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Policy & Politics

Beyond Intentional Trust: Supplier Opportunism and Management Control Mechanisms in Public Sector Procurement and Contracting

--Manuscript Draft--

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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.
Keywords:	procurement; contract management; intentional trust; opportunism
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**Beyond Intentional Trust: Supplier Opportunism and Management Control
Mechanisms in Public Sector Procurement and Contracting**

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2 **Introduction**
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4 In many countries the outsourcing of public services to the private sector is
5 accelerating (Batley and Larbey, 2004; Hart, 2007). While contrary claims are
6 common (for example, Grimshaw et al., 2002; Davies, 2010), this acceleration is often
7 justified on the basis that private sector providers can deliver at least the same quality
8 of services as their public sector counterparts, but for a considerably lower price
9 (Julius, 2008).
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16 One consequence of this increasing use of the private sector is that procurement and
17 contract management has become ever more important to public sector management.
18 However, it would be wrong to assume that there is a settled consensus on what
19 constitutes effective public sector procurement and contract management, not least
20 when it comes to the emphasis that should be placed upon intentional trust in the
21 procurement and contract management process, as against using the process to
22 mitigate potential supplier opportunism (for example, Bovaird, 2006; Lonsdale et al,
23 2010). The debate over this issue is crucial, as clarity over the challenges and
24 objectives of the procurement and contract management process is critical to the
25 delivery of satisfactory outcomes.
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37 In this article, the authors contribute to this debate by reporting on the procurement
38 and contract management practices of public and private sector organisations. In
39 particular, we consider quantitative evidence on the perceived effectiveness of various
40 buy-side management control mechanisms aimed at restraining supplier opportunism,
41 when transaction characteristics make opportunism a possibility.
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48 We test three hypotheses derived from the literature, particularly Williamson (1985
49 and 1996), in pursuit of this research objective. First, we hypothesize that the more a
50 transaction is hazardous the less extensive the management control mechanisms will
51 be. Second, we hypothesize that an increased extensiveness of management control
52 mechanisms will reduce incidences of supplier opportunism. Finally, we test a
53 hypothesis concerning the relationship between transaction characteristics and
54 supplier opportunism, both with and without the intervening variable of management
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1 control mechanisms. This is again to assess the impact of management control
2 mechanisms.

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5 The data used to test these hypotheses are derived from 180 questionnaire responses
6 provided by procurement professionals working in buying organisations. We asked
7 respondents to classify a procurement and contract management situation in terms of
8 the transaction characteristics, report on the procurement and contract management
9 actions taken in the situation and then report perceptions of the outcome in terms of
10 incidences of supplier opportunism. The sample included both public and private
11 sector respondents, allowing us to measure differences between the two sectors.
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20 Our key findings are that certain procurement and contract management mechanisms
21 can assist buying organisations in moderating supplier opportunism, but that some
22 transaction characteristics make the use of certain management mechanisms difficult.
23 We found no significant differences between public and private sector experiences in
24 any part of the study. In terms of theory, our evidence provides support for the view
25 that the economics of contracts should be based on an assumption of supplier
26 opportunism rather than intentional trust (Williamson, 1993). This suggests that there
27 is a need for a cautious approach to procurement and contract management practice.
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36 The article is organised as follows: section two briefly discusses the literature dealing
37 with intentional trust, opportunism and management control mechanisms; section
38 three describes the methodology adopted; section four reports the results of our
39 hypothesis testing; section five concludes with a summary of key results and a
40 discussion of their implications for public sector procurement and contract
41 management practice.
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49 **Trust and Opportunism in Procurement and Contract Management**

