

Extending the decision to ‘ally’: disentangling the interdependent control capacities of hybrid governance structures and embedded management control systems

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WORKING PAPER

Acknowledgements

We gratefully acknowledge the commentary we have received in the development of this working paper, including specific guidance from David Bedford and feedback from members of the Accounting Discipline Group and the Centre for Management and Organizational Studies (CMOS) at the UTS Business School. This paper has been developed from a data collected as part of a project ‘*Australian cotton: Accounting for value chain sustainability and competitive advantage*’ (reference code: UTS1201), which was jointly funded by the UTS Business School and the Cotton Research and Development Corporation. Our thanks extend to other members of the project team, including Paul Brown, Hannah Pham, Kai Jin, Paul Thambar and Dianne Hiles.

Abstract

When exchange parties are faced with the risk of opportunistic and uncooperative behaviour, they have a range of control responses at their disposal. These responses include the type of structure governing the exchange (i.e. to make, buy or ally) as well as the design and operation of management control systems (MCS) embedded within the arrangement. However, what is less clear is how these different control responses interact and combine, in particular, how decisions to ally within a hybrid governance structure shapes the choice of embedded MCS. In this study, we seek to exploit the natural occurrence of two contrasting inter-organisational arrangements within the same institutional setting: a flexible subcontracting arrangement and a limited life equity alliance. By comparing these cases, we explain two implications of hybrid governance structure variation: first, how control is enacted at a structural level; and second, how structural dimensions influence the design and operation of embedded MCS. Our results demonstrate that hybrid governance is not simply the generic inter-organisational context where management control occurs; instead, alternative hybrid structures – characterised by varying degrees of formalisation, centralisation and relational governance – have different control solving capacities. In addition, each hybrid governance structure's unique control capacity influences the design and operation of embedded MCS. This is because some MCS are used to complement the strengths of each hybrid structure; whereas other MCS are used to compensate for each hybrid's structural deficiencies in relation to certain control problems or transactions.

1. Introduction

Idiosyncratic inter-firm transactions expose parties to the risk of self-interested, opportunistic behaviour by their trading counterparts (Arrow 1969; Coase 1937; Williamson 1985). Parties may exploit bargaining positions to hold-up negotiations or take advantage of information gaps to misrepresent their capabilities ex ante or to shirk effort ex post (Neumann 2010). There are several ways parties can respond these types of ‘cooperation control problems’, including the structuring of the inter-firm arrangement, partner selection, management control systems (MCS), or contractual safeguards (Anderson & Dekker 2010; Caglio & Ditillo 2008). However, as most prior inter-firm studies have examined these control responses in isolation, it is not clear how alternative control responses operate in combination. The purpose of this paper is to explain the interdependence between two control responses found within a given inter-firm arrangement: the nature of the hybrid governance structure and the choice of embedded MCS. To do so, we investigate two inter-related research questions: first, how control is enacted at a structural level by alternative hybrid governance structures; and second, how alternative hybrid governance structures influence the design and use of embedded MCS?

In inter-firm accounting research, hybrid governance is often equated with ‘inter-organisational relationships’ (e.g. Caglio & Ditillo 2008; Van der Meer-Kooistra & Vosselman 2000), which may be problematic in two respects. First, there is a danger of treating hybrids as a homogenous category of that constitute all inter-firm arrangements besides pure market contracting. As organisational economics reveals, the category of hybrid governance comprises a rich variety of organisational forms – ranging from long-term bi-lateral contracting agreements to multi-party strategic alliances – each of which are ascribed with their own attributes and governance properties (Ménard 2004, 2013). Second, ‘inter-organisational relationships’ are often used as the context within which accounting researchers have explored how control is enacted by different forms of MCS. However, if the structure of that relationship also addresses opportunism, as transaction cost economic (TCE) theory suggests it would (Williamson 1985, 1991), then treating it simply as context to control could create distorted, under-specified or incomplete views of inter-organisational management control (Anderson & Dekker 2010; Caglio & Ditillo 2008).

The issues in how hybrid governance structures have been conceptualised may also contribute to inconsistencies in the portrayal of the relation between hybrid governance structure and embedded MCS. For example, some studies imply that particular MCS configurations are constitutive of alternative hybrid archetypes (e.g. Speklé 2001); whereas others portray governance structure and MCS as successive choices within an path-dependent ‘extended-make-or-buy decision’¹ (e.g. Johansson & Siverbo 2011; Van der Meer-Kooistra & Vosselman 2000). Both these approaches suggest that cooperation control problems are addressed by both hybrid governance structure and MCS responses; however, without further clarification about the nature of their interdependence, it is difficult to explicate actually how they can be designed and operated, potentially in combination, to address opportunism in inter-firm settings.

In this study we take advantage of the natural occurrence of two different inter-organisational arrangements – a flexible subcontracting arrangement and a limited life equity alliance – that have both been used to administer research and development (R&D) exchanges within the Australian cotton industry. Studying inter-firm R&D contracts provides an opportunity to examine the types of specialised, uncertain transactions that are characteristically prone to potential opportunism (Gulati & Singh 1998; Oxley 1997; Williamson 1985). Furthermore, by conducting an in-depth comparative case study of the two arrangements, we are able to exploit the variation in hybrid structure to contribute two theoretical implications to inter-organisational management control research.

The first implication concerns how control is enacted at a structural level. Using three structural dimensions - formalisation, centralisation and relational governance – we provide a systematic categorisation of the control capacities of alternative hybrid governance structures. The structural dimensions not only describe the characteristics which differentiate alternative types of hybrid, they also explain how the structures themselves address cooperation problems. Market-like hybrid governance structures, through vertical relational governance, centralisation of property and investment rights, and short-term exchange formalisation, combat opportunism by generating supplier competition and providing incentives for cooperative behaviour. In comparison, hierarchy-like hybrid governance structures, with long-term associational

¹ Van der Meer-Kooistra and Vosselman (2000) suggest that in an extended make-or-buy decision, a party first decides the governance structure of a transaction, followed by the type of parties and relational risk to accept, and finally the design of MCS.

formalisation, centralisation of property and managerial rights and intense lateral relational governance, mitigate opportunism by creating interest alignment between parties and reducing of exploitable information asymmetries.

The second implication concerns how each hybrid governance structure's unique control capacity influences the design and operation of embedded MCS. To disentangle the types of interdependencies between control responses we examined patterns in how hybrid governance structure and embedded MCS combined in response to three different cooperation control problems across the two cases. We observed that some MCS are used to complement the strengths of each hybrid structure; whereas other MCS are used to compensate for each hybrid's structural deficiencies in relation to certain control problems or transactions. Based on these results we differentiate between three types of hybrid-MCS relations embedded within an 'extended make-buy-or-ally' decision: complementary relations, where MCS enact each hybrid structure's functioning; endemic compensatory relations, where MCS provide additional safeguarding for each hybrid's structure-wide deficiencies in relation to certain control problems; and, idiosyncratic compensatory relations, where MCS safeguard each hybrid's structural deficiencies in relation to particular sets of transactions.

The paper is structured as follows. In Section 2 we present the conceptual framing of the study. We integrate developments in inter-organisational management control and organisational economics literatures to formulate three cooperation control problems in inter-firm transactions; the potential control responses; and, the types of possible inter-dependencies between those responses. In Section 3 we describe our comparative case approach, outlining the procedures for data collection and analysis of the two inter-organisational arrangements. In Section 4 we present our case findings, applying the conceptual framework to explain how each arrangement's hybrid governance structure and MCS address each of the three cooperation problems. Then in Section 5 we discuss the implications of cross-case patterns in the hybrid-MCS relations for our two research questions, before placing the work in the context of future inter-organisational management control research in Section 6.

2. Conceptual framing

The conceptual framework shaping our study, depicted in Figure 1, comprises of three interrelated elements which are developed in the following sections. First is the nature of cooperation control problems found in inter-firm transaction contexts. Second are the possible hybrid governance structure and MCS control responses to cooperation problems. Third, are the possible inter-dependencies between alternative hybrid governance structures and embedded MCS.

<INSERT FIGURE 1 ABOUT HERE>

Cooperation control problems in inter-firm transactions

Inter-organisational cooperation control problems exist whenever “autonomous partners ... have incentives to cheat and free-ride in order to attain their own specific goals at the expense of the objectives of the collective undertaking, so they [the partners] need to introduce mechanisms to align their objectives” (Caglio & Ditillo 2008, p.891). This imperative for control arises due to the risk of opportunistic behaviour, that is, when one party acts out of their own self-interest at the cost or detriment of others (Simon 1957; Williamson 1985). Although the risk of opportunism may pervade all economic activities, when organisations choose to contract with external parties this risk is heightened, as there is neither the alignment of interests that a shared ownership structure provides, nor the capacity to enact managerial fiat through hierarchical control (Arrow 1969; Coase 1937; Williamson 1985). Furthermore, the severity of cooperation control problems is generally highest for idiosyncratic transactions, as high uncertainty constrains parties’ ability to specify complete contracts for all contingencies, and high asset specificity creates dependency between contracting parties (Williamson 1979, 1985, 1991).²

Most previous inter-organisational control studies formulate a single aggregate cooperation control problem based on a general risk of opportunism (e.g. Dekker 2004; Johansson & Siverbo 2011; Langfield-Smith 2008; Langfield-Smith & Smith 2003; Speklé 2001; Van der Meer-Kooistra & Vosselman 2000). However, there are different forms of opportunistic behaviours,

² A third transactional characteristic – frequency – is also associated with cooperation control problems as low transactional recurrence reduces the long-term cost of opportunism (Shelanski & Klein 1995; Tadelis & Williamson 2013; Williamson 1998). However, the empirical support for this attribute is much less consistent (Macher & Richman 2008).

such as lying, stealing, cheating or efforts to misrepresent (Williamson 1985), which will likely to give rise to different types of control problems that require alternative control responses (Neumann 2010).³ Therefore, in this study we follow Neumann (2010) in decomposing the cooperation control problem category into specific variants. She suggests that hybrid partners may not only be confronted with risk their counter-party will exploit bargaining positions to hold-up⁴ negotiations, but also that they may take advantage of information gaps to either provide distorted information or shirk effort.

In addition, these cooperation problems may not always occur simultaneously; they are likely to arise at different times during a contracting relation. We can conceptualise three successive phases of a contracting relation: the *ex ante* development of a contract, the selection and investment decision at the point of *contract*, and the *ex post* execution and fulfilment of the contract (Van der Meer-Kooistra & Vosselman 2000). As summarised Table 1 below, at the *ex ante* phase, exchange parties may be confronted with the risk of costly setup and negotiation of projects because of dependence on specialised providers. At the point of contract they risk making poor investment decisions due to supplier misrepresentation of their capabilities or the parameters of the transaction. Finally in the *ex post* phase, parties face difficulties in evaluating and enforcing contract compliance in the context of incomplete contracts, information asymmetry and the parties' mutual dependence on one another.

<INSERT TABLE 1 ABOUT HERE>

Control responses to cooperation problems

Inter-firm parties facing the risk of opportunistic behaviour have a variety of control responses at their disposal (Anderson & Dekker 2010; Caglio & Ditillo 2008). Two responses include: the

³ This same logic also differentiates cooperation and appropriation control problems. Several authors treat appropriation and cooperation concerns as synonymous (e.g. Dekker 2004; Gulati & Singh 1998; Sampson 2004; Speklé 2001; Vosselman 2012), likely because both are forms of behavioural issues (Arrow 1969; Coase 1937) that emerge when one assumes bounded rationality and opportunism (Williamson 1985). Appropriation control problems arise because of the risk of theft of property and unfair division of value between parties (Gulati & Singh 1998; Leiblein, Reuer & Dalsace 2002; Oxley 1997; Pisano 1989; Sampson 2004; Teece 1986); whereas cooperation control problems arise because of the risk of a broader range of self-interested behaviours by autonomous trading counterparts.

