer of the PAPA in April 2005. In my view this does not constitute an insurmountable problem, as much of the analysis was based on documents which relate to activities and decisions outside my areas of responsibility. Furthermore, I attempted to support my analysis and interpretations through comparisons of various documents and by comparing the documents with the interviewees’ explanations and with direct
observation of certain events (meetings, conversations and conferences between the parties).

In 1998 an important transformation took place, from a service port to a landlord port model, and this required the PAPA to become more actively involved in coordinating the port’s activities. Consequently, my research studies the PAPA over the period from 1999 to 2011. I started with a detailed analysis of various aspects of the network governance model, including the PAPA’s legal competences, the different types of port organizations involved in the Port, and the IORs between the Port Authority and the other port organizations. The objective was to understand the formal context and the use of licences and contracts in certain IORs.

In the research process several collective MCMs were identified, for instance the Port's Operational Rules, the Port's Environmental Management Rules, the Port's Strategic Plan, the Port's Community Association and the Port's Single Window. These all have the common characteristic of being an initiative of, and used by, the PAPA. I selected the Port's Community Association (PCA) and the Port's Single Window (JUP) as illustrations to analyse in this paper. The first reason was the opportunity that I had to directly observe some of the events through time regarding these two collective MCMs, and this allowed me to conduct a longitudinal analysis. The second was that both collective MCMs were present in the PAPA’s proposed strategic plan (drawn up April 2006). This strategic plan documented planned actions in a table which, where relevant, set out the contributions of each of the port's organizations. It also contained a figure which indicated the importance of each type of port organization for the port’s strategic objectives. When questioned about this document in August 2008, the board president explained that all port organizations had contributed to, and agreed with, the strategic objectives. Therefore, the strategic plan identified the most important multilateral relationships “to be controlled” (in the term used in the plan) by the PAPA. The PCA and the JUP were among them.

To interpret collective MCMs and to identify the PAPA’s assessments of the motivation to cooperate and the contribution to network performance of each network
organization, I gathered information from documents, interviews and informal discussions with the PAPA's members. I also observed meetings and conversations, both internal and external (i.e. between the PAPA and other port organizations). Various types of ‘hard data’ were collected from the PAPA: contracts, licences, internal memos, reports, communications between organizations and other agreements. These are all public documents that can be consulted on request. Due to its legal status as a state owned company, every decision of the PAPA must be supported with an internal memo or a report prepared by a PAPA manager and approved by the board. These and other documents are kept in administrative processes organized by subject. Both the PCA and the JUP have been the subject of specific administrative processes where all documents related to them are kept. These documents became a crucial source of data for my study as they contain assessments of the other port organizations and proposals for the structure of the IORs, including the MCMs to be used.

Two open-end interviews and five informal discussions were held between August 2008 and July 2009, with two PAPA board presidents (period of board membership: 1999-2002 and 2005-present) and with one PAPA manager (period of managerial activity: 1988-present). Additional interviews were held between January and April 2010 and in May 2012, when I re-interviewed both the current board president and the above mentioned manager, and conducted open interviews with two other managers (period of management activity, respectively: 1996-2009 and 2001-present). These interviewees were selected due to their direct involvement in PAPA decisions and in the relationships with other port organizations. The main purpose of these interviews and discussions was to confirm my analyses and interpretations of the various documents. The interviews also contributed to a deeper understanding of the reasons for diversity in the nature and use of collective MCMs in IORs. Additional sources of information were used in the case study, including the notes taken by me when I was present in a public seminar given by an industrial customer's manager in May 2010. These sources of information were used to complement and confirm the interpretation of the data previously gathered in interviews and conversations.
As stated above, my field work started with the identification of the multilateral relationships and the collective MCMs used by the PAPA, and was followed by an exploration of their characteristics. In this process I focused on the identification of patterns in the PAPA’s behaviour in relation to the network through time. The case study explores multilateral relationships with several organizations, including industrial customers, customs, shipping agents, port operators and municipalities. Each illustration starts with the description of the control problem, using the concept of ‘collective action problem’, and is followed by a description of the multilateral relationship and the characteristics of the collective MCM (both its features and consequences of use). A discussion of findings is also presented in each of the illustrations in sections 3.2 and 3.3, and section 3.4 explores the relationship between the use of collective and bilateral MCMs.

3.2. The Port Community Association (PCA)

The PCA is a case of a collective MCM that, from the PAPA’s perspective, failed to reach some of its intended purposes. It provides an illustration of the potentially undesirable consequences of the use of collective MCMs, as the sharing of individual processes of decision making with the collective can lead to non-cooperative – opportunistic – behaviour.

The PCA is a port organization with a legal form of an association. This type of organization is common in European ports and usually assumes roles of port external representation and lobbying. As a port association, all port organizations have the right to become members and its management is the responsibility of a Board that has executive functions. The multilateral relationship at stake is the one between PAPA and all PCA members. I will therefore explore how the PAPA established a simultaneous relationship with all PCA members using a single collective MCM.

The PCA of Aveiro was formed in 1996 and up until 2006 was seen by the PAPA as an organization where some institutional issues were discussed and eventually solved
among their members. An example was a project in 2000-2002 concerning railway access to the Port of Aveiro, where differences of opinion existed between two municipalities. The meetings of the PCA were forums for discussion of the issue, not least because the two municipalities’ presidents were, at the time, Board members. In 2006, as a consequence of the port’s new strategic plan – a PAPA’s initiative – it was decided that the PCA had to adopt an active role in the implementation of strategic actions. As formally stated in the strategic plan:

“More oriented actions by the PCA should be taken to support the port’s development objectives”.

This plan became an important antecedent of changes in the PCA as it defined new objectives for the PCA and also the boundaries of its future actions. It was publically presented in April 2006, including to all PCA members. Some of these members also participated in the 45 interviews previously held by PAPA’s representatives in the formulation of the strategic plan. An executive summary was finally published on the PAPA’s web site. A draft version was previously shared with PCA members. The purpose was:

“[for the plan] to be improved with all port organizations’ comments” (PAPA’s Board President in an internal meeting held in 2006).

The long version of the plan included 34 strategic actions, their time of implementation, the role of each port organization in their implementation and the resources – mainly financial resources – to be obtained. This version was also distributed among PCA members. Each action had the names of the port organizations whose contribution was required, divided into two types: ‘implementation agents’ and ‘execution agents’. Furthermore, one of the chapters of the strategic plan was designated as Strategic Plan Development Agents and included the types of organizations that the PAPA considered to have a contribution to make to the port’s development, and a statement of their expected role.
The PAPA’s main objective in the elaboration of the strategic plan was to have a formal document validated by all port organizations and, more importantly, by port organizations that could make a relevant contribution to its implementation. The strategic plan should become a “common starting point for the port's development”, in the words of the PAPA’s Board President in the public presentation in April 2006. The plan became a collective MCM of a formal (Dekker, 2004) and orchestration (Mouritsen and Thrane, 2006) type. According to Mouritsen and Thrane, “One type of orchestration activity is the effort to equip the network with a strategy” (2006, 268).

The PAPA’s decision to conduct an informal process that led to a formal strategic plan, and the strategic plan itself, seem to have influenced developments in the PCA that were not possible before. In fact, several previous attempts to develop the PCA until 2006 were unsuccessful. Several statements seem to confirm this point:

“It is our unanimous opinion that we should show our discontent about the PCA’s non-operationally ... we require information about the steps that are planned to be done in the near future to activate PCA.” (1998 letter to PAPA from Aveiro Port Operators Association, a member of PCA);

“… PCA has no activity and no intervention in the relevant problems that affect the Port of Aveiro … we wish to leave PCA membership” (2000 letter to PCA President from the Fish Shipping Owners Association, a member of PCA until May 2000).

To support the implementation of the strategic plan, the PCA had to change. Of course, this change would not emerge spontaneously. The PAPA took the initiative and proposed new rules and also new objectives for the PCA, and these were approved by all members in 2008. Objectives related to supporting the implementation of actions included in the strategic plan were formally approved in the PCA’s plan of activities for the period 2009-2010. Included were some MCMs to be used among PCA members: (i) specific monitoring actions regarding certain PCA members’ investments (e.g. new railway connection and new maritime accessibility), concessions decisions (e.g. proposed concession contracts) and businesses (e.g. logistic activities); and (ii)
participation in joint meetings to promote the port (e.g. commercial missions, seminars and conferences).

Following this change, the Board was restructured and re-assumed the position of discussing relevant issues like port prices and business opportunities in PCA meetings. The restructuring of the PCA resulted in an increase in the number of network organizations that became members in 2008, from 12 network organizations (1999-2007) to 34 in 2008 and 35 in 2009. The new PCA members seemed committed to its objectives. As stated by the representative of one of the most active members, the L Company (an Industrial Customer that represents 10% of the total port cargos) in a meeting with a PAPA board member:

“(…) in the current context it is very important to schedule Port Community meetings with more frequency, where the members can discuss new business opportunities for the port, plan and act together in a collaborative way to achieve them. Cooperation among each other is very important… Sharing information in those meetings is very important for my business. Information is one of the most important resources.”

One of the specific issues that frequently arose in PCA meetings was port price competitiveness. Port (network) price competitiveness was assessed by the PAPA in terms of the relative (to other ports) position of the prices charged for its services. The relative position can be measured in two ways: one involves isolating each type of service – where two or more organizations can supply the service – in the port and comparing those prices with competitors in other ports; the other involves comparing the price of each individual type of service and calculating the total port price, which is then compared with another port’s total price. For the PAPA, price competitiveness is a very important subject as price influences customers’ decisions to choose between different ports. Regularly customers visit the PAPA and ask for solutions regarding the uncompetitive prices of some port organizations. In some cases the PAPA is even asked to demonstrate the price competitiveness of the whole network to certain customers. To answer these questions MCMs must be in place, in order to collect price information
from each port organization. With the PCA, the PAPA intended not only to collect information, but also to influence port competitiveness behaviour, as stated in the strategic plan.

In the period of my study the PAPA planned to start using PCA meetings to announce its price increases and to explain the reasons for those increases. Until 2008, announcements were made exclusively through formal communications, i.e., letters from the PAPA to individual organizations setting out the new prices. At the end of 2007 the PAPA invited PCA members to attend the 2008 ‘presentation of prices’. The PAPA manager in-charge of this process commented that meetings with all the members of the PCA were intended to develop cooperative behaviour:

“… by explaining in a meeting the reasons for price increases or changes in the rules is good to avoid having formal and violent positions expressed by port companies that only contribute to an environment of conflict. Also by having the opportunity to explain the bad news to cargo owners [industrial customers] we have the opportunity to give them our reasons. In previous years we sent letters to shipping agents or port operators and it was then that we provided the bad news to cargo owners. Any complaint was answered with the traditional: ‘that is a PAPA decision and you must complain to the PAPA’. By that time the level of potential conflict affected any attempt to mitigate problems”.

Industrial customers also seemed to share PAPA’s interests, as stated by one industrial customer in a 2010 public event:

“Port services represent 40% of our total cost of maritime transportation. To know the real cost of all port operations is fundamental. Only with this knowledge will it be possible to influence the cost and improve maritime transport competitiveness”.

The interest of industrial customers was not only to know the ‘real cost(s)’, but also to know the cost of each organization:
“We do not understand the invoice that we receive. There is a total price per tonne, but we do not know the weight of each company in that total. From time to time we talk about that problem, but nothing changes. There is no transparency in port services invoices” (another industrial customer).

Clearly, information about the cost chain of the port was needed, as price was used as a measure of individual contribution to port performance.

In any case, with the PCA’s improved position and the introduction of price discussions in the PCA’s meetings, it seemed that conditions to develop cooperative behaviour had been settled. However, the PAPA’s intended regular price competitiveness discussion failed and was only done in the referred meeting at the end of 2007. Therefore the implementation of a social collective MCM – PCA meetings as a collective process of a social nature – failed. Two reasons for this failure can be advanced.

3.2.1. Collective action problems in PCA

One reason seems in line with research on open-book accounting. The PCA was open to all network organizations, and the practice of sharing price information could clearly be one of open-book accounting. Research on this topic, however, has shown that disclosure of cost data is often done between dyadic organizations in the network, rather than between the entire network. As Windolph and Moeler (2012, 48) put it, “while openness with regard to cost data occurs at all levels of the supply chain network, such openness seems to be limited to firms that have an influence on their partner firm’s behaviour”. In 2007 the PAPA initiated the practice of annually announcing its own prices, but the other port organizations, like port operators, did not do the same on a regular basis. What was notable was that some of these organizations regularly shared price and cost information directly with the PAPA, but they refused to do so in the context of the PCA.
The initiative of opening its price (and eventually cost) information to PCA’s members was intended, by the PAPA, to be an example to be followed by others with the final objective of increasing transparency of gains distribution among organizations. With the sharing of price (and cost) information, PCA could become an instrument to discuss benefits sharing. But port organizations were not interested in regularly sharing information. Even when expected – by the PAPA – that pressure by industrial customers over port operators could lead to more information sharing, this information was not divulged. One possible reason is that some industrial customers were also not willing to let all port operators publically share their own prices, i.e., the prices that port operators charged to those industrial customers. Industrial customers often sensed that they had ‘special’ prices, due to their commercial discussions with the port operators’ commercial representatives, and they were afraid that sharing that information could negatively impact their prices. This was confirmed in a public comment of an industrial customer made in 2011:

“We will not give our price information. That is a competitive advantage that we will not give”.

The second reason, related with the first, for the failure of price competitiveness discussions and information sharing, was the opposition manifested in a PCA meeting by one relevant industrial customer (company P, which contributes with 10% of port activity, measured in tonnes). In the PAPA’s price presentation PCA meeting in 2007 the industrial customer’s “violent criticisms” and “pressure to reduce the PAPA’s price, rather than to present reasons for it” was considered, by a PAPA manager, as an opportunistic behaviour in face of the information sharing and price discussions that the PAPA intended to develop. In a way, this behaviour is consistent with the above stated limitations for information sharing, when individual interest seems to set boundaries to cooperative behaviour. The individual interest becomes influential and restrains organizations to adopt reciprocity behaviour towards PAPA – reciprocity in sharing the same information that the PAPA shared – and towards the collective. In short, a free-riding behaviour emerges. There are limits to an organisation’s individual contribution to collective action and the use of collective MCMs has the consequence of exposing
those limits to the collective. The public accountability of collective MCMs allows organizations to assess others’ motivations to cooperate. The non-cooperative behaviour of one organization has consequences for the collective, and can change the behaviour of other organizations. Not surprisingly, the PAPA limited its actions regarding price discussions from 2008 onwards:

“We do not want the PCA to become a battlefield for this industrial customer to complain about PAPA’s prices, just because he will always complain no matter what we do” (PAPA’s manager in 2008).

When collective MCMs are used, the conflict between two organizations – bilateral conflict – expands to the collective, i.e. to the network as a whole. No organizations attempted to ‘rescue’ the PAPA from the conflict with this particular industrial customer:

“They were also interested in a decrease of our price, but mainly they were afraid of the customer. He was too big for them to risk a conflict.” (PAPA’s manager in 2008).

The PAPA’s price presentations began and ended in 2007. An equilibrium in the acceptable level of information sharing was, in a sense, reached: sharing information above this level could lead to undesired consequences. The PCA is a collective MCMs where price competitiveness discussions are held, but, with the exception of the 2007 meeting, in a casuistic manner and without a regular process of information sharing and the alignment of price competitiveness. The PAPA’s initiative arguably influenced other organizations to bring price competitiveness discussions to the PCA. In March 2011, for instance, the shipping agents’ association formally shared with the PCA a letter of complaint about a defence ministry port organization’s lack of transparency in the relation between the prices they charged and the estimated costs incurred. But still, no process of sharing information – in this case about cost information of the defence ministry port organization – was adopted. When expanding the network of control from bilateral to collective relationships the PAPA faces the potential consequences of the failure of use of a collective MCM in the broader network context.
The PCA illustration has also allowed me to identify some additional features of collective MCMs. In the issue of port price competitiveness there was a change from formal bilateral MCMs in one-to-one relationships to social collective MCMs involving other organizations in the network. Indeed, up until 2007, price issues were discussed only through formal communications and individual meetings with shipping agents and port operators. In 2007 there was a network-level price discussion in and through the PCA. This took place in a period in which the PAPA was trying to incentivize the more direct involvement of organizations – especially industrial customers – in the implementation of the strategic plan. Historically, industrial customers were “too remote” – in the words of the PAPA’s Board President. By involving additional organizations, the PAPA also intended to avoid organizations such as shipping agents and port operators presenting formal – “and violent” – complaints about price increases in dyadic network relationships. In this way reactions would have to be presented in the presence of other organizations that would have helpful (and not available to the PAPA) information to discuss prices in a multilateral process, rather than in a bilateral one.

The difficulty with the involvement of industrial customers in the price competitiveness issue was also reflected in other collective MCMs used at the PCA. For instance, in 2009 the PCA signed an agreement with other Portuguese port communities and with the Government in which port authorities agreed not to increase their prices and port organizations agreed to pass the benefits to customers. Port authorities (including the PAPA) and the National Regulator were formally mandated by the Government to monitor these obligations. The agreement's clauses evidenced the need felt by Government to make sure that price competitiveness was a fact. Indeed, it seemed that the Government and port authorities did not trust the port organizations to share the benefits with their final customers. This can be considered a lack of trust in the system, because trust was identified in some bilateral relationships with some of those same port organizations, but not in all. In this case, the lack of trust in some organizations influenced the use of collective MCMs for all organizations in the multilateral relationships. Additionally, the nature of collective MCMs to influence the cooperative behaviour of larger groups (passing the price conditions to all industrial
customers) is at stake, as formal collective MCMs were adopted (formal multilateral agreement).

Another aspect to highlight is that although the PCA is open to all network organizations, it is the PAPA that coordinates its agenda. PCA’s actions result from the members' periodic meetings which allow social inter-action among network organizations. The issues discussed in meetings are usually proposed by the PAPA. Price competitiveness discussions are one example of the PAPA's influence over the PCA's agenda. PCA enables network organizations to explore subjects that are collectively oriented and selected through time as a function of the circumstances (e.g. PAPA strategic objectives or the need to approve an environmental study for a port strategic investment). It serves as a basis for collective action, but a basis that has routines aimed at forming an environment of involvement with the network. Thus, in the period between 1999 and 2007, the PCA served as a forum for a general sharing of information; from 2008 on, and as a consequence of the network's strategic plan, it has adopted a different role, with frequent Board meetings and explicit objectives to be pursued.

3.2.2. Nature and consequences of collective MCMs

The above illustration allows me to draw conclusions about the nature and consequences of the use of collective MCMs, i.e., the two first objectives of this paper.

The PCA illustration points to the nature of prices as a network performance measure: indicating individual organizations’ (price) contributions to the total port price, and the relative competitive price position as compared to other ports. Some of the characteristics of these prices contribute to their identification as a collective or network performance measure: each organization has its price, so price is an homogenous measure; it is objective, as a quantity; each organization realizes that it will benefit if another or even all organization(s) decrease price(s), as increase in cargos
(activity volume) in the network would be expected; and information about prices can be obtained and shared at PCA meetings.

Behind the price competitiveness issue was also the PAPA’s intention to open a discussion about the ‘fairness’ of benefits distribution in the network. It was the PAPA’s President of PCA’s Board who launched the subject in a meeting in 2007. The PCA evidences a practice of inter-organizational cost management in the line of Kajütter and Kulmala (2005) study. As already stated in section 2, these authors’ study of cost management in a supply-chain identified the use of collective MCMs – Value Chain Flow Chart – with the main objective of identifying cost reduction opportunities in the whole supply-chain. However, the context surrounding the PCA is that of a network and is hence not restricted to supply-chain activities. PCA is, therefore, a practice of inter-organizational cost management in a network price context. Its study contributes to understanding how a network coordinator tries to control network price competitiveness and, indirectly, tries to control the distribution of benefits among network organizations. The PCA illustration contributes to inter-organizational cost management literature by highlighting the role of a focal organization in developing the practice and the dependence of the degree of information shared on individual organizations’ interests.

It is notable that the PCA did not develop spontaneously. The PCA's development as a collective MCM depended to a great extent on the PAPA’s coordination: for instance, some organizations only became members because the PAPA invited them. This seems to suggest that in the context of the governance of a mixed-type network, Mouritsen and Thrane’s (2006) orchestration and self-regulation mechanisms are simultaneously present in one collective MCM. Therefore, orchestration and self-regulation mechanisms can be used simultaneously in a collective MCM and not as alternatives, as the authors suggest in the specific context of their study. The PAPA expected other organizations to participate (self-regulation), however, at the same time it did not want to lose its direct coordination role (orchestration).
The PCA illustration allows me to discuss some of the consequences of the use of collective MCMs: specifically a sense of community; collective bargaining; trust and commitment; inclusiveness; public accountability; and expansion of the network of control. I follow with a brief explanation of each of these consequences.

The PCA developed a sense of community among its members and contributed to the network being perceived as a homogenous entity. The PAPA wants the Port of Aveiro to be perceived by the PCA members as a network that competes with other networks, and to shift their focus from intra-network competition to inter-network competition, as in the example of price competitiveness. It is thus not surprising that in PCA meetings there were numerous discussions about the Port of Aveiro's competitive position in relation to other nearby ports, and about ways to “beat” the competition. Also, the Port of Aveiro's promotion at international conferences and expositions was a collective objective decided in the PCA. Ouchi's (1979) classic concept of clan control seems to be reflected in the use of social collective MCMs. Even though the price competitiveness issues did not produce the cooperative behaviour initially intended by the PAPA, conversations about price and other subjects nevertheless took place and, therefore, the PCA was used to construct greater unity among network organizations. As the PCA developed, it became self-reinforcing through the inter-actions between organisations. ‘Common-unity’ etymology could be a simpler way of characterizing PAPA’s objectives: ‘to influence all to act as one’.

