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Beyond intentional trust: supplier opportunism and management control mechanisms in public sector procurement and contracting

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Abstract

We test an argument, drawn from transaction cost economics, that an assumption of intentional trust should be replaced with one of supplier opportunism in public sector procurement and contract management. We use structural equation modelling to evaluate quantitative evidence from 180 public and private sector buyers on the perceived effectiveness of various management control mechanisms aimed at restraining supplier opportunism. Our findings suggest that supplier opportunism is potentially a problem and that certain procurement and contract management mechanisms can assist buying organisations in moderating that opportunism. This supports arguments in favour of a 'cautious approach' to procurement and contract management.

Key words

Procurement, contract management, trust, opportunism

Introduction

In many countries, the outsourcing of public services to the private sector is accelerating (Torres and Pina, 2001; Batley and Larbey, 2004; Mulgan, 2005; Hart, 2007). This acceleration is often justified on the basis that private sector providers can deliver at least the same quality of services as their public sector counterparts but for a considerably lower price (Julius, 2008), although numerous claims have been made against this argument (for example, Grimshaw et al., 2002; Pollock, 2006; Davies, 2008, 2010). One consequence of this increasing use of the private sector is that procurement and contract management is ever more important to public sector management.

However, it would be wrong to assume that there is a settled consensus on what constitutes effective public sector procurement and contract management, not least when it comes to the emphasis that should be placed upon intentional trust in the procurement and contract management process, as against using the process to mitigate potential supplier opportunism (for example, Grimsey and Lewis, 2004; Bovaird, 2006; The Author et al, 2010). The debate over this issue is crucial, as clarity over the challenges and objectives of the procurement and contract management process is critical to the delivery of satisfactory outcomes.

In this article, the authors contribute to this debate by reporting on the procurement and contract management practices of public and private sector organisations and the perceived outcomes of those practices. In particular, we consider quantitative evidence on the perceived effectiveness of various buy-side management control mechanisms aimed at restraining supplier opportunism, when transaction characteristics make opportunism a possibility. We test three hypotheses, derived from the literature, particularly Williamson (1985 and 1996), in pursuit of this research objective.

First, we hypothesize that the more a transaction is hazardous the less extensive the management control mechanisms will be. Second, we hypothesize that an increased extensiveness of management control mechanisms will reduce incidences of supplier opportunism. Finally, we test a hypothesis concerning the relationship between transaction characteristics and supplier opportunism, both with and without the

intervening variable of management control mechanisms. This is again to assess the impact of management control mechanisms.

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The quantitative data used to test these hypotheses is derived from 180 questionnaire responses provided by procurement professionals working in buying organisations. The questionnaire asked respondents to classify a procurement and contract management situation in terms of the transaction characteristics, report on procurement and contract management actions taken in the situation and then report perceptions of the outcome in terms of incidences of supplier opportunism. The sample included both public and private sector respondents, allowing a public sector dummy variable to be included to measure differences between the two sectors.

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The article is organised as follows: section two briefly discusses the literature dealing with intentional trust, opportunism and management control mechanisms; section three describes the methodology adopted; section four reports the results of our hypothesis testing; section five concludes with a summary of key results and a discussion of their implications for theory and practice.

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Trust and Opportunism in Procurement and Contract Management

There is a critical debate within the public sector management literature, reflecting a similar debate in the wider management literature, over the emphasis that should be placed upon intentional trust in the procurement and contract management process (for example, Walsh, 1995; Lane 1999; Bovaird and Halachmi, 2001; Grimshaw et al, 2002; Huxham, 2003; Coulson, 2005; Watt, 2005; Bovaird, 2006; Reeves, 2008; The Author et al, 2010). Intentional trust is defined as the expectation of one party to an exchange that the other party will not take advantage of commercial vulnerabilities even when there is an incentive to do so (Nooteboom, 2002). This is distinct from competence trust (Sako, 1992), which is an equally important concept, but not the focus of this article.

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This particular debate does not concern the benefits of intentional trust, should it be successfully created. These have been well charted and agreed upon in the literature and include reduced transaction costs (search costs, negotiation costs, contracting costs and monitoring costs) and an increased level of value creation (Chiles and

McMakin, 1996). The debate is more about the feasibility of its creation and about how its absence in a purchase situation should be addressed.

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There are many that contend that the creation of intentional trust within buyer-supplier relationships is eminently feasible and can then facilitate the above-mentioned lower transaction costs and increased value creation. The reasoning behind this is varied, but covers benign views about human nature (Ghoshal and Moran, 1996; Casey, 2003), the identification of national cultures that facilitate communitarian beliefs and actions (Lane and Bachmann, 1996), contentions that it is possible to both profit from and signal intentional trustworthiness (Ugoji et al, 2007) and arguments that stress the social obligations and confidence that arise out of repeated interactions (Gulati, 1995).

□

Beyond these ideas about the creation of intentional trust are a number of related actions believed to enhance the potential for trust to be maintained over time. First, it is argued that managers should refrain from aggressive and controlling behaviour during pre-contractual negotiations. Such behaviour, it is argued, is likely to encourage 'tit-for-tat' behaviour, as modelled by the prisoner's dilemma (Axelrod and Hamilton, 1981). Second, it is argued that managers should clearly communicate their 'interests' to the other party so as to reduce the chance of misunderstandings and ill-feeling (Kinnaird and Movius, 2008). As Hobbes observed over three centuries ago, aggressive actions are often not a product of wickedness but of fear and ignorance (Berk, 1977).

□

Third, some argue that formal contracts are incompatible with intentional trust and should be avoided, where possible (Boyne (1998). Malhotra and Murnighan (2002, p. 553), for example, state that formal, binding contracts 'crowd out' intentional trust as they affect an individual's 'underlying attributional processes'. A variant on this is that formal contracts can co-habit with intentional trust, but only if they are not too restrictive (Bovaird and Halachmi, 2001; Forder et al., 2004; Hughes and Rayer, 2009; Bertrandias et al, 2010). Finally, it is said that managers from the two parties should adopt established techniques to enhance and maintain intentional trust, including feedback loops (Huxham, 2003), supplier reward schemes (The Authors, 2007),

buyer-supplier forums, aimed at performance improvements (Hines, 1994), and dispute resolution mechanisms (Office of Government Commerce, 2002).

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Once intentional trust has been developed, it is argued that it can be a mechanism for making contracts, which may already be of a 'general clause' or 'relational' type (Williamson, 1985; Macneil, 1978), self-enforcing. Suppliers deliver upon their promises and, where relevant, deal fairly with the consequences of uncertainty, because they feel a social obligation to do so (Granovetter, 1985; Nooteboom, 2002).

□

Others within this debate, however, are less optimistic. Williamson, for example, rejects the usefulness of the concept of intentional trust. He believes instead that the economics of contracts should be based upon an assumption of supplier opportunism and involves a cautious approach (Williamson, 1993). This approach is said to hold even if it is believed that relationships based on trust can and do exist between buyers and suppliers. This is because, even if you believe only a significant minority of suppliers are prone to opportunistic actions, it is hard to tell ex ante which those are (Williamson, 1993).

□

The concept of opportunism in economics is understood as self-interest seeking actions that go beyond the traditional neo-classical concept of simple self-interest seeking (Williamson, 1985). These actions can either be blatant or subtle (Williamson, 1996).