⁴ 'Hold-up' refers to when a contracting party intentionally stalls negotiations or engages in excessive haggling tactics to persuade their trading counterpart to accept more favourable contracting terms (Geyskens, Steenkamp & Kumar 2006; Rindfleisch & Heide 1997).

selection of an appropriate *governance structure*; and, the design and use of particular mechanisms – *management control systems (MCS)* – that are embedded within the governance structure (Grandori & Soda 1995; Ménard 2013; Van der Meer-Kooistra & Vosselman 2000).⁵

Most early accounting research concerning the choice of governance structure have explored the two alternatives in the classic ‘make-or-buy decision’ in TCE (Williamson 1971, 1975) – market and hierarchical governance (e.g. Anderson, Glenn & Sedatole 2000; Balakrishnan et al. 2010; Roodhooft & Warlop 1999; Speklé 2001; Widener & Selto 1999). However, more recently researchers have explored the role of a third alternative – the option to ‘ally’ (Anderson & Dekker 2010), which refers to the choice of ‘hybrid governance’ (Williamson 1985, 1991).⁶ Within organizational economics, hybrid governance is defined as any arrangement “in which two or more partners pool strategic decision rights as well as some property rights while simultaneously keeping distinct ownership over key assets” (Ménard 2013, p.1066).⁷ The pooling of specialised assets creates interdependencies between the parties that require collective planning, decision-making and coordination (Ménard 2004). Also, because parties remain autonomous (i.e. not completely integrated within a common ownership structure), they risk conflict over the distribution of collective gains and partner competition (Ménard 2013).

The choice to ‘ally’ within hybrid governance structure is not a singular decision; rather it prompts parties to consider a diverse array of organisational forms with varying attributes and governance properties (Ménard 2004, 2013). Hybrids include joint ventures, subcontracting, strategic alliances, franchising, supplier parks, co-location, partnerships, consortia, cartels, trade associations, licensing agreements, supply chain systems, cooperatives, networks, reciprocal trading and long-term contracts (Barney & Hesterly 2006; Grandori & Soda 1995; Macher & Richman 2008; Ménard 2004, 2006, 2013; Ménard & Shirley 2005; Powell 1990; Shelanski & Klein 1995; Williamson 1991). As a way of organising this variation, scholars suggest that hybrids exist across a spectrum ranging from more market-like forms, such as contractual

⁵ Other conceptualisations of control responses include broad ‘patterns of control’ (Van der Meer-Kooistra & Vosselman 2000), MCS archetypes (Speklé 2001), individual MCS mechanisms (Langfield-Smith & Smith 2003), and transactional contracts (Anderson & Dekker 2005; Dekker 2008).

⁶ While the term ‘hybrid’ is used in Coase-Williamson economics, it corresponds to the ‘alliances’, ‘networks’, ‘clans’ and ‘symbiotic arrangements’ studied in sociology and management (Grandori & Soda 1995; Ménard 2013; Oliver & Ebers 1998).

⁷ This definition is broader than the dyadic buyer-supplier relationships that have typically been studied in accounting (Lind & Thrane 2010). We have intentionally chosen this definition as a way of exploring the implications of variation in hybrid governance structures.

arrangements, to hierarchy-like forms, such as joint ventures and equity based alliances (Gulati & Singh 1998; Ménard 2013; Oxley 1997; Pisano 1989; Sampson 2004).

In terms of their capacity to control, hybrids' mix of specialized asset pools and partner autonomy exposes parties to opportunism that cannot be mitigated through the price mechanism or managerial fiat found respectively in markets or hierarchies (Geyskens, Steenkamp & Kumar 2006; Ménard 2013; Rindfleisch & Heide 1997). Instead, hybrids enact governance through their structural features, such as *formalisation*, *centralisation* of decision, property and managerial rights and *relational governance* (Geyskens, Steenkamp & Kumar 2006; Grandori & Soda 1995; Gulati & Singh 1998; Joskow 1988; Ménard 2004, 2006, 2013; Powell 1990; Rindfleisch & Heide 1997; Shelanski & Klein 1995; Williamson 1979, 1983, 1996).

Formalisation concerns the reliance on explicit contractual agreements, which comprises both exchange contracts that outline the terms of the goods and service exchange, and associational contracts that prescribe the organisation of the relationship (Grandori & Soda 1995; Joskow 1988; Ménard 2004). These operate by specifying ex ante rules for gain-sharing, partner rights, monitoring and control mechanisms, dispute resolution and penalties (Ménard 2004, 2013; Williamson 1996). In contrast to market-based exchange, hybrids tend to use 'contracts as frameworks', which are relatively incomplete, giving a broad indication of how relations may vary and provide guidance and indications of resolution processes should relations cease to work (Williamson 1991).

Centralisation can be differentiated into two components (Ménard 2013). First, the centralisation of the property rights over pooled assets, through equity swaps, hostage arrangements or creation of formal equity-based entities (e.g. joint ventures), which bonds parties to the collective endeavour and makes opportunism costly (Williamson 1983). Second, the centralisation of rights to manage partners (Ménard 2013), such as through creation of central authority entities. This addresses opportunism through monitoring of activities, determining the allocation of collective gains, disciplining recalcitrant parties, and resolving internal disputes (Grandori & Soda 1995; Ménard 2013).

Finally relational governance (or 'relational contracting'), refers to the reliance on parties' identity and reputation in partner selection, as well as the development of close and enduring

organisational ties, relational norms, and repeated exchanges (Rindfleisch & Heide 1997). This attenuates opportunism by screening the reliability of potential partners as well as developing ‘transactional reciprocity’ (Klein, Crawford & Alchian 1978; Ménard 2004), acting as a self-enforcing safeguard because the value of future business is sufficiently large that “neither partner wishes to renege” (Geyskens, Steenkamp & Kumar 2006, p.522).

Significantly, the structural dimensions describing how hybrids enact governance appear to be useful in describing the variation between market-like and hierarchy-like hybrid governance structures (Grandori & Soda 1995; Ménard 2004, 2013). These are summarised in Table 2.

<INSERT TABLE 2 HERE>

Market-like hybrids, such as long-term contractual arrangements, are characterised by low centralisation as they do not involve an exchange of equity or the creation of a separate entity (Gulati & Singh 1998) and parties retain autonomy over their own operations (Sampson 2004). There is a low degree of relational governance, possibly with the exception of the reliance on prior exchanges as the basis of partner selection. Instead, market-like hybrids tend to rely on the safeguards within the formalised contractual arrangements (Gulati & Singh 1998; Oxley 1997).

Hierarchy-like hybrids, such as joint ventures, long-term strategic alliances or minority equity investments, refer to arrangements where the partners share or exchange equity (Gulati & Singh 1998; Pisano 1989). They typically have a more centralised management structure, such as a board of directors (Pisano 1989) and there is high reliance on relational governance through selective inclusion of a limited number of partners. Formalisation is also typically high, as parties use associational contracts to negotiate their contributions, responsibilities and distribution of joint income (Gulati & Singh 1998; Oxley 1997).

In terms of conceptualising the choice of embedded MCS, there are many alternative frameworks the inter-organisational control literature (e.g. Kamminga & Van der Meer-Kooistra 2007; Speklé 2001; Van der Meer-Kooistra & Vosselman 2000). In this paper, we follow Dekker (2004) in classifying embedded MCS in terms of different mechanisms. We focus on four types of MCS including: planning; monitoring and reporting systems; incentives; and social-based mechanisms.

Planning mechanisms involve “pre-setting schedules, outcomes and targets; and rules, programs and procedures” (Gulati & Singh 1998, p.786). Planning devices mitigate opportunism by setting collective goals, assigning responsibilities and specifying targets that can serve the basis of future performance evaluation (Gulati & Singh 1998; Langfield-Smith 2008; Langfield-Smith & Smith 2003; Mouritsen, Hansen & Hansen 2001).

Monitoring and reporting systems involve the supervision and evaluation of partners’ activities and output to ensure they are compliant with the agreed procedures and performance targets (Van der Meer-Kooistra & Vosselman 2000). They address cooperation control problems because they “reduce information asymmetry and make shirking or failure to provide information either more difficult or less favorable...[and] they assume an important signalling function, since they serve to indicate that opportunistic behavior will not only be detected, it could also have negative effects on a company’s reputation” (Neumann 2010, p.223).

Incentives provide rewards contingent on the measurable outputs captured by monitoring and performance reporting systems. They include financial rewards, such as forms of profit-sharing (Dekker 2004), as well as promotions, where suppliers are offered opportunities for more favourable contracts (Gietzmann 1996; Gietzmann & Larsen 1998). Incentives induce collaborative behaviour by aligning partners’ individual objectives with the alliance’s overall objectives (Gulati & Singh 1998; Neumann 2010; Van der Meer-Kooistra & Vosselman 2000) and by making recalcitrant behaviour costly (Speklé 2001).

Finally, hybrids rely on *social-based mechanisms* or ‘trust-building mechanisms’⁸ (Das & Teng 1998; Dekker 2004; Phua, Abernethy & Lillis 2011). These practices aim to develop trust⁹ between hybrid partners, which can act an informal self-enforcing safeguard (Birnberg 1998; Dekker 2004; Langfield-Smith & Smith 2003). Trusting relationships are likely to be more durable, even in situations of conflict, as partners will seek to promote the other’s interests and “increase the predictability of mutual behaviour through each party honouring commitments and

⁸ Trust-building mechanisms include deliberate risk taking, high levels of interaction between partners, joint goal setting, problem solving and decision-making, open book agreements, intentionally incomplete contracts, and concern by managers for the maintenance of the parents organisations’ reputation as a trading counterpart (Das & Teng 1998; Dekker 2004)

⁹ Trust can be conceived at a very general level describes a willingness to be vulnerable to another party, based on positive expectations about the likelihood a trusted partner behaves in a desirable way (Dekker 2004; Donada & Nogatchewsky 2006; Johansson & Siverbo 2011; Langfield-Smith 2008; Langfield-Smith & Smith 2003; Phua, Abernethy & Lillis 2011; Van der Meer-Kooistra & Vosselman 2000).

allowing partners to deal with unforeseen contingencies in mutually acceptable way” (Langfield-Smith & Smith 2003, p.284).

Interdependencies in control responses

Researchers rarely make their assumptions about the relation between hybrid governance structure and embedded MCS explicit. Therefore, to understand the possible nature of the relations between these two control responses we reviewed how existing studies in the inter-organisational management control literature have conceptualised the co-existence of hybrid structure and MCS. This review revealed at least three different ways researchers have approached the relation between hybrid governance structure and MCS.

The first way is to approach hybrid structures – or ‘inter-organisational relationships’ – as the context for the control enacted by MCS. For example Van der Meer-Kooistra and Vosselman (2000) use hybrid attributes, such as number of potential partners or the degree of symmetry in bargaining power, as explanatory variables to predict variation in ‘patterns of control’. Studies using this approach show that embedded MCS vary with elements in their structural context (e.g. Donada & Nogatchewsky 2006; Langfield-Smith 2008; Langfield-Smith & Smith 2003). However, as this approach tends to overlook the control capacity of the structures themselves, it risks overestimating the role of MCS in addressing cooperation problems. This is likely why researchers have called for a more ‘combinative view’, advocating for investigations into the simultaneous use multiple control responses (Anderson & Dekker 2010; Caglio & Ditillo 2008).