PCA membership provides opportunities for social interaction that can lead to a building of trust (or distrust). This trust (or distrust) emerged in PCA member’s discussions, as problems were (not) solved and information was (not) shared in collective meetings. A network of (un)trustworthy organizations became visible as (non-)cooperative organizations are identified in PCA discussions. Distrust required more coordination by the PAPA, in the form of mediation between organizations. For instance, the 2009 agreement with other port communities and the Government required PAPA’s mediation to verify port organizations’ prices. This mediation was also conducted outside PCA meetings, as bilateral contacts were used to influence non-cooperative organizations to change their behaviour. The PAPA involved other
organizations in this process and the visibility of non-cooperative behaviour (e.g. of the industrial customer – company P) allowed the free-riding collective action problem to be monitored. Monitoring was not restricted to the PAPA, as other organizations had an interest in changing non-cooperative behaviour. It is, therefore, a type of social and self-regulating collective control.

The PCA implied collective solutions – actions to solve collective problems - that required the explicit individual commitment of organizations to collective decisions. Although trust could in some instances be built, it seemed insufficient to avoid non-cooperative behaviour. Consequently, it was necessary for the implementation of decisions to be monitored by other organizations, as was provided in the 2009. Trust has its limits and it may not be enough when material and individual interests are a higher concern. Company P did not share information when it assessed that such sharing could jeopardize the competitive price advantage it was getting from port operators. An agreement on an organizations’ price adjustment would become the subject of future PCA meetings and, therefore, be monitored by other organizations: company P’s competitors would know their prices and press to obtain equal conditions. In this view, PCA also influences the use of other MCMs in other relationships established in the network.

Face-to-face meetings and the network coordinator’s efforts to encourage organizations to become members created a sense of inclusiveness, as opposed to exclusiveness, in the management of the network. The use of a collective MCM allowed organizations to participate in network decisions, e.g. in formulating the strategic plan and in participating in price competitiveness discussions. Organizations that previously did not have a ‘voice’ in the pricing policy started to participate. The PAPA wanted other organizations to participate, or at least to feel they were contributing to the network's management. Inclusiveness also implies participation in the construction of common goals – e.g. the strategic plan - and that each organization expects to benefit from its achievement: “the very fact that a goal or purpose is common to a group means that no one in the group is excluded from the benefit or satisfaction brought about by its achievement” (Olson, 1971, 15).
From the PAPA’s viewpoint, a negative consequence of inclusiveness is that by extending discussions to multilateral relationships, the PAPA can lose influence in bilateral relationships. Direct, one-to-one, control is transferred to more shared and wider-consensual processes that emerge from multilateral relationships. These more complex relationships can get ‘out-of-hand’ as organizations establish relationships among themselves, and possibly exclude the PAPA. By transferring the discussion of some issues to the PCA, the PAPA transferred some of its decision making ‘power’, as some specific PAPA’s issues become network collective issues and therefore subject to the network organizations’ diverse opinions and interests. The PCA has its own dynamics. What seems of interest in the context of management control of the wider network is how the PAPA can cope with the change to a more network – or ‘democratic’ – decision making process. In other words, by inviting network organizations to support the achievement of strategic objectives and by influencing other organizations' actions, the PAPA has to accept the influence of other network organizations on its own decisions. Once more, the price competitiveness issue provides an example. Historically, PAPA had its own process through which it formally communicated to shipping agents and port operators. By transferring this issue to the PCA, the PAPA had to explain price formation and was more exposed to non-cooperative behaviour. In this sense, the new practice resulted in a collective MCM with reciprocal effects: as a consequence of the PAPA's use of collective MCMs to influence PCA members, the latter also influenced the PAPA. In the circumstances, the focal organization decreased its intensity of use of bilateral MCMs as orchestration, becoming a part of the collective action in multilateral relationships that enters in a more emergent and ongoing process of self-regulation. Consequently, the process evolution implies a change in the network position of the PAPA that in a sense ‘abandons’ its network coordinator status to become one member of the collective. That is, PAPA ‘abandons’ its capacity to deploy bilateral MCMs in exchange for an engagement in multilateral relationships where control becomes more subject to collective influences.

It is not surprising, therefore, that the PAPA was active in the selection of the organisations that were invited to become members. To minimize the negative
consequences of inclusiveness, the PAPA tried to control who should or should not have access to the PCA. The main reason for controlling access was to select organizations which made a higher contribution to port price competitiveness or which had the capacity to influence other organizations to become more competitive. In this way, the PCA, although formally an open association, informally became a selective collective MCM, whereby its membership is controlled by the PAPA. In this way, the control of access becomes an ex-ante control over who does (and who does not) participate in PCA’s discussions. As such it is a form of ex-ante personnel control – as PAPA recruits selected organizations – to influence collective behaviour. Consequently, PCA is both a legal entity and a collective MCM or, following Miller’s et al (2008) essay, a hybrid organization form. These authors argue that hybrid organizations must be studied as management controls across organizations, a study to which PCA illustration contributes.

PCA expanded public accountability. Normally, it is the PAPA that is publically accountable for network performance, measured in terms of the number of tonnes and ships. When port problems are reported in newspapers – e.g. when port prices are increased – it is the PAPA that is explicitly or implicitly referred to as being responsible, even if it has no direct responsibility for the specific problem that is reported. For instance, news about port price increases can damage the Port of Aveiro's reputation and require PAPA's actions. PCA discussions about port price competitiveness allow each member to become accountable to the collective (to the PAPA and to all the other members) for its actions and, consequently, to be publically accountable. The identification of each organization’s contribution to the network performance measure – i.e., price – makes each of those organizations more publically visible and as such a system of collective accountability emerges in the PCA meetings.

Finally, the PCA expanded the network of control. Although, by law, the PAPA is responsible for the port's economic development, it only has mandatory competences to approve or refuse prices in relationships that are supported by a public service concession contract. However, port total prices are not restricted to concessionaries: in the Port of Aveiro there are only two public service concessions, and some
organizations which make a higher contribution to port price competitiveness are beyond the scope of the PAPA’s legal competence. By inviting those organizations to participate in the PCA, the PAPA is enlarging the network of control. At stake is not necessarily direct control by the PAPA, but a construction of a self-regulating process – e.g. of price competitiveness – among PCA members.

Some of the consequences of the use of collective MCMs seem to assume a systemic characteristic, as some consequences can influence others. Inclusiveness and commitment are an example. Inclusiveness of organizations in cooperative problem solving can influence commitment to its solution by organizations that are involved. Independently of a more or less active participation in the PCA, all members were present at the time decisions were taken and, therefore, the PAPA probably expected they would be committed to their implementation. Different intensity of commitment still exists, but individual free-riding behaviours were minimized.

In figure 4 I summarize the key features and consequences of the use of the collective MCM, as suggested by the PCA illustration. In the next section I will confront these features and consequences with another illustration.

Figure 4: Collective MCMs and the consequences of their use (PCA illustration)
3.3. The Port Single Window

This section discusses a second illustration of the use of a collective MCM in the Port of Aveiro: the Port Single Window (JUP, for the Portuguese expression "Janela Única Portuária"). Besides confirming and developing the content of figure 4 above, this second illustration allows me to describe changes in the PAPA’s assessments of motivations to cooperate and contribution to network performance. Therefore, the presentation and discussion of JUP illustration allows me to address the third objective of this paper: to explore how the use of collective MCMs is related to the use of bilateral MCMs, an aspect that underlies the theoretical discussion to be conducted in sub-section 3.3.2. As already stated in section 2, specific questions to be addressed are: are collective MCMs used together with bilateral MCMs? Is the use of collective MCMs preferred to the use of bilateral MCMs, or vice-versa? In what conditions?

JUP is a case of a collective MCM that, in contrast to the PCA, arguably reached its intended purposes. As I shall demonstrate, changes in the cooperative behaviour of organizations that form the collective facilitated the ‘success’ of this collective MCM. The implementation of JUP was one of the actions stated in the 2006 Port of Aveiro's Strategic Plan. Action 14.6.4 of that plan was aimed at the:

“Simplification and technological information of the customs and administrative processes”.

Shortly, JUP is a web-based IT system where port organizations can input data to manage port operations. For instance, when a ship is estimated to arrive in the port, shipping agents must input data (e.g. ETA – Estimated Time of Arrival). When the ship enters the port, pilots and tugs organizations must also input data (e.g. initially, the date and time planned to perform the operation and number of tugs needed; and then after the service provision, the actual time and number of tugs). When the ship arrives at the pier port operators must input data; and so on. All this information is visible to all organizations that use JUP, although JUP is the PAPA’s property and investment. For instance, the maintenance of JUP is done by the PAPA. The multilateral relationship at
stake here is between the PAPA and all organizations that use JUP to perform their activities in the port. JUP use is mandatory for some organizations – shipping agents, port operators and tugs, for instance – but not to others, such as customs services. Port organizations must also use JUP to share information, register ships and operations, and request services and other actions. All port users have access to the system and must input data to be able continue to provide their services with their services. The primary objective of the JUP – as formally stated in the 2006 Port of Aveiro Strategic Plan – is to improve port global efficiency, measured by the amount of time required to perform a port service, and to increase information transparency. The system is used by 9 public organizations and 35 private organizations. When it started functioning, in 1997, the JUP was intended to facilitate the administrative authorizations required for the dispatch of ships, through better communication of information between port organizations.

In the period between 1999 and 2009, the JUP was refined, but it was between 2004 and 2009 that a major change took place – a change that is central in the present paper. In 2004 a decision was taken by the PAPA to upgrade the JUP. To achieve the objectives of improving the efficiency of port services it was decided to adopt a paperless system and to rely on electronic information flows, supported by the JUP. One element was to change the approval of cargo manifest, from a paper-based approval process to a JUP-based electronical one. The organization in charge of cargo manifest approvals was Customs. The time taken by the new electronic operation was to be reduced from 1 day to 1 hour. Before this decision was taken, Customs and PAPA had a history of good relationships at the local level. The Customs Director was usually cooperative in solving port problems. Consequently, strong bonds supported the PAPA’s assessment of a relatively high motivation to cooperate on the Customs part. Nevertheless, contribution to network performance was assessed as relatively low. Customs were important in approving cargo manifests, but they “did their job as expected”, as the PAPA’s President of the Board stated. No specific controls were in place regarding Customs at that time. General controls, mainly rules of behaviour and communication, were in place which also encompassed Customs, but these were applied to the whole network.
In 2004, however, the (assessed) level of contribution to network performance changed: it was very important that Customs started approving cargo manifests in JUP. If not, JUP could not fulfil the PAPA's objectives. But, at the same time the (assessed) motivations to cooperate changed from higher to lower:

“Customs had their own system and they were not willing to change to the Port Authority system”. (PAPA’s manager)

The PAPA was determined to ‘influence’ Customs to adopt the JUP upgrade, but no bilateral MCM was in place to influence this cooperative behaviour. Customs has a horizontal relationship with the PAPA. They are both public organizations accountable to different Governmental Ministries. So the PAPA had no legal capacity to impose the use of the JUP upgrade on Customs. Instead, the PAPA proposed that Customs formed a multilateral task group that could study how to adapt JUP to meet Customs specific needs. This multilateral task group had elements not only from Customs and PAPA, but also from shipping agents and other network organizations. Two main reasons for this proposal were advanced by the PAPA. Both reasons provide important evidence on the role of collective MCMs, as the PAPA’s President of the Board stated:

“Any change to JUP would have consequences on other port organizations processes. Therefore it should be an advantage if those organizations could be inside the adaptation process from the start”.

“Resistance to change from Customs was a critical issue. We were not sure that we alone could change their will. By inviting other port organizations to work with us we were hoping that they too could change the Customs' position.”

The multilateral task group started to work in 2005 and concluded JUP changes in 2008. During that time, Customs became ever more participative (cooperative) in the process, to the point of actively contributing to JUP development:
“I think Customs realised that electronic cargo manifest was also an advantage for them. Less paper and a quicker authorization. Their initial resistance was due to their willingness in using their own system to do precisely that. We [PAPA] wanted an integrated system, which could be used by every company and entity in the port. To us a good functioning of the system was synonym of a good functioning of the port”.

(PAPA’s President of the Board)

Consequently, the PAPA changed its assessment of Customs’ motivations to cooperate from relatively low to relatively high and, in 2010, bilaterally signed a formal agreement with Customs whereby both parties not only formally expressed their commitment to adopting and using JUP, as the main IT system for port operations, but also established formal rules of behaviour – e.g. maximum time that each organization had to input their data. Customs were now clearly motivated to use JUP:

“Common work that allowed each organization in one sole project to solve individual information requirements” (Customs National Sub-Director at the time of JUP upgrade, in a public intervention made in March 2012).

As shown in paper 1 theoretical framework, changes in assessments of motivation to cooperate and of contribution to network performance can be associated with changes in the use of MCMs. In this case, when motivation to cooperate was assessed as low and contribution to network performance as high, a collective MCM (multilateral task group) was deployed by the PAPA. When the assessed motivation to cooperate increased, a formal bilateral MCM (the formal agreement) was introduced.

Furthermore, shipping agents were also part of the multilateral task group. Shipping agents are responsible for inputting into JUP information about ship arrivals and requests for services from port operators and tugs. Usually, the PAPA assesses shipping agents contribution to network performance as relatively low, as there are 24 shipping agents in port. Competition among them and general port rules ensure PAPA that shipping agents adopt cooperative behaviour. However, the assessment of contribution to network performance changed from lower to higher in the multilateral task group.
Shipping agents were represented by their national association (AGEPOR, which represents 95% of Port of Aveiro shipping agents) that, as stated by the PAPA's Board President:

"(...) is a very important association that has to be involved in the JUP project".

But, as one PAPA manager told us:

“Shipping agents were not willing to share information that was previously only their individual knowledge. For instance, they resisted inputting data about ships destination because they were afraid that other shipping agents might steal the customers [ship owners] for their own”.

However, the PAPA is responsible for granting the licences which enable shipping agents to perform activities in the port. Although licences can be changed bilaterally and can include specific responsibilities and actions to be taken by shipping agents, the PAPA did not opt to use them in the case of JUP. In fact, shipping agents licences were not changed during the period of analysis (1999-2012). Thus, the decision of the network coordinator was not to use (mandatory) bilateral MCMs. Instead, the PAPA preferred the use of a social type of collective MCMs. This seems to mean that the same network organization can be viewed, by the network coordinator, as an individual in a bilateral relationship or as a (part of a) group in a multilateral relationship. However, the choice by PAPA about the relationship implies a different use of MCMs. If the network coordinator had opted for a bilateral relationship, it could have used the licences. However, it opted for a multilateral relationship and deployed a social type of collective MCMs – a multilateral task group – to influence the cooperative behaviour of this particular group in the network (the JUP participants).
3.3.1. Nature and consequences of collective MCMs: discussion of JUP illustration

Like the PCA, the JUP is both an orchestration and a self-regulation mechanism. It is an orchestration mechanism as the PAPA coordinates the JUP's upgrades and maintenance. It is also a self-regulation mechanism as JUP allows network organizations to exchange, access and monitor other organizations' flows of information and to identify and correct any deviation. In this way the JUP serves to align processes, share information and form joint goals. It does not require a permanent intervention from the network coordinator in order to ensure an adequate level of provision of services by all network organizations. It, therefore, solves collective action problems: cooperation that does not develop spontaneously is 'monitored' by all organizations. As an IT network system, JUP is used to improve network operational efficiency. It addresses collective action problems as organizations must input data, otherwise the port will not operate. Furthermore, it exposes free-riding because any organization that does not input data will be publically exposed.

As in the case of the PCA, the JUP also includes a network performance measure (a form of outcome control): time. At stake is the motto “from 1 day to 1 hour” that allowed each organization to assess individual benefits from its achievement. The relationship of cause-and-effect between the collective objective and the assessment of individual benefits evidences the evolution through time of a network performance objective. Initially each organization had its own individual interest to decrease total time of operations. The participation in the JUP construction has led to the settlement of a common objective, collectively settled in a participative process. Each process was of the responsibility of each organization and a maximum time to perform the operation was expected and monitored by the other organizations. Therefore, a sort of collective accounting emerged as a system that collected information for time in each process within JUP and that allowed self-regulation in the network. Therefore, time became a network performance measure. Each individual organization had its expected time contribution to total time of service, the collective objective (“1 hour”).

As with prices in the PCA, some of the characteristics of time contribute to its identification as a collective performance measure: each organization has its own
service time provision, so time is an homogenous measure; it is objective, as a quantity; each organization realizes that it will benefit if another or even all organization(s) decrease time(s), as the level of service will increase and more cargos (activity volume) in the network could be expected; and information about time can be obtained through JUP. Also, having such a network performance measure means that it is possible to identify each organization's contribution to network performance. Time – like prices – can be compared.

The use of time as a network performance measure was used to plan and align operations of the network organizations. More technical performance measures, like ETA – Estimated Time of Arrival (of the ship at the port) were used not only to communicate and initiate the process, but also to identify variances, i.e., to collectively analyse variances from a target. Sharing information about “why didn't this ship arrive at the ETA?” created an environment in which behaviour focused on the network's objective: to improve port [time] efficiency. JUP was therefore an opportunity to redesign processes in the network in order to achieve time efficiency. JUP as an element of network design allows each network organization to know quite explicitly its position and function in the network and the network coordinator to monitor each organization's contribution to network performance (measured in terms of time). As in the PCA, the JUP means that organizations can be held publicly accountable for their actions. The rules, policies and procedures in JUP were constructed by participating organizations and are known by them. All organizations ‘see’ what is happening in the network, through JUP, and any non-cooperative behaviour is immediately identified.

Here this paper contributes to address Barretta and Busco (2011, 218) call: “Additionally, since performance measurement is critical to accountability, but is not easy to implement in practice, we believe that further research should address issues concerning both performance and performance measurement in public sector networks; i.e. for instance, what do we mean by public network performance? What is the role of management control practices in defining and measuring the concept of network performance?” In this paper's case study network performance was identified as network price competitiveness and network operational efficiency; and the respective
network performance measures are organizations’ price competitiveness and organizations’ time to perform operation. Network performance is linked to network objectives, either informally (e.g. prices and PCA) or formally (e.g. time and JUP). Figure 5 updates figure 4 on the basis of this observation.

One of the pointed features of network performance measures is the high perceived (by organizations) correlation between the improvement in the performance that is being measured and individual benefit obtained by each organization. An underlying characteristic of this feature is that the network performance measure is transactional. That is, prices and time are transactional in the network market. Both are measures of customers’ decisions: time means costs and quality of service; and time multiplied by a unit price means total amount to be charged/paid to a customer. Although time is also operational – as it measures network internal efficiency – the high degree of association between the measure and the impact on customers’ decisions adds to the features of network performance and constitutes one relevant characteristic of its continued use among network organizations. This conclusion contributes to a discussing of Kenis and Provan's (2009) exogenous theory of network performance when they claim that “the performance of a network is a function of the external criteria used to assess the network” (p. 444). On the contrary, the network performance measures identified in this case study are internal to the network. Both time and price are used by ‘internal’ network organizations that participate in multilateral relationships. Furthermore, and
Interestingly, the industry network performance measures – number of tonnes as the performance measure usually used in the port industry to rank ports in the world – is not the one used among organizations when collective actions are taken. Although tonnes are used in bilateral MCMs – e.g. contractual objectives in land use concessions contracts – more transactional, efficiency and competitive driven, measures, like time and prices, are used to construct collective objectives in the network.

In the end, JUP was regarded as good practice for the network, and as an example of how public organizations could become less bureaucratic and more innovative. The PAPA and Customs were publically and politically rewarded for implementing JUP as it created for them a positive reputation. PAPA’s public presentations about Port of Aveiro started to include JUP as an element that added value for its customers. The satisfaction with the JUP success is evident:

“We won a national prize for the JUP implementation” (Customs National Sub-Director at the time of JUP upgrade, in a public statement made in March 2012).

Not only for public organizations, but also for private organizations, the JUP was a sign of port management modernity and success, and therefore of network success. It reinforced a sense of belonging to a community. In fact, social rewards and punishments were present from the start. A failure of JUP was to be considered a failure of each organization that participated in the JUP's construction and, consequently, a failure of the network itself:

“If this project fails, you are all to be publically responsible for failure. You will all be regarded as resistant to change and improvement” (PAPA president in a phone call to one organization that was complaining about the JUP's real benefits, 2007).

However, social rewards and punishments were not in themselves sufficient to influence cooperative behaviour, and a package of collective and bilateral MCMs was used through time, as the next section will illustrate.
3.3.2. How collective MCMs interact with bilateral ones

Clearly, the PCA did not become what the PAPA wanted it to be. In contrast, the JUP seems to have become what the PAPA planned it to be. Why did the PCA become an ineffective collective MCM and the JUP an effective one? I will now explore this question.

The theoretical framework developed in paper 1 helps me to understand how a network coordinator deploys bilateral MCMs to influence the cooperative behaviour of individual organizations in a network setting. The theoretical framework was developed in the same mixed-type network setting and perspective as the present paper. The use of the PCA did not fully resolve free-riding problems – industrial customers did not share their own port operation prices when they had strategic interest in not doing so. However, it reinforced the network coordinator's use of collective MCMs in order to influence individual cooperative behaviour when motivations to cooperate were assessed as low, but contribution to network performance as high (e.g. industrial customer P). PAPA’s assessments of the motivation to cooperate and the contribution to network performance as ‘high’ (‘higher’) or ‘low’ (‘lower’) should be seen in both general and relative terms. In other words, and for example, the assessment of Organization A contribution to performance is higher than that of Organization B. As such, the terms high and low do not have an ‘absolute’ meaning.

A summary of collective MCMs identified in the case study is present in table 9:
The case study findings evidence that bilateral MCMs may not be efficient or effective in a multilateral relationship and, therefore, a network coordinator may be expected to use collective MCMs. In some relationships bilateral MCMs simply did not exist due to horizontal ties (e.g. Customs). Therefore, a first conclusion can be drawn: a network coordinator can use collective MCMs together with bilateral MCMs to influence cooperative behaviour. However, their use will depend on the assessed levels of motivations to cooperate and contribution to network performance.

