COORDINATING MECHANISMS IN INTERORGANISATIONAL ALLIANCES: CONTEXT, CLASSIFICATION AND PERFORMANCE OUTCOMES

Mark Toon

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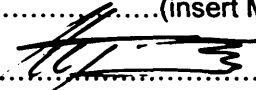**CARDIFF UNIVERSITY**

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Acknowledgements

'A classical understanding sees the world primarily as underlying form itself. A romantic understanding sees it primarily in terms of immediate appearance. If you were to show an engine or a mechanical drawing or electronic schematic to a romantic it is unlikely he would see much of interest in it. It has no appeal because the reality he sees is its surface. [ ] But if you were to show the same blueprint or schematic or give the same description to a classical person he might look at it and then become fascinated by it because he sees that within the lines and shapes and symbols is a tremendous richness of underlying form.'

Robert M Pirsig on the underlying form of quality.
'Zen and the Art of Motorcycle Maintenance' 1974

Abstract

The evolution in the business environment of the last thirty years has brought with it a transformation in business practice and particularly in the way in which organisations relate with one another. Driven by a revolution in information technology and a shift in emphasis from manufacturing to service activities, the UK business environment is increasingly characterised by collaborative and dynamic interorganisational alliances. These collaborative interorganisational alliances supersede former structural divisions between adversarial hierarchical conglomerates.

The greater reliance on collaborative alliances brings with it new problems in the effective governance of these alliances and so an agenda for research. The present study reviews extant empirical work in the field and identifies an anomaly in the underlying assumptions made by many empirical studies. While the context of the organisational alliance has shifted from adversarial to collaborative, empirical studies frequently retain a transaction cost perspective to explain performance in these alliances. While the transaction costs perspective makes a pertinent contribution it only provides a partial explanation and its' over emphasis in empirical work may limit the validity of findings.

Building on the New Dominant Logic perspective of Vargo and Lusch (2004) the present research seeks to examine the performance of interorganisational alliances by aligning the context of the relationship more closely with the theoretical lens. Interorganisational alliances between UK architects and building contractors are used as the context providing a non-hierarchical, non-equity setting and a conceptualisation of the coordination mechanisms at work is proposed.

This investigation employs a structural equation approach and finds evidence for a novel alliance coordination mechanism, procedural dependence, as a type of formal coordination operating at a different level to the conventional mechanism of contractual coordination. Furthermore contractual coordination is found to be redundant under these non-hierarchical, non-equity conditions in respect of alliance performance. Theoretical and practitioner implications are explored and future research directions described.

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CHAPTER ONE

Introduction

Chapter One - Introduction

Chapter Contents

1.1 Introduction

This chapter sets the scene for the thesis, and guides the reader to the outline of the contents for each of the subsequent chapters. Divided into two sections the chapter begins with an overview of the context within which the present work is based and describes a synopsis of the rationale for the study. The second section of this chapter describes each chapter and the contribution made to the thesis.

1.2 Background to the Study

The business environment of the last thirty years has undergone significant changes. The hierarchical and diverse conglomerates of the 1970s and 1980s have largely disappeared. This evolution has transformed the business environment into a series of 'functionally specialised' organisations (Achrol 1997). The implication of this is that organisations are inherently more reliant on one another both for ancillary activities and increasingly for functions central to their core activities. Under these circumstances organisations operate as functional compliments and a mutual dependence exists with organisational performance becoming partially dependent on alliance organisations.

The drivers of this evolution are many and range from social liberalisation to changes in the focus of economies from manufacturing to service orientation. However, the scale of the transformation can be largely attributed to the information technology revolution (Castells 2000). Service-based activities facilitate a greater level of dexterity among organisations allowing them to adapt and change according to variation in

demand, or in competitor behaviour. Benefits of the information technology revolution include faster communication and increased sophistication of software and hardware essential to an organisation's core activities. The result is more frequent and rapid response to environmental changes, and the more rapid exploitation of new developments and product offerings. The resulting conditions in terms of interorganisational alliance activity, is an increased number and frequency of interorganisational alliance formation.

Marketing research has been prolific over this same time frame and a broad spectrum of empirical and conceptual literature is evident. The landscape of this literature is determined by the output of this research and a review of these findings reveals heterogeneity among findings and inconsistency in theoretical perspectives. Some commonalities are evident however and a grouping can be discerned about two areas of theoretical foundation. These meta-narrative positions are neoclassical economics and social exchange theory. The grouping occurs because individual studies tend to draw mainly, but not exclusively, on one or the other of these approaches. Neoclassical economics represents a platform in the literature for transaction costs analysis (TCA). TCA is an important perspective which facilitates the assessment of the relative costs of choosing an alliance over conducting an activity in-house, the frequently cited make or buy decision (Williamson 1975). Social exchange theory on the other hand takes a less pragmatic and more collaborative perspective and assesses an alliance in terms of social factors including trust and commitment (Morgan and Hunt 1994).