The second approach towards hybrid-MCS relations is the development of typologies of particular combinations of hybrid structure and MCS. For instance, Speklé ‘s (2001) taxonomy of ‘management control system archetypes’ specifies distinctive mixes of MCS expected to be used within different types governance modes. This type of approach recognises that control problems are addressed by the combination of *both* governance structure and the embedded MCS (e.g. Kamminga & Van der Meer-Kooistra 2007; Sartorius & Kirsten 2005; Vosselman 2002). However, it implies that the types embedded MCS are constitutive of the type of hybrid, which

appears to collapse what might be separable and distinct control responses into a singular consideration.¹⁰

The demarcation between different types of control responses is more evident in a few studies using a third approach, which conceives of MCS as responses to safeguard misalignment in the choice of governance structure¹¹ (Anderson & Dekker 2005; Dekker 2004; Johansson & Siverbo 2011; Phua, Abernethy & Lillis 2011). This approach builds on the notion of an ‘extended make-or-buy-decision’, which is a path-dependent view of control responses that assumes that parties first decide the choice of governance structure and then subsequently the choice of MCS embedded within the arrangement (Van der Meer-Kooistra & Vosselman 2000). Under a ‘misalignment view’, the choice of MCS is framed by the adequacy of the hybrid governance structure to address cooperation hazards presented by a given transaction. Perhaps the best example is Johansson and Siverbo (2011), who argue that the intensity of the use of MCS is determined, in part, by the degree of misalignment in the decision to outsource. By analysing outsourcing decisions made by public sector organisations, they demonstrate that in situations when the initial choice to outsource appears misaligned to the level of cooperation hazards there is more intense use of MCS, and also correspondingly that organisations which tend to ‘under-outsource’ use MCS less intensely. However, as these results were based on an aggregate estimate of outsourcing misalignment (i.e. a single measure for each organisation for all cooperation hazards and transactions), there remains scope to take a more fine-grained approach to examine if MCS are used within a given structure to safeguard for misalignment for particular control problems or sets of transactions. In addition, as there have been few other studies in accounting using this approach there remains substantial scope to explore, besides the level of

¹⁰ For example, often variation in the entire hybrid-MCS archetype is predicted using the same transactional variables, implying that each different type of transaction would require its own architecture and MCS configuration. This also would appear to be problematic in explaining how hybrids facilitate more than one type of transaction, or for inter-organisational arrangements that change frequently over time.

¹¹ Alignment is central to TCE theory, which expects an efficient alignment between the severity of contractual problems and the cost and complexity of alternative governance modes (Williamson 1985, 1991). Governance structures are expected to converge towards equilibrium in the long-term, however, in assuming bounded rationality of human managers, TCE also accommodates the possibility of misalignment in the short-term (Williamson 1985). Governance misalignment may occur either through the selection of a governance structure that does not provide adequate safeguards for relatively high levels of contractual hazard, thus exposing parties to the cost of unmitigated opportunism, or alternatively through the selection of an unnecessarily intensive governance mode for relatively low contractual hazards that introduces the costs of excessive bureaucracy (Leiblein, Reuer & Dalsace 2002; Sampson 2004; Williamson 1985).

intensity, how MCS compensate for hybrid governance structure misalignment and how these interdependencies hold across alternative types of hybrid governance.

Summary

In inter-firm transactions we can conceive of at least three cooperation control problems that may occur at successive contractual phases, which parties can respond to through at least two types of control responses. The control responses we investigate include the hybrid governance structure, which is characterised by a combination of formalisation, centralisation and relational governance, and embedded MCS including planning, monitoring and reporting systems, incentives and social-based systems. Our empirical analysis will focus on examining whether there are consistent patterns in how these control responses combine to address each of the three cooperation control problems, with a view of assessing how control is enacted by the hybrid governance structure, and the extent to which this structural control capacity influences the design and use of embedded MCS.

3. Empirical approach

In order to explore the how the decision to ally shapes the choice of embedded MCS, we conducted a comparative qualitative case study of two inter-organisational arrangements used to manage inter-organisational R&D exchanges in the Australian cotton industry.

Inter-organisational R&D transactions appear to be a rich site to investigate the management of cooperation control problems. Seen through a TCE lens, the specialised, uncertain traits that are not only inherent, but also desirable attributes of R&D activities, appear to represent the type of complex transactional situations most conducive to cooperation issues (Williamson 1979, 1985, 1991, 2010). For example, R&D projects often require researchers to possess highly specialised knowledge, expertise, and equipment that cannot be easily transferred to other activities (Ditillo 2004); they are characteristically unpredictable, and difficult to observe and monitor (Abernethy & Brownell 1997; Davila 2000); and they often are non-recurring and idiosyncratic (Jørgensen & Messner 2010).

The intent of the multiple case study approach is to enable theory development (Creswell 2007; Eisenhardt & Graebner 2007; Yin 2003) by studying whether discernible patterns between the

three cooperation control problems, hybrid structural characteristics and embedded MCS held consistently across the two cases.¹² These two cases are the Cotton Research and Development Corporation (CRDC) and the Cotton Cooperative Research Centre (Cotton CRC). These pair of cases provides a natural experiment to examine the implications of hybrid variation. While they represent different hybrid governance structures – the CRDC operates as a subcontracting arrangement while the Cotton CRC is an equity-based joint venture - they share similar institutional and operating environments. Both arrangements were established in the early 1990s through federal government programs, with similar mandates to invest collective pools of resources into R&D projects that will benefit the Australian cotton industry. Both also are headquartered in the same regional location in one of the primary cotton growing regions and close to the Australia Cotton Research Institute (ACRI) – a facility that houses scientists who specialise in cotton-related disciplines from various public science institutions. Both the Cotton CRC and CRDC operate by concurrently funding several hundred short-term project contracts, and make the outcomes publically available to grower and community end users. Both have invested heavily in production-related R&D since their inception, which has been conducted by a similar pool of cotton-specialist research providers. Furthermore, over time, both entities have diversified their research programs into environmental, economic and social science research, contracting with a broader range of providers who do not necessarily have prior experience in cotton R&D.

The study’s primary data source was a collection of 64 interviews with members of the organisations involved in the CRDC or Cotton CRC (see Table 3). These included members of the central entities, the industry peak body, research provider organisations, commercial cotton organisations and members of the broader research extension network servicing the industry (see Table 4).

<INSERT TABLE 3 AND TABLE 4 ABOUT HERE>

¹² Each ‘case’ is a distinct inter-organisational arrangement that facilitates R&D exchanges. At the centre of each case is an entity that administers these exchanges; however, the case study also includes the relevant exchange parties. These parties include the commercial or government parties who provide funds or financial resources (‘R&D funders’); science-based research organisations who conduct research activities (‘R&D providers’), and other organisations that mediate the exchange (e.g. advisory bodies).

The interview data was combined with observational data gathered through 11 site visits and field trips over two years (see Table 5). These provided opportunities to observe the activities involved in the conduct, contracting and dissemination of R&D within the industry, how certain management processes occurred and how different organisational members behaved and interacted with one another.

<INSERT TABLE 5 ABOUT HERE>

In addition, throughout this period we gathered a substantial amount of archival documentation (see Table 6). Some of these documents provided background information about the industry. Others, such as strategic plans, provided detailed information about the nature of R&D exchanges. Finally, the annual reports, annual plans, internal management documents and statutory governance documents were directly relevant for understanding the design of the control structures and mechanisms of the arrangements.

<INSERT TABLE 6 ABOUT HERE>

The development of theoretical implications from the data followed an abductive approach¹³ (Peirce 1960) involving the ‘systematic combining’ (Dubois & Gadde 2002) of the case material and conceptual framework through multiple rounds of data collection and analysis¹⁴. The intent of these successive phases, which iterated between making empirical observations and drawing on explanations from existing concepts, was to achieve a ‘matching’ of theory and reality in order to develop and refine the existing theoretical frameworks (Dubois & Gadde 2002; Eisenhardt 1989).

Our theoretical insights about the inter-dependencies of control responses emerged from three successive strategies in the data analysis. The first strategy was descriptive, where we coded, collated and combined the data and developed standalone accounts of the each case’s operating

¹³ Whereas deductive approaches develop theory *a priori* based upon premises from existing literature, and inductive approaches develop theory from empirical observations, abductive approaches start with the observation of a surprising phenomenon, followed by the application and refinement of existing theory, to explain what has been observed (Blaikie 1993, 2010; Bryman 2004; Dubois & Gadde 2002; Modell 2005; Patton 2002).

¹⁴ The research began with an initial familiarisation of the R&D management literature and the cotton industry setting. This was followed by a more extensive period of data collection and initial data analysis. This informed the selection and development of the TCE framing of the study, which was then followed by another smaller round of data collection and more extensive data analysis, refinement of the theoretical framework and the development of theoretical implications.

context, problems and control responses. The second strategy assessed the control solving capacity of each case's hybrid structures and MCS. This involved a process of 'pattern-matching' (Eisenhardt 1989; Miles & Huberman 1994; Patton 2002; Saldaña 2013), where we looked for evidence of the three cooperation control problems in each case, and then assessed the adequacy of the hybrid governance structure and MCS control responses (a detailed description of this strategy is outlined in the Appendix). Finally, the third strategy aimed to discern consistent cross-case patterns in the relations between hybrid structure and MCS. This was achieved using a process of 'forced comparison' (Eisenhardt 1989) of the two cases. Initially cross-case comparisons were descriptive, for example, seeking to compare the types of MCS or structures. These comparisons then became more explanatory, seeking differences and similarities in patterns of relations, between the reliance on MCS and hybrid structures at different stages of contracting and in relation to different transaction types.

In the following sections we present the results of each of these three data analysis strategies. In Section 4 we present the summary descriptions of the hybrid structure and embedded MCS of the two cases (first strategy), as well as an explanation of how these control responses addressed each of the three cooperation problems (second strategy). Then in Section 5, we discuss the results and theoretical implications of cross-case analysis of hybrid structure-MCS relations (third strategy).

4. Case findings

Our empirical results show that despite similarity in their operating contexts, the two arrangements comprise different and distinct combinations of control responses to address each of the cooperation control problems, characterised by varying structural dimensions, structure-wide MCS and project-level MCS. The CRDC and Cotton CRC's structural characteristics and embedded MCS are summarised in TABLE 7 below.

< INSERT TABLE 7 ABOUT HERE >

The CRDC is one of 15 Rural Development Corporations (RDCs) established in 1989 under Commonwealth statute to invest in R&D on behalf of Australian agricultural producers and the Australian Government. It can be classified as a subcontracting arrangement as the central entity acts as an intermediary by allocating mandatory grower levies and matched-government funding

towards projects conducted by external research providers. It is designed to continue in perpetuity, with its variable levy funding dependent on the annual level of cotton production.¹⁵

<INSERT FIGURE 2 ABOUT HERE>

The CRDC's structure exhibits several characteristics of a market-like hybrid. As depicted in Figure 2, the CRDC relies on formal contractual relations that are completely mediated through the central entity. This vertical set of relations are highly formalised, with the use of long-term associational agreements with bodies representing grower and government funders, and use of short-term, arm's length exchange contracts directly with individual external research providers. While there is high centralisation of investment decisions about the collective pool of funding, all parties involved with the CRDC remain highly autonomous. In particular, R&D providers retain high levels of discretion in the use of their own resources and how they operate to deliver contractual project outcomes.

The Cotton CRC was established in 1993 under the federal CRC program which provided the initial funds for the formation of a collaborative R&D joint venture between government, public research agencies and universities, industry-related bodies and commercial cotton organisations. Under the CRC program rules, each CRC entity has a limited life of seven years to achieve certain objectives; however, the Cotton CRC has been renewed twice, in effect creating three Cotton CRCs that ran consecutively until 2012. It can be classified as an equity-based alliance as partner organisations contribute cash, in-kind and capital to a joint-venture entity that administers resources towards R&D project activities conducted by either partner providers or third party research contractors.

<INSERT FIGURE 3 ABOUT HERE>

As a joint venture, the Cotton CRC has several hallmarks of a hierarchy-like hybrid. There is detailed ex-ante formalisation of resource contributions, operations activities and outputs in associational and exchange contracts between all contributing partners. There is moderate centralisation of property and investment decision rights within the separate jointly owned entity;

¹⁵ The grower levy is based on actual cotton production, which is highly variable, depending on the availability of water within catchment. Because the government levy matches the grower contributions, the bulk of the CRDC revenue stream is seasonal, tied closely to patterns of rainfall and cotton production.

even though property rights shift to the central entity, partner organisations have substantial input into the decisions regarding how their resource contributions are allocated to different R&D activities. There is high centralisation of rights to control, as central managers are granted high levels of authority to monitor and direct the activities of individuals within provider organisations. Also, as depicted in Figure 3, the formal contract relations sit within a broader lateral network of close relational ties between partner organisations, which are not necessarily mediated by CRC entity.