□

A key type of blatant opportunism is the hold-up problem, which can be defined as a situation where a supplier refuses to continue to supply, or to supply at a particular level of performance, unless its increased demands are met. This threat can be credible in situations where the buyer's ability to switch to alternative suppliers is constrained by either time or the relationship-specific investments it has made. The problem is particularly serious when a contract is characterised by uncertainty as this will force a buying organisation to sign an incomplete contract, one that is completed through negotiations during the contract period. If the buyer's ability to switch is constrained by its making of relationship-specific investments, it may well undertake those negotiations from a weak position (The Author, 2005).

□

Key types of subtle opportunism include adverse selection and moral hazard (Milgrom and Roberts, 1992). Adverse selection is defined as a situation where, because of a lack of information, a buying organisation pays a price for a good or service that is based upon an erroneous belief about the quality of that good or service. In such a scenario, the supplier, of course, deliberately fails to address the buyer's lack of necessary information. Moral hazard is a situation where a supplier underperforms in order to improve its profits on a contract, safe in the knowledge that the buyer finds it difficult to monitor its performance. Two common manifestations of moral hazard are shirking and quality shading (Milgrom and Roberts, 1992; The Authors, 2007).

Amongst those reasons cited for the existence of opportunism in business relationships are frailties in human nature (Williamson, 1985), individualistic national culture (Lane and Bachmann, 1996), adverse business circumstances (Nooteboom, 2002) and amoral business education (Ghoshal and Moran, 1996), as well as transaction complexity, uncertainty, asset specificity and credence qualities (Williamson, 1985).

In terms of how, at a high level, managers should cope with the existence of opportunistic intent in a significant minority of suppliers, a cautious approach has been advanced, involving the employment of extensive management control mechanisms (Williamson, 1985 and 1996; Anderson and Dekker, 2005). First, it is said that buy-side managers should carefully research and agree upon both their own organisation's purchase requirements and the capabilities and reputation of the supply market (Hughes and Dickson, 2009). Second, and following this, it is said that the two parties should, following careful negotiation, contract formally in the first instance and then look to 'keep the contract in the drawer'.

Contracting formally means, in the manner of Klein (1996), developing legal clauses where the absence of uncertainty makes it possible and developing private enforcement capital where the presence of uncertainty means it is not. 'Keeping the contract in the drawer' does not mean ignoring the contractual provisions, but rather translating them into a set of working procedures, understandings and expectations. If monitoring subsequently reveals that these are not being adhered to then this will see

the legal specifics of the contract being reintroduced. Third, buy-side managers should retain an awareness of the role reputation can play in a cautious approach (Bowles and Gintis, 1999).

□

Those who adhere to this cautious approach (for example, Czerniawska and Smith, 2010) believe that, contrary to the arguments of, for example, Malhotra and Murnighan (2002), the best chance of developing a relationship underpinned by intentional trust is through establishing at the outset a clear and detailed legal agreement. The reasoning behind this is that such an agreement reduces the scope for misunderstandings and reduces the fear of receiving the 'sucker's pay-off'. The idea of a contract 'crowding out' intentional trust is not recognised by this approach, not least as it is believed that managers respect the other party's requirement for security. Furthermore, even when such an agreement does not promote intentional trust, it still provides the basis for compliance.

□

For this group, therefore, fear of opportunism suggests a need for caution in procurement and contract management, with extensive management control structures suggested, especially in the case of potentially hazardous transactions (Forder et al., 2004; Anderson and Dekker, 2005). Proponents of this cautious approach do not deny that this approach imposes higher transaction costs. Nor do they deny that it can cause buying organisations to miss numerous opportunities to develop productive relationships with suppliers that had no intention of acting opportunistically. However, they argue that these costs are outweighed by the prospect of lower opportunism costs over the long run.

□

Having outlined the relevant parts of the debate over intentional trust, supplier opportunism and their management, we now proceed to present quantitative evidence on public and private sector procurement and contract management practice. Specifically, we aim to investigate the contention in the literature that various buy-side management control mechanisms are effective at restraining supplier opportunism, when transaction characteristics make opportunism a possibility. In that sense, we are investigating the cautious approach introduced above.

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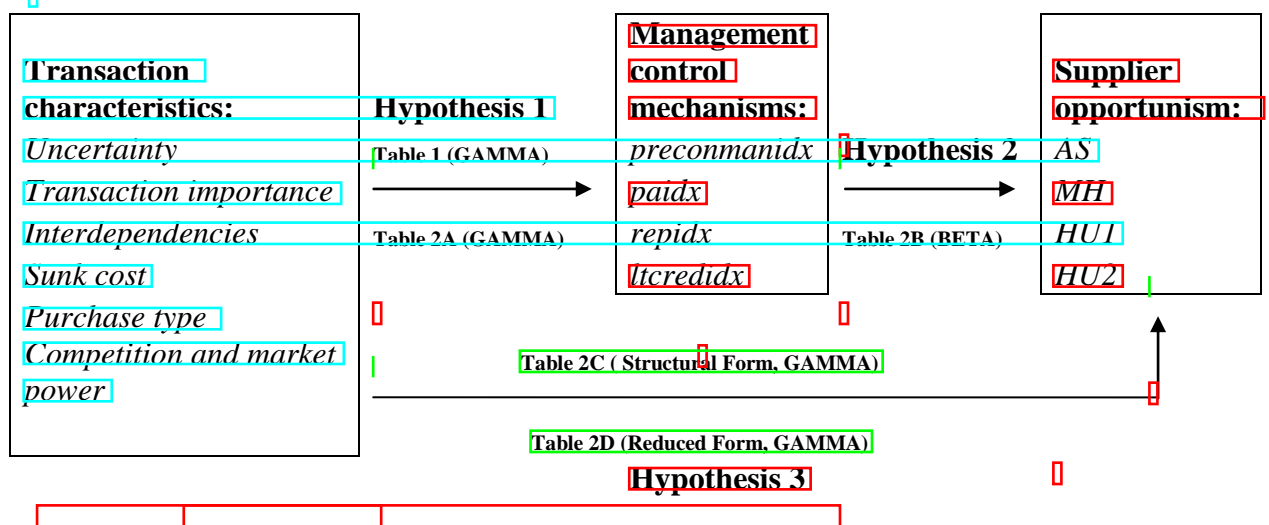
Methodology

In this study, we tested three hypotheses derived from the literature (see Figure 1) in pursuit of our research objective. The first hypothesis concerns the relationship between transaction characteristics and management control mechanisms and posits that the more a transaction is hazardous the less extensive the management control mechanisms will be. The reasoning behind this hypothesis is that extensive knowledge of purchase requirements, communication of that knowledge to suppliers, knowledge of pricing, monitoring, negotiation, contract drafting, and the establishment of the supplier's track record and legal credibility will be more difficult the more a transaction is hazardous. This is because the greater the hazards become the greater the strain they will put on the 'feasible foresight' of managers with bounded rationality (Williamson, 1996).

□

Figure 1: Relationships Estimated between Transaction Characteristics, Management Control Mechanisms and Incidences of Supplier Opportunism

□



The second hypothesis concerns the relationship between management control mechanisms and incidences of supplier opportunism, and posits that increases in the extensiveness of management control mechanisms will reduce incidences of supplier opportunism (Williamson, 1985; Milgrom and Roberts, 1992; Anderson and Dekker, 2005). That is, it posits that a cautious approach will be effective.

□

The third hypothesis concerns the relationship between transaction characteristics and supplier opportunism, both with and without the intervening variable of management control mechanisms. This hypothesis was advanced to provide a further test of the

impact of management control mechanisms on supplier opportunism. We test the argument that more hazardous transaction characteristics will lead to increased incidences of supplier opportunism, but that this outcome will be influenced by the extensiveness of management control mechanisms.