These perspectives are representative of opposite ends of a continuum and yet both contribute to an explanation of interorganisational alliance coordination. Perhaps in response to this a central tenet of contemporary empirical work in this area considers the interaction of these two perspectives. This area of investigation is somewhat limited however, to the question of whether these alliance coordination approaches behave as substitutes or complements (Lui and Ngo 2004). The present study evaluates the literature on interorganisational alliances and finds that the two approaches are not given a standing consummate to the context of the study. Rather, the transaction costs perspective is frequently given the status of default theoretical perspective, and the exchange perspective is typically regarded in relation to the former. Given the preponderance of service orientated and collaborative contexts this represents a systematic bias in the assumptions of extant empirical work. An attempt is made in the current work to remove this bias and to adopt each perspective on merit.

The context for the study is the relationship between architects and building contractors in the UK. This alliance context is non-hierarchical and non-equity. Within this context an opportunity exists to study alliance coordination mechanisms without constraint to conventional transaction costs definitions. A further gap in the literature is the explanation of what takes place between the two conventional coordinating approaches of contractual and relational coordination. An attempt is made here to explain the coordination of interorganisational alliances in the absence of either of the two pure forms of mechanism mentioned.

1.3 Contents of the Chapters

Chapter two is the literature evaluation and tackles this heterogeneous body of research in four sections. The first section is devoted to neoclassical economics and its role as a theoretical anchor within the interorganisational alliance research. The role of neoclassical economics as described here is as a precursor to institutional economics. Institutional economics represents a departure from neoclassical economics by advocating human factors within analysis of economic decision making behaviour (Hodgson 1998). This in turn gives way to the new institutionalist school and with it Williamson's (1975) development of transaction cost economics, where organisational behaviour is guided by the costs of a transaction. The transactions themselves incur costs associated with human and environmental factors which are largely competitive in nature (Heide *et al* 2007).

Two principal theoretical anchors are identified in the alliance literature, the second is social exchange theory. This section documents the principles of social exchange theory from the reward-based exchange approach regulated through social sanction (Emerson 1976). A greater contextual analysis is arrived at through the description of the role of norms, the function of embeddedness and the importance of power within the alliance (Granovetter 1973; Gulati and Sytch 2007; Macneil 1980).

The third section of chapter two attempts to outline a significant development in the empirical work on interorganisational alliances through which strict boundaries become eased, and perspectives drawing on multiple theoretical standpoints (neoclassical, and exchange theory) merge.

Finally, the chapter ends with an examination of the alliance coordination mechanisms viewed from the above standpoints.

Chapter three is concerned with the description and conceptualisation of the research model. Section 3.2 describes the conceptual constructs of the model with reference to the literature and establishes the theoretical justification for the ordering of, and relationships between, constructs. A diagrammatic representation of the research model is then presented.

Chapter four addresses research design and empirical methodology and starts with an assessment of epistemological traditions and methodological antecedents before a selection of method is described with justification and rationale. The selection of the population and sample is described in the second section of the chapter. A total of 1200 respondents, each from an individual architectural practice, or branch of a firm of architectural practices are randomly selected from the alphabetically ordered practice membership list of the Royal Institute of British Architects (RIBA). Item selection and measure development is then described with the measures for each lower order construct detailed.

The next section in the chapter determines the design of the survey instrument and concludes that a questionnaire should be designed in such a way as to elicit as high a response rate as possible, and to draw data with a minimum of measurement error (Dillman 2007). Attention is given to several factors including questionnaire wording. It is established that the questions must be tailored to the respondents and acknowledge their idiosyncratic predisposition to providing information.

Following a thorough and considered design of the survey instrument a pre-test is undertaken and the justification and procedure for this is outlined in the next section of chapter four. Finally the last section in chapter four addresses the idiosyncratic issue of survey administration. The sampling process, level of measurement, and communication strategy are each covered in this final section.

Chapter five reports the preliminary results. Included in this is the response rate which is 204 usable responses of 600 eligible respondents giving a response rate of 34.0%. The next section in chapter five is the data preparation stage which is 'an important if frequently under attended function designed to avoid the possible inclusion of skewed data in subsequent analysis (Hair *et al* 2006). The more advanced analysis techniques used in this study (SEM using AMOS 6.0 software) will run irrespective of whether the underlying assumptions are met so chapter five is concerned with establishing that the data meet these assumptions at this stage. This avoids a situation where conclusions are established on the basis of an invalid statistical solution.