In summary, despite the similarity of their operating and institutional contexts, the CRDC and Cotton represent two contrasting types of hybrid governance, each characterised by a different combination of structural dimensions. As will be explored below, this variation in hybrid structure, when combined with different embedded MCS, give each inter-organisational arrangement varying capacities to address each of the three cooperation control problems.

Control responses to cooperation problems in the CRDC

Figure 4 summarises the empirical findings about the CRDC's control responses to the three cooperation control problems.

<INSERT FIGURE 4 ABOUT HERE>

As is shown in the left column, there appears to be significant potential for negotiation problems in the CRDC due to the diversity of its funding constituents¹⁶ and external research providers. Also, its fluctuating resource availability shortens the likely pay-off period for providers' investments in cotton-R&D specialisation to the length of the current project contract.¹⁷ Negotiation problems appear to be addressed through the CRDC's sub-contracting structure, as the high centralisation of investment decisions to the Board of Directors enables the separation and mediation of the funder and provider exchange parties' interests. This is accomplished by using different MCS to reduce negotiation issues on either side of the transaction. Funder-based issues appear to be reduced through efforts to develop long-term collective expectations through the creation of a single investment fund, the appointment of funder-representative bodies,

¹⁶ This includes up to 1400 cotton growers expecting industry-relevant R&D and Australian taxpayers expecting a 'public good'.

¹⁷ This is in contrast, for example, with projects funded in a more stable environment, where providers may be able to expect - with greater certainty - the opportunity to use specialised assets on future contracts.

involvement of grower representatives in development of strategic plan and evaluation of project proposals. In comparison provider-based issues are reduced through facilitating market-like competition amongst providers, through open-calls and proposal processes that boosts number and diversity of applicants, annual decision-making processes and use of short-term contracts. The Board, supported by Program Managers, then has authority to make independent investment decisions that generally satisfy the parties but also ensure alignment to the long-term priorities of the CRDC itself.

The middle column of Figure 4 shows that making inappropriate selection decisions are a salient concern at the CRDC because of information asymmetry gaps between decision-makers and research providers. These are potentially amplified by the turnover of independent Board of Directors and arms' length relations with providers. Furthermore, decisions appear to occur in more complex scenarios, created by the perpetual nature of the CRDC, the fluctuating resource availability, the emergent process of operationalising open-ended long-term strategies, and the diversity of its project applications. To minimise the risk of poor investment decisions, the CRDC Board relies on intensive annual operational planning, including a two-stage pre-investment project screening process. This process enables the collection and consideration of information supplied by providers; the evaluation of proposals by experienced Program Managers and panel members; relative portfolio-based comparisons of individual projects; and, development of standardised short-term project agreements, which provide contractual recourse for misrepresentation.

Finally, the CRDC funders ensure contract compliance by holding the CRDC Board accountable for the monitoring and delivery of R&D outcomes as specified in quarterly and annual reports. The Board, in turn monitor research providers through dedicated Program Managers, who review regular project progress reports that account for the achievement key performance indicators specified in exchange contracts. However, compliance concerns within the CRDC are also relatively modest due to the broader incentives for providers to act cooperatively by make non-fulfilment costly. For example progress report evaluations are tied to conditional project payments and contract renewal incentives motivate providers to deliver funder-relevant outcomes.

Control responses to cooperation problems in the Cotton CRC

Figure 5 summarises the Cotton CRC's control responses to the three cooperation control problems.

<INSERT FIGURE 5 ABOUT HERE>

Given the diversity of party interests, the specialised nature of the projects and the low likelihood of transactional recurrence, it would seem likely that parties within the Cotton CRC would experience substantial negotiation problems. Despite these factors, many negotiation issues appear to be mitigated by the structural features of the CRC arrangement. As described in the left column of Figure 5, the co-contribution funding model creates lateral symmetrical relations between all participating organisations and ensures that they have a substantial equity and relational stake tied to the achievement of the collective goals. In addition, the collective planning of associational and exchange contracts enhances partners' commitment to joint goals and also enables the allocation of specific operational activities. The involvement of providers in planning enables early negotiation of R&D outcomes that are both end-user relevant and scientifically feasible and valuable. The formal Agreements determine the parameters for project investment decisions, which bounds later negotiations once the Cotton CRC commences operation. Finally, any in-process negotiation problems are alleviated by the centralisation of residual investment decisions to members of company management team (CMT).

The middle column shows that selection issues are relatively moderate because most projects are conducted by providers who are participating organisations. These scientific organisations have an equity stake in the achievement of collective goals and have less incentive to misrepresent. Their participation in decision making also minimises information asymmetry between the entity and prospective researchers. Also, the risk of poor selection decisions is mitigated by the detail and finite timeframe of the requirements of the Agreements, the use of the standard project evaluation criteria and collective evaluations conducted by the entire CMT.

Out of the three cooperation problems, concerns about ex post compliance (the right column) are the most significant in the Cotton CRC. This is because of the specificity of the associational-level contractual obligations and the time pressure induced by its limited life. Although this does not necessarily increase the chance of ex post contingencies occurring, it creates a lower

tolerance of variability and increases the cost of ex post uncertainties. There is a concerted effort to manage these concerns through intense use of monitoring and reporting systems. For example, at a project level, R&D activities and outcomes are monitored through six monthly progress reporting, monthly management by exception reviews by the entire CMT, and direct, yet informal project supervision by Program Leaders. Centre-level outcomes are then monitored through quarterly financial reporting and annual reporting, bi-annual updates to partners, the use of an internal monitoring and evaluation system, and three external consultant reviews during the life-cycle of each CRC. The Cotton CRC also relies on the use of relational governance and a shared sense of joint ownership by providers to mitigate ex post compliance concerns. For example, it invests in regular workshops and conferences to bring together different providers and end users, in an attempt to socialise researchers to understand the value of collaboration towards collective goals and the relevance of commercial R&D outcomes.

5. Cross-case analysis and discussion

The individual case findings reveal how each inter-organisational arrangement addresses three different cooperation control problems through combinations of its hybrid governance structure and embedded MCS. In this section we analyse the cross-case patterns of these relations to return to the two research questions: first, how control is enacted at a structural level by alternative hybrid governance structures; and second, how alternative hybrid governance structures influence the design and operation of embedded MCS?

The control capacity of alternative hybrid governance structures

Our case findings align with broader economic literature (Grandori & Soda 1995; Ménard 2004, 2013), in revealing the variation in structural characteristics of different hybrid governance structures. The more ‘market-like’ flexible subcontracting model relies on standardised short-term contracts, supplier-competition, decentralised monitoring, renewal incentives, and arm’s length relations with suppliers; whereas the more ‘hierarchy-like’ equity-based alliance bounds partners through equity commitments and relies on high levels of ex ante formalisation, high centralisation of monitoring and control, and strong lateral relational ties between parties. These results show that different hybrid governance structures do not constitute equivalent inter-

organisational relationships; rather they constitute structurally distinct organisational configurations for managing inter-organisational exchanges.

Our results also reveal that structural characteristics of alternative hybrid governance are a significant source of management control in addressing cooperation control problems. The relative strength of hierarchy-like hybrids is their ability to create alignment between a diverse set of organisational parties towards a collective goal, through a combination of high formalisation, high centralisation of property rights, and intense, lateral relational governance between a selective group of parties. In addition, the specificity of ex ante formalisation, involvement of provider parties, and centralisation of the rights to control, also give hierarchy-like hybrids an information advantage. This is because individuals responsible for decision-making and control have the high levels of expertise that reduce exploitable information asymmetries. Market-like hybrids, by comparison, rely on a combination of supplier competition and incentive intensity, which are created by vertical relational governance, high centralisation of property and investment rights, and short-term exchange formalisation. Buyers can switch to alternative parties if providers attempt to engage in hold-up, misrepresent, or sub-optimize on any single transaction.

Therefore, the type of hybrid is significant as different hybrid governance structures, characterised by different combinations of structural characteristics, will have alternative ways of addressing cooperation control problems. Furthermore, the variation in hybrid governance structures is significant as the nature of the hybrid structure as a ‘first-order’ control response will likely influence the imperatives for MCS control responses embedded within the structure. We can conceptualise the structural characteristics of inter-organisational arrangements – like the structural characteristics of traditional hierarchies – as both a *source* of management control and a *context* for management control (Fisher 1995; Flamholtz 1983, 1996; Flamholtz, Das & Tsui 1985; Merchant & Van der Stede 2007).

Differentiating between alternative hybrid-MCS relations

Our results show that within each arrangement, the three different control problems were addressed by various combinations of hybrid structure and embedded MCS. The embedded MCS comprised of various mechanisms with varying degrees of scope: some mechanisms, such as

long-term strategic plans were used to manage the entity as a whole; while some mechanisms, such as proposal evaluation processes were used to manage at the project-level. Significantly, not all project-level MCS were used at all three contracting phases. For example, project planning was relied on in ex ante and contracting phases, whereas project monitoring and reliance on incentives occurred in ex post phases. In addition, not all project-level MCS were used equivalently for all types of R&D projects. We observed, for example, in the CRDC the use of non-standard project proposal processes for a core set of long-term providers in the production programs, and in the Cotton CRC, much more intensive project planning and monitoring of projects with non-partner providers in newer social research programs. By studying the patterns of variation in the use and scope of mechanisms across the two hybrid structures we are able to differentiate between what appear to be three types of hybrid-MCS interdependencies.

The first type of hybrid-MCS interdependency exists in attempts to ensure MCS support the functioning of alternative hybrid governance structures. This was evident in the occurrence of consistent, logical cross-case patterns linking the variation of structural characteristics to differences in the design and operation of MCS. Observations consistent with this pattern can be seen looking across the rows of Figure 6.

< INSERT FIGURE 6 ABOUT HERE >

As an example, one of the key structural differences was the degree of centralisation of the right to monitor and manage partners. Central staff within the CRDC had limited rights to periodically monitor providers' contractual outcomes and providers retained substantial autonomy to control their own activities. In comparison, managers in the Cotton CRC had the rights to monitor not only outcomes of R&D projects, but also the ongoing progress of activities within projects. This variation in the intensity of centralisation of monitoring and control rights is reflected in the number of layers of monitoring and reporting mechanisms. For example, the right to periodically monitor in the CRDC is reflected in the reliance on bi-annual progress reporting; whereas the higher centralisation of monitoring in the Cotton CRC is enacted through a multi-level internal management structure who use numerous different types of project-level and structure-wide reporting systems and regular personal interaction between Program Leaders and researchers.

This perspective corresponds to the typology approach of conceiving hybrid-MCS relations (e.g. Kamminga & Van der Meer-Kooistra 2007; Sartorius & Kirsten 2005; Speklé 2001; Vosselman 2002), whereby MCS are shaped by the functional requirements of the hybrids' structural characteristics. These types of embedded MCS, which are designed and operated to support or enact the functionality of particular structural characteristics, therefore appear to have a '*complementary relation*' with hybrid structure. We can conceive of 'complementary MCS' as remaining distinct from hybrid structural dimensions, yet their operation improves the enactment of control by the structure (Milgrom & Roberts 1995). Our results show that the types of MCS likely to have complementary relations are structure-wide MCS that were implemented simultaneously with the inception of the arrangement, which corresponds to the decision scenario of complementary systems described by Grabner and Moers (2013). The close entanglement of complementary MCS and hybrid structure also potentially explains why previous researchers have viewed certain MCS as constitutive of particular hybrid governance structures (Gulati & Singh 1998; Ménard 2004, 2006, 2013; Speklé 2001).