In relationships with organizations that were assessed as having a lower level of contribution to network performance (e.g. Customs and shipping agents in the initial phase in JUP illustration) no specific collective MCMs were used. In the case of shipping agents, this might be due to the network coordinator's assessment that the normal functioning of the network was enough to ensure the desirable level of cooperation. In these groups there are multiple organizations (24 shipping agents) which compete among themselves. Intra-network competition guarantees an adequate level of cooperative behaviour, when there is an assessment of lower level of contribution to performance. This suggests that the network coordinator relies on the normal functioning of the network and further use of MCMs is not necessary. This conclusion
is consistent with paper 1, and specifically with the concept of ‘network control’ which requires only minimal intervention by the network coordinator when competition among organizations influences cooperative behaviour. Nevertheless, collective MCMs are deployed to ensure that each network organization knows its position and acts cooperatively in relation to the network's general procedures and rules. For instance, JUP minimal rules of functioning were applied to all organizations. This use is of a more general or broader scope, that is, it is directed to all network organizations, and aims at influencing a cooperation that is embedded in the usual functioning of the network. In these situations, where there is a lower assessed level of contribution to performance, paper 1 ‘network control’ concept can be seen as a deployment of a ‘Market governance type’ of collective MCMs to influence a minimal level of network cooperative behaviour. ‘Market governance type’ is therefore a label that the exploration of the case study allowed me to identify and that contributes to a better understanding of how the concept of ‘network control’ in paper 1 works in situations of competition among network organizations. I follow with a conceptual elaboration to better understand what ‘Market governance type’ collective MCMs are and how they are used by a network coordinator.

It can be argued that an assessed lower contribution to network performance implies that organizations can be replaced in the normal functioning of the network. Control can be derived through competition between organizations, as in market governance (Williamson, 1985, 1996). Self-regulation is a premise of ‘Market governance type’ collective MCMs and also a relevant condition, especially in the situation of provision of public infrastructures. The network coordinator will be concerned with securing a minimal level of cooperative behaviour which will achieve the network objectives. This minimal level of cooperative behaviour among network organizations can be influenced, for instance, by general network rules, network communication rules, network social events, network public procedures and network social norms (Crawford and Ostrom, 1995), as in the JUP illustration. Collective MCMs can also result in a system of informal rules that can influence the cooperative behaviour of organizations (Schmid, 2004).
‘Market governance type’ collective MCMs can include formal general rules that constitute the structural conditions for network functioning. In this sense, formal collective MCMs can be the basis on which social bilateral MCMs can be applied. However, rules can be broken and, accordingly, a system of monitoring is needed (Olstrom, 2005) or the transactions may not be sufficiently substantial to require complex arrangements and simple rules and arbitration may be more efficient (Nooeboom, 2009). Where there is an assessed lower contribution to network performance, the network coordinator may rely on being informed by network organizations' members (e.g. PCA or JUP members) about potential or actual conflicts, or any change in the level of contribution to network performance. In this sense, network organizations can rely on the network coordinator to intervene where necessary in order to re-establish the expected cooperative behaviour that achieves the desired network outcomes – contribution to network performance (Olstrom, 2005). As already mentioned, self-regulation and self-enforcement can create the conditions in which the network coordinator will use collective MCMs to achieve the minimal level of network cooperative behaviour. This conclusion adds to Mouritsen and Thrane's (2006) self-regulating mechanisms by suggesting the conditions – assessment of lower contribution to network performance – in which these collective MCMs are used.

Consequently, a second conclusion of the paper is that when there is an assessment of lower contribution to network performance, a network coordinator may be expected to use ‘Market governance type’ collective MCMs in order to achieve a minimal level of cooperative behaviour. This reinforces the conclusion in paper 1 that ‘network control’ is used when contribution to network performance is assessed as lower.

The theoretical expectations about the use of collective MCMs by a network coordinator can be illustrated with the ‘Coordination framework’ shown in figure 6. The three boxes (boxes 1, 2 and 3) represent collective MCMs and draw upon the characteristics (in lowercase letters) of bilateral MCMs presented in paper 1. Box 1 illustrates the first conclusion of collective MCMs use together with bilateral MCMs to influence cooperative behaviour. The label of ‘Market governance type’ is added to the concept of ‘Network control’ in the left column in figure 6, illustrating the use of these

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collective MCMs in situations of assessment of lower contribution to network performance.

<table>
<thead>
<tr>
<th>Assessment of motivations to cooperate</th>
<th>Features of Collective Management Control Mechanisms (used together with bilateral MCMs)</th>
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<tbody>
<tr>
<td>High</td>
<td>Assessment of high motivation based mainly on material interest → Package of MCMs: - Outcome and behaviour (high) - Social (low)</td>
</tr>
<tr>
<td></td>
<td>Assessment of high motivation not based mainly on material interest → Package of MCMs: - Outcome and behaviour (high) - Social (high)</td>
</tr>
<tr>
<td>Low</td>
<td>Box 1 - Collective MCMs as general facilitators of control: motivating and enabling cooperative behaviour.</td>
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<td>Box 2 - Social collective MCMs as complementary to bilateral ones.</td>
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<td>Box 3 - Social collective MCMs as substitutes of bilateral ones.</td>
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<th>Assessment of contribution to network performance</th>
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<tbody>
<tr>
<td>Low</td>
</tr>
<tr>
<td>High</td>
</tr>
<tr>
<td>Bilateral MCMs can be deployed</td>
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<td>Bilateral MCMs cannot be deployed</td>
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Figure 6: Collective MCMs through the lens of the ‘Coordination framework’

The case study further suggests that self-regulation and self-enforcement can also occur in situations of assessed higher contribution to network performance. However, in such a situation I found a different use of collective MCMs. The network coordinator did not rely only on information provided by network organizations in order to take action (responsive position), instead, it took the initiative of using collective MCMs to influence cooperative behaviour. The case study suggests that a network coordinator will give more attention to network organizations that have a higher assessed level of contribution to network performance. That was the situation with Customs and with shipping agents when they were represented by their national association in the JUP.
illustration. In those relationships the network coordinator actively deployed collective MCMs.

In the case of Customs, when the network coordinator changed its assessment of contribution to network performance from lower to higher, and in face of ineffective bilateral MCMs, a collective MCM was deployed. I label this use of collective MCMs as a ‘preferred use’, in substitution of the use of bilateral MCMs. However, there were also situations where, although the use of bilateral MCMs was possible (e.g. licences and shipping agents individually), the network coordinator preferred to use collective MCMs (the network task group involving the shipping agents' national association). The latter preference relates with the relationship context, of multilateral relationships where a sole collective MCM is in use. Here I still define the use of collective MCMs as preferred, but complementary – and not in substitution - of the use of bilateral MCMs.

Consequently, my third conclusion is that an assessment of lower motivation to cooperate and higher contribution to network performance may lead the network coordinator to prefer collective MCMs over bilateral ones. However, collective MCMs may be used in two ways: when bilateral MCMs can be deployed, collective MCMs could be used as complementary to bilateral ones (Box 2 of figure 6); when bilateral MCMs cannot be deployed collective MCMs could be used as substitutes for the bilateral ones (Box 3 of figure 6). In both cases, collective MCMs are likely to be used in a selective way, with preference to the ones of social type.

When motivations to cooperate are assessed as higher in bilateral relationships, the use of bilateral MCMs, such as incentives and performance monitoring, seems to be more effective. That was the case of the formal agreement with Customs when assessed motivations to cooperate changed to higher. Taking into account the possibility of bilateral MCMs, I expect no need for further intensity of collective MCMs use, unless it is needed to complement the use of bilateral MCMs. For instance, in the specific situation of incomplete contracts (Williamson, 1985), bilateral MCMs may be insufficient. Consequently, if assessed contribution to network performance is high, the network coordinator may, in these situations, use collective MCMs in a complementary
way. Therefore, I can formulate the following theoretical expectation: an assessment of higher motivation to cooperate and higher level of contribution to network performance will lead the network coordinator to a preferred use of bilateral MCMs. Collective MCMs will be used in a complementary, selective and ‘as needed’ manner, in order to influence a higher level of cooperative behaviour. Therefore, figure 6 illustrates the bilateral MCMs presented in paper 1.

The complementarity and substitution of bilateral and collective MCMs illustrated in figure 6 allows me to question Olson’s (1971, 51) argument that “only a separate and ‘selective’ incentive will stimulate a rational individual in a latent [larger] group to act in a group-oriented way”. I conclude that the use of ‘selective’ MCMs – such as bilateral MCMs – depends on the network coordinator’s assessment of motivation to cooperate and contribution to network performance. However, in some multilateral relationships, ‘common’ collective MCMs will be sufficient. Following the same line of thought, my conclusions reinforce and expand the argument that social rewards and punishments may not be sufficient to influence cooperative behaviour (Olson, 1971; Gächter and Fehr, 1999; Takács et al, 2008). I propose that the sufficiency or insufficiency of collective MCMs is related to the network coordinator’s assessments and I also identify the actions – e.g. complementary use of MCMs – taken by the latter in consequence of possible inefficiencies. Additionally, what this conclusion also may imply is that the use of existing theoretical frameworks in the same network setting (e.g. mixed-type network) to study different types of IORs (from bilateral to multilateral) may contribute to a better understanding of management control. The theoretical framework in paper 1 may have been developed in a context of bilateral relationships, but it contributed to our understanding of the use of collective MCMs by a network coordinator in the present paper.

Finally, and in general, this second paper also contributes to explain the effectiveness of collective MCMs. The two illustrations are cases of failed (PCA) and successful (JUP) use of collective MCMs, in the viewpoint of the network coordinator. Collective action problems, such as the free-riding of Company P in PCA, influenced the failure of collective MCMs. In the JUP illustration it was the use of collective
MCMs that influenced a change in the cooperative behaviour of one influential organization (Customs). This conclusion contributes to a discussion of the “cooperative “ideal”” of Barreta and Busco (2011, p. 216), where “… management control practices enable cooperation among partners who are driven by different and sometimes opposing objectives”. I conclude that management control can influence organizations to become more cooperative (Customs) but can also be inefficient if an influential organization does not to cooperate because of its own interests (Company P). Furthermore, the consequences of these individual organizations' behaviours, that the use of collective MCMs makes visible to other organizations, seem to influence collective behaviour.

4. Final remarks

Departing from a network context in which a network coordinator used both collective MCMs in its multilateral IORs and bilateral MCMs in its bilateral IORs, this paper aimed (i) to understand the nature of these collective MCMs; (ii) to assess the consequences of the use of these mechanisms; and (iii) to explore how their use is related to the use of bilateral MCMs. Regarding the nature of collective MCMs, the paper develops a theoretical conceptualization based on existing literature and uncovers collective practices of network performance measurement, network cost management and social rewards (political and public recognition). Also, several consequences of the use of collective MCMs are identified, including the creation of a sense of community, trust, commitment, inclusiveness, public accountability and an expansion of the network of control. Finally, and based on the theoretical framework developed in paper 1, I conclude that collective MCMs are used complementarily to bilateral ones. However, there is a preference use for a type of mechanism that depends on the network coordinator’s assessments of other organizations' motivations to cooperate and contribution to network performance. I found that: (i) in a mixed type network the network coordinator uses various types of MCMs together, in complementary fashion, in order to create a control package for the whole network; (ii) the use of network MCMs, or combinations of such mechanisms, is related to, and evolves in accordance to, the network coordinator’s assessments of the network organizations’ motivations to
cooperate and contribution to the network performance. Specifically, (iii) when contribution to network performance is assessed as lower, my evidence points to a reliance on the functioning of the network. This leads to the use of a minimal and general set of formal and social collective MCMs, that I have label as ‘Market Governance Type’; (iv) when contribution to network performance is assessed as high and motivation to cooperate is also assessed as high, a more intense use of bilateral MCMs emerges, albeit this use may be complemented by formal and social network MCMs on a ‘as needed’ basis’, i.e., when the sole use of bilateral MCMs is insufficient; (v) when contribution to network performance is assessed as high and motivation to cooperate is assessed as low, network MCMs seem to be preferred to bilateral ones, they tend to be of a social rather than formal type, and they tend to focus on specific parts of the network: this I label a preferred and selective deployment of social network MCMs.

As stated, this second paper addresses multilateral relationships. Although the paper contributes to the enlargement of the boundaries of network control, when it explores the use of both bilateral and collective MCMs, it does not address indirect relationships involving third parties. The study of indirect relationships and their influence on the control of the network would also contribute to further our understanding of the role of management control in networks.

Opportunities for future research also include comparisons between networks with networks coordinators – my case here – and self-organized networks. The study of the latter would certainly contribute to our knowledge of the role of emergent self-regulating mechanisms.

Finally, the constitution of collective forums for problem solving has been recently introduced in some countries; e.g. collaborative public management. The argument that public organizations are closer to the public and, consequently, more accountable for their actions was confirmed in the case of the PCA. However, the network coordinator’s intentions were not fulfilled, as some organizations did not became publically accountable. Even though the network coordinator has taken the lead and become publically accountable to set the example to other organizations, reciprocal behaviour
did not occur as expected. Individual free-riding behaviour persisted due to higher material interest motivations in several of the organizations involved in the multilateral relationship. Studies on this particular issue could contribute to public policy understanding of the role of more powerful individual organizations and how to encourage more collaborative behaviour through the use of collective MCMs.
Third Paper: Third parties and the control of networks by a coordinator: the case of the dockers pool crisis in the Port of Aveiro

Abstract

The conception of networks as being self-regulated through cooperation leads to a view of control as contradictory or even harmful, and even to the view that networks are uncontrollable. Arguably, both views can be contested in networks where a coordinator seeks to promote the network's objectives and, hence, to control the network. However, recent reviews in the management control literature argue that research has been focused on dyadic relationships and dyadic parties, neglecting the consequences of a more systemic view of inter-organizational relationships in the context of wider networks. Some authors have specifically called for research on the use of management control in networks that include third parties.

This third paper contributes both to systematize the understanding of the influence of third parties on control of the network by a network coordinator and to understand the actions and strategies conducted by the latter in order to keep the network under control in the presence of one, or several, organization(s) with whom that network coordinator does not establish a direct relationship.

Departing from a case study conducted in a network - Port of Aveiro, Portugal - the paper proposes a theoretical framework where reliance on third parties' inter-relational management control mechanisms influences the network coordinators’ use of control strategies whose aim is to control the network. When the network coordinator relies on inter-relational management control mechanisms there is system trust, which implies a relatively passive posture regarding network control. However, when the network coordinator does not rely on inter-relational management control mechanisms a more active role is adopted, and three strategies to control the network may be used: repair, reconstruction and substitution. These strategies include actions intended to fix relationships between third parties, to add relationships or to substitute relationships with the direct use, by the network coordinator, of management control mechanisms.
also found that the formation of reliance is influenced by the presence of control agents, as well as public, visible and transparent inter-relational management control mechanisms.

1. Introduction

The issue of management control in inter-organizational relationships (IORs) has been extensively addressed in the past two decades (Caglio and Ditillo, 2008; Berry et al., 2009), with the unit of analysis varying from dyads to networks. In dyads we find one-to-one relationships (e.g. a joint-venture or a strategic alliance between two organizations), one-to-one serial relationships in a chain (e.g. a supply-chain) or one-to-many relationships (e.g. several counterparts in one direction, like a seller and multiple customers) (Caglio and Ditillo, 2008; Lind and Thrane, 2010). Management control literature on dyadic relationships has adopted two different perspectives: a first one aims to identify the contingent variables that influence the use of MCMs; while the other one seeks to identify the consequences of the use of various configurations of MCMs (see Caglio and Ditillo, 2008; Berry et al., 2009).

Only a few studies, however, have adopted a network perspective, of contexts characterised by multiple interactions between organizations (Caglio and Ditillo, 2008). In fact, although suggestions for the adoption of a more systemic perspective when studying management control in IORs have been issued more than a decade ago (Frances and Garnsey, 1996), only recently a few researchers have tackled those suggestions. This gap seems to be problematic, mainly because a “…selective orientation in defining the unit of analysis has hindered the exploration of the impact that other actors and/or relationships have on the relationship(s) under analysis and on their differential influence, both on the relationship-specific cost accounting choices and on the overall cost and use of accounting controls at the network level” (Caglio and Ditillo, 2008, p. 885). In the same line, Berry et al (2009, p. 11) reinforce that “… only scant attention has been paid to how powerful external groups and institutions might also influence the design of hybrid control structures.”
Expanding the unit of analysis from dyadic relationships to the whole network raises the issue of control of the network. Authors who conceive networks to be self-regulated through cooperation envisage control as contradictory or even harmful; some even consider networks to be uncontrollable (Kenis and Provan, 2006). However, both views are contentious, especially in networks that include network coordinators. As argued by in both papers 1 and 2, a network can be considered a coordination form and, therefore, an object of control by a network coordinator, even though it includes processes of self-regulation. Furthermore, the network coordinator is generally responsible, or at least accountable, for network outcomes. Indeed, the coordinator can be legally accountable or have a mandate, formally or informally granted by network organizations, to be responsible for some key governance activities (Provan and Kenis, 2008). In general, the issue of control of the network is a key concern of the network coordinator. Therefore, the argument of Kenis and Provan (2006), that networks are uncontrollable since “tasks are supposedly conducted jointly by participants and, consequently the problem is that no single organization or individual has responsibility for network-level outcomes”, loses ground.

That networks, especially those that involve a coordinator, are controllable and controlled does not mean that such control is simple. Organizations’ multiple interactions can occur in a significant part of the network. For instance, there may be multiple counterparts relating in multiple directions, as in the case of a coordinator simultaneously handling multiple suppliers and multiple customers, who, in turn, also establish dyadic relationships between them. At stake is the whole network, including third parties to a focal organization, i.e., organizations that do not establish a dyadic relationship with that focal organization: competitors, unions, regulators, customers’ other suppliers and suppliers’ other customers. Although the potential influence that the presence of third parties has on management control has been suggested, such influence has, with the exception of a few recent studies, been neglected to a great extent (Caglio and Ditillo, 2008 Lind and Thrane, 2010). It is this gap in the management control literature that this paper aims to address.
2. Third parties and network control

For the purposes of this paper, MCMs are instruments or processes deployed by a network coordinator with the purpose of achieving network control, i.e., of influencing other organizations’ cooperative behaviour in order to achieve a desirable or predetermined network performance (Dekker, 2004). Each organization in the network has its own contribution to network performance and, therefore, from the network coordinator’s viewpoint, it is relevant that each organization behaves cooperatively in order to contribute to that performance. The use of MCMs can stimulate cooperative behaviour (Zajac and Olsen, 1993; Coletti et al., 2005; Mahama, 2006) and, when supported by adequate information systems, can tighten inter-organizational ties and reduce costs throughout the system (Frances and Garnsey, 1996). The appropriate use of MCMs can also increase the level of trust between organizations (Coletti et al., 2005). Indeed, the relation between MCMs use and the different types of trust in IORs - system trust, calculative trust, competence trust and goodwill trust - has been extensively discussed in management control literature (Langfield-Smith, 2008; Vosselman and van der Meer-Kooistra, 2009; Cäker and Siverbo, 2011).

Following Dekker (2004), MCMs in IORs can be of one of three types: outcome, behavioural or social. Outcome controls involve the use of performance measures to assess and monitor the outputs of operations and other actions. Behavioural controls involve the specification and direct monitoring of the expected behaviour (Langfield-Smith, 2008). Taken together, outcome and behavioural controls can be classified as formal controls (Ouchi, 1979; Dekker, 2004). In contrast, the third type – social controls – involves informal controls that imply a reliance on self-regulation (Ouchi, 1979) and are grounded on shared norms, values and beliefs (Langfield-Smith, 2008). Examples of the three types of controls in the context of IORs are (i) goal-setting, incentive systems and performance monitoring (outcome MCMs); (ii) rules and operational procedures (behavioural MCMs); and (iii) informal interactions, joint decision-making, social ties and events, meetings, negotiation of disputes, codes of conduct, senior management attitudes and style, and rituals (social MCMs).
In their turn, Mouritsen and Thrane (2006, p. 241) classify MCMs distinguishing between self-regulation and orchestration mechanisms: “Self-regulating mechanisms allow interaction and exchange to occur unobtrusively, while orchestration mechanisms involve structuring these interactions”. Self-regulating mechanisms are, thus, network controls that require only minimal active intervention by the public organization. Examples given of self-regulating mechanisms are transfer prices and fees to the network coordinator. Orchestration mechanisms are exemplified as segmentations of organizations into groups to smooth away internal competition, as well as social events.

Some studies go further, and seek to explain the factors that explain the deployment of specific types of MCMs. The insights of Dekker (2004) are relevant here: both the coordination of tasks (influenced by the degree of interdependence and task uncertainty) and appropriation concerns (influenced by asset specificity, environment uncertainty and the level of frequency) influence the design and implementation of both the formal and the social MCMs in IORs. Paper 1 studied the deployment of MCMs by a network coordinator in the context of dyadic relationships. Their conclusions were presented in the form of a theoretical framework that proposes that the use of these MCMs, or combinations of such mechanisms, is related to, and evolves in accordance, with two dimensions: the network coordinator’s assessments of other network organizations’ motivations to cooperate and its assessment of their contribution to network performance. Therefore, the research done in paper 1 contributes to an initial understanding of how and why a network coordinator adopts specific MCMs to control the network.

The focus of paper 1 is on bilateral MCMs, i.e., MCMs that are used in one-to-one relationships. But collective MCMs have also been studied. Collective MCMs are directed not to one but to a group of organizations to whom the network coordinator establishes a direct relationship. Changing the type of relationship from one-to-one to one-to-many has consequences in the mechanisms used to control the network, especially when at stake are actions that depend not only on the cooperative behaviour of a single organization but on the collective cooperative behaviour of two or more
organizations acting together. Collective MCMs are mechanisms that a focal organization deploys in the management of multiple relationships simultaneously. Examples of collective MCMs can be found in the management control literature: the value chain flow chart (Kajütter and Kulmala, 2005) or the technology roadmap mechanism (Miller and O’Leary, 2005). Paper 2 has shown that focal organizations may use bilateral and collective MCMs complementarily when they seek to promote control in IORs.