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51 There is a critical debate within the public sector management literature, reflecting a
52 similar debate in the wider management literature, over the emphasis that should be
53 placed upon intentional trust in the procurement and contract management process
54 (for example, Lane 1999; Bovaird and Halachmi, 2001; Grimshaw et al, 2002; Watt,
55 2005; Bovaird, 2006; Lonsdale et al, 2010). In the procurement context, intentional
56 trust is defined as the expectation of one party to an exchange that the other party will
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1 not take advantage of commercial vulnerabilities even when there is an incentive to do
2 so (Nooteboom, 2002). This is distinct from competence trust (Sako, 1992), which is
3 an equally important concept, but not the focus of this article. This particular debate
4 does not concern the benefits of intentional trust, should it be successfully created.
5 These have been well charted and agreed upon in the literature and include reduced
6 transaction costs (search, negotiation, contracting and monitoring costs) and an
7 increased level of value creation (Chiles and McMakin, 1996). The debate is more
8 about the feasibility of its creation and about how its absence in a purchase situation
9 should be addressed.
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18 There are many that contend that the creation of intentional trust within buyer-
19 supplier relationships is eminently feasible and can then facilitate the above-
20 mentioned benefits. The reasoning behind this is varied, but covers benign views
21 about human nature (Ghoshal and Moran, 1996), the identification of national cultures
22 that facilitate communitarian beliefs and actions (Lane and Bachmann, 1996),
23 contentions that it is possible to both profit from and signal intentional trustworthiness
24 (Ugoji et al, 2007) and arguments that stress the social obligations and confidence that
25 arise out of repeated interactions (Gulati, 1995).
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34 Beyond these ideas about the creation of intentional trust are a number of related
35 actions believed to enhance the potential for trust to be maintained over time. First, it
36 is argued that managers should refrain from aggressive and controlling behaviour
37 during pre-contractual negotiations, because such behaviour is likely to encourage ‘tit-
38 for-tat’ behaviour, as modelled by the prisoner’s dilemma (Axelrod and Hamilton,
39 1981). Second, it is argued that managers should clearly communicate their ‘interests’
40 to the other party so as to reduce the chance of misunderstandings and ill-feeling
41 (Kinnaird and Movius, 2008).
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51 Third, some argue that formal contracts are incompatible with intentional trust and
52 should be avoided where possible. Malhotra and Murnighan (2002, p. 553), for
53 example, state that formal, binding contracts ‘crowd out’ intentional trust as they
54 affect an individual’s ‘underlying attributional processes’. A variant on this is that
55 formal contracts can co-habit with intentional trust, but only if they are not too
56 restrictive (Bovaird and Halachmi, 2001; Forder et al., 2004). Finally, it is said that
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1 managers from the two parties should adopt established techniques to enhance and
2 maintain intentional trust, including supplier reward schemes, buyer-supplier forums,
3 and dispute resolution mechanisms (Office of Government Commerce, 2002;
4 Lonsdale and Watson, 2007). Once intentional trust has been developed, it is argued
5 that it can be a mechanism for making contracts self-enforcing. Suppliers deliver upon
6 their promises and, where relevant, deal fairly with the consequences of uncertainty,
7 because they feel a social obligation to do so (Granovetter, 1985).
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14 Others within this debate, however, are less optimistic. Williamson (1993), for
15 example, rejects the usefulness of the concept of intentional trust. He believes instead
16 that the economics of contracts should be based upon an assumption of supplier
17 opportunism and involve a cautious approach. This approach is said to hold even if it
18 is believed that relationships based on trust can and do exist between buyers and
19 suppliers. This is because, even if you believe only a significant minority of suppliers
20 are prone to opportunistic actions, it is hard to tell ex ante which those are. The
21 concept of opportunism in economics is understood as self-interest seeking actions
22 that go beyond the traditional neo-classical concept of simple self-interest seeking
23 (Williamson, 1985). These actions can either be blatant or subtle (Williamson, 1996).
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34 A key type of blatant opportunism is the hold-up problem, which can be defined as a
35 situation where a supplier refuses to continue to supply, or to supply at a particular
36 level of performance, unless its increased demands are met. This threat can be
37 credible in situations where the buyer's ability to switch to alternative suppliers is
38 constrained by either time or relationship-specific investments. The problem is
39 particularly serious when a contract is characterised by uncertainty as this will force a
40 buying organisation to sign an incomplete contract, one that is completed through
41 negotiations during the contract period. If the buyer's ability to switch is constrained,
42 it may well undertake those negotiations from a weak position (Lonsdale, 2005).
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53 Key types of subtle opportunism include adverse selection and moral hazard
54 (Milgrom and Roberts, 1992). Adverse selection is defined as a situation where,
55 because of a lack of information, a buying organisation pays a price for a good or
56 service that is based upon an erroneous belief about the quality of that good or
57 service. In such a scenario, the supplier deliberately fails to address the buyer's lack
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1 of necessary information. Moral hazard is a situation where a supplier underperforms
2 in order to improve its profits on a contract, safe in the knowledge that the buyer finds
3 it difficult to monitor its performance. Two common manifestations of moral hazard
4 are shirking and quality shading (Lonsdale and Watson, 2007).
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9 Reasons cited for the existence of opportunism in business relationships include
10 frailties in human nature (Williamson, 1985), individualistic national culture (Lane
11 and Bachmann, 1996), and amoral business education (Ghoshal and Moran, 1996), as
12 well as transaction complexity, uncertainty, asset specificity and credence qualities
13 (Williamson, 1985).
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20 In terms of how managers should cope with the existence of opportunistic intent in a
21 significant minority of suppliers, a cautious approach has been advanced, involving
22 the employment of extensive management control mechanisms (Williamson, 1985
23 and 1996; Anderson and Dekker, 2005). First, it is said that buy-side managers should
24 carefully research and agree upon both their own organisation's purchase
25 requirements and the capabilities and reputation of the supply market (Hughes and
26 Dickson, 2009). Second, buy-side managers should retain an awareness of the role
27 reputation can play in a cautious approach (Bowles and Gintis, 1999).
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36 Third, it is said that the buyer should, following careful negotiation, contract formally
37 in the first instance and then look to 'keep the contract in the drawer'. Contracting
38 formally means developing legal clauses where the absence of uncertainty makes it
39 possible and developing private enforcement capital where the presence of uncertainty
40 means it is not (Klein, 1996). 'Keeping the contract in the drawer' does not mean
41 ignoring the contractual provisions, but rather translating them into a set of working
42 procedures, understandings and expectations. If monitoring subsequently reveals that
43 these are not being adhered to then this will see the legal specifics of the contract
44 being reintroduced.
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54 Those that adhere to this cautious approach believe that, contrary to the arguments of,
55 for example, Malhotra and Murnighan (2002), the best chance of developing a
56 relationship underpinned by intentional trust is through establishing at the outset a
57 clear and detailed legal agreement. It is argued that such an agreement reduces the
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1 scope for misunderstandings and mitigates the fear of receiving the ‘sucker’s pay-off’.
2 The idea of a contract ‘crowding out’ intentional trust is not recognised by this
3 approach, not least as it is believed that managers respect the other party’s
4 requirement for legal security. Furthermore, even when such an agreement does not
5 promote intentional trust, it still provides the basis for compliance.
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10 For this group, therefore, fear of opportunism suggests a need for caution in
11 procurement and contract management, with extensive management control structures
12 suggested, especially in the case of potentially hazardous transactions (Forder et al.,
13 2004). Proponents of this approach do not deny that it imposes higher transaction
14 costs. Nor do they deny that it can cause buying organisations to miss numerous
15 opportunities to develop productive relationships with suppliers that had no intention
16 of acting opportunistically. However, they argue that these costs are outweighed by
17 the prospect of lower opportunism costs over the long run.
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27 Having outlined the relevant parts of the debate over intentional trust, supplier
28 opportunism and their management, we now present quantitative evidence on public
29 and private sector procurement and contract management practice. Specifically, we
30 aim to investigate the contention in the literature that various buy-side management
31 control mechanisms are effective at restraining supplier opportunism, when
32 transaction characteristics make opportunism a possibility. In that sense, we are
33 investigating the cautious approach introduced above.
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42 **Methodology**