The second and third types of hybrid-MCS interdependencies we observe are both examples of attempts to design and use MCS to safeguard for relative deficiencies or weaknesses in the control capacity of hybrid governance structures. These both correspond to the 'misalignment' approach to conceptualising hybrid-MCS relations (Anderson & Dekker 2005; Dekker 2004; Johansson & Siverbo 2011; Phua, Abernethy & Lillis 2011; Sampson 2004), where we expect the use of MCS in situations when governance structures are insufficient to address the severity of cooperation hazard. As summarised in Table 8, we found that each hybrid structure exhibited comparative strengths and weaknesses in relation to certain types of control problems and particular groups of transactions. Their structural weaknesses appeared to be addressed by use of embedded MCS, particularly project-level mechanisms. This suggests that some embedded MCS have a '*compensatory relation*' with hybrid governance structure, where 'compensatory MCS' are used to address the residual control problems that have not been adequately addressed, or even aggravated by the hybrid structure.

< INSERT TABLE 8 ABOUT HERE >

Significantly, we find two different types of compensatory hybrid-MCS relations. The first type - which we label '*endemic compensatory responses*' - exists when particular control problems are

accompanied by the relatively higher intensity use of project-level MCS at certain contracting stages to compensate for misalignment that would occur for all exchanges administered within the hybrid. That is, endemic compensatory MCS are used to address specific cooperation control problems that are either not addressed, or perhaps even magnified by the features of the given hybrid structure.

For example, we found the market-like CRDC to be vulnerable to negotiation problems because of the use of short-term contracts, centralised investment decision-making, and arm's length relations with providers. Together these structural characteristics create uncertainty about future contract renewals and make it difficult to convince providers to make funder-specific investments (Gietzmann 1996; Gietzmann & Larsen 1998). Also, the centralisation of investment decision making exposes it to the risk of making suboptimal selection decisions, as it exacerbates the information asymmetry between the parties making investment decisions and prospective providers. Both negotiation and selection problems appear to be addressed through the CRDC's more intensive use of project-level MCS. For example, negotiation problems appear to be minimised through the use of open calls and two-stage proposal processes that maximise the number of potential applicants and the personal mediation of the project proposals through multiple rounds of review by the Program Managers. In addition the use of more extensive pre-screening and evaluation processes to reduce levels of information asymmetry.

In the Cotton CRC, ex post compliance problems are particularly salient because of the specificity of the associational-level contractual obligations, the time pressure introduced by its limited life, and the collective responsibility to achieve the formalised associational agreements outcomes reduces individual partners' incentives to perform (Alchian & Demsetz 1972; Williamson 1981). This risk of ex post non-compliance is addressed through intensive use of multiple monitoring and reporting systems.

These empirical examples show that endemic compensatory hybrid-MCS relations align most closely with earlier studies of misalignment (Dekker 2004; Johansson & Siverbo 2011), which observed that that safeguarding of hybrid structure misalignment can be achieved through moderating the relative intensity of MCS.

The second type of compensatory relation we found occurs when specific cases of misalignment prompts idiosyncratic MCS responses. These '*idiosyncratic compensatory responses*' appeared to occur when the hybrid governance structure appeared to experience problems in relation to particular sets of transactions.¹⁸

For example, the CRDC's flexible subcontracting arrangement appeared to experience difficulties in negotiating R&D transactions with core providers because of high asset specificity arising out of 'fundamental transformation' that occurs with repeated exchanges (Williamson 1985). That is, as individual researchers have repeatedly had their funding renewed, they develop cotton-specific expertise that becomes more difficult to replace. These transactions do not fit well within the competitive subcontracting model, as the high asset specificity creates funder dependence and opportunities for hold-up in negotiations. The CRDC appeared to respond by specific initiatives tailored specifically towards its nominated 'core providers' during project proposal processes, such as options to fast-track to FRP stages, offers of commissioned projects, and longer project durations.

The Cotton CRC's hierarchy-like equity alliance appeared to be well-suited to contracting with partner-providers; however, it was challenged in all three contractual phases by transactions with non-partner providers. This is because one-off transactions with non-partner providers are also characterised by relatively higher information asymmetry and higher asset specificity. Also, these transactions do not fit the equity alliance model as they are with parties who do not share existing contractual or social relations with the Cotton CRC who are not bound by the Agreements; who do not share a long history of working with Cotton CRC members; and who retain strong host-organisational affiliations. In response, the Cotton CRC employed full-time Program Leaders to manage research areas with non-partner providers, who used much tighter project initiation channels and spend considerable time screening, socialising and interacting with providers that appear capable and willing to deliver the Cotton CRC R&D outcomes.

Based on these observations it appears that idiosyncratic compensatory MCS will be used in relation to certain transactions whose characteristics create cooperation hazards that the existing

¹⁸ Although we do not measure the degree of ex post control problems for all contracts administered within each hybrid arrangement, we do observe that within each arrangement, managers consistently identify certain sets of transactions as having a higher risk of opportunism. Furthermore, these particular groups of problematic transactions also appear to prompt idiosyncratic MCS responses.

hybrid structure and endemic embedded MCS control responses are insufficient to address. This type of misalignment arises because within a given hybrid arrangement, different transactions will present with varying severity of cooperation control problems, as each transaction is characterised by different levels of asset specificity, uncertainty, information asymmetry and frequency. As hybrid structures and a large proportion of embedded MCS used across all transaction types are relatively standardised and fixed, the nature and severity of misalignment will likely be transaction-specific. One implication of idiosyncratic MCS responses is that studying arrangements with significant transactional heterogeneity using a single aggregate, average measure of transactional characteristics, cooperation hazards and misalignment, will likely underestimate the absolute level of misalignment. In addition, based on the characteristic of alternative hybrid governance structures, we can explain why certain types of transactions were particularly problematic for each arrangement. For example, market-like hybrids are likely to be less well suited to repeated exchanges that create dependency, and hierarchy-like hybrids are likely to be less well suited to once-off exchanges with parties that are not contributors to the broader arrangement.

The value of conceptualising alternative types of hybrid-MCS relations is conditional on our ability to differentiate complementary and (endemic and idiosyncratic) compensatory MCS. We propose three ways the types of interdependencies may be distinguished.

First, the type of MCS-hybrid interdependency is likely to vary with the relative breadth of scope (Caglio & Ditillo 2008) of the embedded MCS. Our empirical results show that complementary relations tend to exist between hybrid structure and structure-wide MCS; whereas compensatory relations exist between hybrid structure and project-level MCS. This seems logical: complementary MCS are used to support the enactment and functioning of hybrid structures, therefore they would have a similarly wide breadth of scope; and compensatory MCS are used to address structural weaknesses in relation to either particular control problems (endemic compensatory) or specific sets of transactions (idiosyncratic compensatory), and will have a relatively narrower breadth of scope, targeted towards either specific contractual phases or specific transactions.

Second, the type of MCS-hybrid interdependency is likely to vary by the degree to which the focal MCS is internally congruent with the overall 'governance package' (Johansson & Siverbo

2011). Broader package research suggests that complementary MCS will be characterised by internal congruence (Grabner & Moers 2013{Abernethy, 1996 #1006}). ‘Internal congruence’ is a term used in inter-organisational control research to describe the similarity of ‘patterns of control’ within an overall governance package or configuration (Johansson & Siverbo 2011), where each pattern of control manifests in the types of MCS used at different contractual phases (Donada & Nogatchewsky 2006; Langfield-Smith & Smith 2003; Van der Meer-Kooistra & Vosselman 2000). Thus, as complementary MCS support the enactment of the hybrid structural characteristics they will tend to form part of congruent ‘patterns of control’ (Van der Meer-Kooistra & Vosselman 2000) in relation to the type of hybrid structure. For example, competitive bidding practices will be used to complement market-like hybrids such as subcontracting arrangements. In comparison, because compensatory MCS are used to counter-balance the control deficiencies of the structure, they will likely involve MCS associated with different patterns of control. For example, highly interactive, relational-based project negotiation processes will be used to compensate negotiation control problems in market-like hybrids.

Third, different MCS-hybrid interdependencies will manifest in different cross-sectional patterns between or within alternative hybrid types. Complementary MCS may be identified as embedded MCS that vary with structural characteristics, but are only indirectly related to antecedent characteristics. Endemic compensatory MCS, like complementary MCS, will tend to be used consistently across all exchanges embedded within a particular hybrid, and likewise will vary with structural characteristics. However, as each hybrid arrangement has varying capacities and deficiencies in relation to different cooperation control problems, the use of endemic compensatory MCS will emerge in within-case variation in the use of MCS at different contractual phases. Furthermore, as different types of hybrids will rely on compensatory MCS for different types of control problems, we can also identify endemic compensatory MCS in between-case variation in the patterns of MCS use across contractual phases. Finally, as idiosyncratic compensatory MCS are only used in relation to specific subsets of transactions, they can be identified by examining within-case variation of the association between embedded MCS and individual transactions’ characteristics.

6. Conclusion

The aim of this study was to explore how the decision to ally with alternative hybrid governance structures influences the design and use of MCS embedded within inter-organisational arrangements. By studying two different inter-organisational arrangements within the same operating and institutional environment we contribute two theoretical insights of hybrid structure variation for the design and use of inter-organisational MCS.

The first insight is based on our finding is that there is variation in the extent that the two hybrid structures - characterized by varying degrees of formalisation, centralization and relational governance - address three cooperation control problems that occur in inter-firm transactions. This demonstrates that hybrids are not simply the generic inter-organisational context where management control occurs. Instead hybrid variation – ranging from more market- to hierarchy-like structures – produces distinct control responses, at a structural level, to address cooperation control problems.

The empirical results also provide support to *both* the typology and misalignment approaches to conceptualising interdependencies between hybrid structures and MCS. Some MCS – typically more structure-wide mechanisms – appear to be designed and used to support the operational functioning of the each hybrid structure. Other embedded MCS - typically project-level mechanisms – appear to be designed and used to compensate for deficiencies of each hybrid structure in relation to certain cooperation control problems or sets of transactions. Based on these results we explicate and differentiate between three types of hybrid-MCS relations embedded within an ‘extended make-buy-or-ally’ decision: complementary relations, where MCS enact the hybrid structure’s functioning; endemic compensatory relations, where MCS provide additional safeguarding for structure-wide deficiencies in relation to certain control problems; and, idiosyncratic compensatory relations, where MCS safeguard structural deficiencies in relation to particular sets of transactions.

The study’s results reveal the potential for future research to enrich our understanding of inter-organisational management control by recognising the control capacity and variation of hybrid governance structures. Rather than treating inter-firm arrangements as homogenous contexts for new forms of management control, accounting researchers can leverage the broader economic

literature on hybrid arrangements to develop more sophisticated and complete understandings of the control capacity of these different structures. Within this study we have only examined two relatively well-known hybrid governance structures; there remain many other lesser-known forms, such as franchising, supplier parks, cartels, licensing agreements, cooperatives, supply chain networks, and reciprocal trading agreements, whose MCS implications could to be explored.

The results from this study also reinforce the view that control choices are interdependent within a more extended make-buy-or-ally decision (Anderson & Dekker 2010; Johansson & Siverbo 2011; Van der Meer-Kooistra & Vosselman 2000). In order to fully comprehend the interdependency of control choices, future inter-organisational studies should avoid examining MCS in isolation and instead adopt a more ‘combinative view’ (Caglio & Ditillo 2008) by considering how hybrid governance structures and MCS operate simultaneously. For example, future research could extend this study’s findings by examining the patterns of MCS within more extreme cross-sectional variation in hybrid structures to verify the associations between structural characteristics and certain types of MCS. Researchers could also use statistical research designs (e.g. using multi-level hierarchical modelling) to explore the emergent insights regarding endemic versus idiosyncratic compensatory use of MCS.

Appendix

The relation between potential control problems and control responses was assessed with reference the first-hand accounts provided by the CRC and CRDC managers, who sometimes provided explicit explanations of how particular practices or structures dealt with a problem, such as the use of pre-investment screening and evaluation practices to reduce the occurrence of misrepresentation by providers in the contract set-up. Managerial accounts also provided indirect evidence, such as their rationale, logic or intention in using certain mechanisms or practices; why structures or practices have been changed; or the perceived effectiveness of the control responses. Also, the interviewees familiar with both structures made comparative statements that highlighted the relative benefits or drawbacks of how R&D transactions were administered in one arrangement compared to the other.