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We undertook tests of the hypotheses using structural equation modelling (SEM) and LISREL 8.8 (Jöreskog and Sörbom, 2006).ⁱ The characteristics of the sample that facilitated the tests and the variable measures used in the tests are now described.

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Sample details

The quantitative evidence used to conduct the investigation is from 180 responses provided by procurement (that is, buy-side) professionals to a cross-sectional questionnaire survey. Most of the respondents filled out the questionnaire while at the authors' institution attending some form of procurement-related event; a smaller number, attendees at earlier events, responded by post or email. The questionnaire asked respondents to classify a contract management situation in terms of the transaction characteristics, the procurement and contract management actions taken and the perceived outcome in terms of incidences of supplier opportunism. The nature of the sample meant that the response rate was high, about 50%.

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Following, for example, Anderson and Dekker (2005), supply-side perceptions of the transactions were not collected. Safeguards against false reporting on the part of the buy-side respondents, particularly with respect to perceptions of transaction outcomes, included both an offer of anonymity and privacy at the time of completing the questionnaire. This was aimed at removing any risk of an 'audience effect'. There was also careful selection of the sample. The managers asked to participate in the research were selected on the basis of their association with the authors' institution (through attendance at conferences, courses, workshops, etc.). While this buy-side focused convenience sampling might have limited the representativeness, of the survey it did mean that the respondents were academically informed managers with an interest in contributing to robust research findings within their vocational area. It can be also plausibly argued that buy-side managers are a more reliable source of data than supply-side managers on the issue of supplier opportunism. Buy-side managers tend to see addressing supplier opportunism as a standard part of their role (The Authors,

2007), whereas supply-side managers tend to be reluctant to admit opportunism, not least as some forms of opportunism fall outside of commercial law. Finally, while the respondents were asked to provide their perceptions of the transaction outcomes, the phrasing of the questions regarding outcome were specifically designed to encourage objectivity.

□

The aforementioned offer of anonymity means that the demographic breakdown of the sample is not complete, because a proportion of the respondents opted to omit some or all of the personal details section of the questionnaire. The only personal detail that was insisted upon related to whether their employment was in the public or private sector (104 and 76 respondents respectively). Anonymity was one element of the ethical approval process related to this project. Other aspects were assurances over the storage and use of the data, voluntary participation and an offer of privacy during questionnaire completion, facilitating non-participation.

□

However, on the basis of the information possessed by the researchers, the following breakdown can be reported. Many purchase categories were covered: telecoms and IT (20.6%); commodities and chemicals (15.5%); miscellaneous business services (12.1%); miscellaneous materials, e.g. printed materials (11.2%); professional services (11.2%); industrial equipment (7.2%); and others (21.6%). In terms of position in the organisation, 25.5% of respondents were procurement executives/directors, 48.9% were procurement managers and 11.2% were buyers or senior buyers. The remaining 12.2% were general managers involved in procurement. Most of the respondents were from the UK (73.4%). Others came from Africa (18.1%), Europe (4.2%), and the rest of the world (4.2%).

□

All of the respondents had been prominently involved in, and were therefore highly knowledgeable about, the situation on which they reported. All of the suppliers reported on by the respondents were private sector, for-profit organisations; no public or third sector suppliers were covered. As mentioned, the research sample included respondents from both public and private sector buying organisations. This allowed a public sector dummy variable to be included to assess differences in procurement and contract management practices and outcomes between the two sectors.

□

Variable measures and scale development

In selecting both the independent and dependent variables, we have been guided by the relevant literature (for example, Williamson, 1985; Milgrom and Roberts, 1992; Klein, 1996; Anderson and Dekker, 2005; The Author, 2005). Given the breadth of the coverage of the research study, however, not all aspects of the concepts arising out of the relevant literature were covered by the questionnaire. Instead we questioned the respondents about certain aspects of the concepts that can be used to qualify relevant transaction characteristics, management control mechanisms and types of opportunism. While this was done to prevent the questionnaire from becoming overly long and complex in an effort to achieve a good response rate, the authors recognise that as a result they can make no claim that the research is comprehensive in terms of testing the literature.

□

Independent variables

The first task in this part of the article is to describe how we measured our latent independent variables of transaction characteristics and supply market competition. A statistical description of each of the six independent variables considered in this study is provided in Table A (Panel A), which is included in Appendix A.

□

(i) Transaction importance

Buying organisations are potentially vulnerable to supplier opportunism when what they are buying is strategically and/or operationally important. This is because they are likely to be in a position where they will have to make a purchase and see through the contractual period. Choosing not to buy is not an option. We use two indicators, *opeimp* (Q1) and *strimp* (Q2), to measure this transaction characteristic.

□

(ii) Competition and supplier bargaining power

In the research it was hypothesized that more powerful suppliers, facing less intense competitive pressure and dealing with dependent buyers, would be more prone to opportunistic behaviour (The Author, 2005). Buyer-supplier power across the 180 contract management situations was measured using the indicator *market* (Q4) and a range of power relationships were found.

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(iii) Uncertainty

Uncertainty is a concept that has many manifestations (The Author, 2012). In line with Williamson (1985), we focused here on the ex ante specification problem. This problem can cause contractual incompleteness that, in turn, creates vulnerability to opportunism, especially in the form of hold-up (Williamson, 1985). It can also cause information asymmetry problems for buyers. We used two survey questions as indicators of this latent construct to describe ex ante uncertainty. Respondents were asked to report the extent to which future contingencies could be envisaged, *noenvcon* (Q5), and the extent to which a common understanding of future contingencies could be achieved, *nocomcon* (Q6).

□

(iv) Sunk costs (transaction-specific investments)

Transaction-specific investments, particularly when combined with the type of uncertainty described above, create potential vulnerability to supplier opportunism in the form of hold-up. The term refers to investments in human, site or physical assets that have little or no value outside of a particular transaction. Here we used two questions concerning the losses the buyer would sustain if the relationship ended, first in terms of investments in physical equipment, *invphy* (Q10), and, second, in terms of investments in training, *invtrain* (Q11).

□

(v) Purchase type

We measured purchase type in two ways. First we differentiated between goods and services purchases using the indicator *service*, with goods as 0 and services as 1. Second we differentiated between types of agreement in terms of the complexity of the payment mechanism. This was measured by the indicator *dpl* (Q26), with fixed price agreements as 0, and flexible price agreements and other more complicated payment mechanisms as 1. We were interested to explore the argument that services purchases involving flexible payment mechanisms might pose hazards of supplier opportunism, because of ‘plasticity’, greater scope for supplier discretion, in the delivery process (Alchian and Woodward, 1988).

□

(vi) Interdependencies with other transactions

We measured the extent to which performance on a contract would affect a supplier's ability to win further business from the relevant internal client or the buying organisation in general. The extent to which this is the case is a result of relative transaction interdependency. We used two indicators, *perfresulta* (Q36) and *perfresultb* (Q37), to measure the latent variable of interdependencies with other transactions. The argument explored here is that transactions with high levels of interdependency are less likely to pose hazards of supplier opportunism than those with low levels.

□

Dependent variables

The following sections describe the measures and scale-development procedures for the dependent variables: management control mechanisms and problems of supplier opportunism.