43 In this study, we tested three hypotheses derived from the literature (see Figure 1) in
44 pursuit of our research objective. The first hypothesis concerns the relationship
45 between transaction characteristics and management control mechanisms and posits
46 that the more a transaction is hazardous the less extensive the management control
47 mechanisms will be. The reasoning behind this hypothesis is that extensive
48 knowledge of purchase requirements, extensive communication of that knowledge to
49 suppliers, extensive knowledge of pricing, extensive monitoring, negotiation and
50 contract drafting, the effective establishment of the supplier's track record and
51 credible threats of legal action will be more difficult the more a transaction is
52 hazardous. This is because the greater the hazards become the greater the strain they
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1 will put on the ‘feasible foresight’ of managers with bounded rationality (Williamson,
2 1996).
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5 **Figure 1 here**
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9 The second hypothesis concerns the relationship between management control
10 mechanisms and incidences of supplier opportunism, and posits that increases in the
11 extensiveness of management control mechanisms will reduce incidences of supplier
12 opportunism (Williamson, 1985; Anderson and Dekker, 2005). That is, it posits that a
13 cautious approach will be effective.
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19 The third hypothesis concerns the relationship between transaction characteristics and
20 supplier opportunism, both with and without the intervening variable of management
21 control mechanisms. This hypothesis was advanced to provide a further test of the
22 impact of management control mechanisms on supplier opportunism. We test the
23 argument that more hazardous transaction characteristics will lead to increased
24 incidences of supplier opportunism, but that this outcome will be influenced by the
25 extensiveness of management control mechanisms.
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34 We undertook tests of the hypotheses using structural equation modelling (SEM) and
35 LISREL 8.8 (Jöreskog and Sörbom, 2006).¹ The characteristics of the sample that
36 facilitated the tests and the variable measures used are now described.
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42 ***Sample details***
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44 The evidence used to conduct our investigation is from 180 responses provided by
45 procurement (buy-side) professionals to a cross-sectional questionnaire survey. A
46 copy of the questionnaire is available from the authors upon request. Most of the
47 respondents filled out the questionnaire while at the authors’ institution attending a
48 procurement-related event; a smaller number, attendees at earlier events, responded
49 by post or email. The questionnaire asked respondents to classify a contract
50 management situation in terms of the transaction characteristics, report on the
51 procurement and contract management actions taken and report on the perceived
52 outcome in terms of incidences of supplier opportunism. The nature of the sample
53 meant that the response rate was high, about 50%.
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1 Following Anderson and Dekker (2005), supply-side perceptions of the transactions
2 were not collected. Safeguards against false reporting on the part of the buy-side
3 respondents, particularly with respect to perceptions of transaction outcomes, included
4 both an offer of anonymity and privacy at the time of completing the questionnaire.
5 This was aimed at removing any risk of an ‘audience effect’. There was also careful
6 selection of the sample. The managers asked to participate in the research were
7 selected on the basis of their association with the authors’ institution (through
8 attendance at conferences, courses, workshops, etc.). While this buy-side focused
9 convenience sampling might have limited the representativeness of the survey it did
10 mean that the respondents were academically informed managers with an interest in
11 contributing to robust research findings within their vocational area.
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22 It can also be plausibly argued that buy-side managers are a more reliable source of
23 data than supply-side managers on the issue of supplier opportunism. Buy-side
24 managers tend to see addressing supplier opportunism as a standard part of their role
25 (Lonsdale and Watson, 2007), whereas supply-side managers tend to be reluctant to
26 admit opportunism, not least as some forms of opportunism fall outside of commercial
27 law. Finally, while the respondents were asked to provide their perceptions of the
28 transaction outcomes, the phrasing of the questions regarding outcome were
29 specifically designed to encourage objectivity.
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38 The aforementioned offer of anonymity means that the demographic breakdown of the
39 sample is not complete - a proportion of the respondents opted to leave blank some or
40 all of the personal details section of the questionnaire. The only personal detail that
41 was insisted upon was whether their employment was in the public or private sector
42 (104 and 76 respondents respectively). Anonymity was also one element of the ethical
43 approval process related to this project. Other aspects were assurances over the
44 storage and use of the data, voluntary participation and an offer of privacy during
45 questionnaire completion, facilitating non-participation.
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54 On the basis of the information possessed by the researchers, however, the following
55 breakdown can be reported. Many purchase categories were covered: telecoms and IT
56 (20.6%); commodities and chemicals (15.5%); miscellaneous business services
57 (12.1%); miscellaneous materials, e.g. printed materials (11.2%); professional
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1 services (11.2%); industrial equipment (7.2%); and others (21.6%). In terms of
2 position in the organisation, 25.5% of respondents were procurement
3 executives/directors, 48.9% were procurement managers and 11.2% were buyers or
4 senior buyers. The remaining 12.2% were general managers involved in procurement.
5 Most of the respondents were from the UK (73.4%). Others came from Africa
6 (18.1%), Europe (4.2%), and the rest of the world (4.2%).
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12 All of the respondents had been prominently involved in, and were therefore highly
13 knowledgeable about, the situation on which they reported. All of the suppliers
14 reported on by the respondents were private sector, for-profit organisations; no public
15 or third sector suppliers were covered. The research sample included respondents
16 from both public and private sector buying organisations. This allowed a public sector
17 dummy variable to be included to assess differences in procurement and contract
18 management practices and outcomes between the two sectors.
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27 *Variable measures and scale development*

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

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51 In what follows, we describe how we measured our latent independent variables. A
52 statistical description of each of the six independent variables is provided in Table 1
53 (Panel A).
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(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 used two indicators, *opeimp* and *strimp*, to measure this transaction characteristic.