In general, thus, research that has approached the issue of management control in IORs has analysed dyadic or multi-dyadic relationships and the bilateral and collective MCMs that a network coordinator deploys in these relationships. However, one issue remains: networks can go beyond dyads and include indirect relationships with other, third, parties, i.e., organizations to whom the network coordinator does not have, in a specific point in time, direct access. And at least some third parties may be relevant - sometimes extremely relevant - to network performance. The actions of these relevant third parties, if not consistent with the network’s goals, may hinder the achievement of network control. This seems to constitute an important constraint to the network coordinator, whose role involves taking actions with the purpose of influencing network cooperative behaviour to achieve a desirable or predetermined network performance. Thus, the control of indirect relationships is also relevant in the study of control by a network coordinator. Literature seems to support this view: Thrane and Hald (2006) suggested that in a network perspective “[the] focus shifts from the dyadic relation to the overall holistic organizations of the network of relationships between entities in the field.” (pp. 294-295). This suggestion has recently been reinforced by Lind and Thrane (2010, p.72), who have called for research to “comprehend the systemic characteristics” of networks that include “third parties, such as the competitors of the focal firm, customers’ other suppliers, suppliers’ other customers, regulators and trade unions into account”.

Obviously, adequate structures or forms of network governance may be in place, and the lack of direct control on third parties may not be problematic. As noted in papers 1 and 2, market-based network governance forms will do in some situations.
Mechanisms such as those of price formation and competition may ensure the network coordinator that there’s a minimal level of network functioning. This relates with Mouritsen and Thrane’s (2006) concepts of orchestration and self-regulation management control technologies. When network organizations’ rely on other organizations’ mutual controls, one can say that self-regulation MCMs are effective among network organizations. When network organizations’ do not rely on other organizations mutual controls – “self-regulating mechanisms are fragile” – they may, so the argument goes, take actions that intensify the deployment of bilateral and collective MCMs – “orchestration mechanisms”.

But it is possible to conceive that in some situations orchestration mechanisms will be ineffective or even unavailable, i.e., the bilateral and the collective MCMs deployed by that coordinator may not be effective in influencing third parties' cooperative behaviour. Here, alternative strategies of control must be undertaken by the network coordinator. The study of these strategies for network control have been absent from the literature, a gap that the present paper seeks to fill (see figure 7).
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<td>Definition</td>
<td>Instruments or processes deployed by a network coordinator in order to lead second parties to cooperate in achieving the desired or predetermined network performance (see Paper 1).</td>
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Figure 7: The paper’s problem

Taken literally, the term ‘third parties’ means network organizations that are positioned in a third level in relation to the focal organization. Of course, other "more distant" network positions can be identified. For instance, Kajütter and Kulmala (2005) and Chua and Mahama (2007) have noted the influence of “fourth parties” in buyer-
seller relationships. I will adopt an extensive classification including in the term “third parties” all organizations that do not establish dyadic IORs with the focal organization.

Key managerial issues pointed in the management control literature as opportunities for further research include the study of indirect effects, dynamics and “risk and opportunities in the wider chain: How are our suppliers involved with our customers, what are the risks from our suppliers’ suppliers?” (Lind and Thrane, 2010, p. 75).

One theoretical clarification is of order at this point, regarding the several types of networks that are identified in the literature. For instance, network types can be bounded and unbounded (Kraus and Lind, 2007), and it is necessary to clarify what third parties are under the light of these different network types. Research on complex networks has presented examples of third parties (e.g. “suppliers’ other customers”) but not a definition. Also, we cannot find a definition of third parties in research on bounded and unbounded networks. One may infer that in bounded networks third parties should be any organization that does not have a direct relationship with the centre of the network. Unbounded networks do not have a centre (Kraus and Lind, 2007), but, even so, by taking the perspective of a departure point, third parties can be seen as any organization that does not have a direct relationship with the organization positioned in that departure point. So, it seems that an operational definition can be proposed, based on the network position of third parties. This paper will simply consider a third party as any organization that does not have a dyadic relationship with a focal organization that, in the circumstance, is the network coordinator.

Another important issue (one that has often been neglected in the literature) concerns the type of relationship employed in the definition of the position of other organizations towards a focal organization such as a network coordinator. Arguably, we can even have different networks according to the type of relationship at stake. Borgatti and Foster (2003) advance this view when they state that “each relation defines a different network (e.g., the friendship network is distinct from the advice network, although empirically they might be correlated)” (p. 992). Provan et al (2007) concur: “network members can be linked by many types of connections and flows, such as information, materials, financial resources, services, and social support” (p. 482). For
the purposes of this paper, network relationships will be defined according to a criterion which is especially instrumental given the purposes of my research: the control relationship between the organizations under analysis. Under this criterion, third parties are those organizations with whom the focal organization does not establish - in a certain moment at least - a direct relationship of control. This means that the focal organization is not currently able to influence or shape the decisions, and thus to ensure cooperative behaviour, of those network organizations, through direct control mechanisms (of a formal or a social type). This inability may have several reasons: for instance, the focal organization may not have the authority (granted, for instance, by a legal or contractual mandate) to deploy control mechanisms. Also, access (be it formal or social) to ‘distant’ organizations may be simply constrained. Finally, and in a more dynamic stance, the focal organization may have failed in the past to deploy strategies capable of granting access to those ‘distant’ organizations and of enabling their control: of course, this also means that, in the future, direct access may be achieved if adequate strategies are pursued.

My aim is to understand the actions and strategies conducted by the network coordinator in order to keep the network under control in the presence of one, or several, organization(s) with whom that network coordinator does not establish a direct relationship. Literature provides some (few) insights on the issue. Frances and Garnsey (1996) illustrate how a supplier-retailer system could influence third parties, including labour agencies, international suppliers and consultants. Taking a systemic perspective, they argued that MCMs can, when supported by adequate information systems, tighten inter-organizational ties and reduce costs throughout the system. Miller and O’Leary (2005; 2007) used the term ‘mediating instruments’ to refer to “those practices that frame the capital spending decisions of individual firms and agencies, and that help to align them with investments made by other firms and agencies in the same or related industries.” (Ibid, 2007, p. 702). Their research focused on the use of a technology roadmap mechanism in the establishment, coordination and change of network organizations' investments and business expectations, including third parties such as government agencies, universities, competitors and complementors. Kajütter and Kulmala (2005) studied open-book accounting in a supply-chain where this practice was
not limited to the focal organization's dyadic relationships. In one case study – a mature supply chain – the focal organization's suppliers were expected to transfer open-book accounting practice to their own suppliers, who in turn would transfer this same practice to their suppliers, and so on. The main objective was to identify cost reduction opportunities and a *Value Chain Flow Chart* supported the inter-organizational cost management in the whole supply-chain. In the same perspective, Tomkins (2001) argued that trust in dyadic relationships can influence trust between second and third parties.

The potential influence that the presence of third parties has on management control has been suggested in the cited studies. However, that presence has not been addressed in a network perspective that includes a theorization of the systemic characteristics of how third parties influence network control (Caglio and Ditillo, 2008; Lind and Thrane, 2010). It is this theoretical framework that the present paper seeks to develop. Starting from the viewpoint of a focal organization acting as a network coordinator, the paper's main question is: how does the presence of third parties influence the network control by a focal organization? This involves an important extension of previous research: an enlargement of the boundaries of the study of control from direct to indirect relationships and, in general, a more comprehensive view of the network of relationships and of network control.

3. Methodology

The present paper reports on a case study conducted in the Port of Aveiro, Portugal. Ports are networks in which multiple independent organizations, with their own individual interests and objectives, work together for a common goal: to provide competitive port services (van der Lugt and de Langen, 2008). Specifically, ports can be classified as mixed-type networks in which one organization – usually a “Port Authority” – acts as a network coordinator whose aim is to make sure that collective goals are pursued. In such mixed-type networks a network coordinator assumes a coordinating role which is aimed at stimulating cooperation within the network and at
ensuring that network members make adequate contributions to network performance (Torfing, 2005). As such, the network coordinator takes responsibility for key governance activities, leaving other activities to the network members. The case study research method was selected due to the research focus on “how things work in a particular context” (Mason, 2002, p.1). Also, this method is consistent with the holistic perspective adopted in the research. Indeed, it is by addressing a “wider network of interconnections” (Berry et al, 2009, p. 9) that I expect to study the characteristics of what constitutes the foundations of network control by the network coordinator. Therefore, I adopt an open and multilateral perspective including not only the network coordinator's viewpoint but also other network organizations’ information, whenever I had access to this information. By using several network organizations as sources of information I aimed at a broader understanding of the whole effects of MCMs. In this way, I sought to attain a holistic picture, comparing other network organizations’ viewpoint with the network coordinator's one.

A transformation process which took place in the Port of Aveiro in 1998 has required the Port of Aveiro's Port Authority (henceforth, PAPA) to become more actively involved in coordinating the port’s activities. This provided an obvious starting point for my research and, consequently, my focus is on the period between 1999 and the present. Direct observation of events (e.g. port seminars and fairs) and meetings (some with the active participation of the PAPA, some not) were relevant sources of information. I also gathered information from interviews, informal discussions and documents. Various types of ‘hard data’ were collected from the PAPA: contracts, licences, internal memos and reports, including communications and agreements between network organizations. These are all public documents that can be consulted on request.

I started with a detailed analysis of various aspects of the network governance model, including the PAPA’s legal competences, the different types of network organizations involved in the Port, and the relationships established between the PAPA and other port organizations. This first stage was conducted mainly on the basis of documents. Among these, one document was of particular importance: the Port of
Aveiro's Strategic Plan. This document was produced with the participation of several network organizations. A total of forty six meetings between the PAPA and network organizations were held between September 2005 and April 2006, and a final and global meeting concluded the document's preparation. The Strategic Plan was key to attain the main research objective at this stage: to identify each network organization, its function and position in the network, and its relationships with other network organizations. In order to better understand these relationships, two preliminary open-ended interviews and five informal discussions were held between August 2008 and July 2009 with two PAPA's Board Presidents (period of board membership for both: 1999-2002 and 2005-present) and with one PAPA manager (period of managerial activity: 1988-present).

After this first stage of documental analysis, interviews and informal discussions, I felt I had an adequate view of the whole network of relationships and I was able to identify second and third parties to the PAPA. Also, by this time I had already gathered information on relationships and events that might be of special interest to my research. Specifically, my analysis was to focus on a series of events that took place in the Port of Aveiro, related with a labour problem that unfolded and gained prominence in recent years, culminating in a labour crisis in the Portuguese port sector that had considerable impact on the media last December 2011. The richness of the story - which I label ‘the dockers pool crisis’ - is sufficient to explore and develop a set of theoretical insights whose systematization is conducted in subsequent sections. Indeed, the case provides the opportunity to understand the influence through time of third parties on network control. Also, it allows for the consideration of types of third parties not usually found in management control literature, such as unions, work-force suppliers, national regulators, and associations. These are the types of organizations that Lind and Thrane (2010) advance as promising objects of research, expanding the usual focus on supplier-customer relationships.

Additional interviews were held between January and April 2010. I re-interviewed one PAPA board member and the aforementioned PAPA manager, and conducted new open interviews with two PAPA managers (period of management activity: in one case, 1998-present; in the other: 1996-2009). These interviewees were selected due to their
direct involvement in PAPA’s decisions and in the relationships with other network organizations involved in the dockers pool problems. The main purpose of these interviews and discussions was to confirm my analysis and interpretation of the various documents. At this stage I had identified relationships involving third parties, and had a preliminary identification of third parties' influence on the network control conducted by the PAPA. The next stage would be an exploration of the how. In this process, I had to be focused on the identification of patterns of network relationships through time. To achieve this, I had to include and consider the viewpoint of network organizations other than the PAPA. Information from some network organizations, including third parties, had been gathered from documents such as agreements between ‘distant’ network organizations – including agreements between third and second parties - that were communicated to the PAPA. These communications include the positions taken by those network organizations and some of the official reasons that sustained those positions. These were also complemented with direct observation of some events: for instance, I observed some of the events that took place in the summer of 2009 when a dockers’ strike occurred. This observation included on-time access to communications, preparation of draft agreements and meetings between the parties involved in the dispute. In particular the observation of meetings allowed a better understanding of the motivations of each party, as some of the more ‘un-official’ motivations were only shared in meetings and were not completely clear in the formal communications that I had access to in the start of my research.

As I started writing down my case study analysis, the systemic consequences of network relationships involving third parties became clearer, not least since the time span of these consequences was larger than initially expected. In order to better understand these consequences, I came back to the data, not only to recall information previously gathered from the involved third parties (e.g. information gathered by me on a previous conversation held in 2006 between myself and one National Regulator manager), but also to observe additional events during the period. Documents collected by the PAPA from relevant organizations in the events under analysis - communications, agreements drafts, meetings records and notes regarding the National
Regulator, the Dockers Union and Port Operators - were also included in the research file.

One final methodological note is of order. I was appointed as the Chief Financial Officer of the PAPA in April 2005. In my view this does not constitute a crucial problem, as much of the analysis was based on documents which relate to activities and decisions outside my area of responsibility. Furthermore, I attempted to support my analysis and interpretations through comparisons of the various documents and through triangulating, i.e., through comparison of the documents with the interviewees’ explanations. It should also be noted that my position in the PAPA had some important advantages: for instance, it allowed me to be present in a number of meetings between representatives of the various organizations under study and to directly observe events, during the period between April 2005 and June 2011. Notes of these meeting were taken, and had a real contribution to my interpretations and conclusions.

4. Third parties and network control by the PAPA - the case of the dockers pool crisis

Dockers pools are organizations that manage stevedores’ work force in ports. At Port of Aveiro, the dockers pool (also known as ETP) concentrates 85% of the total stevedores’ work force and is a legal association with 4 owners: the stevedores union (dockers union) and 3 port operators that are private companies. Port operators are in-charge of port operations, such as loading cargoes to vessels. Each day or week port operators request a number of stevedores to perform port operations, and pay a price to the dockers pool.

As illustrated in figure 8, the PAPA does not possess any formal authority regarding the dockers pool's main activities. Maximum prices are approved by the national regulator on an yearly basis. Also, the national regulator has the competence to approve the number of stevedores that can be registered in each dockers pool. Work organization

1 In Portugal, dockers pools are usually owned by port operators.
is of the responsibility of a general manager, nominated by the dockers pool's owners. Quantity of service depends on port operators' decisions. In these relationships, illustrated by the arrows in figure 8, the PAPA does not have any direct involvement. Of course, the PAPA is generally concerned with the dockers pool, which is clearly a relevant player in the port, with an important contribution to network performance. As a PAPA board member stated:

“It is not only the price impact on port competitiveness. Port operation represents 80% of total port price and 50% of that are labour costs. It is also the image of the port to our customers. Dockers are associated with labour problems and any news about a dockers pool labour problem can create a bad opinion about the port and cargoes will move to other ports”.

Figure 8: Network of relationships between the PAPA and organizations related with the dockers pool

In any case, as we saw above, there may be situations in which the network coordinator recognises that the network – including third parties – is functioning normally and assumes a distant stance, relying on market-based network governance. This seems to have been the case early in the period of my study.
4.1. Reliance on inter-relational MCMs and the prerequisites for this reliance

Up until about 2006, the relationship between the PAPA and the dockers pool was established through intermediaries, namely through the port operators. As represented in figure 8 above, the dockers pool and the stevedores union were third parties, hence out of direct control. This was true in formal but also in informal terms:

“The leader of the local stevedores union had a high influence on the management of the dockers pool and was a reserved person who avoided open discussion about their issues.” (PAPA's board member)

However, and despite the relevance of the dockers pool for port operations, the PAPA seems to have recognised that a situation of equilibrium was in place between 1999 and 2001 and that those relevant third parties were under control. There was a reliance on the MCMs established between the national regulator and the dockers pool. The perception that the national regulator would be capable of effectively controlling the dockers pool – supported, of course, by the absence of major problems – was obvious during this period:

“We knew that the dockers pool sent its price proposals to the national regulator for approval on an yearly basis. As no news about increase of prices was put on top of the table, we assumed that the national regulator was doing the job that it was legally expected to do.”(PAPA’s manager)

This insight relates with both papers 1 and 2 arguments that a network coordinator can rely, in some circumstances, in more market-based network governance forms. In general, and besides the mobilization of bilateral and collective MCMs, the case suggests that a network coordinator acknowledges the existence of mutual controls between network organizations and assesses the respective effectiveness. I will term these as inter-relational MCMs, i.e., instruments or processes deployed by any network organization (except the network coordinator) in their attempts to influence other network organizations to cooperate in achieving desirable or predetermined outcomes.
This definition is coherent with others presented in the management control literature (Dekker, 2004).

The unfolding of the dockers pool crisis, however, soon changed the perception in the PAPA that inter-relational MCMs were effective. In 2001 a labour conflict took place in the port between the stevedores union and port operators. The PAPA was called to be present in meetings, with the status of an observer. These meetings were coordinated by the national regulator. A final agreement was established between the parties, but the port was threatened of strike for several weeks. In subsequent years (2001-2005), news of disagreements between port operators and the stevedores union reached the PAPA from time to time. Also, some port customers complained about problems with stevedores, regarding issues of lack of productivity and flexibility, and price increments. All these events led the PAPA to gradually acknowledge that the level of cooperation by the dockers pool was not adequate and, thus, inter-relational MCMs were becoming ineffective. This created awareness in the PAPA that a more proactive approach towards control of the dockers pool was desirable. The PAPA had to be able to better understand problems and to influence solutions to conflicts.

4.2. Loss of reliance on inter-relational MCMs: strategies to re-establish network control

When third parties are not ‘naturally’ under control given the functioning of the ‘market’, i.e. when an adequate level of motivation to cooperate is not ensured by inter-relational MCMs in place, the network coordinator is faced with a problem. The whole story of the ‘dockers pool crisis’ after 2001 is marked by a succession of actions, by the PAPA, to respond to events, seeking to re-establish control in the port. Concepts related with the ‘mobilization of MCMs’ (be they of a bilateral or collective type) are, in the circumstance, insufficient to theoretically frame my analysis. The dockers pool crisis seems to reflect at least three approaches adopted by the PAPA to solve control problems in relation to third parties: I will label them substitution, repair and
reconstruction. All strategies departed from the recognition that inter-relational MCMs were no longer effective in keeping third parties under control.

*Substitution* constitutes an expectable reaction from the part of a network coordinator faced with problems to control third parties: to seek to replace indirect inter-relational MCMs with direct – collective or bilateral – ones, i.e., to turn third parties into second ones. Management control literature has already hinted at this kind of approach. Miller and O'Leary (2005) described how network organizations that started to be third parties became directly related with a network coordinator. The authors noted that in a situation where third parties had lack of confidence in the information provided, a focal organization – Intel – implemented specific dyadic actions, “in the form of technical assistance and venture capital to such firms” (Miller and O’Leary, 2005, p. 176).

Several similar examples were found in my case. In 2006, for instance, the process of preparation of the port of Aveiro's strategic plan created an opportunity for an open discussion about the port's strategic objectives. Together with other port organizations' members, the leader of the stevedores union was invited to the public presentation of the port's strategic plan, which took place in April 2006. This can be seen an example of a deployment of a collective MCM of a social type. Furthermore, the leader of the stevedores union was invited to a direct conversation with the PAPA managers, and opinions were exchanged. Both parties agreed that these meetings were useful and should continue in the future. This created a direct relationship and an opportunity for the PAPA to start exchanging information with the stevedores union and also with the dockers pool.

A second example concerns the involvement of the dockers pool – from 2007 on – in yearly meetings with the PAPA, where prices were discussed and financial information was shared. This practice was triggered by a request by the PAPA, in 2006, for the national regulator to send dockers price information to the PAPA prior to its approval. This procedure was then formally adopted by the national regulator, who
started issuing an annual request for an opinion on proposed prices from the PAPA's part. According to an individual who was a national regulator manager at the time:

“We are sending information because we have the opinion that prices are very important for port competitiveness and also because we feel that by involving the [PAPA] in the approval process our own decision will be taken with a more solid support. Let me say that it is also our vision that a problem with prices will benefit from a more local intervention from the [PAPA].”

In 2007, an extraordinary price increase request led the PAPA to establish direct contact with the dockers pool management. During this process, both parties became aware that coordination of price policy could result in mutual benefits. These mutual benefits were described by the PAPA board president in the following terms:

“(…) we would have the chance to influence any extraordinary increase request (…) and they would have the guarantee that we would not give any negative opinion to the national regulator that could result in delays or even in the request being disapproved”.

From then on, the dockers pool management requested the aforementioned yearly meeting in order to present their proposal prior to its sending to the national regulator. In these meetings, discussions focused on the impact of price increases on port competitiveness, but other issues – such as port investments – were discussed as well, and there was an informal (oral) exchange of information on cost evolution, financial statements and year budgets. In short, bilateral MCMs were established between the PAPA and the dockers pool from then on.

This establishment of bilateral mechanisms was clear when, in 2009, another labour problem occurred. Key to the problem was the fact that the dockers pool was not generating sufficient revenues to support total labour costs. Dockers pool management, mostly influenced by port operators, proposed wage decreases. The stevedores union contested the dockers pool management and pressed for a different solution. Both the
national regulator and the dockers pool requested the direct help of PAPA, not as a mere observer (as it had been the case previously), but as an active player in negotiations. Meetings and contacts were held. Each meeting had a meeting summary, prepared by the national regulator and by the PAPA. After signed, this summary would become a list of actions to be taken. At the end, however, a final agreement was not reached, and the stevedores union entered into a strike that brought the port to a halt for 3 weeks. Even during the strike, though, direct communication was maintained between the PAPA and the leader of the stevedores union: this had not been the case when previous labour problems had occurred. Clearly, a direct relationship had been established with both the dockers pool and the stevedores union.