□

(i) Common factor analysis (CFA) of the management control mechanisms

Our questionnaire survey gathered evidence about sixteen management control mechanisms that have been identified in the literature as having the potential to restrain supplier opportunism, i.e. mechanisms that can be placed within the cautious approach to procurement and contract management. These relate to the areas of pre-contract management, procurement actions, reputation effects and legal action. The questions that covered these mechanisms may have been subject to measurement errors and will also inevitably be correlated to each other. To address these risks, we used common factor analysis to obtain four common factors.ⁱⁱ These are as follows:

□

Factor 1: Pre-contract management index: *preconmanidx* (higher values = more understanding of procurement requirement)

Factor 2: Procurement actions index: *paidx* (higher values = more control effort)

Factor 3: Reputation effects index: *repidx* (higher values = more track record)

Factor 4: Credibility of legal threat index: *ltcredidx* (higher values = more credible legal threat)

□

In order to keep the common factors consistent with the original 0 to 10 scales used for the separate variables in the survey, they were rescaled with a mean of 5 and a standard deviation of 2.ⁱⁱⁱ

The first common factor, pre-contract management index, loads on variables relating to the framing of the agreement. Key questions here concern the extent to which the internal client and the supplier have a clear idea of the buying organisation's procurement requirements. The indicators used were *clearidea* (Q15), *procurepro* (Q16), *comptension* (Q17), *suppliercleara* (Q18), *supplierclearb* (Q19) and *supmonitor* (Q24). Higher values represent a well-researched understanding of the purchase requirement.

The second factor, procurement actions index, loads on variables concerned with the time and effort required to research, negotiate, design and draft the contract. The indicators used were *searsup* (Q21), *negterms* (Q22) and *dedrcon* (Q23). Higher values indicate that more resources have been devoted to these procurement actions.

The third factor, labelled reputation effects index, concerns the extent to which the supplier's reputation is known by the buyer. The indicators used were *repuexpa* (Q34) and *repuexpb* (Q35). Higher values indicate that the supplier is well known by both the buyer and the industry more generally.

The fourth factor, credibility of legal threat index, loads on items related to the credibility of legal threats to the supplier. The relevant variables are the chance of winning a legal case (*lowwin*, Q49), potential damage to the supplier relationship from a prolonged legal dispute (*reladamage*, Q50), the impact on operational performance of a prolonged legal dispute (*operadamage*, Q51), the financial cost of a legal dispute (*financost*, Q52) and the size of any potential legal pay-out (*lowpay*, Q53). The way these questions were asked means that higher values suggest a more credible legal threat.

Descriptive statistics of these four management indices are presented in Table A (Panel B) in Appendix A.

(ii) Incidence of opportunistic behaviour

Panel C in Table A contains the main dependent variables to measure opportunistic behaviours by suppliers. The variables chosen were certain restricted aspects of adverse selection (AS), moral hazard (MH), pre-contractual hold-up (HUI) and post-

contractual hold-up (*HU2*). These concepts were discussed earlier in the article as hazards that a cautious approach to procurement and contract management might seek to address. All variables are measured in a range from 0 to 10, with a high score reflecting a higher level of opportunism. It is important to note here that, in accordance with the literature, there is no expectation that all of the independent variables relating to transaction characteristics will cause a rise in the level of all four of the selected opportunistic behaviours. Certain problems of opportunism are understood as being associated only with certain transactional characteristics.

□

We explored only certain restricted aspects of the selected types of opportunism in order to ensure that the questionnaire survey was not overly long or complex. It was felt that aspects of each opportunism type would together provide a sample of potential opportunistic actions and allow certain, if restricted, conclusions to be drawn about the efficacy of management control mechanisms. In this context, the incidence of adverse selection (*AS*) was measured in terms of whether the product or service lived up to the *ex ante* promises made by the supplier (*Q30*) and that of moral hazard (*MH*) by asking whether, following the signing of the contract, the supplier consistently came up short in terms of effort (*Q32*). This is what Milgrom and Roberts (1992) refer to as shirking.

□

Two hold-up variables (*HU1* and *HU2*) were also explored. *HU1* was measured by a question asking whether, between winning the competitive tender and signing the contract, the supplier attempted to revise and renegotiate the terms of the deal (*Q31*) – a situation known as pre-contractual drift (The Authors, 2007). Evidence of *HU2* was gleaned by asking whether following start of the contract period the supplier attempted to revise and renegotiate the terms or take advantage of contract variations (*Q33*), familiar situations relating to post-contractual hold-up (Williamson, 1985).

□

Specification and Results

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Relationships between transaction characteristics and management control mechanisms

Table 1 reports the findings of our test of hypothesis 1. This hypothesis concerns the relationship between transaction characteristics and management control mechanisms.

The findings show that transactions characterised by the selected ex ante uncertainty attribute are significantly associated with less extensive management control, especially pre-contract management (-0.6) and reputation effects (-0.53). Our results also show negative, although not statistically significant, associations between the selected uncertainty attribute and both procurement actions (-1.23) and the credibility of legal threats (-0.14). We also find significant negative associations between the sunk costs incurred by the buying organisation and the extent of management control through pre-contract management (-0.69) and credible legal threats (-0.53).

□

Table 1 Relationships Between Transaction Characteristics and Management Control Mechanisms (GAMMA)

	<i>preconmanidx</i>	<i>paidx</i>	<i>repidx</i>	<i>ltcredidx</i>
<i>Uncertainty</i>	-0.60***	-1.23	-0.53***	-0.14
	(0.18)	(1.6)	(0.19)	(0.18)
<i>Transaction importance</i>	0.2	-0.1	0.25	-0.25
	(0.2)	(0.92)	(0.21)	(0.2)
<i>Interdependencies</i>	-0.03	-1.14	-0.98***	0.04
	(0.18)	(1.64)	(0.2)	(0.18)
<i>Sunk cost</i>	-0.69***	-0.81	-0.23	-0.53***
	(0.2)	(1.82)	(0.21)	(0.21)
<i>Purchase type</i>	0.15	3.24	0.41*	-0.14
	(0.23)	(3.2)	(0.25)	(0.23)
<i>Competition and market power</i>	-0.07	0.19	-0.04	-0.14
	(0.09)	(0.39)	(0.1)	(0.09)
<i>Public</i>	-0.18	-0.25	-0.41	0.17
	(0.29)	(1.07)	(0.31)	(0.3)
Degrees of freedom	61			
Chi-square (min.fit)	112.37 (p=0.00)			
RMSEA	0.063			
SRMR	0.048			
GFI (AGFI)	0.93 (0.85)			
NNFI	0.86			
CFI	0.93			

Notes: Each cell reports the maximum likelihood coefficient and the estimates of standard errors (in parentheses). ***, **, * indicate a p value of < 0.01, 0.05, 0.10 in a two-tailed test.

□

Taking together the findings in relation to both the selected uncertainty attribute and sunk costs, we can say there is indeed evidence that certain transaction characteristics place a strain on the 'feasible foresight' of managers (Williamson, 1996). This reflects expectations in the literature (for example, Williamson, 1985).

□

Our data also shows a significant negative association between the level of transaction interdependencies and knowledge of the supplier's reputation (-0.98). This shows that when a supplier's ability to win future business is dependent on its performance in current contracts, buyers are less concerned with examining the supplier's historical track record. By contrast, purchase type is positively associated with knowledge of the supplier's reputation (0.41). Service purchases with flexible payment mechanisms are shown to be associated with greater consideration of supplier reputation than is the case for goods purchases with fixed payment mechanisms.