(ii) *Competition and supplier bargaining power*

We were interested to understand if more powerful suppliers, facing less intense competitive pressure and dealing with dependent buyers, would be more prone to opportunistic behaviour (Lonsdale, 2005). Buyer-supplier power across the 180 contract management situations was measured using the indicator *market* and a range of power relationships were found.

(iii) *Uncertainty*

Uncertainty is a concept that has many manifestations (Sanderson, 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. It can also cause information asymmetry problems for buyers. Respondents were asked to report the extent to which future contingencies could be envisaged (indicator *noenvcon*), and the extent to which a common understanding of future contingencies could be achieved (indicator *nocomcon*).

(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*), and second in terms of investments in training (*invtrain*).

(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*, 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’, that is 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* and *perfresultb*, to measure 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.

Table 1 here

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. 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

1 inevitably be correlated to each other. To address these risks, we used common factor
2 analysis to obtain four common factors.² These are as follows:
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5 Factor 1: Pre-contract management index: *preconmanidx* (higher values = more
6 understanding of procurement requirement)
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8 Factor 2: Procurement actions index: *paidx* (higher values = more control effort)
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10 Factor 3: Reputation effects index: *repidx* (higher values = more track record)
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12 Factor 4: Credibility of legal threat index: *ltcredidx* (higher values = more credible
13 legal threat)
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18 In order to keep the common factors consistent with the original 0 to 10 scales used
19 for the separate variables in the survey, they were rescaled with a mean of 5 and a
20 standard deviation of 2. This was done to facilitate convenient interpretation of our
21 results. Descriptive statistics of these four management indices are presented in Table
22 1 (Panel B).
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28 The pre-contract management index loads on variables relating to the framing of the
29 agreement. Key questions here concern the extent to which the internal client and the
30 supplier have a clear idea of the buying organisation's procurement requirements. The
31 indicators used were *clearidea*, *procurepro*, *comptension*, *suppliercleara*,
32 *supplierclearb* and *supmonitor*. Higher values represent a well-researched
33 understanding of the purchase requirement.
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41 The procurement actions index loads on variables concerned with the time and effort
42 required to research, negotiate, design and draft the contract. The indicators used were
43 *searsup*, *negterms* and *dedrcon*. Higher values indicate that more resources have been
44 devoted to these procurement actions.
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51 The reputation effects index concerns the extent to which the supplier's reputation is
52 known by the buyer. The indicators used were *repuexpa* and *repuexpb*. Higher values
53 indicate that the supplier is well known by both the buyer and the industry more
54 generally.
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1 The credibility of legal threat index loads on items related to the credibility of legal
2 threats to the supplier. The relevant variables are the chance of winning a legal case
3 (*lowwin*), potential damage to the supplier relationship (*reladamage*), the impact on
4 operational performance of a prolonged legal dispute (*operadamage*), the financial
5 cost of a legal dispute (*financost*), and the size of any potential legal payout (*lowpay*).
6 Higher values suggest a more credible legal threat.
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12 (ii) *Incidence of opportunistic behaviour*
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14 Panel C in Table 1 contains the main variables to measure opportunistic behaviours by
15 suppliers. The variables chosen were certain restricted aspects of adverse selection
16 (*AS*), moral hazard (*MH*), pre-contractual hold-up (*HU1*) and post-contractual hold-up
17 (*HU2*). These concepts were discussed earlier in the article as hazards that a cautious
18 approach to procurement and contract management might seek to address. All
19 variables are measured in a range from 0 to 10, with a high score reflecting a higher
20 level of opportunism. It is important to note here that, in accordance with the
21 literature, there is no expectation that all of the independent variables relating to
22 transaction characteristics will cause a rise in the level of all four of the selected
23 opportunistic behaviours. Certain problems of opportunism are understood as being
24 mainly associated with certain transactional characteristics.
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36 We explored only certain aspects of the selected types of opportunism in order to
37 ensure that the questionnaire survey was not overly long. It was felt that aspects of
38 each opportunism type would together provide a sample of potential opportunistic
39 actions and allow certain, if restricted, conclusions to be drawn about the efficacy of
40 management control mechanisms.
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46 The incidence of adverse selection (*AS*) was measured in terms of whether the product
47 or service lived up to the ex ante promises made by the supplier, and that of moral
48 hazard (*MH*) by asking whether, following the signing of the contract, the supplier
49 consistently came up short in terms of effort. This is what Milgrom and Roberts
50 (1992) refer to as shirking. Two hold-up variables (*HU1* and *HU2*) were also
51 explored. *HU1* was measured by a question asking whether, between winning the
52 competitive tender and signing the contract, the supplier attempted to revise and
53 renegotiate the terms of the deal – a situation known as pre-contractual drift (Lonsdale
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1 and Watson, 2007). Evidence of *HU2* was gleaned by asking whether, following the
2 start of the contract period, the supplier attempted to revise and renegotiate the terms
3 or take advantage of contract variations, familiar situations relating to post-contractual
4 hold-up (Williamson, 1985).
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7 8 9 **Specification and Results**

10 *Relationships between transaction characteristics and management control* 11 *mechanisms* 12