The willingness of the dockers pool to establish these meetings had been, in turn, shaped by an important strategic move by the part of the PAPA: this second move was related to the second strategic approach which I could identify in the case. Similarly to substitution, a strategy of repair is also triggered by the recognition that inter-relational MCMs in place are not sufficiently effective in leading relevant third parties to cooperate. However, rather than solving this problem by substituting these MCMs by alternative (bilateral and/or collective) ones, the strategy of repair aims to fix or repair those inter-relational MCMs. The way the PAPA became involved in the process of pricing and approval of labour conditions between the national regulator and the dockers pool in the period 2006-2007 (see above) provides an example of a strategy of repair. The PAPA was purposeful in its request for price information, which in turn led the national regulator to ask for the PAPA’s more active involvement. In this circumstance, the PAPA did not promote direct control on the dockers pool, but rather on the relationship of control established between the national regulator and the dockers pool. Another example of a strategy of repair was present in the relationships established between the PAPA and the two groups of dockers pool associates: port operators and the stevedores union. Facing a divergence of opinions about the way to solve dockers pool financial and labour problems, the PAPA established contacts with

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2 Although these are distinct organizations, stevedores union was representing the part of dockers pool associates that did not approve of a decrease in wages. To defend their interests they were, this way, trying to directly relate with the PAPA.
both parties and tried to intermediate the conflict between them. Finally, a strategy of repair was visible when some industrial customers demonstrated concerns to the PAPA about the potential consequences on port operation’s prices of any increase of the dockers pool prices. The PAPA informally ensured those port operator’s customers that problems would be solved and no negative consequences would arise.

The unfolding of the crisis led the PAPA to take actions that seem to configure a third type of strategic approach. I label this approach reconstruction, since it involves an attempt to intervene on the very structure of control relationships that constitute the network. Arguably, substitution may be seen as a kind of reconstruction, since it involves the creation of new relationships in which the coordinator is directly involved. However, the concept of reconstruction I wish to advance implies the creation of relationships of control in which the coordinator is not directly involved. From 2009 onwards, when the dockers pool crisis reached its peak, most of the PAPA’s strategic moves seem to have been of this last kind. At stake were successive attempts to involve new actors in the network. For instance, during the strike in 2009 both PAPA and the national regulator asked for informal actions by the government, such as conversations with port operators' shareholders. These shareholders had interests in other ports, and even in other national economic sectors, which meant that the government had an influential position towards them. Indeed, at the end of the 3 weeks, when the strike came to an end, port operators agreed on a reinforcement of the dockers pool's financial resources, and injected the cash necessary to pay wages.

A second example of a reconstruction strategy was evident in early 2011. Financial problems with the dockers pool had persisted throughout the year 2010 and, in January 2011, the Aveiro Port Operators Association (APOA) asked for the PAPA's financial support in a meeting held in January. In APOA's view, the dockers pool’s financial problems were now due to an excess in the number of stevedores, and so the dockers pool would need a financial loan to finance the dismissal of a number of stevedores. The PAPA was requested to grant support to the loan operation in the form of a financial guarantee. Given the recent past history, the PAPA was well aware that a new conflict could probably carry systemic damage to the port. This led the PAPA to propose that
APOA involved other third parties in the solution, such as industrial customers, via the port community association (PCA)\(^3\). The argument used by PAPA to involve the PCA in the dockers pool issue was that it was the industrial customers that had the financial capacity to support the dockers pool. In an internal meeting, the PAPA’s board president commented that by involving industrial customers he wanted to enlarge the number of network organizations involved in the discussion of problems. The PCA was the ideal instrument for this to be achieved, since industrial customers, port operators – through APOA – and the PAPA were all members (contrary to the dockers union, the dockers pool and, of course, the national regulator). Additionally, as industrial customers were port operators’ customers, they would have the capacity to verify if price competitiveness would reflect dockers pool changes. Thus, industrial customers would become a third party committed to a solution that could be controlled by that same third party.

Further examples of a reconstruction strategy could be found in the PAPA’s subsequent actions in 2011. In February, the dockers pool’s general manager commented, in an open conversation which one of the researchers witnessed that:

“Tomorrow, the stevedores union will have a general assembly. We are out of cash to pay their salaries. We will face problems. We do not believe they will go into an open strike once more. But they may well enter into a slow-down strike.”

Slow-down strikes are well known in ports. They involve an intentional decrease in productivity due to ‘security reasons’. This slow-down strike in particular was expected to be followed by other Portuguese ports stevedores unions that were members of the same national federation of stevedores unions. According to that general manager, this would press port operators into a solution, because port operators' shareholders have interests in other ports, particularly in the port of Lisbon. Thus, the situation reached a

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\(^3\) The PCA is a port organization, with the legal form of an association, whose objectives are linked to port representation and lobbying. As a port association, all port organizations have the right to become members, and its management is of the responsibility of a board with executive functions.
point whereas not only could the dockers pool problem in Aveiro affect port operation in the port of Lisbon, but also some of the port of Aveiro's industrial customers that were simultaneously customers of the port of Lisbon. In fact, in a meeting in the end of February, the national federation of stevedores unions approved a “Solidarity Motion”, a copy of which was sent to the PAPA, stating that:

“The national federation of stevedores unions (...) commits itself to develop contacts and influence competent organizations, the government, the national regulator, the PAPA, the APOA and others (...) in order to achieve a quick solution”.

In a reaction to the “Solidarity Motion”, the APOA sent a letter to the PAPA asking for a structural solution to the issue. A copy of the same letter was sent to the government, to the PCA and to the national regulator. In the same week, the government sent this letter back to the PAPA asking for “due effects”. In the APOA's letter it was stated that:

"[Any solution] requires that all, union, the PAPA and port operators, should find urgent solutions to ensure [dockers pool's] financial viability and that it is not the future of Port of Aveiro that is at risk but its present”.

Later in the same month of February 2011, in a meeting between the APOA and the PAPA where financial information that evidenced the dockers pool's financial risks was presented, it was suggested by the PAPA that a consultancy organization should be hired to present a financial viability study of the dockers pool. The APOA agreed that the involvement of an independent party could contribute to a solution, especially since it could well introduce a common basis for further negotiations (which were frozen, at the time). However, all parties would have to agree on this. Also, one significant event occurred during the consultancy study: the suggestion by the national regulator and by the PAPA for the consultancy organization to interview the two port operators’ shareholders. This suggestion was accepted, and both board presidents increased their awareness of local problems and were in a sense involved in local management.
With the PAPA's request for industrial customers, the consultancy organization and the port operators’ shareholders to be involved, the network of control was reconstructed to become the one illustrated in figure 9 (in 2011 only two port operators were active in the port). While the arrows in figure 9 illustrate the dyadic relationships established between each party (beyond the relationships already described, National Regulator also approves prices in the Port of Lisbon) the dotted circles intend to exemplify some of the network expansions that occurred through time (as compared to figure 8).

Figure 9: Network of relationships between the PAPA and organizations related with the dockers pool (the situation in January 2011)
In general, my case study provides evidence on the means a network coordinator may deploy in order to achieve network control and, to some extent, on the factors behind the deployment of specific means. However, it does not provide evidence capable to support some assessment of the effectiveness of the means deployed since, up until the end of my study and indeed until 2012 at least, the network was not under control. The stevedores union agreed with the solution of early 2011, of hiring a consultancy firm as long as the PAPA and the national regulator were involved in the coordination of the process. But in the formal memo of the meeting in which such agreement was stated, the stevedores union’s representative declared that this agreement did not imply the approval of the study's conclusions. This cautious position seemed to reflect some lack of ease with the process, an interpretation that was confirmed in the following months. When asked to participate in a meeting between the consultancy and the stevedores union, the president of the latter replied that he wanted to check the contract before confirming he would attend the meeting. This was interpreted by a national regulator manager, as he confided to one of the researchers, as a signal of lack of trust by the union on APOA. In early 2012 it became clear that the situation was (again) out of control, as port operators filed for the bankruptcy of the dockers pool, formally arguing that the organization was not financially viable in current conditions. The consultancy work was used to support their judicial process. It was interesting to observe that in May 2012 it was the stevedores union that was requesting the PAPA to organize a PCA meeting where stevedores would, in the words of the union’s president, “ensure industrial customers that a financial viability plan would be presented and no price increase would be adopted”. Their purpose was to “re-establish industrial customers’ trust in port of Aveiro” which would contribute to the “return of cargoes to the port”. By this time, the crisis was obvious for all involved.

4.3. Discussion

Table 10 summarizes the events described in the previous sections and highlights the ways through which network control was pursued and, in some instances, achieved by the PAPA.
<table>
<thead>
<tr>
<th>Period of Time</th>
<th>Symptoms of control problems</th>
<th>Network control (by and with the PAPA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999-2001</td>
<td>Dockers pool has a high contribution to network performance (it represents 40% of total port price and has a potentially strong impact on port reputation). Low motivation to cooperate by the stevedores union, one of the dockers pool's owners.</td>
<td>Dockers pool outside the PAPA's control. Somewhat passive posture: belief that relationship between national regulator and dockers pool would suffice in keeping network under control. (Ever-diminishing) reliance on inter-relational MCMs</td>
</tr>
<tr>
<td>2001-2005</td>
<td>Labour problems in 2001 and numerous subsequent complaints.</td>
<td>Increasing awareness of need to adopt more proactive posture.</td>
</tr>
<tr>
<td>2006</td>
<td>Labour problems in 2001 and numerous subsequent complaints.</td>
<td>Indirectly involved in a first stage, PAPA's strategy was to turn third 'distant' parties (stevedores union and dockers pool) into second ones, deploying collective MCMs of a social type: per PAPA invitation, Stevedores Union participation in Port Strategic Plan also involving other port organizations.</td>
</tr>
<tr>
<td>2006-2007</td>
<td>Labour problems in 2001 and numerous subsequent complaints. Dockers Pool price increases with relevant impact on port price competitiveness.</td>
<td>Intensification of the PAPA's strategy of turning third ‘distant’ parties into second ones: Deployment of bilateral MCMs: yearly meetings between the PAPA and the dockers pool were held in order to analyse price proposals. Meetings included sharing financial information to support price proposals. The deployment of bilateral mechanisms was, in turn, enabled by the PAPA's intervention on the relationship between the dockers pool and the national regulator, by subtly becoming</td>
</tr>
<tr>
<td></td>
<td>Repair of inter-relational MCMs. In the circumstance, this repair led to substitution of inter-relational MCMs by bilateral MCMs</td>
<td></td>
</tr>
<tr>
<td>Period of Time</td>
<td>Symptoms of control problems</td>
<td>Network control (by and with the PAPA)</td>
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<tr>
<td></td>
<td></td>
<td><strong>Description</strong></td>
</tr>
<tr>
<td>2009</td>
<td>Dockers Pool financial problems and risk of strike of stevedores, with consequent impact on port operations and reputation.</td>
<td>involved in the process of pricing and approval of labour conditions (e.g. maximum number of stevedores that belong to Dockers Pool).</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>MCMs</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Substitution</strong> of inter-relational MCMs by bilateral and collective MCMs</td>
</tr>
<tr>
<td>2011 (January-June)</td>
<td>Dockers Pool excess of workers (stevedores) leads to an increase of financial problems, with possible impacts on port price competitiveness and risk of strike. Risk of spreading of Aveiro's labour problems to other ports, namely Lisbon</td>
<td>Intensification of the PAPA’s strategy of creating new relationships in the network, involving: Industrial Customers, via the Port Community Association. Possible Industrial Customers financial support to Dockers Pool reconstruction. Could increase port operators' motivations to cooperate, given that industrial customers would check whether price competitiveness would reflect a possible dockers pool reconstruction. Consultancy firm, who would develop a financial viability study.</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Reconstruction</strong> of the control network surrounding the dockers pool.</td>
</tr>
</tbody>
</table>
Period of Time | Symptoms of control problems | Network control (by and with the PAPA)
<table>
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<tbody>
<tr>
<td>(given strategy conducted by Aveiro's stevedores union)</td>
<td>Port operators' shareholders, who would be interviewed by the consultancy form and thus become more aware of the problems.</td>
<td>Description</td>
</tr>
</tbody>
</table>

Table 10: Control problems and network control

Arguably, the richness of the dockers pool case derives from the difficulty the PAPA had in achieving a situation of network control throughout the years. My research suggests that in other, less problematic, situations involving third parties, a network coordinator will prefer to rely on the normal functioning of the network, i.e., on inter-relational MCMs. It was indeed clear in my study that while the PAPA perceived that such MCMs were effective in controlling the dockers pool, a distant posture was the preferred one, as shown in the dotted arrow labelled with the number 1 in figure 10. Trust is at stake here. As already stated, there are different types of trust in IORs: system trust; calculative trust; competence trust and goodwill trust. The three later types of trust have been studied in dyadic relationships as inter-organizational assessments conducted between organizations (Langfield-Smith, 2008; Vosselman and van der Meer-Kooistra, 2009; Cäker and Siverbo, 2011). In the above terms, reliance on inter-relational MCMs seems closer to system trust. Inter-relational MCMs may be seen as ‘tools’ (instruments and processes) that support and allow for the emergence of system trust, albeit of a more ‘facts-based kind’ than prior definitions in the literature. I.e., the system trust that emerged in my case study is not merely based on a belief in formal institutions (e.g. law) or informal rules (e.g. national culture): rather, there is an objective assessment, an identification of the instruments and processes that support the system. Therefore, reliance is the network coordinator’s assessment that inter-relational MCMs will be effective to guarantee that a third party will cooperate in achieving desired or predetermined outcomes.
One issue that emerges at this point relates to the conditions for the aforementioned reliance: what conditions lead to an assessment, by the network coordinator, that inter-relational MCMs in place are effective, given the goals of the whole network? I.e., what leads the network coordinator to form an assessment that ‘the market’ is functioning? What leads him to trust the system? One obvious answer relates to available information regarding the functioning of the network: the perception by the coordinator, given the information he possesses, that the network is functioning effectively, is certainly the key condition for reliance. *A contrario*, it may well be argued that the evidence of problems in the functioning of the network is an important cause for the loss of that reliance. In the case study, the absence of major labour problems and also the relative stability in prices in the period 1999-2001 seem to indicate that the PAPA’s passive posture was explained by reliance in the functioning of the network and, thus, in a sense, a calculated posture.

Another insight relates to the concept of *motivation to cooperate* (see paper 1): the network coordinator will probably form a positive assessment regarding the expected
network functioning if he perceives that relevant organizations – including third parties – have a motivation to cooperate for the network’s goals. Up until 2001, this was the case in the dockers pool story: clearly, the PAPA formed a view that the features of the relationship between the dockers pool and the national regulator ensured that the former would cooperate, for instance, in the all-important process of price negotiation. This assessment of a motivation to cooperate by the dockers pool is arguably linked with the type of entity with whom the dockers pool related directly in that price negotiation. Indeed, some organizations are probably seen by a network coordinator as control agents (Zald, 1978). Control agents are network organizations that the coordinator trusts will effectively safeguard the cooperative behaviour of third parties. In my case study, the national regulator has the public mandate to approve dockers pools’ prices and legitimacy to apply sanctions. Obviously, this mandate is not granted by the network coordinator, but rather by law. This implies that inter-relational MCMs established between the national regulator and the dockers pool are characterized by publicity and visibility. Furthermore, and although the PAPA does not have any agency contract with the national regulator, it has a strong reliance that law will be objectively applied, which means that those inter-relational MCMs are also characterized by transparency. In general, my case study suggests that the presence of control agents capable of mobilizing public, visible and transparent MCMs, were crucial in the period 1999-2001. These seem to be prerequisites that lead to the formation, by the network coordinator, of an assessment of third parties’ motivation to cooperate and hence to a perception that the network is under control.

My case shows that when such an assessment is broken the network coordinator will, as expected, adopt a more proactive and strategic stance, as shown in the dotted arrow labelled with the number 2 in figure 10. I have identified three types of movements or strategies aimed at attaining network control: substitution, repair and reconstruction. It seems logical to suppose – and my case study provides evidence on that direction – that the last of these three strategies will be pursued only after the other two have failed, or if they prove impossible to deploy. The PAPA’s early strategic moves sought to repair the inter-relational MCM established between the national regulator and, simultaneously, to introduce direct – bilateral and collective – MCMs. It
was only when such types of control proved ineffective that reconstruction attempts were made. I do not feel, however, that the case study provides sufficient evidence to state, in definitive terms, that this ‘order’ will be followed in all situations. Further research may well clarify this issue.

The concepts of reliance, substitution and repair seem in general consistent with Mouritsen and Thrane's (2006) concepts of self-regulation management control and orchestration technologies. Mouritsen and Thrane (2006, p. 269) argue that “the process of setting up the self-regulating mechanisms is also an orchestration mechanism. In the process where ownership and distribution of financial flows are negotiated there is a strong orchestration effect because this is where the networking parameters are founded. Self-regulating mechanisms are fragile and from time to time they are renegotiated via orchestration mechanisms that are typically related to network-wide board meetings”. Therefore, the strategies of substitution and repair may be seen under a new light: substitution is a reaction to a crisis in the functioning of inter-relational MCMs (and thus a loss of reliance) that involves the introduction of orchestration mechanisms. Repair may be seen as a reaction involving the orchestration of self-regulation. My concept of reconstruction seems to move one step further, since it suggests that a network coordinator may also, in a sense, attempt to introduce new self-regulations that reinforce network control. Where Mouritsen and Thrane (2006, p. 269) suggest the “creation of relations in the network” as a type of orchestration mechanism, I argue that at stake is the creation of new inter-relational MCMs that constitute the objective of a strategy of reconstruction. Finally, my study provides an answer to Mouritsen and Thrane's (2006) question regarding the conditions in which orchestration mechanisms are preferred to ‘fragile’ self-regulation mechanisms: in the perspective of a network coordinator, ‘fragility’ means lack of reliance in inter-relational MCMs.

5. Conclusions

This paper addresses the issue of control of a network by a coordinator responsible, or at least accountable, for the outcomes of that network. The unit of analysis is
expanded from dyadic relationships to the whole network, including second and third parties in relation to the coordinator. Although the potential influence of third parties on management control has been suggested, such influence has, with the exception of a few recent studies, been neglected to a great extent. Not surprisingly recent calls for further research on this field have been issued: (Caglio and Ditillo, 2008; Berry et al, 2009; Lind and Thrane, 2010). This paper sought to address these calls by adopting a network perspective that includes a theorization of the systemic characteristics of how third parties influence network control by a coordinator. This involved an important extension of previous research: an enlargement of the boundaries of the study of control from direct to indirect relationships and, in general, a more comprehensive view of the network of relationships and of network control.

Third parties may be relevant - sometimes extremely relevant - to network performance and, consequently, the control of indirect relationships is an integral part of the study of control by a network coordinator. Alternative strategies of control may be undertaken by the network coordinator in such a context. The study of these strategies for network control has been also absent from the literature, a gap that the present paper sought to fill. Therefore, the paper contributes both to systematize the understanding of the influence of third parties on control of the network by a network coordinator and to understand the actions and strategies conducted by the latter in order to keep the network under control in the presence of one, or several, organization(s) with whom that network coordinator does not establish a direct relationship.

Departing from a case study conducted in a network – Port of Aveiro, Portugal – my paper proposed a theoretical framework where reliance on third parties' inter-relational MCMs influences the network coordinators’ use of control strategies whose aim is to control the network. When the network coordinator relies on inter-relational MCMs, a form of system trust supports a less active network control. However, when the network coordinator does not rely on inter-relational MCMs a more active role is adopted, and three strategies to control the network are used: repair, reconstruction and substitution. These strategies include actions aiming to fix relationships established between third parties, to add relationships or even to substitute relationships with the direct use of
MCMs by the network coordinator. I also found that the formation of reliance is influenced by the presence of control agents, as well as public, visible and transparent inter-relational MCMs.

A key message of the paper is that the adoption of an holistic perspective of ‘network control’ leads to a much more dynamic and strategic view of the way a network coordinator fulfils its role. Table 11, presented in the next page, concludes the paper with the characteristics of network control that fill the literature gap initially illustrated in figure 7. One important hypothesis is that the network coordinator, when confronted with the need to put ‘distant’ organizations under control, conducts strategies that do not merely involve the deployment of MCMs, but also (and especially) the creation of an adequate configuration of a network of relationships of control. Consequently, the approach not only includes the control of the network ‘by’ a network coordinator but also that which is ‘enabled’ by the network coordinator. The later involves the control that emerges from network relationships and – so I expect – is taken into consideration by the network coordinator and informs the strategies of control he conducts. Therefore, in the study of network control the emphasis is on “how control operates in the whole interconnected set of inter-organizational relationships” (Kraus and Lind, 2007, p. 285). To be short, a coordinator does not limit itself to control other organizations through the deployment of, or reliance in, MCMs, but it is also concerned with controlling the network of relationships of control itself: this he does by conducting a strategy which may involve, but is not constrained to, the deployment of MCMs.
### Bilateral MCMs

**Focal organization role**

- Network coordinator.

**Relationship settings**

- Dyads: one (network coordinator)-to-one.
- Multi-dyads: one (network coordinator)-to-many.
- Direct and indirect: One (network coordinator)-to-network.

**Main characteristic**

- Bilateral instruments or processes deployed in dyadic relationships between the network coordinator and second parties.
- Multilateral instruments or processes deployed by a network coordinator in a part (group) of the network.
- Strategies conducted by a network coordinator.

**Definition**

- Instruments or processes deployed by a network coordinator in order to lead second parties to cooperate in achieving the desired or predetermined network performance (see paper 1).
- Instruments or processes deployed by a network coordinator in order to lead groups of organizations in the network to cooperate in achieving the desired or predetermined network performance (see paper 2).
- Control strategies conducted by a network coordinator in order to lead network organizations, including third (‘distant’) parties, to cooperate in achieving the desired or predetermined network performance.