In order to establish confidence in the outcome of the statistical solution minimum prerequisites of reliability and validity must be achieved and the next section in the chapter addresses this. Reliability is defined here as a measure of how consistently something is measured (Hair *et al* 2006). Validity meanwhile is taken to be the degree to which the measures represent, or capture, the theoretical construct being measured (Hair *et al* 2006). The chapter ends with a series of descriptive statistics, tabulated for each construct and accompanied by an interpretation for each table.

Chapter six reports the results of the measurement model. This is essentially an operationalisation and assessment of the constructs described in chapter three. The first stage of this process is exploratory factor analysis in which sets of measures are analysed together to assess the factor structure and to inform the re-specification process moderated by theoretical assessment of content validity. Following the theory led re-specification process confirmatory factor analysis (CFA) the factor structure is checked to see the 'degree to which the data meet the expected structure' (Hair *et al* 2006). The overall conceptual model is divided into two components and the CFA is performed on each. Standardised regression weight, composite reliability, average variance extracted and Cronbach's alpha are each reported for each construct. Assessment of fit indices (χ^2 ; df; CFI; IFI; TFI; RMSEA) are each reported for each construct and model fit is assessed based on these metrics.

The final section in chapter six reports the results of the reliability and validity assessment together with assessment of common method bias. Reliability is assessed using both a test-retest method and measures of internal consistency. Content and construct validity is assessed with the latter including results for convergent, discriminant and nomological validity. A correlation table is included for inter-measure correlations and average variance extracted values.

Chapter seven starts with an outline of the operationalisation of the conceptual model. The model is described in terms of the constituent constructs, their inter-relationships, and the hypothesised relationships between constructs. This is also presented in diagrammatic form in this

section. The fit of the structural model is assessed in the second section and the implication of the goodness of fit statistics is discussed. The final section of chapter seven assesses the hypotheses reports the results and discusses the interpretation of these results in respect of the model.

Chapter eight is divided into three sections. The first section, conclusion, revisits the purpose of the thesis. The generic purpose of the thesis is to further the understanding of the function of interorganisational alliance coordination mechanisms, and to assess the validity of the transaction costs premise upon which much interorganisational research is founded.

The conceptual model and associated hypothesised relationships between coordinating mechanisms are central to this generic purpose contained within the thesis. The results from assessment of this model are discussed in this section and outcomes from the study together with the implication for the research question investigated here are discussed. The final part of this first section of chapter eight explores the implications of these empirical results in respect of the wider empirical landscape outlined in chapter two.

The next section in chapter eight addresses the limitations of the study. Three generic sets of limitations are identified and described as practical limitations, theoretical limitations, and methodological limitations.

Finally chapter eight addresses the implications of the study. Contributions are outlined for theory, methodology, and future research. Theoretical contributions centre on the typological synthesis of the alliance

literature, and the establishment and measurement of a novel alliance coordination construct, that of procedural dependence. Methodological contributions are modest and centre on the application of structural equation modelling to alliance coordination mechanisms with successful conceptualisation of the relationships between constructs. Directions for future research are described. Managerial implications of the study are extensive and focus on the correction of a frequent and erroneous assumption that contractual coordination is central to alliance performance. The function of the procedural dependence construct is outlined and its role described.

CHAPTER TWO

Evaluation of the

Interorganisational Alliance

Literature

Chapter Two: Evaluation of the Interorganisational Relationship Literature

Chapter Contents

2.1 Chapter Overview

The current research is characterised by empirical work which draws on multiple epistemological standpoints. This chapter begins with an outline of these standpoints, Institutional Economics and Social Exchange Theory, describing their origins and characteristic forms. This dichotomous, description of the theoretical antecedents then gives way to a description of the literature on alliances generally, and concludes with interorganisational alliances in particular. The later sections document important developments in alliance theory. This empirical landscape represents something of an iterative journey in which the influence of the epistemological origins overlap and merge. An outline of the key focus of the present research concludes the penultimate section on alliance performance and governance types.

2.2 Institutional Economics and the Supplanting of Neoclassical Economics

Institutional economics marks a paradigmatic departure from the neoclassical economics which precedes it. The neoclassical agenda includes a principal focus on issues of supply and demand and assumes relative equilibrium among factors of influence. Institutional economics meanwhile is concerned with social agenda, with 'habits, rules and their evolution' (Hodgson 1998). As such, and as implied in the name, institutional economics may be said to be concerned with the institution rather than the market.