□

Finally, we note that, while the findings show no significant associations between the use of management control mechanisms and transaction importance, competition and market power, and the public dummy variable, the whole structural equation model exhibits a good fit (Fan et al., 1999; Hu and Bentler, 1999). This applies across a wide range of fit statistics, including but not limited to those reported.^{iv}

□

In terms of hypothesis 1, therefore, we can conclude that evidence exists that certain transactional characteristics reduce the extensiveness of management control mechanisms. Some contributors to the literature (for example, Williamson, 1985) argue that this will increase buyer vulnerability to supplier opportunism. Also, efforts to establish the reputational track record of suppliers are shown to be lower when the transaction is interdependent with others made by the buying organisation. What we see here is that this transaction characteristic contains its own protection against opportunism.

□

Relationships between transaction characteristics, management control mechanisms and supplier opportunism

Table 2 reports the findings from our test of both hypothesis 2 (Panel B) and hypothesis 3 (Panels C and D). Hypothesis 2 proposes that increases in the extensiveness of management control mechanisms will reduce incidences of supplier opportunism, while hypothesis 3 proposes that more hazardous transaction characteristics will lead to increased incidences of supplier opportunism, but that this outcome will be impacted by the extensiveness of management control mechanisms. Table 2 (Panel A) also reports the findings of an alternative test of hypothesis 1,

which links transaction characteristics and the extensiveness of management control mechanisms.

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Table 2 Relationships Between Transaction Characteristics, Management Control Mechanisms and Incidences of Supplier Opportunism

□

Panel A. Relationships Between Transaction Characteristics and Management Control Mechanisms (GAMMA)

	<i>preconmanidx</i>	<i>paidx</i>	<i>repidx</i>	<i>ltcredidx</i>
Uncertainty	-0.59***	-0.92*	-0.51***	-0.08
	(0.18)	(0.51)	(0.18)	(0.18)
Transaction importance	0.19	0.01	0.24	-0.26
	(0.19)	(0.55)	(0.2)	(0.19)
Interdependencies	-0.03	-0.9*	-0.98***	0.03
	(0.18)	(0.53)	(0.2)	(0.18)
Sunk cost	-0.7***	-0.59	-0.23	-0.54**
	(0.21)	(0.59)	(0.21)	(0.21)
Purchase type	0.16	2.72***	0.41*	-0.13
	(0.22)	(0.55)	(0.23)	(0.23)
Competition and market power	-0.07	0.13	-0.05	-0.15
	(0.09)	(0.27)	(0.1)	(0.09)
Public	-0.18	0.01	-0.37	0.2
	(0.29)	(0.85)	(0.31)	(0.3)

□

Panel B. Relationships Between Management Control Mechanisms and Supplier Opportunism (BETA)

	<i>AS</i>	<i>MH</i>	<i>HUI</i>	<i>HU2</i>
Ltcredidx	-0.12*	0.03	-0.1	-0.15*
	(0.08)	(0.09)	(0.08)	(0.08)
Paidx	-2.68	-2.66	-3.92	-3.13
	(3.38)	(3.36)	(5.28)	(4.42)
Preconmanidx	-0.13*	0	-0.22***	-0.3***
	(0.09)	(0.1)	(0.09)	(0.08)
Repidx	-0.3***	-0.4***	-0.3***	-0.36***
	(0.09)	(0.1)	(0.09)	(0.09)

□

Panel C. Relationships Between Transaction Characteristics and Supplier Opportunism (Structural Form, GAMMA)

	<i>AS</i>	<i>MH</i>	<i>HUI</i>	<i>HU2</i>
Uncertainty	-2.08	-1.98	-4.16	-3.41
	(3.41)	(3.39)	(5.33)	(4.46)
Transaction importance	-0.1	0.11	0.27	-0.02
	(1.52)	(1.51)	(2.37)	(1.99)

<i>Interdependencies</i>	-2.52	-2.91	-4.01	-3.69
	(3.35)	(3.33)	(5.23)	(4.38)
<i>Sunk cost</i>	-1.55	-1.09	-2.61	-2.36
	(2.55)	(2.54)	(3.98)	(3.34)
<i>Purchase type</i>	7.46	7.4	11.68	9.78
	(9.34)	(9.29)	(14.6)	(12.22)
<i>Competition and market power</i>	0.27	0.37	0.39	0.27
	(0.87)	(0.87)	(1.36)	(1.14)
<i>Public</i>	0.07	-0.25	-0.06	0.09
	(2.34)	(2.33)	(3.65)	(3.06)

Panel D. Relationships Between Transaction Characteristics and Supplier Opportunism (Reduced Form, GAMMA)

	<i>AS</i>	<i>MH</i>	<i>HU1</i>	<i>HU2</i>
<i>Uncertainty</i>	0.63***	0.66***	-0.27	-0.16
	(0.24)	(0.26)	(0.31)	(0.31)
<i>Transaction importance</i>	-0.2	-0.03	0.14	-0.16
	(0.22)	(0.25)	(0.27)	(0.3)
<i>Interdependencies</i>	0.18	-0.13	-0.19	-0.53*
	(0.25)	(0.27)	(0.33)	(0.33)
<i>Sunk cost</i>	0.25	0.55*	-0.04	-0.16
	(0.28)	(0.31)	(0.38)	(0.37)
<i>Purchase type</i>	-0.01	0	0.83	1.04*
	(0.46)	(0.47)	(0.63)	(0.54)
<i>Competition and market power</i>	-0.05	0.03	-0.09	-0.1
	(0.1)	(0.12)	(0.13)	(0.14)
<i>Public</i>	0.15	-0.12	0.03	0.21
	(0.32)	(0.37)	(0.4)	(0.45)

Degrees of freedom 87

Chi-square (min.fit) 148.16 (p=0.00)

RMSEA 0.057

SRMR 0.045

GFI (AGFI) 0.93 (0.83)

NNFI 0.88

CFI 0.95

Notes: Each cell reports the maximum likelihood coefficient and the estimates of standard errors (in parentheses). ***, **, * indicate a p value of < 0.01, 0.05, 0.10 in a two-tailed test.

Panel A results

The results presented in Table 2 (Panel A) are in many respects consistent with what we find in the single equation model reported in Table 1, but they produce more efficient estimations for our coefficients. Hence, we find that the conclusions drawn

above regarding relationships between transaction characteristics and management control mechanisms (hypothesis 1) have become more broadly and prominently supported. As in Table 1, our results show that transactions characterised by the selected ex ante uncertainty attribute are significantly associated with less extensive management control through pre-contract management (-0.59) and reputation effects (-0.51). We also again find a negative association between this aspect of uncertainty and procurement actions, but this has now become statistically significant (-0.92). As before, more investment in sunk cost has a negative association with pre-contract management (-0.7) and credibility of legal threat (-0.54).

□

We also find the same significant negative association between the level of transaction interdependencies and knowledge of the supplier's reputational track record (-0.98), but this time we also see significant evidence of less extensive procurement actions (-0.9) as interdependencies increase.

□

Purchase type is once again positively associated with management control through reputation effects (0.41). We also now see evidence of a significant positive association between purchase type and the effort put into procurement actions (2.72).

□

As before, we find no evidence of significant associations between the use of management control mechanisms and transaction importance, competition and market power, and the public dummy variable.

□

Panel B results

Panel B presents the results of our test of hypothesis 2, which proposes that increases in the extensiveness of management control mechanisms will reduce incidences of supplier opportunism. Our data provide some support for this hypothesis.