However, as these accounts only provided a partial view of the management of control hazards, we supplemented the examination of managerial accounts with a theorisation process of ‘disciplined imagination’ (Weick 1989, p. 516). Through a series of ‘thought trials’ we assumed the existence of the three potential cooperation control problems and considered how the hybrid structural dimensions and embedded MCS contributed to the minimisation of the problem, working systematically through each combination of the three control problems, the three hybrid structure dimensions, and four embedded MCS categories.

We were mindful of the danger of developing ‘hagiographic’ accounts of the cases, and intentionally looked for ‘negative cases’ in the data (Patton 2002). Although both arrangements were considered to be successful overall, respondents did describe certain persistent problems in managing certain R&D projects. Because of the number of exchanges handled by each arrangement, we treated different sets of R&D exchanges as embedded units of analysis (Yin 2003), and studied instances when control responses were perceived as less effective, or when particular transactions were more problematic, or when control responses had been adjusted. Based on the analysis of negative embedded cases, we refined theoretical explanations so that they were consistent with both unproblematic and dysfunctional contracting situation.

Finally, in order to minimise the risk of confirmation bias, our preliminary results were discussed and refined with colleagues familiar with the cases and internal managers in subsequent rounds of interviews (Patton 2002; Yin 2003).

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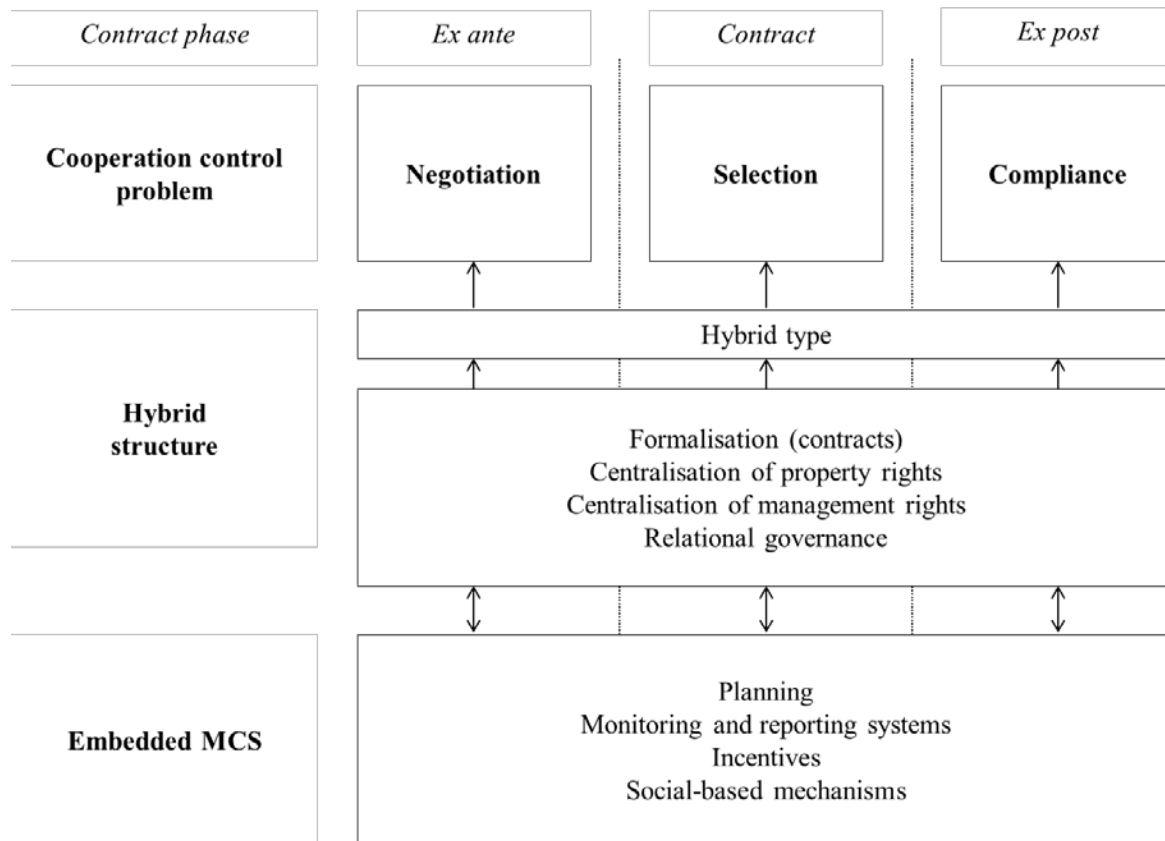


Figure 1: Preliminary conceptual framework

Table 1: Summary of types of cooperation control problems in R&D exchanges

Phase	Ex ante	Contract	Ex post
Cooperation control problem	Costly set-up and negotiation of projects	Poor project investment decisions	Difficulty in evaluating and enforcing contract compliance
Potential opportunism	Hold-up	Misrepresentation	Hold-up; shirking; misrepresentation

Table 2: Categorising hybrid variation

	Market-like hybrids	Hierarchy-like hybrids
Organisational forms	<i>Uni-lateral contractual arrangements</i> , such as unilateral licensing or long-term supply contracts; <i>pooling contractual arrangements</i> , such as technology sharing, cross-licensing, and joint research agreements.	<i>Equity-based alliances</i> , such as equity joint venture; <i>minority equity investments</i> , such as direct investment arrangements
Reliance on:		
- Formalisation	High	High
- Centralisation of property rights	Low (uni-lateral) - Medium (pooling contracts)	Medium (minority equity investments) - High (equity-based alliances)
- Centralisation of management rights	Low	High
- Relational governance	Low	High
Relevant inter-firm accounting studies	Gietzmann (1996); Gietzmann and Larsen (1998); Miller and O'Leary (2005); Miller and O'Leary (2007); Mouritsen, Hansen and Hansen (2001); Revellino and Mouritsen (2009)	Dekker (2004)

Table 3: List of interviews

Month	Interviewee (Organisation – Position)	Length (hrs)
April 2012	Cotton Australia – Policy Officer	1.5
April 2012	CRDC – Senior Manager	1.5
April 2012	Research provider 1 – Private Consultant	0.75
April 2012	Commercial cotton organisation 1 – Senior Manager	1
April 2012	Extension – Consultant	1
April 2012	Extension – Consultant	1
April 2012	Extension – Consultant	0.75
April 2012	Commercial cotton organisation 1 – Senior Manager (2)	1
April 2012	Cotton Australia – Manager	1
May 2012	Cotton Australia – Manager	1.75
May 2012	Commercial cotton organisation 1 – Senior Manager	1
May 2012	Research provider 2 – Research scientist	1
June 2012	Research provider 3 – Senior research scientist	2
June 2012	Cotton Australia – Staff (3)	3
June 2012	CRDC – Program Manager	1
June 2012	Cotton CRC – Program Leader	1.5
June 2012	Cotton Australia – Policy Officer	1
June 2012	Commercial cotton organisation 3 – Senior Manager	1
June 2012	CRDC – Senior Manager	0.5
June 2012	Cotton CRC – Staff	0.75
June 2012	Cotton CRC – Senior Manager	1.5
June 2012	Cotton CRC – Senior Manager	0.5
June 2012	Cotton CRC – Program Leader	0.5
June 2012	Cotton CRC – Staff (2)	0.75
June 2012	Cotton CRC – Board Member	0.75
June 2012	Cotton CRC – Board Member	0.75
June 2012	Research provider 3 – PhD candidate	0.5
June 2012	Cotton CRC – Program Leader	0.75
June 2012	Research provider 4 – Postdoctoral Fellow	0.5
June 2012	Cotton CRC – Board Member	1.5
August 2012	Cotton Australia – Manager	1.5
Sept 2012	Cotton Australia – Manager	1.5
Sept 2012	Research provider 4 – Senior research scientist	1.5
Sept 2012	Research provider 4 – Senior research scientist	1.5
Sept 2012	Research provider 5 – Project Officer	1
Sept 2012	Research provider 5 – Senior research scientist	0.75
Sept 2012	Research provider 4 – Research scientist	0.75
Sept 2012	Research provider 4 – Project Officer	1
Sept 2012	Cotton Australia – Manager	1
Sept 2012	Research provider 4 – Research scientist	0.5
Sept 2012	Cotton CRC – Senior Manager	1

Month	Interviewee (Organisation – Position)	Length (hrs)
Sept 2012	Cotton Australia – Manager	1
Sept 2012	Research provider 5 – Research scientist	0.5
Sept 2012	Research provider 4 – Postdoctoral Fellow	0.5
Sept 2012	Research provider 4 – Senior research scientist	1
Sept 2012	Research provider 4 – Postdoctoral Fellow	0.75
Sept 2012	Research provider 5 – Senior research scientist	1
Sept 2012	CRDC – Program Manager	1.5
Sept 2012	CRDC – Senior Manager	1.5
Sept 2012	Research provider 4 – Senior research scientist	1
Sept 2012	Commercial cotton organisation 2 – Senior Manager (2)	1
Sept 2012	CRDC – Senior Manager	0.75
Sept 2012	Research provider 1 – Private consultant	0.75
Sept 2012	CRDC – Program Manager	0.5
Sept 2012	Cotton CRC – Senior Manager	0.5
Sept 2012	CRDC – Program Manager	1.5
Sept 2012	Commercial cotton organisation 4 – Senior Manager	0.5
Sept 2012	Research provider 4 – Research scientist	1.5
Sept 2012	Research provider 4 – Research scientist	1.25
Sept 2012	Research provider 4 – Administrative Manager	0.75
Nov 2012	Cotton Australia – Policy Officer	1
Nov 2012	Cotton Australia – Staff	1
Oct 2013	CRDC – Senior Manager	1
Nov 2013	CRDC – Program Manager	1
Total (64 interviews)		65.75 hrs

NOTES: Of these 64 interviews, 59 were digitally recorded and transcribed; during the remaining 5 interviews, researchers took notes. Occasionally more than one individual was interviewed at once; where multiple interviewees were present the number has been included in brackets. In order to protect the identity of interviews, generic descriptions of their position have been used.

Table 4: Number of interviews by organisation

Organisation	Interviews	Interviewees*
CRDC	10	8
Cotton CRC	12	11
Cotton Australia	11	9
Extension	3	3
Commercial cotton organisations	6	7
Research providers	22	21
Total	64	59

NOTES: * The number of interviewees represents the number of individuals who were interviewed as part of the study. This varies from the total number of interviews as occasionally more than one individual was interviewed at a time (i.e. group interview), and some individuals were interviewed multiple times. The position of interviewees by organisation has been excluded from this table to maintain the anonymity of the participants.