This social agenda referred to above manifests as 'working rules' derived from collective action and enforced through collective sanction (Commons 1931). Collective sanctions represent a mechanism through which institutional norms are maintained, and may be considered somewhat analogous to the neoclassical economic sanctions of profit or loss. Collectivism is a key theme in Common's seminal (1934) treatise 'Institutional Economics'. The first volume takes a wide sweep of antecedent economic and social theory while volume two draws the narrative to the principle thesis of political economy and collective action, and the operation of this in the institutional context.

It is not the case that institutional economics succeeds neoclassical economics even though it follows it chronologically. Rather, institutional economics represents a contextual departure in economic analysis from the market to the hierarchy. So the lens through which the institution is viewed is changed and in this sense institutional economics has been said to have 'supplanted traditional neoclassical economics' with something more pertinent to its context (Rindfleisch and Heide 1997). The purpose of the organisation (or *institution*) is the 'supersession of the market mechanism' (Coase 1937). In other words the organisation coordinates transactions. In doing so individual actions occur giving rise to 'economic behaviour', or the coordination of 'units of economic activity' including managing, bargaining and rationing transactions (Commons 1931). Thus institutional economics seeks to develop the description of the firm beyond the 'patently unrealistic' version favoured by neoclassical economists in which maximisation of monetary returns is given to be the unitary function of the

firm (Blaug 1980). A key contribution of Commons' work was the focus on 'legal control and the efficacy of contracting' (Williamson 1975).

> *'Transactions determine legal control, while the classical and hedonic economics was concerned with physical control. Legal control is future physical control.'*
>
> Commons (1931) p.648

Commons and fellow institutional economics protagonists Thorstein Veblen and Wesley Mitchell receive criticism on the grounds that their approach is purely descriptive and even 'anti-theoretical' (Coase 1998). Coase (1998) claims that his seminal 1937 paper *The Nature of the Firm* is different, going further in developing institutional economics with its explicit treatment of transaction costs. Commons' work has become termed *old* institutional economics to differentiate from the subsequent *new* institutional economics school with which Coase and Williamson in particular are associated. However in defence of the old school the influence of their work generally, and that of Veblen and Commons in particular, on new school academics including Friedrich Hayek (1988), Richard Nelson and Sidney Winter (1982), Herbert Simon (1979) and Oliver Williamson (1975), is evident and demonstrates that they addressed 'crucial theoretical issues' which inform more contemporary work (Hodgson 1998).

Most of the work of the new institutionalist school came much later than Coase's 1937 work. This substantial temporal divide between the *old*

institutional economics and the *new* ('some forty years' Williamson 1975) may in itself go some way to explain differences in perspective. To summarise the position for present purposes, the substantive differentiating factors between the two perspectives is the greater eclecticism of the latter over the former along with its unambiguous treatment of transaction costs (Williamson 1975). Further, new institutional economics is characterised in particular by the interdisciplinary contributions which inform the perspective.

Against a backdrop of progressive liberalisation among market economies from the second half of the twentieth century the opportunities for firms to create and coordinate interorganisational relationships, including alliances, increased. This naturally led to an increasing focus on transaction costs and associated make or buy decisions. Williamson's seminal Markets and Hierarchies (1975) text may be regarded as a watershed for this focus. The subsequent literature on transaction costs economics frequently draws on Williamson's work as its foundation or simply as a seminal reference.

2.2.1 Transaction Cost Analysis

2.2.1.1 The principal logic of Transaction Cost Analysis

The somewhat simplified view of the institution (organisation) having the choice between making or buying a process input based on transaction costs becomes more complex when the costs of coordinating the transaction with the supplier are factored in. This context of action under uncertainty forms the setting for Williamson's treatment of transaction cost

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analysis (TCA). Further, this also places the emphasis on the transaction rather than technology as the key driver of efficacy in exchange. Technological considerations while important, are 'rarely decisive' (Williamson 1975).