□

In the case of pre-contract management, we find a significant association. More extensive pre-contract management is significantly associated with fewer problems of the selected aspect of adverse selection (AS, -0.13), pre-contract hold-up (HU1, -0.22) and post-contract hold-up (HU2, -0.15). Our findings show an association between knowledge of supplier reputation and all four opportunistic behaviours: the selected aspect of adverse selection (AS, -0.3), the selected aspect of moral hazard (MH, -0.4),

pre-contractual hold-up (HU1, -0.3) and post-contractual hold-up (HU2, -0.36). Finally, we find that a credible legal threat is significantly associated with a reduced incidence of two of the four supplier opportunism problems, the selected aspect of adverse selection (AS, -0.12) and post-contractual hold-up (HU2, -0.15). The results for the procurement actions index have big values and show that more control effort led to lower opportunism, but they are not statistically significant.

□

Panel C and D results

The results of our test of hypothesis 3 are presented in Panels C and D. This hypothesis concerns the relationship between transaction characteristics and supplier opportunism, both without the intervening variable of management control mechanisms (the structural form) and with the intervening variable (the reduced form). We test the argument that more hazardous transaction characteristics will lead to increased incidences of supplier opportunism, but that this outcome will be influenced by the extensiveness of management control mechanisms.

□

In the structural form (Panel C), our findings are broadly supportive of the argument that increased transactional hazards will lead to increased incidences of opportunism, but none of the results are statistically significant. The effects of transaction characteristics on opportunism become much more significant when we look at the reduced form of our model (Panel D). This complements the data on hypothesis 2 in that it provides further evidence that the extensiveness of management control mechanisms has an important impact on opportunism.

□

In terms of the details of this, we found that our selected types of opportunism are a particular problem for buying organisations when transactions are characterised by our selected ex ante uncertainty attribute and significant sunk costs. The results show a significant positive association between the selected uncertainty attribute and both the selected aspect of adverse selection (AS, 0.63) and the selected aspect of moral hazard (MH, 0.66). A high level of sunk cost investment, meanwhile, is significantly positively associated with the selected aspect of moral hazard (MH, 0.55).

□

Beyond this, purchase type being a service with a flexible payment mechanism rather than a good with a fixed payment mechanism increases the incidence of post-

contractual hold-up (HU2, 1.04), while there is a significant negative association between the level of transaction interdependencies and the incidence of post-contractual hold-up (HU2, -0.53).

Finally, although we find no significant association between any of the four chosen types of supplier opportunism and transaction importance, competition and market power, and the public dummy variable, the whole structural equation model does exhibit a good fit across a wide range of fit statistics.

Conclusion

In this article, we have provided a data set concerning the procurement and contract management experiences of a sample of buying organisations. Using data from 180 procurement and contract management situations, 104 of them in the public sector, we have tested three hypotheses derived from the literature. We have also assessed whether there were significant differences between public sector and private sector experience. The evidence, although at times inconclusive, provided some support for the view that certain procurement and contract management mechanisms can assist buying organisations in moderating opportunism, but that certain transaction characteristics make the use of certain management mechanisms difficult. The evidence found no significant differences between public and private sector experiences in any part of the study. We summarize our key findings below.

First, we found that transactions characterized by a greater degree of hazard, in particular, the selected ex ante uncertainty attribute and sunk costs, tended to be associated with less extensive management control mechanisms. This was in line with the expectation of the literature (for example, Williamson, 1985 and 1996). Second, our evidence showed that increased extensiveness of management control mechanisms tended to reduce incidences of supplier opportunism. Efforts to establish supplier track record and reputation had the broadest impact, with the evidence showing a significant negative association across all four types of opportunism. Pre-contract management and credible legal threats also had a significant impact in reducing the selected aspect of adverse selection and hold-up. There is some evidence,

therefore, that supplier opportunism can be addressed through elements of what we have called a cautious approach.

□

Third, we found that transactions characterized by a greater degree of hazard, in particular the selected ex ante uncertainty attribute and sunk costs, were associated with a greater incidence of supplier opportunism. The selected aspects of adverse selection and moral hazard were the most prominent problems. These positive associations were only statistically significant, however, when modelled with the intervening variable of management control mechanisms. This again suggests that the degree to which supplier opportunism is a problem can be influenced by the extensiveness of management control mechanisms.

□

Given these findings, there is some merit in considering in more detail what a cautious approach to procurement and contract management might entail. There are a number of main elements that arise specifically from this research:

□

- Time and effort in ensuring, particularly in the case of significant procurement exercises, that, in so far as uncertainty allows, there is clarity over purchase requirements and that those requirements are communicated effectively to suppliers. Opportunistic suppliers will seek to take advantage of both a lack of clarity (and any consequent contractual incompleteness) and frequent changes to the purchase requirement.
- Time and effort in researching the attributes of the supplier so as to address the possibility of adverse selection. It is common for suppliers to exaggerate their capabilities.
- Enquiries into a supplier's reputation and track record prior to selection.
- Time and effort, particularly in the case of those procurement exercises that pose a risk of supplier opportunism, to carefully draw up a contract that will protect against potential opportunism. In terms of addressing hold-up, the contract might contain balancing provisions, for example, liquidated damages and property rights allocation (Williamson, 1985; Grossman and Hart, 1986). In terms of addressing moral hazard, the contract might contain performance incentives.

- A common feature of procurement practice is the tendency to 'let and forget'. A cautious approach warns against this and includes effective monitoring to address potential moral hazard. This runs in combination with the aforementioned incentive provisions within the contract (Baron and Besanko, 1987).
- Active promotion of contingent renewal. Contingent renewal refers to a buyer communicating to a supplier that its likelihood of winning future contracts is dependent upon its current performance and behaviour (Bowles and Gintis, 1999).
- Signalling to the supplier the hazards that arise from wider reputational damage.
- Finally, the retention of a credible legal threat. Clearly, court action is a last resort because of its costs and uncertainties. However, highlighting the 'shadow of the courts' can provide an effect without actual legal action (Messick, 2005).

□

There are two other important features of a cautious approach, although these were not part of the research study reported here. First, such an approach includes an extensive internal focus (The Authors, 2005). Where opportunism is feared, the need is heightened for buying organisations to agree a 'protocol' for both cross-functional internal discussions and interactions with the supplier, i.e. which personnel are permitted to communicate with the supplier and in what ways (Hughes and Dickson, 2009). The public sector has been identified as being weak in this area of practice (for example, National Audit Office, 2011). Second, this approach does not prohibit close collaboration with suppliers, but suggests that it should be undertaken with safeguards (Williamson, 1985).

□

In terms of the broader implications of our findings, these can be identified for both public policy-makers and academics. For policy-makers, this research provides a reminder that supplier behaviour is highly variable and that the price of poor judgement is potentially high. Promises of integrity are not always sincere. The study is also a reminder to take with a pinch of salt those clichés, so often heard at policy-related conferences and seminars, which contend that success in procurement and

contract management is about trusting relationships and not about contracts. Business markets are more challenging and complicated than that and a cautious approach to procurement and contract management can, according to this study, help buying organisations to cope with these challenges and complications.

□

For the academic literature, this article adds further weight to the view that, while the concept of supplier opportunism is an uncomfortable and regrettable one, it is not one that can be ignored by those interested in procurement and contract management, including that undertaken within the public sector. Furthermore, the evidence presented here suggests that supplier opportunism is most likely to be a problem in just the kind of complex, uncertain and involved contractual situations into which governments are increasingly entering, for example complex PPP and PFI arrangements (The Authors, 2007).. Public management academics have an important role to play in highlighting the challenges such complex procurements generate and the mechanisms that can be used to manage these challenges.