Table 5: List of site visits and field trips

Period	Site(s)	Location	Duration
Jun-12	University research providers	Sydney	1.0
Jun-12	CRDC; Cotton CRC; ACRI	Narrabri	2.0
Aug-12	<i>Australian Cotton Conference</i>	Gold Coast	3.0
Aug-12	Cotton Australia	Sydney	0.5
Sep-12	Cotton Australia	Sydney	0.5
Sep-12	ACRI; Cotton CRC; CRDC; other cotton organisations in Narrabri region	Narrabri	11.0
Nov-12	Cotton Australia	Sydney	0.5
Nov-12	Cotton Australia Panel review meetings; Cotton Australia AGM	Sydney	2.0
Sep-13	<i>Australian Cotton Research Conference</i>	Narrabri	3.0
Oct-13	CRDC; farming operations in Narrabri and Moree region; ACRI	Narrabri	5.0
Mar-14	Cotton Australia	Sydney	0.5
		Total (days)	29.0

Table 6: List of archival documentation collected

Scope	Type of archival documentation
Cotton CRC	Annual reports (1993–2012)
Cotton CRC	Public documents about Commonwealth CRC program
Cotton CRC	List of current and completed projects (2005–2012)
Cotton CRC	Internal management documents (Board Book; Project management procedures manual; project evaluation template; Red Amber Green reports; Strategic Plans)
Cotton CRC	CRC Participants Agreement, CRC Commonwealth Agreement, CRC Affiliate Agreement
Cotton CRC	CRC Application material
Cotton CRC	Examples of calls for research proposals
Cotton CRC	Conference documentation and presentations
Cotton CRC	CRC Exit Book
Cotton CRC	External reviews of Cotton CRC economic impact
Cotton CRC	Examples of final project reports
CRDC	Annual reports (1990–2013)
CRDC	Five year strategic plans (1991–2018)
CRDC	Annual operating plans (1991–2013)
CRDC	CRDC Researchers Handbook
CRDC	Project evaluation templates
CRDC	Deed Agreement
CRDC	Productivity Commission Review of RDC Structures (review report and submission documents)
Other	Cotton Industry Research Development & Extension Strategy
Other	Cotton Industry Vision 2029
Other	Australian Cotton Growers Research Association Board Book (1974–2002)
Other	Australian Cotton Conference Proceedings (1984–2012)
Other	Australian Cotton Grower Yearbook
Other	Timeline of history of Australian Cotton Research Institute
Other	Australian Cotton Crop Statistics (ABARES)
Other	Cotton Australia Annual Reports (1996–2013)

Table 7: Comparison of the CRDC and Cotton CRC

	CRDC	Cotton CRC
Operating context		
Initiated	In 1990 under the PIERD Act 1989	In 1993 under the CRC Program
Funding basis	A mandatory industry levy collected from cotton growers matched by federal government contribution	Contributing partners provide cash, capital and in-kind resources; Commonwealth CRC grant
Resource uncertainty	Variable, levy system subject to fluctuations in cotton production	Confirmed funding over 7 years
Lifecycle	Perpetual	Finite, three iterations of 7 years
Hybrid structure		
Type of hybrid	Subcontracting arrangement	Equity alliance
Formalisation	<i>Associational contracts:</i> PIERD Act; Deed; Constitution; <i>Exchange contracts:</i> Standardised individual project contracts	<i>Associational contracts:</i> CRC Program Rules; Bid application, Cotton CRC Agreements Constitution; <i>Exchange contracts:</i> Standardised individual project contracts; Initial project list
Centralisation of property rights	High centralisation of assets and property rights: Single collective investment pool from mandatory grower levies and matched government contributions	Moderate centralisation of assets and property rights: Collective investment pool funded by CRC grant from Commonwealth government and untied contributions from partners; tied contributions from partners
Centralisation of investment decision rights	High centralisation of R&D project investment decisions, made annually by CRDC Board of Directors	Moderate centralisation of R&D project investment decisions, where initial investment decisions made contributing partners as part of bid application; residual investment decisions made by Company Management Team (CMT)
Centralisation of coordination, monitoring and evaluation	Moderate centralisation of monitoring by CRDC entity (Board of Directors, Program Managers); Reliance on research provider organisations' for operational control of R&D project activities Accountable to funder representative bodies (Cotton Australia and DAFF) at different points in annual investment cycle.	High centralisation of monitoring and operational control by CRC entity (Board of Directors, CMT, Program Leaders) Accountable to DIISR and contributing partners at different points in CRC lifespan
Relational governance	Vertical hierarchical demarcations between funders, CRDC entity and providers; relations completely mediated by the CRDC. Close relational ties with grower representatives	Lateral collaborative network between all contributing partners. Demarcation between partner and non-partners. Close relational ties between CRC entity and partners.
Embedded management control systems (MCS)		
Planning mechanisms	5-year strategic R&D investment plan Annual operating plan Annual budget Cash reserves Open call and Preliminary Research Proposal/Final Research Proposal (PRP/FRP)	7-year strategic plan Annual operational plan Annual budget Initial project list; tied contributions Open and narrow call

	process Program manager, Cotton Australia panel and Board evaluations and feedback Commissioning strategic projects	Program leader and CMT evaluation and feedback Commissioning projects
Monitoring and reporting systems	<i>Monitoring by DAFF and Cotton Australia:</i> Annual reporting Quarterly financial reporting <i>Monitoring by Board:</i> Reporting by Program Managers <i>Program manager monitoring:</i> 6-monthly progress reporting Quarterly financial reporting Final reporting	<i>Monitoring by DIISR and Partners:</i> Centre Forum Annual reporting Quarterly financial reporting 3rd year and 5th year external review CRC final evaluation <i>Monitoring by Board:</i> Reporting by CEO <i>Monitoring by CEO and COO:</i> M&E program <i>CMT monitoring:</i> Monthly Red-Amber-Green monitoring Quarterly financial reports Final report approval <i>Program leader monitoring:</i> 6-monthly progress reports Direct supervision/interaction Final reports and evaluation
Incentives	Growers annual financial contributions Continuation of CRDC program Project payments Future contract renewal	Partner equity contributions Project payments
Social-based mechanisms	<i>Maintain trust of funders in CRDC entity:</i> Regular information exchange Regular interaction between CRDC and Cotton Australia staff and panel members Selection of independent, skill-based Board Selection and retention of Managers Program manager personal interaction with researchers Prioritisation of core providers in project selection Assessment of reputation, prior ties in project selection	<i>Maintain trust of contributing partners:</i> Professional Program Leaders; in-kind managers from partners Selection of independent skill-based Board Regular information exchange <i>Build 'collaborative culture' between partners:</i> Interaction at conferences, workshops Co-location with providers at ACRI Socialisation of junior researchers Design of joint projects Program leader personal interaction with researchers Prioritisation of partner-providers for project selection Socialisation of non-partner providers

NOTES: The following abbreviations introduced in Table 7 are: PIERD Act - Primary Industries and Energy Research and Development Act 1989; DAFF – Department of Agriculture, Forestry and Fisheries; DIISR - The Department of Innovation, Industry, Science and Research.

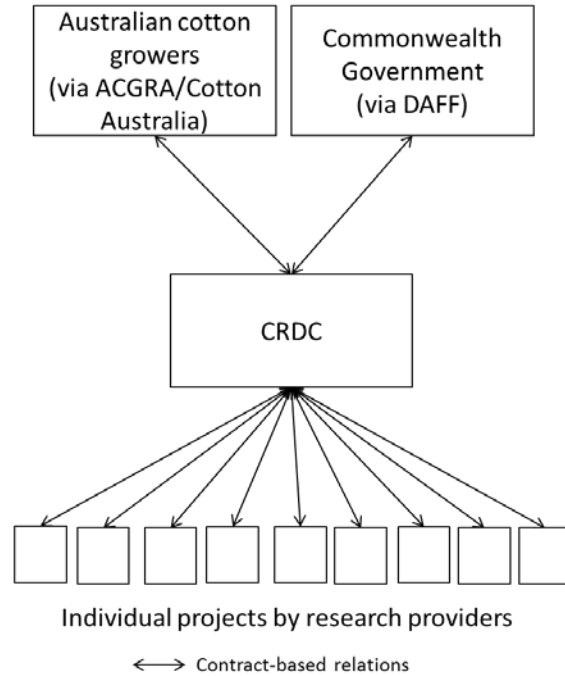


Figure 2: Structure of relations in the CRDC

NOTES: The following abbreviations are introduced in Figure 2: ACGRA – Australian Cotton Growers Research Association; DAFF – Department of Agriculture, Forestry and Fisheries

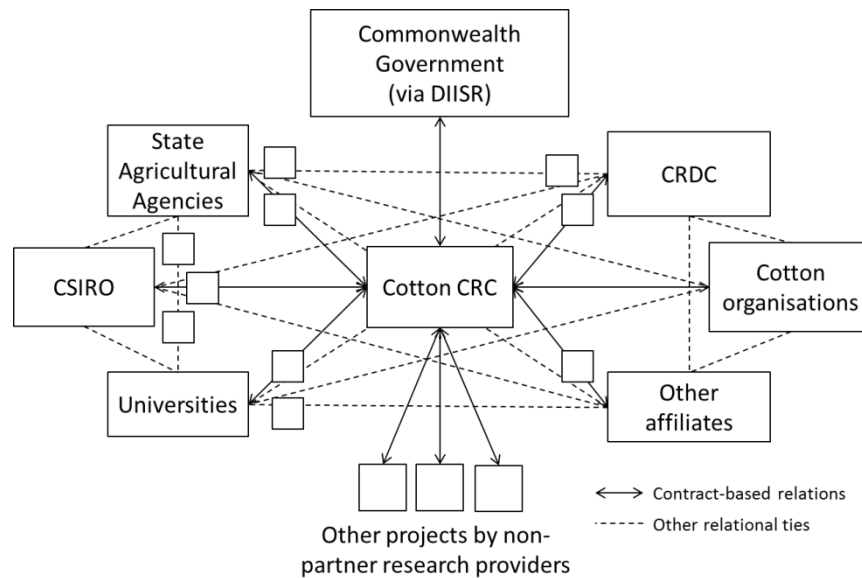


Figure 3: Structure of relations in the Cotton CRC

NOTES: The following abbreviations are introduced in Figure 3: DIISR – The Department of Innovation, Industry, Science and Research; CSIRO - Commonwealth Scientific and Industrial Research Organisation