2.2.1.2 The Organisational Failures Framework

Under certain conditions the coordination of activities through the market may be complex and the contract governing this coordination difficult to operationalise. This represents the logic underpinning the decision to move to hierarchies, that is, to internalise the same activities. Where the cost of writing, executing and enforcing this contract becomes prohibitive the case is made for this internalisation of activities (Williamson 1975). The prevailing conditions under which this might occur are illustrated in Figure 2.1 Organisational Failures Framework. The purpose of the framework is to illustrate how certain of these conditions operate in combination to frustrate transactions, specifically 'the joining of human with environmental factors' to bring about a confounding effect (Williamson 1975).

```
+-----------------------------------------------------------------+
|                        ATMOSPHERE                               |
|                                                                 |
|    BOUNDED                          UNCERTAINTY                  |
|    RATIONALITY  <=========>         COMPLEXITY                   |
|                                            \                    |
|                                             \                   |
|                                              \                  |
|                       INFORMATION                               |
|                       IMPACTEDNESS                              |
|                          /        \                             |
|                         /          \                            |
|                        /            \                           |
|    OPPORTUNISM  <=========>      SMALL                           |
|                                 NUMBERS                          |
+-----------------------------------------------------------------+
```
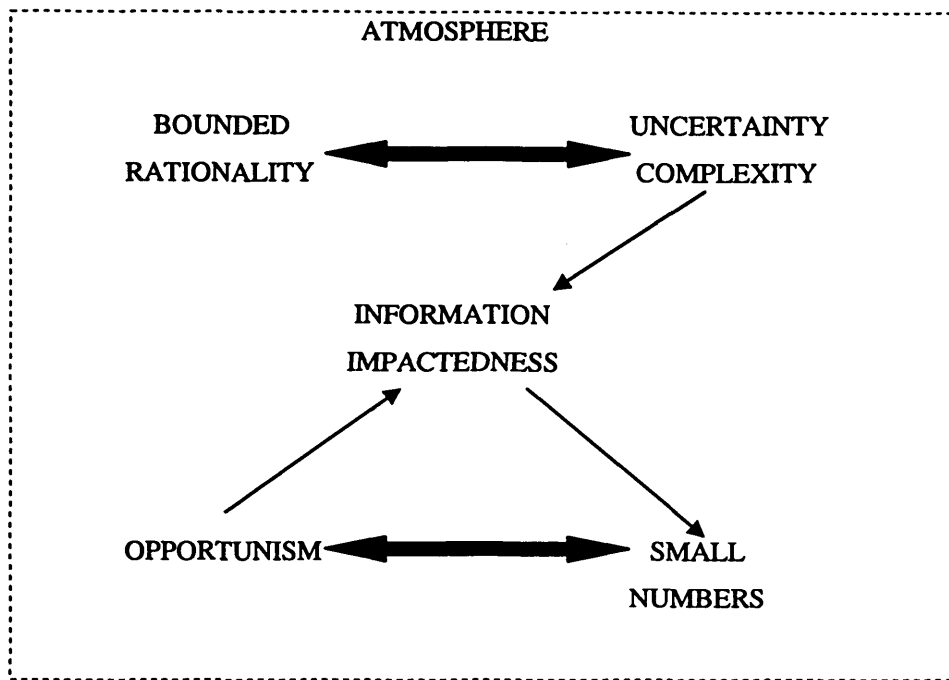
Fig 2.1 The Organisational Failures Framework, Williamson 1975 p.40

One could go further and state that the two critical factors, bounded rationality and opportunism, and must occur to a sufficient extent and simultaneously in order to render the market contract dysfunctional (Kay, 1992; Thompsom 2003).

2.2.1.3 Bounded Rationality

Bounded rationality refers to the natural limits of the decision maker to make sense of and act on all available information. It combines both 'neurophysiological' limits on the one hand, and linguistic limits on the other (Williamson 1975). The classic definition popularised by Williamson (1975) defines bounded rationality as 'intendedly rational, but only limitedly so' (Simon 1961; 1972). While it is an eloquent summary of the condition it should be noted that it is used in transaction cost analysis outside of its intended context. Nonetheless it is an insightful definition

from a TCA perspective which neatly identifies the dual elements of intendedly and limitedly in determining a level of rationality. This duality increases the variability in the economic analysis of transaction costs.

'An economizing orientation is elicited by the intended rationality part of the definition, while the study of institutions is encouraged by conceding that cognitive competence is limited.'

Williamson (1985) p.45

A key point illustrated by the concept of bounded rationality is the nature of the decision making process in an organisation which is not deterministic, and instead involves 'decision-making under uncertainty' (Williamson 1975). The likely response by the decision maker where limits to cognitive competence are acknowledged is to try to limit the effects of these limits. This may be done heuristically, or as is principally the case in TCA, by discriminating among governance types on the grounds of the anticipated efficacy of the transaction execution (Williamson 1985).

2.2.1.4 Opportunism

'Men are so simple, and so much creatures of circumstance, that the deceiver will always find someone ready to be deceived.'