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14 Table 2 reports the findings of our test of hypothesis 1. This hypothesis concerns the
15 relationship between transaction characteristics and management control mechanisms.
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17 The findings show that transactions characterised by the selected ex ante uncertainty
18 attribute are significantly associated with less extensive management control,
19 especially pre-contract management (-0.6) and reputation effects (-0.53). Our results
20 also show negative, although not statistically significant, associations between the
21 selected uncertainty attribute and both procurement actions (-1.23) and the credibility
22 of legal threats (-0.14). We also find significant negative associations between the
23 sunk costs incurred by the buying organisation and the extent of management control
24 through pre-contract management (-0.69) and credible legal threats (-0.53). Taking
25 together the findings in relation to both the selected uncertainty attribute and sunk
26 costs, we can say there is indeed evidence that certain transaction characteristics place
27 a strain on the ‘feasible foresight’ of managers (Williamson, 1996). This reflects
28 expectations in the literature (for example, Williamson, 1985).
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41 **Table 2 here**

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45 Our data also shows a significant negative association between the level of transaction
46 interdependencies and knowledge of the supplier’s reputation (-0.98). This shows that
47 when a supplier’s ability to win future business is dependent on its performance in
48 current contracts, buyers are less concerned with examining the supplier’s historical
49 track record. By contrast, purchase type is positively associated with knowledge of the
50 supplier’s reputation (0.41). Service purchases with flexible payment mechanisms are
51 shown to be associated with greater consideration of supplier reputation than is the
52 case for goods purchases with fixed payment mechanisms.
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Finally, we note that, while the findings show no significant associations between the use of management control mechanisms and transaction importance, competition and supplier bargaining power, and the public dummy variable, the whole structural equation model exhibits a good fit (Fan et al., 1999). This applies across a wide range of fit statistics, including but not limited to those reported.ⁱⁱⁱ

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.

Relationships between transaction characteristics, management control mechanisms and supplier opportunism

Table 3 reports the findings from our test of hypothesis 2 (Panel B) and hypothesis 3 (Panels C and D). Table 3 (Panel A) also reports the findings of an alternative test of hypothesis 1.

Table 3 here

Panel A results

The results presented in Table 3 (Panel A) are in many respects consistent with what we find in the single equation model reported in Table 2, 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 2, 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

1 significant negative association between the level of transaction interdependencies
2 and knowledge of the supplier's reputational track record (-0.98), but this time we
3 also see significant evidence of less extensive procurement actions (-0.9) as
4 interdependencies increase. Purchase type is once again positively associated with
5 management control through reputation effects (0.41). We also now see evidence of a
6 significant positive association between purchase type and the effort put into
7 procurement actions (2.72).
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14 As before, we find no evidence of significant associations between the use of
15 management control mechanisms and transaction importance, competition and
16 supplier bargaining power, and the public dummy variable.
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21 *Panel B results*

22 Panel B presents the results of our test of hypothesis 2, which proposes that increases
23 in the extensiveness of management control mechanisms will reduce incidences of
24 supplier opportunism. Our data provide some support for this hypothesis.
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31 In the case of pre-contract management, we find a significant association. More
32 extensive pre-contract management is significantly associated with fewer problems of
33 the selected aspect of adverse selection (AS, -0.13), pre-contract hold-up (HU1, -0.22)
34 and post-contract hold-up (HU2, -0.15). Our findings show an association between
35 knowledge of supplier reputation and all four opportunistic behaviours: the selected
36 aspect of adverse selection (AS, -0.3), the selected aspect of moral hazard (MH, -0.4),
37 pre-contractual hold-up (HU1, -0.3) and post-contractual hold-up (HU2, -0.36).
38 Finally, we find that a credible legal threat is significantly associated with a reduced
39 incidence of two of the four supplier opportunism problems, the selected aspect of
40 adverse selection (AS, -0.12) and post-contractual hold-up (HU2, -0.15). The results
41 for the procurement actions index have big values and show that more control effort
42 led to lower opportunism, but they are not statistically significant.
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54 *Panel C and D results*

55 The results of our test of hypothesis 3 are presented in Panels C and D. This
56 hypothesis concerns the relationship between transaction characteristics and supplier
57 opportunism, both without the intervening variable of management control
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1 mechanisms (the structural form) and with the intervening variable (the reduced
2 form). We test the argument that more hazardous transaction characteristics will lead
3 to increased incidences of supplier opportunism, but that this outcome will be
4 influenced by the extensiveness of management control mechanisms.
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9 In the structural form (Panel C), our findings are broadly supportive of the argument
10 that increased transactional hazards will lead to increased incidences of opportunism,
11 but none of the results are statistically significant. The effects of transaction
12 characteristics on opportunism become much more significant when we look at the
13 reduced form of our model (Panel D). This complements the data on hypothesis 2 in
14 that it provides further evidence that the extensiveness of management control
15 mechanisms has an important impact on opportunism.
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23 On a detailed level, we found that our selected types of opportunism are a particular
24 problem for buying organisations when transactions are characterised by our selected
25 ex ante uncertainty attribute and significant sunk costs. The results show a significant
26 positive association between the selected uncertainty attribute and both the selected
27 aspect of adverse selection (AS, 0.63) and the selected aspect of moral hazard (MH,
28 0.66). A high level of sunk cost investment, meanwhile, is significantly positively
29 associated with the selected aspect of moral hazard (MH, 0.55). Beyond this, purchase
30 type being a service with a flexible payment mechanism rather than a good with a
31 fixed payment mechanism increases the incidence of post-contractual hold-up (HU2,
32 1.04), while there is a significant negative association between the level of transaction
33 interdependencies and the incidence of post-contractual hold-up (HU2, -0.53).
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45 Finally, although we find no significant association between any of the four chosen
46 types of supplier opportunism and transaction importance, competition and supplier
47 bargaining power, and the public dummy variable, the whole structural equation
48 model does exhibit a good fit across a wide range of fit statistics.^{iv}
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54 **Conclusion**