□

Finally, we need to acknowledge the limitations of this research study and suggest avenues for future research. First, in order to make our data gathering exercise manageable, we considered a relatively restricted set of variables representing only a portion of the concepts suggested as significant by the literature. Future research could look at additional dimensions of the chosen transaction characteristics, ex post uncertainty for example, and at the impact of other characteristics such as transaction size and frequency. Other dimensions of supplier opportunism, for example strategic misrepresentation and quality shading, could also be considered. Second, while we were careful to ensure that the data gathered from our sample of buyers was robust and reliable, future research could usefully introduce triangulation with other sources of evidence on supplier behaviour and performance, both primary (for example from other actors in the buying organisations) and secondary (i.e. supplier performance data). Third, our survey reports only on transactions involving private sector, for-profit suppliers. Future research could consider transactions involving public and third sector, not-for-profit suppliers to see if similar associations to those observed in this study are in evidence. This would be an important extension to our research given recent contributions to the public sector management literature which suggest that the procurement of services from the third sector should be less formal and contractual.

that is perhaps more trusting and less like the cautious approach outlined here, to take account of the distinctive social relations and practices of voluntary organisations (Carmel and Harlock, 2008; Buckingham, 2009).

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Appendix A

Table A Descriptive Statistics for Data Used to Construct Measures of Independent and Dependent Variables (N= 180)

	Mean	SD	Min	Max	Skewness	Kurtosis
Panel A. Independent variables:						
Transaction importance						
The operational importance of the transaction to the organisation? (<i>opeimp</i>): 0=None, 10=critical	8.3	1.7	0	10	-1.6	6.3
The strategic importance of the transaction to the organisation? (<i>strimp</i>): 0=None, 10=critical	7.5	2.7	0	10	-1.1	3.2
Competition and supplier bargaining power						
The market in which you were operating (<i>market</i>): 0=A highly dependent supplier, 10=A highly dominant supplier (monopoly)	4.7	1.9	1	10	0.5	2.9
Uncertainty						
Difficulty of envisaging all future contingencies (<i>noenvcon</i>): 0=fully foreseeable, 10=in the dark	4.6	2.0	0	9	-0.3	2.6
Difficulty of a common understanding of future contingencies (<i>nocomcon</i>): 0=fully foreseeable, 10=in the dark	4.5	2.0	0	9	-0.2	2.5
Investments in transaction-specific assets						
Investments in physical equipment (<i>invphy</i>): 0=None, 10=significant, non-Re-deployable investments	4.7	2.8	0	10	-0.2	2.1
Investments in training or competence development (<i>invtrain</i>): 0=None, 10=significant, non-Re-deployable investments	4.4	2.6	0	10	0.0	2.4
Purchase type						
Transaction type (<i>service</i>): 0=goods, 1=services	0.6	0.5	0	1	-0.4	1.2
On what basis was the deal priced? (<i>dp1</i>): 0=Fixed Price Agreement; 1=Flexible Price Agreement, Flexible Price with Maximum Threshold, Cost Plus Agreement; Target Cost Incentive Fee (With No Maximum Threshold) Agreement; Target Cost Incentive Fee (With Maximum Threshold) Agreement, Other:	0.7	0.5	0	1	-0.8	1.6
Interdependencies with other transactions						
Failure for it to perform adequately on this contract would mean that the supplier would not be used again by your internal client (<i>perfrea</i>): 0=Irrespective of performance, the supplier knew it	5.9	2.5	0	10	-0.4	2.6

would be re-used, 10=The supplier would have to 'delight' everybody in order to secure new business

Failure for it to perform adequately on this contract would mean that the supplier would not be used again by your whole organisation(*perfreb*): 0=Irrespective of performance, the supplier knew it would be re-used, 10=The supplier would have to 'delight' everybody in order to secure new business

5.9 2.4 0 10 -0.5 2.9

Other control variable

Public sector dummy: 0= private; 1=public

0.6 0.5 0 1 -0.3 1.1

□

Panel B. Dependent variables (management control mechanisms)

Pre-contract management index: *preconmanidx* (higher values = more understanding of procurement requirement)

5.0 2.0 -2.1 9.3 -0.5 3.8

Procurement actions index: *paidx* (higher values = more control effort)

5.0 2.0 0.3 8.8 -0.2 2.5

Reputation management index: *repidx* (higher values= more track record)

5.0 2.0 0.5 8.1 -0.6 2.6

Credibility of legal threat index: *ltcredidx* (higher values= more credible legal threat)

5.0 2.0 -0.7 12.2 0.4 5.4

□

Panel C. Dependent variables (supplier opportunism)

Adverse selection (AS):

The product/service in question lived up to the ex ante promises made by the supplier:

0=completely fit; 10= in no way met with our expectation/supplier's promises

3.0 2.2 0 10 1.0 3.8

Moral hazard (MH):

Following the signing of the contract, the supplier consistently came up short in terms of effort:

0=The supplier always tried to delight us; 10=The supplier only ever did what it absolutely had to

4.6 2.5 0 10 0.4 2.5

Hold-up (HU):

Between winning the competition and signing the contract, the supplier attempted to revise and renegotiate the terms (HU1) : 0= What was signed was what was delivered; 10=The supplier systematically went about trying to improve the profitability of the deal

2.8 2.1 0 10 1.1 4.4

Following the signing of the contract, the supplier attempted to revise and renegotiate the terms (HU2): 0= What was signed was what was delivered; 10=The supplier systematically went about trying to improve the profitability of the deal

2.9 2.2 0 10 1.0 3.9

Appendix B - Questionnaire

For reasons of space, this is an abridged version of the questionnaire. The full version is available from the authors upon request.