Machiavelli (1514) p.55

Opportunism represents the strongest of three forms of self interest orientation, and is defined as 'self interest seeking with guile' (Williamson 1975, 1985). It is this strong form of self interest orientation to which transaction costs analysis (TCA) appeals. The semi-strong form, simple self interest seeking, and the weak or null form of obedience may be addressed through contingent claims contracting. Opportunism may not be effectively countered by contingent claims contracting and is frequently made more complex to combat since it involves subtle as well as blatant forms. Williamson (1985) is clear to include 'active and passive, and both *ex ante* and *ex post*' forms of opportunism in transaction cost considerations. Consistency is also ruled out by Williamson (1985) who considers that levels of opportunism vary 'among members of the contracting population'. Opportunism brings advantage to the opportunist in addition to any existing fully disclosed advantages. This is the case both for active and passive opportunism, in other words advantage may be derived from opportunism whether or not the protagonist intended this to be the case.

2.2.1.5 Uncertainty

Williamson's (1975) comments on uncertainty are not expansive and are largely restricted to a discussion on how the confounding effects of uncertainty on bounded rationality may be constrained. For example he explains that in implementing internal organisation the hazards of uncertainty and complexity can be dealt with sequentially and adaptively. Such a procedural, rather than prescriptive approach is therefore said to

'economize greatly on bounded rationality' (Williamson 1975). Within this context it also represents a pertinent justification for moving from market to hierarchy.

Uncertainty however is a significant theme in the literature on transaction cost analysis and also in contemporary alliance literature more generally (Rindfleisch and Heide 1997). Williamson (1985) deals with uncertainty explicitly within the context of transaction costs outlining the contingent costs of asset specificity. Where a transaction is nonspecific, continuity he argues 'has little value' Williamson (1985). Conversely asset specificity increases the likelihood of adopting hierarchical governance structures through which disagreements may more readily be negotiated *ex post*.

Uncertainty is treated by Williamson (1975 & 1985) less as a concept and more as a context. For example while the above comments apply to environmental uncertainty this is not made explicit by Williamson. Behavioural uncertainty is taken to have been addressed in the commentary on opportunism. Such conceptual clarification is important however for the present study and is detailed later in this chapter.

2.2.1.6 Small Numbers Bargaining

Small numbers bargaining occurs where idiosyncratic, or asset specific investments are made within a bilateral governance context (Kogut 1988). The resulting high switching costs typically justify costly bargaining as an alternative such that under these conditions transaction costs may be generally high. Where such conditions are anticipated the decision may be

taken to internalise the transaction even where the production cost is higher than with an external party since the production cost represents one component of the overall transaction costs. A small number of bargaining partners is necessary for *ex post* difficulties to arise in the form of opportunism since a larger number of partners would facilitate switching (Williamson 1975). Asset specific investment is therefore an implicit safeguard in effectively reducing the number of eligible bargaining partners. *Ex post* difficulties may arise where the initial interpretation of a large-numbers scenario proves 'illusory', and the 'implicit homogeneity assumptions' (that many potential partners are available) prove incorrect (Williamson 1975).

2.2.1.7 Systems of Monitoring and Control

Having established that Machiavelli's (1995) 'deceiver' is at work under contingent conditions, and outlined the consequences of this, the logical next step is the monitoring and control of transaction partners where internalising is not the preferred option. Monitoring and control may be regarded essentially as an *ex post* activity (Rindfleisch and Heide 1997).

While the notion of threats as a control mechanism is well established, the idea that commitments might be used as a control mechanism is less intuitive. The oversight may in part be the result of assumptions that the law will enforce promises. However a system of 'private ordering' through the use of 'credible commitments' is described by Williamson (1983). The use of credible commitments as 'the economic equivalent[ ] of hostages' is a system of control 'widely used' in the

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support of exchange (Williamson 1983). The prospect of pecuniary loss operates as a deterrent in what becomes a largely self-regulating system.

Monitoring represents a transaction cost (Williamson 1975), and acts as a control mechanism through which partner opportunism may be suppressed (Heide *et al* 2007). It is conceivable that as recently as 1985 monitoring was more complex and costly than it is following the advent of the information technology revolution. This may explain in part why monitoring seems implicitly to be a thing to avoid in Williamson's earlier work (1975; 1985), and by the same token receives particular attention in the contemporary empirical literature as a tool for effective management of interorganisational relationships (Heide *et al* 2007; Wathne and Heide 2004).