55 In this article, we have used data from 180 procurement and contract management
56 situations, 104 of them in the public sector, to test three hypotheses derived from the
57 literature. We have also assessed whether there were significant differences between
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1 public and private sector experiences. The evidence provided some support for the
2 view that certain procurement and contract management mechanisms can assist
3 buying organisations in moderating opportunism, but that certain transaction
4 characteristics make the use of some management mechanisms difficult. The evidence
5 found no significant differences between public and private sector experiences in any
6 part of the study. We summarize our key findings below.
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12 First, we found that transactions characterized by a greater degree of hazard, in
13 particular, the selected ex ante uncertainty attribute and sunk costs, tended to be
14 associated with less extensive management control mechanisms. This was in line with
15 the expectation of the literature (for example, Williamson, 1985 and 1996). Second,
16 our evidence showed that increased extensiveness of management control
17 mechanisms tended to reduce incidences of supplier opportunism. Efforts to establish
18 supplier track record and reputation had the broadest impact, with the evidence
19 showing a significant negative association across all four types of opportunism. Pre-
20 contract management and credible legal threats also had a significant impact in
21 reducing the selected aspect of adverse selection and hold-up. There is some evidence,
22 therefore, that supplier opportunism can be addressed through elements of what we
23 have called a cautious approach. These significant impacts are illustrated in Figure 2.
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36 Figure 2 here
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40 Third, we found that transactions characterized by a greater degree of hazard, in
41 particular the selected ex ante uncertainty attribute and sunk costs, were associated
42 with a greater incidence of supplier opportunism. The selected aspects of adverse
43 selection and moral hazard were the most prominent problems. These positive
44 associations were only statistically significant, however, when modelled with the
45 intervening variable of management control mechanisms. This again suggests that the
46 degree to which supplier opportunism is a problem can be influenced by the
47 extensiveness of management control mechanisms.
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56 Given these findings, there is merit in considering in more detail what a cautious
57 approach to procurement and contract management might entail. There are a number
58 of main elements that arise specifically from this research:
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- 1 • Time and effort in ensuring, particularly in the case of significant procurement
2 exercises, that, in so far as uncertainty allows, there is clarity over purchase
3 requirements and that those requirements are communicated effectively to
4 suppliers. Opportunistic suppliers will seek to take advantage of both a lack of
5 clarity (and any consequent contractual incompleteness) and frequent changes
6 to the purchase requirement.
7
- 8 • Time and effort in researching the attributes of the supplier so as to address the
9 possibility of adverse selection. It is common for suppliers to exaggerate their
10 capabilities.
11
- 12 • Enquiries into a supplier's reputation and track record prior to selection.
13
- 14 • Time and effort, particularly in the case of those procurement exercises that
15 pose a risk of supplier opportunism, to carefully draw up a contract that will
16 protect against potential opportunism. In terms of addressing hold-up, the
17 contract might contain balancing provisions, for example, liquidated damages
18 and property rights allocation (Williamson, 1985). In terms of addressing
19 moral hazard, the contract might contain performance incentives.
20
- 21 • A common feature of procurement practice is the tendency to 'let and forget'.
22 A cautious approach warns against this and includes effective monitoring to
23 address potential moral hazard. This runs in combination with the
24 aforementioned incentive provisions within the contract (Baron and Besanko,
25 1987).
26
- 27 • Active promotion of contingent renewal. Contingent renewal refers to a buyer
28 communicating to a supplier that its likelihood of winning future contracts is
29 dependent upon its current performance and behaviour (Bowles and Gintis,
30 1999).
31
- 32 • Signalling to the supplier the hazards that arise from wider reputational
33 damage.
34
- 35 • Finally, the retention of a credible legal threat. Clearly, court action is a last
36 resort because of its costs and uncertainties. However, highlighting the
37 'shadow of the courts' can provide an effect without actual legal action
38 (Messick, 2005).
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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 dictates the need for buying organisations to agree a ‘protocol’ for both cross-functional internal discussions and interactions with the supplier, specifying 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. 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 help buying organisations to cope with these challenges and complications.

For the academic literature, this article adds further weight to the view that the concept of supplier opportunism 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 (Lonsdale and Watson, 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 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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1 ¹ SEM allows us to model the measurement error of our latent variables. Additionally, it permits us to
2 simultaneously estimate the relationships between transaction characteristics and the four management
3 control mechanisms, while modelling co-variation amongst them. This is particularly important in light
4 of theories that assume such control systems are jointly determined. Since our data are on ordinal scales
5 and may not be normally distributed, maximum likelihood methods should perform well (Distefano,
6 2002).

7 ² We calculated the Kaiser–Meyer–Olkin (KMO) measures of all 16 variables (Kaiser, 1974). All
8 KMO measures are more than 0.5 and the overall KMO is more than 0.65, so we concluded that the
9 variables have enough common factors to warrant the use of a factor model. According to Fabrigar et
10 al. (1999) at least 3-5 measured variables representing each common factor should be included, and a
11 sample size of 5-10 times the number of measured variables is required for accurate results from the
12 CFA method. Our sample size was 180, so the possible number of measured variables for factor
13 analysis should be limited below 36 (=180/5), and the number of possible common factors should be
14 below 12 (=36/3). The Akaike information criterion (AIC) (Akaike, 1987) and Bayesian information
15 criterion (BIC) were used to determine the appropriate number of factors. Both AIC and BIC indicate
16 that 4 common factors are the best choice for the 16 measured variables. Next, using maximum
17 likelihood estimation and an oblique rotation, we extracted four factors with eigenvalues greater than
18 one. The factor analysis yields a well-behaved solution, with items typically loading on a single factor,
19 loading greater than 0.30 and few significant cross loadings. Scoring coefficients from the regression
20 method inform us that the factor is obtained as a weighted sum of standardized versions of the 16
21 variables.