**Examples**

- Benefits sharing, contractual goals, quality rules, joint planning and open book accounting (Dekker, 2004; Chua and Mahama, 2007).
- Value chain flow chart (Kajütter and Kulmala, 2005), technology roadmap mechanism (Miller and O’Leary, 2005; 2007) supplier-retailer system (Frances and Garnsey, 1996), operational IT network system and network association.
- Encompasses the deployment of control mechanisms (bilateral MCMs and collective MCMs), the reliance on inter-relational MCMs, and also the creation of a configuration of a network of control that seeks to put all organizations (including third parties) under control.

### Collective MCMs

**Focal organization role**

- Network coordinator.

**Relationship settings**

- Multi-dyads: one (network coordinator)-to-many.
- Direct and indirect: One (network coordinator)-to-network.

**Main characteristic**

- Multilateral instruments or processes deployed by a network coordinator in a part (group) of the network.

**Definition**

- Instruments or processes deployed by a network coordinator in order to lead groups of organizations in the network to cooperate in achieving the desired or predetermined network performance (see paper 2).

**Examples**

- Value chain flow chart (Kajütter and Kulmala, 2005), technology roadmap mechanism (Miller and O’Leary, 2005; 2007) supplier-retailer system (Frances and Garnsey, 1996), operational IT network system and network association.

### Network Control

**Focal organization role**

- Network coordinator.

**Relationship settings**

- Multi-dyads: one (network coordinator)-to-many.
- Direct and indirect: One (network coordinator)-to-network.

**Main characteristic**

- Strategies conducted by a network coordinator.

**Definition**

- Control strategies conducted by a network coordinator in order to lead network organizations, including third (‘distant’) parties, to cooperate in achieving the desired or predetermined network performance.

**Examples**

- Value chain flow chart (Kajütter and Kulmala, 2005), technology roadmap mechanism (Miller and O’Leary, 2005; 2007) supplier-retailer system (Frances and Garnsey, 1996), operational IT network system and network association.

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**Table 11: Control concepts developed**
Conclusion

This chapter summarizes the thesis, outlines its main contributions to the management control literature, its limitations and suggests some opportunities for further research.

1. Summary of the thesis

The objective of this thesis has been to address the issue of control of a network by a network coordinator that uses MCMs to influence other organizations' cooperative behaviour. The thesis is divided into three papers that follow the research and learning process and whose aim was to address that research question in the context of three different types of IORs: bilateral, multilateral and indirect. The following thesis summary attempts to integrate the rationale of each paper in the context of the whole thesis. Although repeating some of the material already included in the individual papers, the dispersion of this material in several parts of the thesis justifies the presentation of an integrated thesis summary. This way, an overall picture will be achieved and the thesis' main contributions will become clearer.

Figure 11 is used to achieve that objective. The figure is not intended to add new insights on top of the previous chapters. It is simply an illustration of the network control process that the three papers explore, allowing to present the connections between the papers. It is presented from the perspective of a network coordinator who follows a process of decision making about the package of MCMs used to control the network.
Network Coordinator identifies the objective

Objective
(Network performance measurement)

Which organizations must contribute to achieve the objective?

Assessment of contribution to network performance

What are the motivations to cooperate in achieving the objective?

Assessment of motivations to cooperate

What is the type of relationship with the organization?

one-to-one
Bilateral MCMs

one-to-group
Collective MCMs

one-to-one/group
-to-third parties
Inter-relational MCMs

Network Control

Monitor

Is the objective being achieved?

YES

NO

Figure 11: Illustration of the network control process
An explanation of figure 11 can be presented as follows. To facilitate the identification of the stages in figure 11, each stage will be identified with bold letters.

In the context of networks, a network coordinator has several functions that together area aim at achieving the desired or predetermined level of network performance. Network performance is considered to be the network coordinators’ view of the desired or predetermined objectives of the network (Child et al, 2005). The identification of the objectives by the network coordinator constitutes the starting point of a network control process. Figure 11 illustrates the first stage using the singular for ‘objective’ instead of ‘objectives’, with the purpose of following a process of control of a single organization in the network.

Objectives are the desired or predetermined outcomes that the network coordinator wants the network to achieve. Outcomes are quantified by a network coordinator using network performance measures. Network performance measures “…may include many dimensions such as: efficiency, development capability, flexibility, adherence to specifications, network position, value as a source of learning, international presence, continuity” (Nooteboom, 1996, p. 995).

Network performance, as a whole, depends on the individual performance of each organization (Provan and Kenis, 2008). While network performance depends on the contribution of all organizations involved in the network (Brignall and Modell, 2000), each organization is likely to make a different contribution – both in terms of its nature and of its scope – to the network performance (Child et al, 2005). Thus, to control network performance, the network coordinator must, first of all, recognise the necessary contribution of each network organization (Nooteboom, 2009), i.e., which organizations must contribute to achieve the network performance?

Assessment of contribution to network performance is the network coordinator's assessment of the extent to which a network organization's actions can contribute to the achievement of the desired or predetermined objectives of the network (Child et al,
Network performance is assessed at the network level by the network coordinator (Provan and Kenis, 2008). The contribution to network performance will be assessed by the network coordinator as lower or higher according to the relative contribution that each network organization makes to the performance of the network as a whole. That is, each assessed contribution is compared, by the network coordinator, with the other assessments, so as to determine the individual organization's relative position in the network.

Network coordination comprises the actions taken by the network coordinator to ensure that each organization realizes its expected contribution to the network. As cooperation is necessary to achieve network performance (Smith, et al, 1995; Child et al, 2005), the network coordinator will seek to influence cooperative behaviour to achieve the desired or predetermined network performance. However, “motivational factors are (…) prerequisites of cooperation” (Smith, et al, 1995, p. 8), and each organization has its own motivations to (or not to) cooperate with the network coordinator and/or with the other organizations in the network. Consequently, the network coordinator will exercise its coordinating function taking into account its assessment of each network organization’s motivation to cooperate: what are the motivations to cooperate in achieving the objective?

Assessment of the motivation to cooperate is the assessment, formed by the network coordinator, of each network organization’s motivation to undertake the expected level of cooperative behaviour (Smith et al, 1995). Such motivation is a prerequisite for cooperation and it determines the cooperative behaviour which is actually undertaken (Ring and Van de Ven, 1994; Smith et al, 1995).

To sum up figure 11 so far, it illustrates that the exercise of the coordinating function by a network coordinator is shaped by its assessment of the motivation to cooperate and of the contribution to network performance of the various organizations involved in the network.
To exercise its responsibilities in coordinating the IORs in which it is involved, the network coordinator is in a position to select and use MCMs. The use of MCMs by a network coordinator is not restricted to securing cooperation between two organizations. The network coordinator is responsible for the performance of the network as a whole and, consequently, adopts a network perspective in selecting MCMs. That is, in order for the desired or predetermined network outcomes to be achieved, it is not only cooperation with the network coordinator which is important, but also cooperation with and between all the network organizations in the relationships established in the network.

Consequently, as illustrated in figure 11, to select the appropriate MCMs, the network coordinator must identify the type of relationship established with the organization at stake: what is the type of relationship with the organization? From the perspective of the network coordinator three types of relationships can be established with organizations that contribute to network performance: bilateral (one-to-one), multilateral (one-to-group) and indirect relationships (one-to-(one or group)-to-third parties).

To each type of relationship corresponds the use of a different type of MCM. Each paper in the thesis is dedicated to the study of the types of MCMs used in each type of relationship: the first paper studies bilateral MCMs in one-to-one relationships (bilateral relationships); the second paper studies collective MCMs in one-to-group relationships (multilateral relationships); the third paper studies inter-relational MCMs in one-to-(one or group)-to-third parties relationships (indirect relationships).

I follow with a brief explanation of each of the three papers, relevant to understand how a network coordinator uses each type of MCMs. After that I will come back to the next stage of figure 11. The following explanation is intended to provide the reader with the key messages and what have we learned in each paper and, consequently, in the thesis. A more developed presentation of these key messages is presented in the next section. The following presentation also addresses the three research questions set out in
the introduction of the thesis: (i) how does a network coordinator use MCMs to control the network in bilateral relationships (Paper 1); (ii) how does a network coordinator use MCMs to control the network in multilateral relationships (Paper 2); and (iii) how does a network coordinator use MCMs to control the network in indirect relationships (Paper 3).

The first paper explores the issue of control in the context of bilateral relationships. The objectives of the paper were: to identify the bilateral MCMs used by the Portuguese Port Authority in the Port of Aveiro in the exercise of its coordinating role; and to discern - on the basis of theoretical reasoning and empirical evidence - the factors which explain the nature and use of these mechanisms.

Several conclusions emerged from the study. A general conclusion was that my prior literature-based theorization was generally consistent with the case observations. That is, in mixed-type networks, the nature and use of MCMs by the public organization acting as a network coordinator is shaped by its assessment of motivations to cooperate and of the contribution to network performance of the various organizations involved in the network. Other more specific conclusions are encapsulated in a ‘coordination framework’, which relates those assessments to specific features of the MCMs. Crucially, my results provide insights into the role of public organizations which act as network coordinators in mixed-type networks.

The second paper explores the issue of control in multilateral relationships. In this type of relationship the network coordinator is concerned about the actions of other organizations in situations where those actions depend on the collective cooperative behaviour of two or more organizations, and not only on the cooperative behaviour of individual organizations. When facing a common objective, organizations in networks need to take joint actions and to act collectively. From the perspective of a focal organization, groups in networks can change the type of relationship from bilateral (i.e., one-to-one) to multilateral (i.e., one-to-group). Such a change has consequences for the mechanisms used to govern relationships.
In a network context where a network coordinator uses collective MCMs in its multilateral IORs and bilateral MCMs in its bilateral IORs, the second paper contributes: (i) to understand the nature of these collective MCMs; (ii) to assess the consequences of the use of these mechanisms; and (iii) to explore how their use is related to bilateral MCMs. Regarding the nature of collective MCMs, the second paper develops a theoretical conceptualization based on existing literature and uncovers collective practices of network performance measurement, network cost management and social rewards (political and public recognition). Also, several consequences of the use of collective MCMs are identified, including the creation of a sense of community, trust, commitment, inclusiveness, public accountability and an expansion of the network of control. Finally, and based on the ‘coordination framework’, I conclude that collective MCMs are used complementarily to bilateral ones. The preference for a type of mechanism depends on the network coordinator’s assessments of other organizations motivations to cooperate and contribution to network performance.

Hence, the second paper contributes to a developed understanding of management control in broader inter-organizational contexts, as it expands the object of study from bilateral to multilateral relationships in the context of networks. Consequently, it also extends the scope of the study to the use by a network coordinator of both bilateral and collective MCMs.

The third paper explores control in indirect relationships, and specifically the use of MCMs in networks that include third parties. The paper systematizes the understanding of the influence of third parties on the control of the network by a network coordinator. It identifies the actions and strategies conducted by the latter in order to keep the network under control in the presence of one, or several, organization(s) with whom that network coordinator does not establish a direct relationship.

The paper proposes another theoretical framework that shows how control strategies used by a network coordinator to control the network are influenced by its reliance on third parties' inter-relational MCMs. Reliance is the network coordinator’s assessment that inter-relational MCMs will be effective to guarantee that a third party will
cooperate in achieving desired or predetermined outcomes. When the network coordinator relies on inter-relational MCMs there is system trust, which implies a relatively passive posture regarding network control. However, when the network coordinator does not rely on inter-relational MCMs a more active role is adopted and three strategies to control the network may be used: repair, reconstruction and substitution. These strategies include actions intended to fix relationships between third parties (repair), to add relationships (reconstruction) or to substitute relationships with the direct use, by the network coordinator, of MCMs (substitution).

I also found that the formation of reliance is influenced by the presence of control agents, as well as public, visible and transparent inter-relational MCMs. Control agents are network organizations that the coordinator trusts to effectively safeguard the cooperative behaviour of third parties. The case study suggests that the presence of control agents capable of mobilizing public, visible and transparent MCMs were crucial in influencing the network coordinator's assessments of motivations to cooperate.

Having explained each paper’s conclusions on how a network coordinator controls the network through the use of bilateral, collective and inter-relational MCMs, I now come back to figure 11.

The use of the three types of MCMs in different relationships enables the network coordinator to achieve network control. Network control encompasses the deployment of control mechanisms (bilateral MCMs and collective MCMs), the reliance on inter-relational MCMs, and also the creation of a configuration of a network of control that seeks to put all organizations (including third parties) under control.

Network control also implies that the network coordinator monitors the effective achievement of the network's objectives. Thus, the question "is the objective being achieved" underlies the following alternative steps in figure 11. If the objective is being achieved, network control is effective and no additional action is required. On the contrary, if the objective is not being achieved three courses of action may be taken, depending on the causes of that non-achievement. If there are problems with the
effectiveness of network control, the network coordinator reanalyses whether its relationship with the organization is the most appropriate to achieve network control. If not, a different relationship may imply different MCMs. If there are problems resulting from changes in the assessment of contribution to network performance and/or motivations to cooperate, the network coordinator must revise its assessments and decide on what the best MCMs are, given the new assessments. Finally, the problem can also be due to changes in the objective, which means that the network coordinator needs to reanalyse the whole flow of decisions illustrated in figure 11.

The next section will develop the key conclusions that figure 11 has introduced.

2. Contributions to management control literature: what have we learned?

To present the thesis’ contributions I start by presenting the main gaps identified in recent management control literature in the field of IORs. The objective is to demonstrate how the thesis contributes to fill some of these gaps and, therefore, to describe what I have learned from this study. Consequently, this section also identifies some of the limitations of my work that constitute the opportunities for further research which are presented in a subsequent section. Some repetition of the material in the individual papers is necessary to provide the reader with an integrated overview of the thesis’ contributions.

Recent studies have identified gaps in the literature of management control in IORs (Barretta and Busco, 2011; Berry et al, 2009; Caglio and Ditillo, 2008; Cäker and Siverbo, 2011; Chua and Mahama, 2008; Dekker, 2008; Langfield-Smith, 2008; Lind and Thrane, 2010; Miller et al, 2008; Vosselman and van der Meer-Kooistra, 2009, Windolph and Moeller, 2012). Caglio and Ditillo (2008) have presented a comprehensive literature review with the objective of identifying literature gaps and proposing topics for further research. Barretta and Busco (2011) have also presented opportunities for the study of control in the more specific field of IORs that involve public organizations, as is the case with the case study setting used in the thesis.
Table 12: Management control in IORs: some literature gaps

Table 12 illustrates the authors and the gaps they identify in management control literature in IORs. To facilitate cross-reference, I have numbered each gap with the same number of the following sub-sections and will now follow with a comparison of each with this thesis' conclusions.

2.1. Focus on control solutions and neglecting control problems

Caglio and Ditillo (2008) argue that the management control literature has focused on the study of control solutions, neglecting the study of control problems and of how they influence the former. Control problems are presented, by the authors, with recourse to several examples: managers in organizations may have incentives to free-ride to achieve their individual objectives and not the collective objectives (cooperation problems); sharing of benefits among organizations may not be fairly distributed (appropriation concerns problems); and interdependence between organizations requires some form of coordination (coordination problems). These control problems are drawn from transaction cost economics and agency theory (cooperation problems), traditional organizational contingency theory (coordination problems) and resource-based theory (appropriation concern problems). The focus on control problems “would allow management accounting scholars to integrate and compare the results reported in the literature that were developed with reference to different breadths of control, and to highlight some variables that are key in explaining controls configurations and that have
been neglected thus far in the management accounting field” (Caglio and Ditillo, 2008, p. 891). Proposed questions by the authors include: “What types of control solutions can be combined to solve a specific problem? At which level of intensity? Can complementarities of control solutions vary in sign depending on the intensity of adoption? Can different combinations of control solutions be effective under the same circumstances? Is there any ceiling to the effective adoption of control mechanisms of different kinds to solve the same control problem?” (Caglio and Ditillo, 2008, p. 892).

The issue of control problems and control solutions was addressed in this thesis in the context of three types of network coordinator's relationships: bilateral, multilateral and indirect. I follow with a brief introduction of the thesis' conclusions in each of those types of relationships and I then explore what the thesis allows us to learn on the issue of control problems and control solutions.

Caglio and Ditillo (2008) suggest that a focus on control problems can lead to a better understanding of how different control solutions are used. This idea is clearly supported by the case study that underlies this thesis: the control solutions deployed by the network coordinator were shaped by the network control problems it identifies. The third paper which follows the strategies deployed by the coordinator in response to actual problems emerging in the network is especially insightful at this level. But in general, the assessments made by the network coordinator on other organizations motivations to cooperate and contribution to network performance, and its consequences on the control solutions to ensure cooperation among organizations, reflects the focus of the coordinator on the avoidance of potential control problems.

The thesis does not focus only on the study of control problems, but integrates both control problems and control solutions. The ‘coordination framework’ proposed to understand the relationships between the network coordinator's assessments and the packages of bilateral and collective MCMs in use is a theoretical contribution that integrates both control problems and control solutions. The ‘coordination framework’ addresses the three control problems presented by Caglio and Ditillo (2008): cooperation problems; coordination problems; and appropriation concern problems. In
short, cooperation problems are the object of the network coordinator actions and the ‘coordination framework’ rationale considers motivations to cooperate as pre-requisites to cooperation. Coordination problems are identified by the network coordinator and taken into account in its own role in the network. Appropriation concerns are included in the assessment of material interests to cooperate.

The thesis also addresses the control problems that a focal organization faces in multilateral relationships. I propose and conclude that control problems in multilateral relationships can arise from problems of collective action. Collective action is the cooperative behaviour of a set of organizations to achieve a common goal. However, collective action does not always develop spontaneously and individual organizations can free-ride on the cooperative efforts of others, as a number of organizations are involved in multilateral relationships (Olson, 1971). Management control problems, like coordination requirements and appropriation concerns (Dekker, 2004) can arise as a consequence of collective action problems. And “… unless there is coercion or some other special device to make individuals act in their common interest, rational self-interested individuals will not act to achieve their common or group interests” (Olson, 1971, 2). Therefore, in the viewpoint of a focal organization, collective action problems become the object of control in multilateral relationships. The thesis concludes that collective MCMs are ‘special devices’ that can be used by focal organizations to solve collective action problems in multilateral relationships, i.e., instruments and processes deployed in order to influence collective action.

An integrated study of both control problems and control solutions was also done in the elaboration of the concept of network control, integrating not only assessments made by the network coordinator (control problems) but expanding the study of control to a wider network of relationships and control solutions. By expanding the study of control to include all relationships of a focal organization it was possible to learn that a holistic view of control is taken and identify strategies of control aimed at controlling the network of relationships.
Using the arguments of Caglio and Ditillo (2008), the thesis elaborates some conclusions regarding the relation between control problems and control solutions. I follow by recapping the theoretical development of those conclusions.

As stated in the ‘coordination framework’, when the (assessed) contribution to network performance is (relatively) low, network control is seen as adequate. However, when the assessed contribution to network performance is high, the bilateral control package is, in a sense, more intensive, in both its nature and use. Where possible (i.e., when the assessed motivation to cooperate is high), formal controls – including outcome bilateral controls – will be present in the control package. Finally, when the (assessed) motivation to cooperate is low, formal bilateral controls will be difficult to use or less effective, and consequently there will be a more intensive and proactive use of social controls.

When the assessed contribution to network performance is high, different sources of the network coordinators’ assessments of motivations to cooperate led to different bilateral control packages. When the assessments of a high motivation to cooperate are based mainly on material interests, the bilateral MCMs tend to be rather formal, but in IORs where similar assessments of (high) motivation to cooperate are based on bonds and ethics, social bilateral MCMs seem to be used more intensively. This observation is consistent with Nooteboom’s (1996) argument that the formation of bonds and the assessment of ethical values require at least some minimal experience and familiarity with the other organization. Nevertheless, even where there is such an experience and the assessment of high motivation to cooperate is based on bonds and ethics (i.e., goodwill trust), the simultaneous presence of a strong material interest is likely to imply the use of mainly formal bilateral MCMs. This conclusion allows me to extend Dekker’s (2004) conclusion that goodwill trust (or reputation) can mitigate the (need to) use of formal controls. The case study suggests that, where there is a strong material interest, this mitigation will only be effective if the goodwill trust is based on a solid history of past relationships.
The existing literature also suggests that where the motivation to cooperate is assessed as high, it is not essential, nor expected, that benefits will be distributed equally. What is essential is a belief, and a demonstrated commitment (grounded in bonds and ethics), that there will be an equitable distribution. As Miles et al (2005, p. 42) put it:

“Because of the shared belief that equitable (fair) outcomes will always be pursued, collaboration does not require continuous cost-benefit calculations”.

In such circumstances, there are likely to be social bilateral MCMs based on joint (or mutual) objectives (Dekker, 2004). Some have argued that trust and commitment among the parties in situations of high motivation to cooperate will lead to a higher reliance on informal bilateral MCMs based on social controls (Langfield-Smith, 2008; Miles et al, 2005). The case findings do not seem to support such arguments. It could be argued that in IORs in which the network coordinator assessed the contribution to network performance as high, it sought to include formal bilateral MCMs in contracts and other formal agreements whenever possible. Social bilateral MCMs were complementary to the formal bilateral MCMs. This is consistent with the conclusions of authors in the fields of strategic management (Poppo and Zenger, 2002) and management control (Tomkins, 2001; Mouritsen and Thrane, 2006). In some IORs whose organizations were assessed by the network coordinator as having higher motivations to cooperate and higher contribution to network performance, the network coordinator developed the package of formal and social bilateral MCMs over time. The formal bilateral MCMs created the stability necessary for reaching agreements and for establishing guidelines for the relationship. Subsequently, social bilateral MCMs were used together with the formal bilateral MCMs in order to handle change situations and to resolve problems created by the incompleteness of the formal agreements. In a sense, this contradicts existing literature that suggests that social bilateral MCMs, based on trust, have a moderating effect on the use of formal bilateral MCMs (Dekker, 2004). I found that the (pre-)existence of stable formal bilateral MCMs can contribute to higher trust and to commitment among the network organizations. Furthermore, the complementary use of social bilateral MCMs is a dynamic and interactive process that reinforces both trust and the formal bilateral MCMs.
Another idea of control problems is that opportunistic behaviour (cooperation problem) and appropriation concern problems can be managed using hierarchical controls to align incentives through appropriate monitoring mechanisms (see Langfield-Smith, 2008, p. 362) is debatable in situations where there is no explicit hierarchy. Consequently, the claim in transaction cost economics that governance structures can be used to manage opportunistic behaviour may not be appropriate in IORs where organizations cannot select their partners, but must accept and deal with the existing members of a network. In such IORs a different control package – with more emphasis on social mechanisms – may be needed to support the relationships. This conclusion provides an alternative perspective on Dekkers’ (2004) ex-ante and ex-post phases – i.e., before and after partner selection. Where there is no explicit partner selection process, the network coordinator has to assess the various partners and then choose an appropriate control package. This lends support to Langfield-Smith's suggestion that “TCE prescriptions need to be interpreted in the light of the broader control mechanisms which contribute to the overall control package” (2008, p. 362), and it stresses the adaptability which public organizations need to demonstrate in the context of mixed-type networks.