1. How would you rate the operational importance of the transaction to the organisation?
2. How would you rate the strategic importance of the transaction to the organisation?
3. How would you rate the political sensitivities of the transaction within the organisation?
4. Which of the following best describe the market in which you were operating: a highly dependent supplier: a highly competitive market: a mutually dependent environment: a strongly dominant supplier: a highly dominant supplier (monopoly)?
5. Prior to the agreement 'all future contingencies fully foreseeable' to 'everybody was pretty much operating in the dark'.
6. Prior to the agreement a common understanding of the possible nature of future contingencies: 'all future contingencies fully foreseeable' to 'everybody was pretty much operating in the dark'.
7. Prior to the agreement a common and complete understanding of the appropriate adaptations: 'all future contingencies fully foreseeable' to 'everybody was pretty much operating in the dark'.
8. Subsequent to the agreement, agreement over contingent events: 'all future contingencies fully foreseeable' to 'everybody was pretty much operating in the dark'.
9. Subsequent to the agreement, agreement over which adaptations to the realised contingencies corresponded to those specified in the contract: 'all future contingencies fully foreseeable' to 'everybody was pretty much operating in the dark'.
10. The transaction required you or your supplier to make investments in physical equipment, which should the relationship terminate prematurely, would have to be written-off: 'no such investments' to 'significant levels of such investments'.
11. The transaction required you or your supplier to make investments in training, which should the relationship terminate prematurely, would have to be written-off: 'no such investments' to 'significant levels of such investments'.
12. The transaction required considerable reputational investment: 'no reputational investments' to 'potential to be career destroying'.
13. Should the transaction terminate prematurely, there were no readily available alternatives: 'many' to 'none'.
14. The premature termination of the relationship would lead to a time-consuming and costly re-tendering: 'no costs' to 'costs of finding alternative make option unrealistic'.
15. Internal client idea of what required from supplier: 'clearly understood specification' to 'no understanding of what was required'.
16. The procurement process and researching the requirements of the organisation: 'went to market prematurely' to 'procurement process well structured and systematic'.
17. Organisation maintained competitive tension up to the moment the agreement was signed: 'supplier had no idea it would win the business' to 'supplier knew from outset it would win'.
18. The supplier 'had a clear of what it was our organisation required' to 'supplier had no understanding'.
19. The supplier 'had a clear idea of its ability to meet our organisation's requirements' to 'supplier clearly had no capability'.
20. Prior to signing the agreement, 'consideration was given to internal provision' to 'internal supply was a non-option'.
21. Prior to signing the agreement, 'considerable time and effort was spent researching price and performance attributes of different suppliers' to 'performance attributes not discernible, even after purchase'.
22. Prior to signing the agreement, time and effort required to negotiate terms: 'no effort required' to 'the negotiation process took months'.
23. Time and effort required to design and draw up the contract: 'no effort required' to 'the process took months'.
24. The supplier 'was carefully monitored' to 'no effort to monitor performance made'.
25. Time and effort enforcing and (where necessary) renegotiating the agreement: 'no effort required' to 'the relationship was reduced to a battleground'.
26. On what basis was the deal based: fixed price: flexible price: flexible with thresholds: cost plus: target cost with incentive?
27. Which of the following behaviours most accurately reflects your experience of the supplier: 'a partner whose promises were always kept' to 'supplier systematically set out to cheat my organisation'?
28. Which of the following behaviours describe the level of conflict: 'the relationship progressed smoothly' to 'the relationship broke down completely, leading to legal action'?
29. Agreement controlling expectations on price: 'price met our expectations' to 'we completely lost control of costs'.

30. Supplier's product or service living up to promises: 'completely fit for purpose' to 'supply effort in no way met our expectations / supplier's promises'.
31. Between agreeing deal and signing contract: 'what was signed was what was delivered' to 'supplier systematically sought to improve profitability of the deal'.
32. Supplier effort: 'supplier always tried to delight us' to 'supplier only did what it had to'.
33. Following the signing of the contract, 'what was signed was what was delivered' to 'supplier systematically sought to improve profitability of the deal'.
34. Past experience of the supplier's trustworthiness: 'good or bad, supplier had an extensive track record' to 'transaction represented first contact'.
35. Supplier reputation in the industry: 'good or bad, everyone knows this supplier to 'no track record people were aware of'.
36. Performance and future use by internal client: 'irrespective of performance, supplier knew it would be re-used' to 'supplier would have to delight to secure new business'.
37. Performance and future use by organisation as a whole: 'irrespective of performance, supplier knew it would be re-used' to 'supplier would have to delight to secure new business'.
38. Performance and future chances in industry: 'irrespective of performance, supplier knew it would not lose business elsewhere' to 'failure to perform on this contract would destroy reputation in industry'.
39. Deliberate attempts by my organisation to improve deal and dispute resolution: 'this was not a factor' to 'this made settlement impossible'.
40. Deliberate attempts by the supplier to improve deal and dispute resolution: 'this was not a factor' to 'this made settlement impossible'.
41. Stalling tactics by my organisation and dispute resolution: 'this was not a factor' to 'this made settlement impossible'.
42. Stalling tactics by the supplier and dispute resolution: 'this was not a factor' to 'this made settlement impossible'.
43. The lack of any obvious settlement point, acceptable to my organisation, and dispute resolution: 'this was not a factor' to 'this made settlement impossible'.
44. The lack of any obvious settlement point, acceptable to the supplier, and dispute resolution: 'this was not a factor' to 'this made settlement impossible'.
45. Poor communication and misunderstanding and dispute resolution: 'this was not a factor' to 'this made settlement impossible'.
46. Expectations of internal clients / senior managers and dispute resolution: 'this was not a factor' to 'this made settlement impossible'.
47. Expectations of internal clients / senior managers and premature dispute resolution: 'yes' to 'no'.
48. Personality clashes and dispute resolution: 'this was not a factor' to 'this made settlement impossible'.
49. Court action: 'If we had gone to court, we would have clearly won' to 'If we had gone to court, we would have clearly lost'.
50. The impact of court action on the relationship: 'no damage, expected as part of the game' to 'it would destroy it'.
51. The impact of court action on the organisation's operations: 'no effect' to 'would bring operations to a halt'.
52. Court action 'would have been costless' to 'would have been prohibitively expensive'.
53. Payout, if it came, was likely to be low compared to the real damage of court action to your organisation: 'false' to 'true'.

□

SEM allows us to explicitly model the measurement error of our latent variables. Additionally, it permits us to simultaneously estimate the relationships between transaction characteristics and the four management control mechanisms, while explicitly modelling co-variation amongst them. Modelling interdependencies amongst the management control mechanisms is particularly important in light of theories that assume such control systems are jointly determined. Since our data are on ordinal scales and may not be normally distributed, maximum likelihood methods should perform well (Boomsma and Hoogland, 2001; Distefano, 2002; Anderson and Dekker, 2005).

ii In the questionnaire survey, there are 16 questions relating to management control mechanisms. These questions may have measurement errors and also are correlated to each other. We calculated the Kaiser-Meyer-Olkin (KMO) measures of all 16 variables (Kaiser, 1974). All KMO measures are more than 0.5 and the overall KMO is more than 0.65, so we can conclude that the variables have enough common factors to warrant the sampling adequacy to use a factor model. Hence, we applied a common factor analysis (CFA) method that allows for measurement error. We used the maximum likelihood (ML) estimation and an oblique rotation that allows constructs of interest to correlate with each other. According to Fabrigar et al. (1999) at least 3-5

measured variables representing each common factor should be included, and a sample size of 5-10 times the number of measured variables is required for accurate results from the CFA method. Our sample size was 180, so the possible number of measured variables for factor analysis should be limited below 36 ($=180/5$), and the number of possible common factors should be below 12 ($=36/3$). We used a formal ML method to allow a vast array of goodness-of-fit information. The standard model information criteria, Akaike information criterion (AIC) (Akaike, 1987) and Bayesian information criterion (BIC) (Schwarz, 1978), have been used to determine the appropriate number of factors. Both AIC and BIC indicate that 4 common factors are the best choice for the 16 measured variables. Next, using maximum likelihood estimation and an oblique rotation, we extracted four factors with eigenvalues greater than one. The factor analysis yields a well-behaved solution, with items typically loading on a single factor, loading greater than 0.30 and few significant cross loadings. Scoring coefficients from the regression method inform us that the factor is obtained as a weighted sum of standardized versions of the 16 variables. Each estimated factor variable has been dominated by a domain of variables, which mainly reflects the latent variable in this domain.

ⁱⁱⁱ Our choice to rescale the common factors with a mean of 5 and a standard deviation of 2 was made to keep the factors similar to the original, underlying variables, measured on a 0-10 scale, and thereby to facilitate convenient interpretation of our results.

^{iv} Good fit is indicated by a Root Mean Squared Error of Approximation (RMSEA) of less than 0.07, a Standardized Root Mean Square Residual (SRMR) of less than 0.05, and the Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), Non-Normed Fit Index (NNFI) and Comparative Fit Index (CFI) being above or around 0.9.

^v Good fit is indicated by a RMSEA of less than 0.06, a SRMR of less than 0.05, and the GFI, AGFI, NNFI and CFI being above or around 0.9.