2.2.2 Section Summary

The theoretical developments that represent the journey from neoclassical economics to transaction cost considerations of the organisation have been outlined above. The supplanting of neoclassical economics with a new wave of economic theory, where the focus shifts from the market to the institution, lays the foundation for transaction cost theory and the work of the new institutionalists. It can be postulated therefore that augmenting production costs with transaction costs provides a more realistic account of the overall cost of transacting. Transaction cost analysis develops the theoretical position much further and outlines the contingent conditions under which transaction costs may be incurred. Thus the transaction cost

lens facilitates a judgement on the relative pecuniary and policy merits of internalising transactions.

New institutional economic theory claims a multidisciplinary pedigree (Coase 1998) and although it is clear that the inclusion of behavioural theory forms a substantive part of transaction cost analysis it remains nevertheless broadly positivist, something which may represent a limitation. A further limitation is the assumption of transaction frequency (Williamson 1975) which is further addressed in Williamson (1985) where occasional and recurrent transactions are described in the efficient governance framework.

A final limitation of the transaction cost approach is the implicit assumption of vertical hierarchy. This suggests an organisational structure which is exclusively linear and vertical. The present study is concerned with such interorganisational structure but not exclusively so. Included in the activity of internalisation are horizontal, or co-marketing relationships, and a plethora of non-core activities which may variously be conducted in house or using an external agent. This is partly a theoretical position since the present work seeks to address interorganisational relationship performance without specific regard to hierarchy. It is also an issue of context since the contemporary business environment is no longer dominated by vertically integrated, centralised structures, but is characterised instead by functionally specialised organisations operating on a basis of cooperation rather than coercion (Katsikeas *et al* 2000; Rindfleisch and Heide 1997).

2.3 Social Exchange Theory

Social exchange theory draws on economics and social psychology to provide a framework through which social exchange may be interpreted. In this context social exchange theory may be taken less as a theory, and more as a frame of reference concerned with the 'movement of valued things [ ] through social process' (Emerson 1976). Social exchange theory seeks to explain the mechanics behind the movement of these valued things.

The theory, or frame of reference, owes its early morphology to a handful of academics whose work dates from the 1950s and 1960s. Homans (1958), Thibaut and Kelley (1959), and Blau (1964) each represent seminal works in social exchange theory. Individually these works differ in their approaches. However, and crucially, this heterogeneity in 'morphological detail' is brought together through the key analytical concepts which include 'reward, reinforcement, cost, utility' (Emerson 1976).

Homans (1958) and Thibaut and Kelley (1959) each emphasise forms of reward-based exchange albeit from differing approaches, while Blau (1964) focuses on rational choice in exchange. Bringing together economic anthropology on the one hand, with economic decision theory on the other, may be justified by the commonality of the analytical concepts, but must also be reconciled practically. Thus the social exchange theory explicitly adopts the social relation as the unit of analysis thus providing a resolution both in terms of commonality and measurement (Emerson 1976). Greater insight of social exchange theory may therefore be gained from a brief exploration of each of the social exchange components.

2.3.1 Homans and Social Operant Format

George Homans (1958) puts forward the principle of reinforcement psychology in which an exchange takes place without the expectation of reward and yet, paradoxically, where the continuation of the exchange is limited by satiation (excessive reward) on the one hand and a continued failure to reward the exchange on the other. Thus Homans (1958) postulates that reciprocal reward is in fact necessary for the continuation (or repetition) of an act since the actor may 'incur a cost, and [in any case] has more than one course of behaviour open to him' (Emerson 1976). The two limiting factors, satiation and failure to reward, each represent an imbalance between reward and cost and may be likened to the concept of diminishing marginal utility familiar in economics.

This state of affairs would tend to suggest that individual psychology is not greatly removed from rational economic choice favoured by economists. However Homans (1958) outlines key contingencies before describing the nature of exchange more fully. Individuals rarely act without a sphere of influence and it may be expected that the behaviour of an individual will be influenced by this sphere, or group. The degree to which the group has influence over the individual is termed 'cohesiveness' (Homans 1958). The influence, or social approval, works alongside, but not necessarily complementary to the desire to act according to self interest (Homans 1958). From this one might assume that the two major characteristics determining individual action have been identified and a reckoning of their relative magnitude will determine the probable action taken. There is a further consideration however which distinguishes social

exchange theory from what would otherwise be economic rationale and that is the innate sense of equity typically exercised by human actors.

In short, the propositions of behavioral psychology imply a tendency toward a certain proportionality between the value to others of the behavior a man gives them and the value to him of the behaviour they give him.

Homans (1958) p.600

This creates a tension on the part of the actor where the social approval guides the actor contrary to self interest. Homans' (1958) definition of self interest is not to be confused with selfishness, rather it is acting in accordance with one's best judgement and so as a form of 'personal integrity' (Homans 1958). The tension is high when the self interest agenda is at odds with the group agenda since the potential cost is high. Under these circumstances the propensity for behavioural change is highest (Homans 1958).