Coming back to Caglio and Ditillo’s (2008) three control problems (cooperation problems, coordination problems and appropriation concern problems), and considering the reasons for the network coordinator’s use of bilateral MCMs, the thesis provides evidence that, in the context of mixed-type networks, coordination and cooperation are key objectives, taking into consideration the network coordinator's role in such networks. While coordination and cooperation are crucial for the entire network, the network coordinators’ appropriation concerns appear on the right hand side of the ‘coordination framework’ presented in paper 1. As we saw, when the network coordinator formed assessments of low motivation to cooperate, but high contribution to network performance, appropriation issues became a major concern. In such situations I observed the intensive use of social bilateral MCMs which were aimed at influencing behaviour and achieving a fair distribution of benefits within the network. On the other hand, when there was an assessment of a high motivation to cooperate, it was the formal
bilateral MCMs which were used to address the appropriation concerns. Therefore, the same objective – to minimize appropriation concerns – can be pursued using different types of bilateral MCMs.

The concepts of trust and power may help to shed light on this issue. The use of formal bilateral MCMs was particularly intensive in those instances where the assessment of a high motivation to cooperate was based primarily on material interest, i.e., where trust was arguably lower. This supports the management control literature which argues that, in the absence of trust, appropriation concerns should be addressed through a more intensive use of formal bilateral MCMs (Dekker, 2004; 2008). In the case study, where the assessed motivation to cooperate was low, the network coordinator had to use social bilateral MCMs due to its lack of power. Organizations with assessed low motivation to cooperate but high contribution to network performance were empowered by the circuits of power which were in place; namely, the rigid long-term contract and the ability to divert cargoes to other ports, respectively. Here, the deployment of social bilateral MCMs can be interpreted as an attempt to re-establish a balance of power through the management of meanings, which is a potentially important dimension (or circuit) of power in its own right (Lukes, 1974; Clegg, 1989).

However, bilateral MCMs may not be efficient or effective in a multilateral relationship. In the case study underlying this thesis, the network coordinator also used collective MCMs. Consequently, this thesis also presents a theoretical framework that explores how a focal organization tries to solve collective action problems using collective MCMs of different kinds.

When studying the relation between the use of bilateral and collective MCMs, this thesis explores the relation between control problems and control solutions. Based on the ‘coordination framework’, I conclude that collective MCMs are used complementarily to bilateral ones. The preference for a type of MCM depends on the network coordinator’s assessments of other organizations’ motivations to cooperate and contribution to network performance. I found that: (i) in the mixed type network under
study the network coordinator uses various types of MCMs together, in complementary
fashion, in order to create a control package for the whole network; (ii) the use of
network MCMs, or combinations of such mechanisms, is related to, and evolves in
accordance to, the network coordinator’s assessments of network organizations’
motivations to cooperate and contribution to the network performance. Specifically, (iii)
when contribution to network performance is assessed as low, the evidence points to a
reliance on the functioning of the network ‘market’. This leads to the use of a minimal
and general structure of formal and social network MCMs, of a ‘Market Governance
Type’; (iv) when contribution to network performance is assessed as high and
motivation to cooperate is also assessed as high, I found evidence of a more intense use
of bilateral MCMs, albeit this use may be complemented by formal and social network
MCMs on a ‘as needed’ basis’, i.e., when the sole use of bilateral MCMs proves
insufficient; (v) when contribution to network performance is assessed as high and
motivation to cooperate is assessed as low, network MCMs seem to be preferred to
bilateral ones, they tend to be of a social rather than formal type, and they are focused
on specific parts of the network: this I labelled a ‘preferred and selective deployment of
social network MCMs’.

The complementarity and substitution of bilateral and collective MCMs evidenced
in the thesis allows me to question Olson’s (1971, 51) argument that “only a separate
and ‘selective’ incentive will stimulate a rational individual in a latent [larger] group to
act in a group-oriented way”. I conclude that the use of ‘selective’ MCMs – such as
bilateral MCMs – depends on the network coordinator’s assessment of motivation to
cooperate and contribution to network performance. However, in some multilateral
relationships – ‘common’ – collective MCMs will be sufficient. Following the same line
of thought, my conclusions reinforce and expand the argument that social rewards and
punishments may not be sufficient to influence cooperative behaviour (Olson, 1971;
Gächter and Fehr, 1999; Takács et al, 2008). Indeed, in this thesis it is shown that the
sufficiency or insufficiency of collective MCMs is related to the network coordinator’s
assessments and the actions – e.g. complementary use of MCMs – taken by that
coordinator as a result of possible inefficiencies are identified.
Additionally, what this conclusion also implies is that in management control research the use of existing theoretical frameworks in inter-organizational contexts different from those in which they were originally developed may contribute to the understanding of management control and thus be useful in developing knowledge. The ‘coordination framework’ may have been developed in a context of bilateral relationships, but it has also contributed to our understanding of the use of collective MCMs by a network coordinator.

Finally, the thesis also contributes to explain the reasons for the effectiveness, or non-effectiveness, of collective MCMs. The two illustrations provided in paper 2 are cases of a failed (PCA) and a successful (JUP) use of collective MCMs, in the viewpoint of the network coordinator. Collective action problems, such as the free-riding of Company P in PCA, influenced the failure of collective MCMs. In the JUP illustration it was the use of collective MCMs that influenced a change in the cooperative behaviour of one influential organization (Customs). This conclusion contributes to discuss the “cooperative ideal” that Barreta and Busco (2011, p. 216) identify, i.e., those situations in which “(…) management control practices enable cooperation among partners who are driven by different and sometimes opposing objectives”. I conclude that management control can influence organizations to become more cooperative (Customs) but can also be inefficient if an influential organization resist to cooperation due to its own individual interests (Company P). Furthermore, the consequences of these individual organizations’ behaviour, that the use of collective MCMs makes visible to other organizations, influenced collective behaviour.

In their effort to review and organize the growing literature in the field of control in IORs, Caglio and Ditillo (2008) have also identified some issues or control problems that have been neglected by management control literature (see table 12); these being: (1) the structure of interests; (3) the complexity related to the number of parties involved, the number of activities and the level of interconnection among them; and (3) the cognitional complexity of tasks. To these I now turn.
2.2. Structure of interests

The study of the structure of interests or the preferences of partners can, according to Caglio and Ditillo (2008, p. 893), lead to new casual models and “would contribute to explaining how to solve the cooperation problem and would innovate with respect to the universal assumptions of both transaction cost and agency theory (which tend to assume diverging interests of partners), and organization contingency theory (which tends to assume converging interests of parties)”. The authors explore the potential of studying the structure of interests to find if different control solutions are used in the wide variety of mixed motivational contexts. Additionally, the authors expect that their study also contributes to understanding some of the contradictions found in management control literature, namely why open book accounting fails in some circumstances and succeeds in others.

In this thesis I do not follow any assumptions of divergent or convergent interests of partners. The thesis innovates by concluding that interests vary and that the level of other organizations interests, as assessed by a network coordinator, influences the use of MCMs in IORs. Furthermore, the thesis confirms Caglio and Ditillo's (2008) proposition that different "types" of interests (e.g. assessment of motivations to cooperate based on material interests), lead to different control solutions. Elaboration on this conclusion was already presented earlier in this section. As already stated, the ‘coordination framework’ also shows that the same control solution cannot be used in all the network coordinators’ relationships independently of its assessments.

Finally, we have also learned that organizations might change their interests when they act individually and when they act together in a group of organizations, and that this change influences the use of MCMs. My study of the use of collective MCMs, as MCMs used to influence the cooperative behaviour of groups of organizations as a whole, has demonstrated that MCMs are used in relation to the network coordinators’ assessments of group behaviour. Furthermore, the use of network performance measures by groups of organizations establishes a basis for common goals that can be individually and mutually monitored and that influence behaviour in a network. Although the use of
network performance measures does not, per se, guarantee the achievement of the network coordinators’ objectives, it provides an instrument to assess individual contributions to network performance and incentives for self-regulating mechanisms.

2.3. Complexity related to the number of parties involved, the number of activities and the level of interconnection among them

Caglio and Ditillo (2008) also draw our attention to the focus of management control studies on one single specific type of relationship, neglecting that a focal organization develops several types of relationships with other organizations. This criticism is included in table 12, with the label of ‘Complexity related to the number of parties involved, the number of activities and the level of interconnection among them’. The focus on dyadic relationships can lead to the danger of assuming that relationships are managed individually – ‘link by link’ – neglecting that they are part of a wider network of interconnections. The present thesis studies the multiple types of relationships that a focal organization develops in a network. As already stated, the thesis starts with the study of bilateral, continues with collective and ends on third parties relationships. The study of control was made in all these types of relationships. Indeed, the final paper incorporates all relationships as an object of control through the concept of network control. I follow by recapping the thesis’ contribution to fill this specific gap.

As Caglio and Ditillo (2008) suggest, only a few studies have adopted this thesis’ network perspective on contexts characterised by multiple interactions between organizations. In fact, although suggestions for the adoption of a more systemic perspective when studying management control in IORs have been issued more than a decade ago (Frances and Garnsey, 1996), only recently a few researchers have tackled those suggestions. This gap seems to be problematic, mainly because a “…selective orientation in defining the unit of analysis has hindered the exploration of the impact that other actors and/or relationships have on the relationship(s) under analysis and on their differential influence, both on the relationship-specific cost accounting choices and
on the overall cost and use of accounting controls at the network level” (Caglio and Ditillo, 2008, p. 885). In the same line, Berry et al (2009, p. 11) emphasise that “… only scant attention has been paid to how powerful external groups and institutions might also influence the design of hybrid control structures.”

By expanding the unit of analysis from dyadic relationships to the whole network, this thesis raises the issue of control of the network. A first implication of my study is that MCMs in dyadic IORs can be used by the network coordinator as a means of managing the network as a whole. For instance, information sharing allows the network coordinator to identify the value chain of network organizations and to measure their performance, and this can contribute to greater visibility and to a better understanding of the effects and desirability of potential actions within the network. This seems consistent with Mouritsen and Thrane’s (2006) notion of orchestration mechanisms; i.e., mechanisms that “help develop the network as an entity with a common objective” (p. 268). The ‘coordination framework’, however, takes a further step by proposing two contingent variables that can be added to the conceptualization of MCMs in the context of a mixed-type network: the assessment of motivation to cooperate and the assessment of contribution to network performance. My conclusions also suggest that the study of dyadic IORs, when conducted from a network perspective, can contribute to an understanding of the multiple interactions between network organizations, and thereby provide a more systemic view of network relationships.

However, some authors conceive networks to be self-regulated through cooperation and envisage control as contradictory or even harmful; some even consider networks to be uncontrollable (Kenis and Provan, 2006). This thesis takes issue with both views, especially in the case of networks that include network coordinators. I argue and conclude that a network can be considered a coordination form and, therefore, an object of control by a network coordinator, even though it includes processes of self-regulation. Furthermore, the network coordinator is generally responsible, or at least accountable, for network outcomes. Indeed, the coordinator can be legally accountable or have a mandate, formally or informally granted by network organizations, to be responsible for some key governance activities (Provan and Kenis, 2008). In general,
the issue of control of the network is a key concern of the network coordinator. Therefore, the argument of Kenis and Provan (2006), that networks are uncontrollable since “tasks are supposedly conducted jointly by participants and, consequently, the problem is that no single organization or individual has responsibility for network-level outcomes”, loses ground.

That networks, especially those that involve a coordinator, are controllable and controlled does not mean that such control is simple. Organizations’ multiple interactions can occur in a significant part of the network. For instance, there may be multiple counterparts relating in multiple directions, as is the case of a coordinator simultaneously handling multiple suppliers and multiple customers, who, in turn, also establish dyadic relationships between them. At stake is the whole network, including third parties to a focal organization, i.e., organizations that do not establish a dyadic relationship with that focal organization: competitors, unions, regulators, customers’ other suppliers and suppliers’ other customers. In this thesis, I argue and conclude that at least some third parties may be relevant - sometimes extremely relevant - to network performance. The actions of these relevant third parties, if not consistent with the network’s goals, may hinder the achievement of network control. This seems to constitute an important constraint on the network coordinator, whose role involves taking actions with the purpose of influencing network cooperative behaviour to achieve a desirable or predetermined network performance. Thus, the control of indirect relationships is also relevant in the study of control by a network coordinator. Literature seems to support this view: Thrane and Hald (2006) suggested that in a network perspective “[the] focus shifts from the dyadic relation to the overall holistic organizations of the network of relationships between entities in the field.” (pp. 294-295). This suggestion has recently been reinforced by Lind and Thrane (2010, p.72), who have called for research to “comprehend the systemic characteristics” of networks that include “third parties, such as the competitors of the focal firm, customers’ other suppliers, suppliers’ other customers, regulators and trade unions into account”. This thesis answered to these calls by studying indirect relationships with third parties.
Obviously, adequate structures or forms of network governance may be in place, and the lack of direct control on third parties may not be problematic. As I conclude in this thesis, market-based network governance – ‘network control’ – forms will be sufficient in some situations. Mechanisms such as those of price formation and competition may ensure the network coordinator that there is a minimal level of network functioning. This relates with Mouritsen and Thrane's (2006) concepts of orchestration and self-regulation management control technologies. When network organizations’ rely on other organizations’ mutual controls, one can say that self-regulation MCMs are effective among network organizations. When network organizations’ do not rely on other organizations mutual controls – “self-regulating mechanisms are fragile” – they may, so the argument goes, take actions that intensify the deployment of bilateral and collective MCMs – “orchestration mechanisms”.

Especially in situations where there is a lower assessed level of contribution to performance, the ‘network control’ concept can be seen as a deployment of a ‘market governance type’ of collective MCMs to influence a minimal level of network cooperative behaviour. ‘Market governance type’ is therefore a label that the exploration of the case study allowed me to identify and that contributes to a better understanding of how the ‘network control’ concept works in situations of competition among network organizations. I follow with a conceptual elaboration to better understand what ‘market governance type’ collective MCMs are and how they are used by a network coordinator.

It can be argued that an assessed lower contribution to network performance implies that organizations can be replaced in the normal functioning of the network. Control can be derived through competition between organizations, as in market governance (Williamson, 1985, 1996). Self-regulation is a premise of ‘market governance type’ collective MCMs and a relevant condition, especially in the situation of provision of public infrastructures. The network coordinator will be concerned with securing the minimal level of cooperative behaviour for the achievement of the network objectives. This minimal level of cooperative behaviour among network organizations can be influenced, for instance, by general network rules, network communication rules,
network social events, network public procedures and network social norms (Crawford and Ostrom, 1995). Collective MCMs can also result in a system of informal rules that can influence the cooperative behaviour of organizations (Schmid, 2004). ‘Market governance type’ collective MCMs can, therefore, be considered as more efficient when used to influence expected cooperative behaviour.

‘Market governance type’ collective MCMs can include formal general rules that constitute the structural conditions for the network functioning. In this sense, formal collective MCMs can constitute the basis on which social bilateral MCMs can be applied. However, rules can be broken and, accordingly, a system of monitoring is needed (Olstrom, 2005) or the transactions may not be substantial enough to require complex arrangements and simple rules and arbitration may be more efficient (Nooteboom, 2009). Where there is an assessed lower contribution to network performance, the network coordinator may rely on being informed by network organizations' members of potential or actual conflicts or of any change in the level of contribution to network performance. In this sense, network organizations can rely on the network coordinator to intervene where necessary in order to re-establish the expected cooperative behaviour that achieves the desired network outcomes – contribution to network performance (Olstrom, 2005). As already mentioned, self-regulation and self-enforcement can create the conditions on which the network coordinator will use collective MCMs to achieve the minimal level of network cooperative behaviour. This conclusion adds to Mouritsen and Thrane (2006) self-regulating mechanisms by pointing out the conditions – assessment of lower contribution to network performance – on which these collective MCMs are used.

Coming back to the study of indirect relationships it is possible to conceive that in some situations orchestration mechanisms will be ineffective or even unavailable, i.e., the bilateral and the collective MCMs deployed by that coordinator may not be effective in influencing third parties' cooperative behaviour. Here, alternative strategies of control must be undertaken by the network coordinator. The study of these strategies for network control have been absent from the literature, a gap that this thesis fulfils. I have
identified three types of movements or strategies aimed at attaining network control: 
*repair, reconstruction and substitution.*

Therefore, the thesis contributes both to systematize the understanding of the influence of third parties on control of the network by a network coordinator and to understand the actions and strategies conducted by the latter in order to keep the network under control in the presence of one, or several, organization(s) with whom that network coordinator does not establish a direct relationship. Literature provides some (few) insights on the issue of the potential influence that the presence of third parties has on management control. However, that presence has not been addressed in a network perspective that includes a theorization of the systemic characteristics of how third parties influence network control (Caglio and Ditillo, 2008; Lind and Thrane, 2010). It is this theoretical framework that the present thesis develops. This involves an important extension of previous research: an enlargement of the boundaries of the study of control from direct to indirect relationships and, in general, a more comprehensive view of the network of relationships and of network control.

Departing from this thesis' case study I propose a theoretical framework where reliance on third parties' inter-relational MCMs influences the network coordinators’ use of control strategies whose aim is to control the network. When the network coordinator relies on inter-relational MCMs, a form of system trust supports a less active network control. However, when the network coordinator does not rely on inter-relational MCMs a more active role is adopted, and three strategies to control the network are used: *repair, reconstruction and substitution.* These strategies include actions aiming to fix relationships established between third parties, to add relationships or even to substitute relationships with the direct use of MCMs by the network coordinator.
2.4. Cognitional complexity

The final issue identified by Caglio and Ditillo is that of cognitional complexity, which the authors define as a “situation in which contributions (inputs) and outcomes (outputs) are unmeasurable and unobservable” (2008, p. 893). The authors relate this issue to contexts of management of knowledge resources that makes difficult the definition of the appropriation of each organization: “This may occur when firms collaborate on innovative activities that require the provision of knowledge resources. With knowledge resources, it is difficult to evaluate the effort and contribution of each party to the final output, thus making the issue of how to define the appropriations of each partner particularly difficult”. The thesis does not address this issue in the specific context of knowledge resources and, therefore, no particular contribution can be reported. Nevertheless, the study of the network coordinator's assessments and how they influence control solutions may provide clues for further research.

The present thesis' rationale is that the network coordinator makes an effort to assess other organizations' contribution to network performance, and I did not observe any relationship where the network coordinator did not form an assessment of that contribution. In any case, in the case study underlying this thesis I had to infer the assessment of contribution to network performance from my observations, i.e., it was not possible to "calculate" the (assessed) contribution in some objective way. This may be seen as a limitation of the present thesis and an opportunity for further research: studies proposing ways to measure other organizations’ contribution to network performance can be of great value.

Coming back to table 12, Barretta and Busco (2011) present two opportunities for further research in IORs involving public organizations. One of these relates to the study of the reasons for, and processes leading to, the adoption by public sector networks of particular control mechanisms. Another suggestion relates to the issue of network performance measurement.
2.5. How and why public sector networks adopt particular control mechanisms

As already stated, the ‘coordination framework’ presented in the thesis directly address how and why public sector networks adopt particular control mechanisms. This is in fact the overall problem that inspired this research. The study of the Port of Aveiro, together with the ‘coordination framework’ I have developed, provides several insights which contribute to our understanding of control in networks in general, and specifically in situations whereby a public organization acts as the network coordinator. The thesis concludes that the nature and use of MCMs by a public organization acting as a network coordinator is related to its assessment of the motivation to cooperate and of the contribution to network performance of the organizations involved in the network. The ‘coordination framework’ shows how the nature and use of MCMs by a public organization, acting as a network coordinator, is shaped by these two types of assessments. However, other conclusions presented in the thesis foster our knowledge about public sector networks. I follow by recapping those conclusions.

One first reflection is prompted by the observation that the network coordinator did not seek to apply rules and procedures in some strictly legalistic or bureaucratic way. I found considerable diversity in the use of legal instruments, such as contracts and licences, and also in their contents. Clauses in contracts were very diverse, even where administrative law prescribed the principle of equal treatment. To achieve its objectives, the public organization opted for the use of MCMs based on its assessments of the particular situation. General rules were applied to the network as a whole, but different MCMs were used to influence cooperative behaviour in specific situations on an ‘as needed’ basis. This conclusion seems consistent with network and organizational theory, but not with assumptions about the legal basis of administrative actions in public organizations. However, the flexible (as distinct from legalistic) use of MCMs was crucial for achieving both network and public objectives. Here, there seems to be a tension between the expectation of strictly law-abiding and impartial behaviour by public organizations, and the practicalities of situations in which public organizations are responsible for the coordination of multiple (private) organizations in the pursuit of social goals. My observations seem to challenge Teisman and Klijn’s (2002) contention
that governments and their representatives, even when involved in public-private partnerships, tend to adopt their traditional policy making and control procedures.