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

26 ^{iv} Good fit is indicated by a RMSEA of less than 0.06, a SRMR of less than 0.05, and the GFI, AGFI,
27 NNFI and CFI being above or around 0.9.
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Figure 1: Relationships Estimated between Transaction Characteristics, Management Control Mechanisms and Incidences of Supplier Opportunism

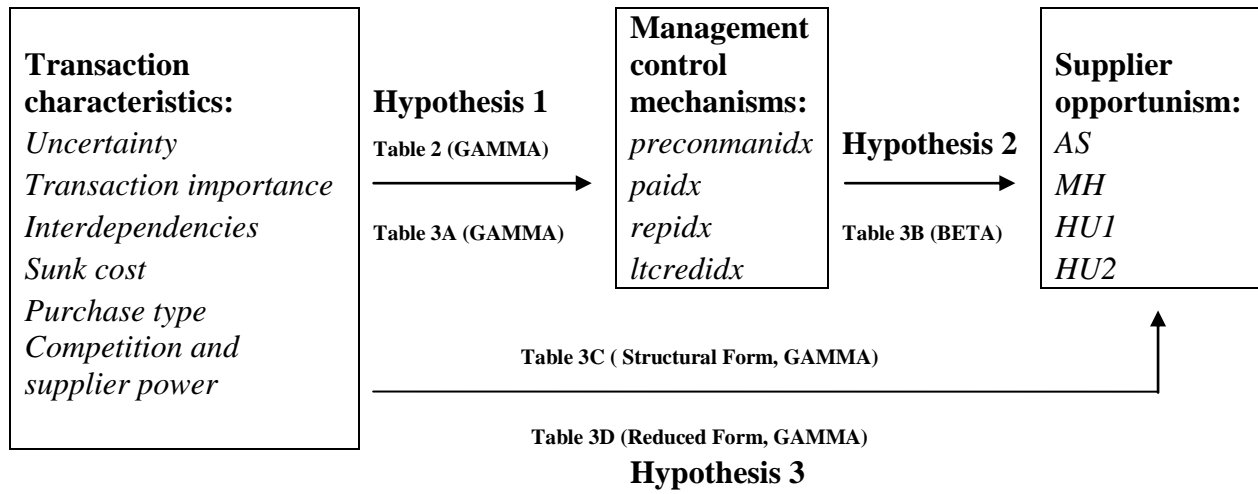
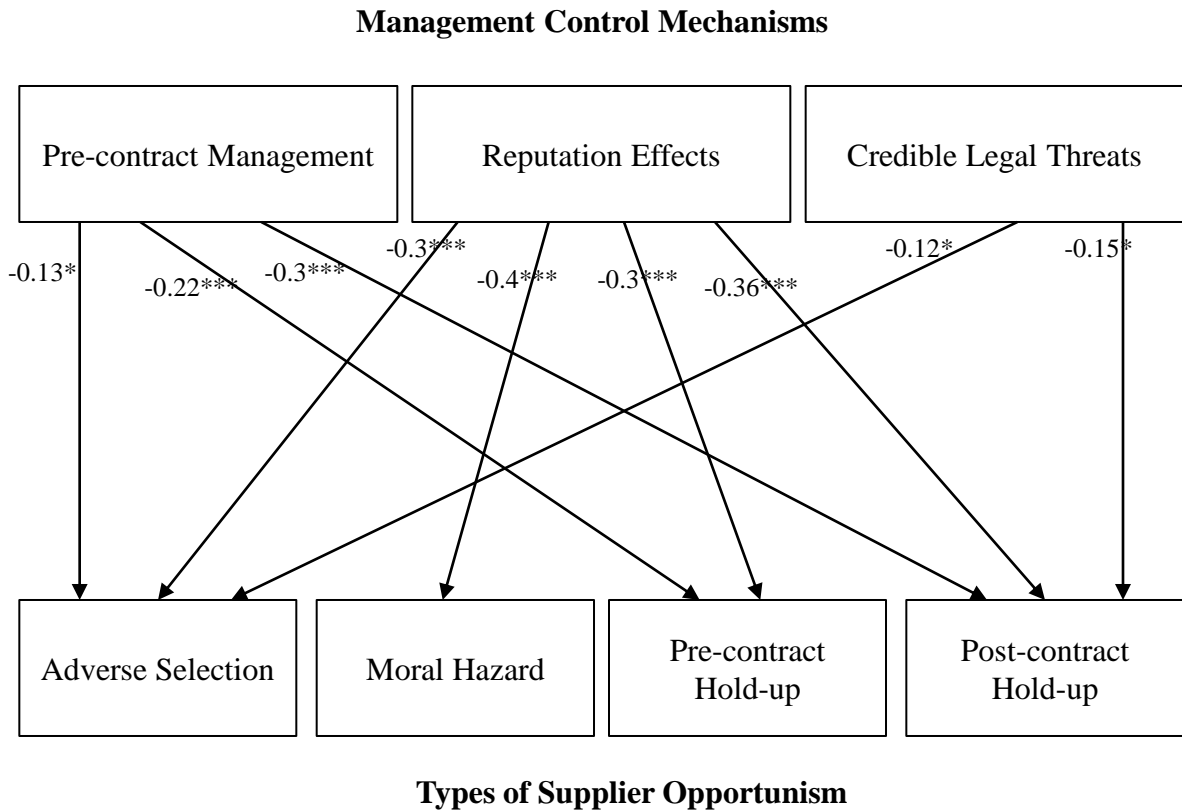