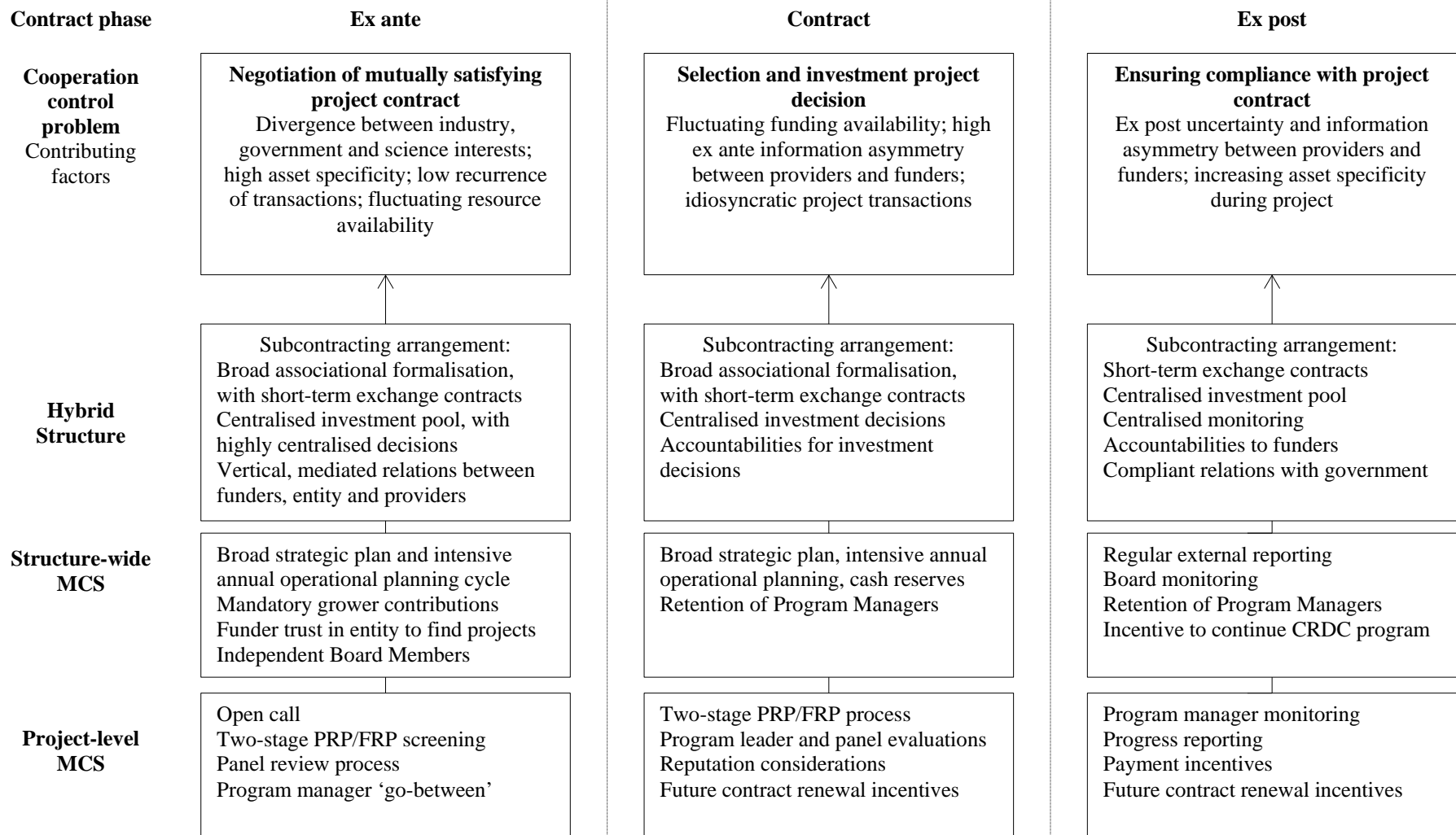


Figure 4: Control responses to cooperation control problems at the CRDC

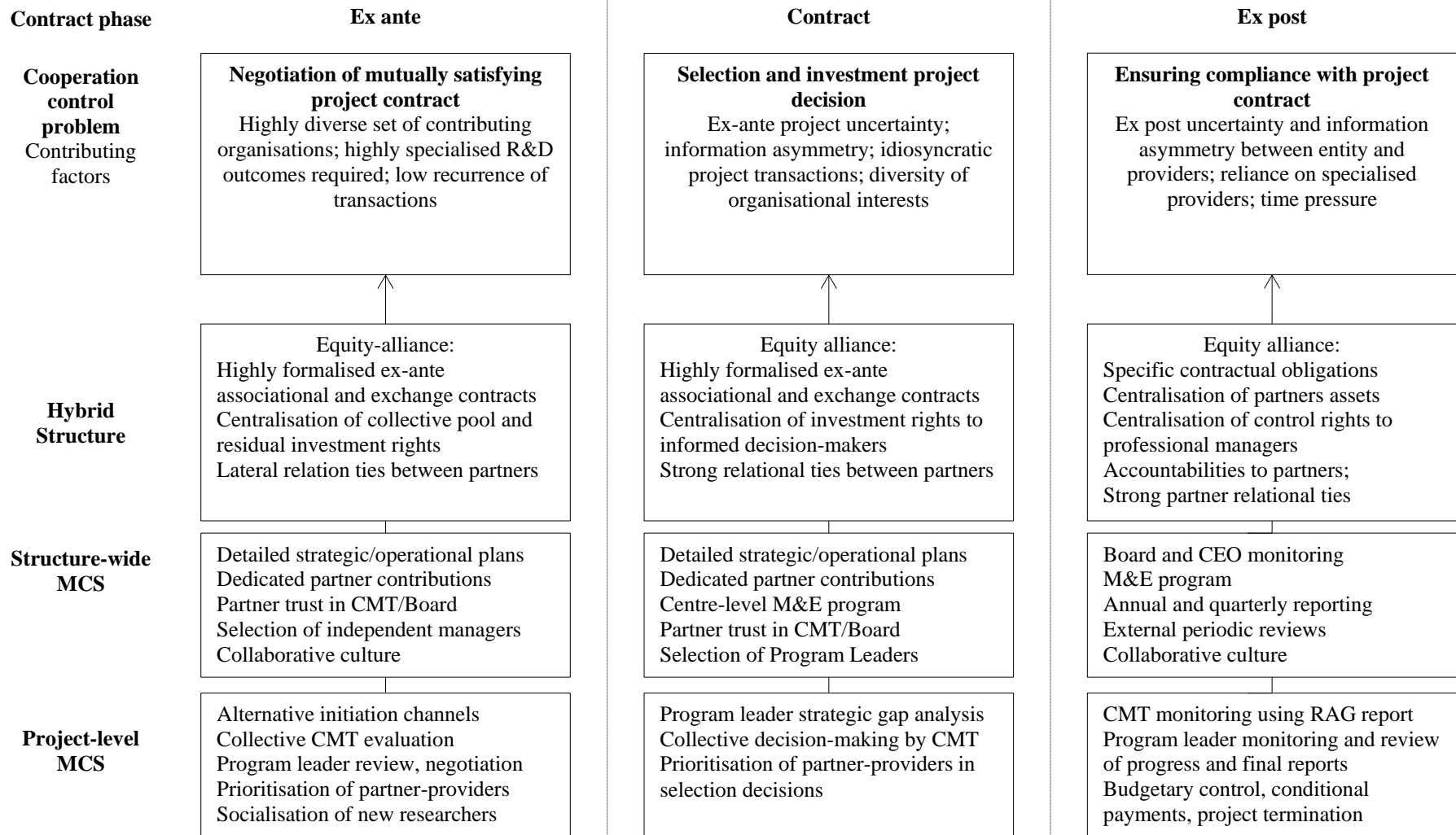


Figure 5: Control responses to cooperation control problems at the Cotton CRC

		<i>CRDC</i>		<i>Cotton CRC</i>	
		Structural characteristics	MCS Linkages	Structural characteristics	MCS Linkages
<i>Formalisation</i>	<p>Perpetual associational contracts between funders and CRDC</p> <p>Short-term exchange contracts with providers</p> <p>Emergent formalisation ‘contract as framework’ (contractual detail developed annually)</p>	<p><i>Planning:</i> rolling, broad strategic plans developed by Board with input from funders; intensive annual operational planning, based on standardised proposal processes with funder consultation</p> <p><i>Monitoring:</i> DAFF and CA regular monitoring of appropriateness of entity decision-making; progress report monitoring by Program Managers</p> <p><i>Incentives:</i> creates contractual incentives (financial commitment by funders; conditional project payments); and uncertainty of continuation of CRDC program and contract renewal</p> <p><i>Social:</i> focus on maintaining funder trust to make effective investment decisions</p>	<p>Finite associational and exchange contracts between all contributing partners</p> <p>Short-term exchange contracts with non-partner providers</p> <p>Highly specified ex ante formalisation, (most contractual detail developed before commencement of operation)</p>	<p><i>Planning:</i> stand-alone, detailed strategic and operational plans, developed ex ante between all partners; flexible annual planning to operationalise agreements</p> <p><i>Monitoring:</i> highly specific DIISR and Partner monitoring of the achievement of specific progress and output goals; Board and CEO use of M&E program; intense monitoring of project progress and completion</p> <p><i>Incentives:</i> creates contractual incentives (equity commitment by partners; conditional project payments)</p> <p><i>Social:</i> contributes to collaborative culture between partners</p>	
<i>Centralisation of property and investment decision rights</i>	<p>Annual allocation of grower levies and government funds to CRDC</p> <p>Highly centralised investment decision-making by Board</p>	<p><i>Planning:</i> intensive annual operational planning/budgeting by Board with funder and Program Manager consultation</p> <p><i>Monitoring:</i> reporting of investment decisions in annual report to DAFF and CA</p> <p><i>Incentives:</i> creates financial commitment by funders</p> <p><i>Social :</i> independent Board Member selection; selection and retention of Program Managers; funder reliance on trust in Board to make effective investment decisions</p>	<p>Commitment of all resources ex-ante by partners and government to CRC entity</p> <p>Partners given discretion in allocation of contribution; residual investment decisions made centrally</p>	<p><i>Planning:</i> intensive preparation of bid application by partner representatives evaluated by government. Later investment decisions shaped by plan parameters</p> <p><i>Monitoring:</i> regular CEO reporting to Board, bi-annual reporting to partners about investment decisions</p> <p><i>Incentives:</i> creates partner equity incentives</p> <p><i>Social :</i> independent Board Member selection; appointment of expert Program Managers; co-investment model reinforces lateral relations between partners</p>	

Figure 6: Typology patterns showing variation in structural characteristics and embedded MCS

	<i>CRDC</i>		<i>Cotton CRC</i>	
	Structural characteristics	MCS Linkages	Structural characteristics	MCS Linkages
<i>Centralisation of monitoring and control</i>	<p>Periodic monitoring centralised within strategic centre Reliance on provider organisations for operational control of R&D activities</p>	<p><i>Monitoring:</i> Reliance on periodic, standardised progress reporting monitored by Program Managers, reported to Board of Directors. DAFF and CA review strategic and annual investment plans; review quarterly expenditure; review annual reports <i>Incentives:</i> use of conditional project payments; future contract renewals <i>Social:</i> independent Board Member selection; selection and retention of Program Managers; high information exchange and personal interaction between CRDC and CA staff and panel representatives</p>	<p>Ongoing monitoring and control of operational activities centralised within strategic centre</p>	<p><i>Monitoring:</i> intense, multi-level internal monitoring structure, with numerous reporting practices (M&E program; CEO reporting; monthly RAG review, progress reporting, final report evaluation, Program Leader supervision); advisory through Centre Forum; DIISR and partners review annual reports, quarterly financial reports, and external reviews of CRC progress and outcomes <i>Incentives:</i> conditional project payments; right of project termination <i>Social:</i> physical proximity; regular personal interaction by Program Leaders; in-kind managers from providers; appointment of CEO, CEO, and independent Board</p>
<i>Relational governance</i>	<p>Vertical, hierarchical relations between funders, entity and providers Close relational ties with growers; distant, compliant relations with government; arms' length relations, open structure to foster provider competition; Prioritisation of core providers</p>	<p><i>Planning:</i> use of open call and PRP process to maximise number of research applications; high consultation with funders <i>Monitoring:</i> provision of 'below the radar' annual reports to government; high information exchange with grower funders <i>Incentives:</i> reliance on contract renewal incentives <i>Social:</i> Build and maintain trust of grower representatives with regular interactions; retention of long-term Program Managers; assessment of reputation and prior ties in project selection; fast-track core providers to FRP and offer longer duration</p>	<p>Lateral network of relations between all partner organisations Close relational ties between CRC entity and partners</p>	<p><i>Planning:</i> high partner involvement in ex-ante planning and latter project planning; design of joint projects <i>Monitoring:</i> regular information exchange to partners; regular interaction between Program Leaders and researchers <i>Social:</i> facilitate regular interaction at workshops and conferences; co-location of CRC with providers at ACRI; socialisation of junior researchers; appointment of in-kind managers and professional Program Leaders, CEO and COO; prioritisation of partner-providers in project negotiation; intense screening of non-partner providers</p>

Figure 6 (continued): Typology patterns showing variation in structural characteristics and embedded MCS

Table 8: The relative strengths and weaknesses of each hybrid structure

	CRDC	Cotton CRC
Hybrid structure type	Flexible subcontracting Market-like hybrid	Equity alliance Hierarchy-like hybrid
Addressing different types of control problems		
Structural strengths	Addressing compliance problems	Addressing negotiation and selection problems
Structural weaknesses	Addressing negotiation and selection problems	Addressing compliance problems
Compensatory MCS (endemic response)	More intensive project management processes ex-ante, e.g. two-stage PRP/FRP process	More intensive ex post project and centre-level progress and outcome monitoring and reporting
Contracting different types of transactions		
Structural strengths	Transactions that are short-term, arm's length or once-off	Transactions with partner providers or in R&D areas of partners' expertise
Structural weaknesses	Highly specialised transactions with core providers or with longer-term strategic value	Transactions relating to new R&D areas with non-partner providers
Compensatory MCS (idiosyncratic responses)	Prioritisation of 'core providers': <ul style="list-style-type: none"> - Fast track to FRP - Greater discretion in project development - Longer project durations - Commissioning projects for strategic needs 	Management of communities and catchment programs: <ul style="list-style-type: none"> - Full-time Program Leaders - Reliance on commissioning - Intense screening and socialisation of providers - Regular personal monitoring