Another reflection stems from my observation that, although the public organization I studied had the legal means to enforce control solutions and to impose formal MCMs, in some situations it opted for the use of more persuasive and/or social mechanisms. Despite remaining a public organization, with the authority and responsibility that such a position entails, in recent years the network coordinator has undergone a process of organizational learning and change in which its previously hierarchical and directing stance has progressively been replaced by a more low-profile, ‘softer’, influencing posture. This use of MCMs is consistent with the tendency towards more consensus-oriented decision making in mixed-type networks (see Ansell and Gash, 2008).

This low-profile posture was, for instance, visible in situations where the network coordinator relied on the “credible replacement” (Brown and Potoski, 2003), which emerged from either competition or coordination between the network organizations. In the IORs with assessed low contribution to network performance, the network coordinator did not deploy specific bilateral MCMs aimed at ensuring particular behaviours. In such situations a certain level of network control ‘would do’, as organizations monitored each other and any deviation from the expected functioning of the network would be reported to the network coordinator. My labelling of such a posture as ‘network control’ develops Mouritsen and Thrane’s (2006) conclusion that bilateral MCMs are used as self-regulating mechanisms in mixed-type networks, thereby limiting the public organization’s active intervention. I can add that such self-regulating mechanisms are more likely in IORs with low contribution to network performance, and in market-based networks (see Håkanson and Lind, 2004). I should also recognise, however, that as a public organization the network coordinator has to apply a minimum level of formal controls to all network organizations (e.g. a common set of rules, regulations and procedures). Such formal controls constitute an essential backbone for the functioning of the network (Dekker, 2004), and underpin the often intensive use of social bilateral MCMs.
2.6. Network performance measurement

Finally, suggestions for further research in network performance from Barretta and Busco (2011, p. 218) include: “what do we mean by public network performance? What is the role of management control practices in defining and measuring the concept of network performance?”.

As already stated, network performance measures “…may include many dimensions such as: efficiency, development capability, flexibility, adherence to specifications, network position, value as a source of learning, international presence, continuity” (Nooteboom, 1996, p. 995). The multiplicity of dimensions is one example of the complexity in the study of network performance (Kenis and Provan, 2009) and therefore it is not surprising that recent management control literature has called for further research capable of developing the network performance concept and of shedding light on the role of management control in measuring it (Barretta and Busco, 2011). This thesis establishes a common basis: network performance, as a whole, depends on the individual performance of each organization (Provan and Kenis, 2008) and in networks where a focal organization assumes the role of a network coordinator, network performance is useful and is used to assess the contribution of each organization to the whole network.

Despite that in the first paper of the thesis I conceptualized contribution to network performance, this was done at the individual level, that is, at the level of the contribution to network performance by each individual organization. It was in the second paper that I conceptualized network performance at the collective level, using common network performance measures for all organizations in the collective. Network performance was identified as network price competitiveness and network operational efficiency; and the respective network performance measures were identified as organizations’ price competitiveness and organizations’ time to perform operation. Network performance is linked to network objectives, either informally (e.g. prices and PCA) or formally (e.g. time and JUP).
Features of network performance measures were identified in the use of collective MCMs: each organization calculates its result in terms of the performance measure, so network performance (price and time in the thesis case study) is an homogenous measure; it is objective, as a quantity; each organization realizes that it will benefit if another or even all organization(s) decrease price(s) or time(s), as increase in cargos (activity volume) in the network would be expected; and information about prices and time can be obtained and shared in the network.

One of the pointed features of network performance measures is the high perceived correlation between the improvement in the performance that is being measured and the individual benefit obtained by each organization. An underlying characteristic of this feature is that network performance measures are market-oriented, a feature that I label as transactional. That is, prices and time are transactional in the network market. Both are measures of customers’ decisions: time is related to costs and quality of service; and time multiplied by a unit price means total amount to be charged/paid to a customer. Although time is also operational – as it measures network internal efficiency – the high degree of association between the measure and the impact on customers’ decisions adds to the features of network performance and constitutes one relevant characteristic of its continued use among network organizations. All organizations assess what they will individually benefit from collective improvements. The identification of these features of network performance measures contributes to a discussion of Kenis and Provan (2009, 444) exogenous theory of network performance where they claim that “the performance of a network is a function of the external criteria used to assess the network”. In contrast, in this thesis, the network performance measures are internal to the network. Both time and price are used by ‘internal’ network organizations that participate in multilateral relationships. Furthermore, the industry network performance measures of the case study – number of tonnes as the performance measure usually used in the port industry to rank ports in the world – is not the one used among organizations when collective actions are taken. Although tonnes are used in bilateral MCMs – e.g. contractual objectives in land use concessions contracts – more transactional, efficiency and competitive driven, measures – like time and prices – are used to construct collective objectives to the network.
Therefore, to Barretta and Busco's (2011) question on “what is the role of management control practices in defining and measuring the concept of network performance?”, my answer will be that network performance measures are one of the characteristics that define the nature of collective MCMs. Network performance measures involve the collective objective and the contribution of each organization to achieve it. It allows self-monitoring and assessment of benefits distribution among organizations. As mentioned before, the use of network performance measures by groups of organizations establishes a basis for common goals that can be individually and mutually monitored and that influence behaviour in a network. Although the use of network performance measures does not, per se, guarantee the achievement of the network coordinators’ objectives it provides an instrument to assess individual contributions to network performance and to incentivize self-regulating mechanisms. In conclusion, by pre-determining the outcome, network performance measures set the direction that the network must take.

2.7. Conceptualization of MCMs in function of the type of IOR

Although not explicitly recognised as a gap in the recent management control literature, I include the conceptualization of MCMs as an additional contribution of this thesis.

In the context of IORs, MCMs can be seen as instruments or processes deployed by an organization with the purpose of influencing another organization’s behaviour in order to achieve desirable or predetermined outcomes (Das and Teng, 1998; Dekker, 2004). As indicated earlier, management control studies have tended to focus on dyadic IORs, such as alliances, joint-ventures and supply-chains; very few have taken a network perspective and analysed the nature and use of dyadic MCMs in contexts characterised by multiple interactions between organizations (Caglio and Ditillo, 2008). Berry et al (2009, p. 9) review some notable exceptions; i.e., studies that analyse management control in “…dyadic relationships as but one element in a wider network
of interconnections”. In one of those studies, Mouritsen and Thrane (2006) draw on actor-network theory to classify management controls in horizontal networks, distinguishing between self-regulation and the orchestration mechanisms which establish coherence and complementarity within the network. For them, “Self-regulating mechanisms allow interaction and exchange to occur unobtrusively, while orchestration mechanisms involve structuring these interactions” (Mouritsen and Thrane, 2006, p. 241).

Self-regulating mechanisms are, thus, network controls that require only minimal active intervention by the public organization. In another study, Håkanson and Lind (2004) explore the relationship between Ericsson and Telia Mobile, and identify the use of MCMs in three different forms of inter-organizational coordination: hierarchy, market and business relationship or cooperation. They argue that these different forms of coordination are not necessarily alternatives; they can be used in combination and further research is needed to study “how the forms of coordination can be combined” (Håkanson and Lind, 2004, p. 68). Furthermore, Berry et al (2009) observe that while there are only a few studies of MCMs from a network perspective, there are even fewer that have specifically tackled the use of MCMs by public organizations in mixed-type networks.

In mixed-type networks, the network coordinator, as a public organization, is in a position to select and use MCMs to exercise its responsibilities in coordinating the IORs in which it is involved (which, as I pointed out above, does not necessarily imply a legally enforceable mandate). It should be noted that in a mixed-type network issues of cooperation and coordination are related to the network context. This means that the use of MCMs by a network coordinator is not restricted to securing cooperation between two organizations – as in a bilateral relationship. Instead, the network coordinator is responsible for the performance of the network as a whole and, consequently, the coordinator is likely to adopt a network perspective in selecting MCMs. That is, in order for the desired network outcomes to be achieved, it is not only cooperation with the network coordinator which is important, but also cooperation with and between all the other network organizations. Therefore, this thesis concludes that the use of MCMs in
mixed-type networks will focus on cooperation and performance in very broad terms – i.e., at the level of the network as a whole. Thus, I conceptualise MCMs as instruments or processes which are deployed to influence the other network organizations to cooperate in achieving the desired or predetermined network performance.

This thesis also reflects on the definition of social MCMs. Although I have worked with a lato sensu definition of social MCMs, I have nonetheless described different uses of social MCMs. In IORs which are assessed as involving a low contribution to network performance, social MCMs are used only inasmuch as network control is not effective. Basically, the network coordinator used meetings with network organizations to address problems and to resolve conflicts, thereby ensuring the re-establishment of the ‘normal’ functioning of the network. As such, the network coordinator was passive and acted as an arbitrator only when needed, using its social MCMs to deal with problems. However, when the contribution to network performance was assessed as high, the network coordinator adopted a more proactive stance and made more intensive use of its social MCMs. But even in this last situation I detected variations in the nature and use of social MCMs. Where the network coordinator assessed the network organizations’ motivations to cooperate as low, it used information sharing, both formal and informal meetings and social events to stimulate cooperative behaviour or, at least, to build the social ties which would facilitate more cooperative relationships in the future. In contrast where both motivation to cooperate and contribution to network performance were assessed as high, the network coordinator deployed its social MCMs to identify common goals, to encourage joint decision making and to agree the sharing of benefits, and through these mechanisms to consolidate the generally already strong cooperative relationships. Thus, the case suggests that the specific mix of social MCMs can also vary depending on the assessments formed by the network coordinator.

As stated, the management control literature has already explored how a focal organization can use bilateral MCMs to manage relationships simultaneously, or even in a network context as was done in the first paper of the thesis. However, in such cases, the simultaneous use of bilateral MCMs is linked to one-to-one relationships; i.e., the MCMs are used ‘one at a time’. In multilateral relationships, however, the case study of
the port of Aveiro suggests that focal organizations will deploy specific MCMs in order to directly affect all the organizations that participate in a relationship. In the second paper of this thesis I was particularly interested in the situations where a focal organization has to simultaneously manage multiple organizations in a multilateral relationship using a specific MCM, which I labelled collective management control mechanism. Therefore, this thesis also suggests a conceptualization of collective MCMs.

When studying indirect relationships, this thesis defines reliance as the network coordinator’s assessment that inter-relational MCMs will be effective to guarantee that a third party will cooperate in achieving desired or predetermined outcomes. Inter-relational MCMs may be seen as ‘tools’ (instruments and processes) that support and allow for the emergence of system trust, albeit of a more ‘facts-based kind’ than prior definitions in the literature. I.e., the system trust that emerged in the case study is not merely based on a belief in formal institutions (e.g. law) or informal rules (e.g. national culture): rather, there is an objective assessment, an identification of the instruments and processes that support the system. Therefore, reliance is the network coordinator’s assessment that inter-relational MCMs will be effective to guarantee that a third party will cooperate in achieving desired or predetermined outcomes.

Taking a broader view of reliance in the whole thesis, reliance was also present in the use of bilateral and collective MCMs. Reliance in ‘Network control’ was used in situations of assessed low contribution to network performance. However, if ‘Network control’ is characterized by reliance on the normal functioning of the network – self-coordination that in situations of competition I labeled as ‘Market governance type’ – in indirect relationships reliance is more ‘facts-based’, with inter-relational MCMs effectiveness being assessed by the network coordinator. While in situations of bilateral and multilateral IORs the network coordinator expects to be informed by other organizations if a cooperation problem arises, in indirect relationships the network coordinator takes a more active role of monitoring the effectiveness of inter-relational MCMs.
When third parties are not ‘naturally’ under control given the functioning of the ‘market’, i.e. when an adequate level of motivation to cooperate is not ensured by inter-relational MCMs in place, the network coordinator is faced with a problem. Concepts related with the ‘mobilization of MCMs’ (be they of a bilateral or collective type) were, in these circumstances, insufficient to theoretically frame my analysis. Three approaches are adopted by network coordinator to solve these control problems in relation to third parties: this thesis introduces and labels them as substitution, repair and reconstruction. All strategies departed from the recognition that inter-relational MCMs were no longer effective in keeping third parties under control.

**Substitution** constitutes an expected reaction on the part of a network coordinator faced with problems in controlling third parties: seeking to replace indirect inter-relational MCMs with direct – collective or bilateral – ones; i.e., turning third parties into second ones. Management control literature has already hinted at this kind of approach. Miller and O’Leary (2005) described how network organizations that started out to be third parties became directly related with a network coordinator. The authors noted that in a situation where third parties lacked confidence in the information provided, a focal organization – Intel – implemented specific dyadic actions, “in the form of technical assistance and venture capital to such firms” (Miller and O’Leary, 2005, p. 176).

Similarly to substitution, a strategy of **repair** is also triggered by the recognition that inter-relational MCMs in place are not sufficiently effective in leading relevant third parties to cooperate. However, rather than solving this problem by substituting these MCMs by alternative (bilateral and/or collective) ones, the strategy of repair aims to fix or repair those inter-relational MCMs.

The third type of strategic approach is labelled as **reconstruction**, since it involves an attempt to intervene on the very structure of control relationships that constitute the network. Arguably, substitution may be seen as a kind of reconstruction, since it involves the creation of new relationships in which the coordinator is directly involved.
However, the concept of reconstruction I advance in this thesis implies the creation of relationships of control in which the coordinator is not directly involved.

Finally, the concepts of reliance, substitution and repair seem in general consistent with Mouritsen and Thrane's (2006) concepts of self-regulation management control and orchestration technologies. Mouritsen and Thrane (2006, p. 269) argue that “the process of setting up the self-regulating mechanisms is also an orchestration mechanism. In the process where ownership and distribution of financial flows are negotiated there is a strong orchestration effect because this is where the networking parameters are founded. Self-regulating mechanisms are fragile and from time to time they are renegotiated via orchestration mechanisms that are typically related to network-wide board meetings”. Therefore, the strategies of substitution and repair may be seen under a new light: substitution is a reaction to a crisis in the functioning of inter-relational MCMs (and thus a loss of reliance) that involves the introduction of orchestration mechanisms. Repair may be seen as a reaction involving the orchestration of self-regulation. My concept of reconstruction seems to move one step further, since it suggests that a network coordinator may also, in a sense, attempt to introduce new self-regulations that reinforce network control. Where Mouritsen and Thrane (2006, p. 269) suggest the “creation of relations in the network” as a type of orchestration mechanism, I argue that at stake is the creation of new inter-relational MCMs that constitute the objective of a strategy of reconstruction. Finally, my study provides an answer to Mouritsen and Thrane's (2006) question regarding the conditions in which orchestration mechanisms are preferred to ‘fragile’ self-regulation mechanisms: in the perspective of a network coordinator, ‘fragility’ means lack of reliance on inter-relational MCMs.

3. Limitations and opportunities for further research

Even though several years have passed since Hopwood (1996) called for research on management control in IORs, this field still presents promising avenues for further research. Some suggestions made in recent literature involve aspects such as the implications of power and politics (Berry et al, 2009), the relationship between formal
control and trust (Cäker and Siverbo, 2011), the relationship between control and relational signalling (Vosselman and van der Meer-Kooistra, 2009) and the relationship between innovation and control in networks involving both private and public organizations (Barretta and Busco, 2011).

This thesis has also presented some additional suggestions. One direction for future research could be to conduct studies in other mixed-type networks in which a public organization is the network coordinator. Such research could reinforce, amend, develop and (even possibly) discard the coordination framework proposed in this thesis.

Opportunities for future research also include comparisons between networks with network coordinators – this thesis’ case – and mandated and self-organized networks. As previously stated the literature proposes three types of networks: mandated; mixed; and self-organized. This thesis was conducted in a mixed-type network. In mandated networks, network coordinators have more formal competences and therefore motivations from other organizations to cooperate may be based on more coercive means. Therefore it would be interesting to study whether this expectation – if correct – leads to the use of more formal instead of social MCMs. In contrast, in self-organized networks there is no network coordinator. However, as some literature on self-organized networks has studied the role of leader firms – which are private organizations that take roles similar to network coordinators – it certainly would contribute to our knowledge to explore their preference for different types of MCMs.

In the third paper I identified three types of movements or strategies aimed at attaining network control (repair, reconstruction and substitution). It seems logical to suppose – and the case study provides evidence in that direction – that the strategy of reconstruction will be pursued only after the other two have failed, or if they prove impossible to deploy. The network coordinators’ early strategic moves sought to repair the inter-relational MCM established with the national regulator and, simultaneously, to introduce direct – bilateral and collective – MCMs. It was only when such types of control proved ineffective that reconstruction attempts were made. I do not feel, however, that the case study explored in the third paper provides sufficient evidence to
state, in definitive terms, that this ‘order’ will be followed in all situations. Further research may well clarify this issue.

In general, the case study provides evidence on the means a network coordinator may deploy in order to achieve network control and, to some extent, on the factors behind the deployment of specific means. However, it does not provide evidence capable of supporting a definitive opinion about the effectiveness of the MCMs employed. This was the case in the study of indirect relationships since the network was not under control. Thus, an interesting issue for further research would be to determine which packages of MCMs are more effective and why.

The interaction between internal control systems and inter-organizational controls was also not addressed in this thesis. Nevertheless, the data obtained in the case studies supports the opportunity to explore the suggestion of Berry et al (2009). For instance, the network coordinator in this study adopted an internal balanced scorecard in 2008 that included three directly related strategic initiatives to control the network. Internal human resources were designated to manage those initiatives. Questions for further research include: does the use of an internal balanced scorecard influence the control of the network by a network coordinator? How are formal MCMs used to control the network translated into formal internal management control systems?

4. Concluding remarks

The field of management control in IORs has developed in the past two decades and numerous studies have addressed the challenges of managing beyond the boundaries of the firm. Management in the context of IORs raises control problems such as those related to cooperation, appropriation and coordination. Managers in organizations may have incentives to free-ride in order to achieve their individual objectives and not the collective objectives (cooperation problems); sharing of benefits among organizations may not the fairly distributed (appropriation problems); and interdependence between organizations requires some form of coordination
(coordination problems). Therefore, control solutions are needed to minimize the consequences of these problems (Caglio and Ditillo, 2008).

Although the management control literature has identified control problems, the research emphasis has been on proposing control solutions. Research on the nature of control problems has been neglected, which has led to a lack of knowledge on some of the issues that are relevant in explaining control configurations (Caglio and Ditillo, 2008).

This thesis has focused both on control problems and control solutions, thereby contributing to an integration of the issues that are key in explaining control configurations. The influence of the assessments of other organizations’ motivation to cooperate and contribution to network performance on the use of bilateral and collective MCMs has been addressed in this thesis (papers 1 and 2). This adds to the management control literature by suggesting reasons for the adoption of specific control solutions. The ‘coordination framework’ establishes the theoretical relation between sets of both assessments and the use of different packages of MCMs, thus integrating control problems with control solutions. Furthermore, the thesis presents control solutions, in the form of strategies of control, for different types of relationships, thus expanding the study of control in wider networks.

The conception of networks as being self-regulated through cooperation leads to a view of control as contradictory or even harmful, and even to the view that networks are uncontrollable (Kenis and Provan, 2006). This thesis has confronted such views, concluding that there are networks where a coordinator seeks to promote the network's objectives and, hence, to control the network. The network perspective adopted allowed me to fill gaps in the management control literature, by moving from a dyadic perspective which is typical of much literature towards a more systemic view of IORs in the context of wider networks.

A key message of the thesis is that the adoption of a holistic perspective of ‘network control’ integrates the control of different types of relationships through the deployment
of different types of MCMs. Table 11, which is copied below from paper 3, summarises the main characteristics of network control as studied in this thesis.

<table>
<thead>
<tr>
<th>Focal organization role</th>
<th>Bilateral MCMs</th>
<th>Collective MCMs</th>
<th>Network Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dyads: one (network coordinator)-to-one (also designated as bilateral relationships).</td>
<td>Multilateral instruments or processes deployed by a network coordinator in a part (group) of the network.</td>
<td>Strategies conducted by a network coordinator.</td>
<td></td>
</tr>
<tr>
<td>Bilateral instruments or processes deployed in dyadic relationships between the network coordinator and second parties.</td>
<td>Multilateral instruments or processes deployed by a network coordinator in a part (group) of the network.</td>
<td>Strategies conducted by a network coordinator.</td>
<td></td>
</tr>
<tr>
<td>Instruments or processes deployed by a network coordinator in order to lead second parties to cooperate in achieving the desired or predetermined network performance (see paper 1).</td>
<td>Instruments or processes deployed by a network coordinator in order to lead groups of organizations in the network to cooperate in achieving the desired or predetermined network performance (see paper 2).</td>
<td>Control strategies conducted by a network coordinator in order to lead network organizations, including third ('distant') parties, to cooperate in achieving the desired or predetermined network performance.</td>
<td></td>
</tr>
<tr>
<td>Benefits sharing, contractual goals, quality rules, joint planning and open book accounting (Dekker, 2004; Chua and Mahama, 2007).</td>
<td>Value chain flow chart (Kajütter and Kulmala, 2005), technology roadmap mechanism (Miller and O’Leary, 2005; 2007) supplier-retailer system (Frances and Garnsey, 1996), operational IT network system and network association.</td>
<td>Encompasses the deployment of control mechanisms (bilateral MCMs and collective MCMs), the reliance on inter-relational MCMs, and also the creation of a configuration of a network of control that seeks to put all organizations (including third parties) under control.</td>
<td></td>
</tr>
</tbody>
</table>

Table 11: Control concepts developed
The thesis not only includes control of the network ‘by’ a network coordinator but also control which is ‘enabled’ by the network coordinator. The later involves control which emerges from network relationships and – as I conclude in the study of inter-relational MCMs – is taken into consideration by the network coordinator and informs the strategies of control he conducts.

This thesis contributes to a better understanding of the use of MCMs to control mixed-type networks. This includes an understanding of the factors that influence the use of MCMs by a network coordinator, the consequences of their use and the influence of other organizations on the control of the network. By expanding the scope of relationships to include both direct and indirect relationships, and by adopting a network perspective, where relationships are not seen in isolation, but as part of a wider network of relationships, this thesis contributes to a fuller understanding of the control of networks.
References


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