Figure 2: Management Control Mechanisms with Significant Impacts in Moderating Supplier Opportunism



Pre-contract Management

1. Clear articulation of product requirements
2. Clear product specification
3. Appraisal of governance options

Reputation Effects

1. Prior experience of supplier's trustworthiness
2. Supplier's reputation in the industry

Credible Legal Threats

1. Legal responsibility clearly understood
2. Cost of legal action
3. Potential size of settlement
4. Potential damage to the relationship from taking legal action
5. Potential impact on operational performance

Table 1 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>dpl</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 would be re-used, 10=The supplier would have to 'delight' everybody in order to secure new business	5.9	2.5	0	10	-0.4	2.6

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 purchase 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: *lcredidx* (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

Table 2 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*** (0.18)	-1.23 (1.6)	-0.53*** (0.19)	-0.14 (0.18)
<i>Transaction importance</i>	0.2 (0.2)	-0.1 (0.92)	0.25 (0.21)	-0.25 (0.2)
<i>Interdependencies</i>	-0.03 (0.18)	-1.14 (1.64)	-0.98*** (0.2)	0.04 (0.18)
<i>Sunk cost</i>	-0.69*** (0.2)	-0.81 (1.82)	-0.23 (0.21)	-0.53*** (0.21)
<i>Purchase type</i>	0.15 (0.23)	3.24 (3.2)	0.41* (0.25)	-0.14 (0.23)
<i>Competition and supplier power</i>	-0.07 (0.09)	0.19 (0.39)	-0.04 (0.1)	-0.14 (0.09)
<i>Public</i>	-0.18 (0.29)	-0.25 (1.07)	-0.41 (0.31)	0.17 (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 $\leq 0.01, 0.05, 0.10$ in a two-tailed test.

Table 3 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>
<i>Uncertainty</i>	-0.59*** (0.18)	-0.92* (0.51)	-0.51*** (0.18)	-0.08 (0.18)
<i>Transaction importance</i>	0.19 (0.19)	0.01 (0.55)	0.24 (0.2)	-0.26 (0.19)
<i>Interdependencies</i>	-0.03 (0.18)	-0.9* (0.53)	-0.98*** (0.2)	0.03 (0.18)
<i>Sunk cost</i>	-0.7*** (0.21)	-0.59 (0.59)	-0.23 (0.21)	-0.54** (0.21)
<i>Purchase type</i>	0.16 (0.22)	2.72*** (0.55)	0.41* (0.23)	-0.13 (0.23)
<i>Competition and supplier power</i>	-0.07 (0.09)	0.13 (0.27)	-0.05 (0.1)	-0.15 (0.09)
<i>Public</i>	-0.18 (0.29)	0.01 (0.85)	-0.37 (0.31)	0.2 (0.3)
Panel B. Relationships Between Management Control Mechanisms and Supplier Opportunism (BETA)				
	<i>AS</i>	<i>MH</i>	<i>HU1</i>	<i>HU2</i>
<i>ltcredidx</i>	-0.12* (0.08)	0.03 (0.09)	-0.1 (0.08)	-0.15* (0.08)
<i>paidx</i>	-2.68 (3.38)	-2.66 (3.36)	-3.92 (5.28)	-3.13 (4.42)
<i>preconmanidx</i>	-0.13* (0.09)	0 (0.1)	-0.22*** (0.09)	-0.3*** (0.08)
<i>repidx</i>	-0.3*** (0.09)	-0.4*** (0.1)	-0.3*** (0.09)	-0.36*** (0.09)
Panel C. Relationships Between Transaction Characteristics and Supplier Opportunism (Structural Form, GAMMA)				
	<i>AS</i>	<i>MH</i>	<i>HU1</i>	<i>HU2</i>
<i>Uncertainty</i>	-2.08 (3.41)	-1.98 (3.39)	-4.16 (5.33)	-3.41 (4.46)
<i>Transaction importance</i>	-0.1 (1.52)	0.11 (1.51)	0.27 (2.37)	-0.02 (1.99)
<i>Interdependencies</i>	-2.52 (3.35)	-2.91 (3.33)	-4.01 (5.23)	-3.69 (4.38)
<i>Sunk cost</i>	-1.55 (2.55)	-1.09 (2.54)	-2.61 (3.98)	-2.36 (3.34)

<i>Purchase type</i>	7.46 (9.34)	7.4 (9.29)	11.68 (14.6)	9.78 (12.22)
<i>Competition and supplier power</i>	0.27 (0.87)	0.37 (0.87)	0.39 (1.36)	0.27 (1.14)
<i>Public</i>	0.07 (2.34)	-0.25 (2.33)	-0.06 (3.65)	0.09 (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*** (0.24)	0.66*** (0.26)	-0.27 (0.31)	-0.16 (0.31)
<i>Transaction importance</i>	-0.2 (0.22)	-0.03 (0.25)	0.14 (0.27)	-0.16 (0.3)
<i>Interdependencies</i>	0.18 (0.25)	-0.13 (0.27)	-0.19 (0.33)	-0.53* (0.33)
<i>Sunk cost</i>	0.25 (0.28)	0.55* (0.31)	-0.04 (0.38)	-0.16 (0.37)
<i>Purchase type</i>	-0.01 (0.46)	0 (0.47)	0.83 (0.63)	1.04* (0.54)
<i>Competition and supplier power</i>	-0.05 (0.1)	0.03 (0.12)	-0.09 (0.13)	-0.1 (0.14)
<i>Public</i>	0.15 (0.32)	-0.12 (0.37)	0.03 (0.4)	0.21 (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 $\leq 0.01, 0.05, 0.10$ in a two-tailed test.