2.3.2 Thibaut and Kelley and Social Psychology in Exchange

Broadly speaking the work of Thibaut and Kelley (1959) is closely aligned with that of Homans (1958) outlined above, 'strengthening' the social exchange approach (Emerson 1976). In particular Thibaut and Kelley (1959) comment that the tension in the exchange relation will be lower where the behaviour of each party is mutually rewarding, and where this behaviour generates lower costs. This is not a great revelation and

represents an area of social exchange theory where accusations of tautology have been levelled (Emerson 1976). Homans (1961; 1974) mounts a clear defence against this accusation. Emerson (1976) considers these defences and concludes that Homans' (1958) propositions are 'logically useful' albeit 'untestable' but importantly at the 'heart' of exchange theory.

Tautology to one side, the notion of the exchange process working more effectively where behaviour is mutually rewarding, leads to a number of empirical avenues in contemporary alliance literature. Compatibility (Sarkar *et al* 2001), 'fit' among alliance attributes (Murray and Kotabe 2005), relational embeddedness (Moran 2005; Uzzi 1996), and relationship characteristics (Saxton 1997) each represent factors leading to successful social exchange within an alliance context.

The process of harmonising the agenda of the actor with that of the counterpart becomes somewhat more complex where the counterpart is a group. Thibaut and Kelley (1959) offer particular attention to the function of the exchange process in groups. A key contribution is to outline that aspect of social exchange theory that deals with consensus making. These 'norms' occur where agreement exists about how members of the group should behave and where 'social processes' exist to achieve compliance among members (Thibaut and Kelley 1959). In organisation theory this represents a definition of the institution (Giddens 1979) however in social exchange theory it represents the mechanism by which conformity is established in the absence of perfect consensus in the social relationship.

2.3.3 Blau on Exchange

Blau's (1964) treatment of exchange closely follows Homans' (1958) work in particular with the conceptualisation of exchange, and additionally with the description of declining marginal utility over repeated exchange. The work is also an advance in respect of the use of exchange to establish power asymmetry. One-sided giving at an excessive level or 'overwhelming benefactions' in addition to creating bonds will act to 'produce and fortify status differences between superiors and inferiors' (Blau 1964). This notion that over-giving creates a debt of obligation, or subjugation, on the part of the recipient, enriches the one-sided perspective which hitherto focused on more superficial, social transgression of excessive taking in the social exchange situation. It also illustrates a further level of sophistication which may occur in social exchange and which may be disingenuously employed to furnish ulterior agendas, that is to act opportunistically.

The subtleties in distinction make Blau's (1964) work vulnerable to ambiguity of interpretation. For example, Emerson (1976) claims that the work shares commonality with neoclassical economics, giving 'more emphasis to technical economic analysis'. However, close examination of Blau (1964) reveals consistency with the positions of Homans (1958) and Thibaut and Kelley (1959). This can be seen in particular in the notion that social sanction mechanisms guide the social exchange behaviour ensuring repayment ensues. In this respect Blau's (1964) work is closely aligned with the social exchange theory concept outlined at this point in time, and does not err towards economic decision theory. Where the economic

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position is outlined it is done in order to accurately describe a position from which social exchange theory deviates.

Blau (1964) positions social exchange theory along a continuum representing an inter-relationship between polar opposites. At one end is the neoclassical economics in which decision makers have complete information, constant preferences and no social commitments, while at the other exists only social commitment and benevolence.

'Social exchange, then, is an intermediate case between pure calculation of advantage and pure expression of love.'

Blau (1964) p.112

The position of social exchange theory along the above continuum is thus better understood through an examination of both the subjugation of agenda according to social sanction and, further, the level of symmetry in giving. Similarly Blau (1964) clarifies what social exchange theory is not and so, along with his consistency with the positions of Homans (1958) and Thibaut and Kelley (1959), may be said to promote the ossification of the social exchange theory framework.

2.3.4 Norms

The subjugation of the individual agenda is thus achieved by the effective application of norms governing the conduct of members of the dyad or group. Norms are the mechanism by which the purpose of the dyad or group is furthered and represent 'expectations about behaviour' which are

shared at some level, or at least understood (Heide and John 1992). It follows therefore that two issues are of particular concern in a discussion of norms, firstly the type of norm, and secondly effective application of norms.

Norms may be sub-classified according to their relational or formal orientation. Macneil (1980) describes such a classification which is shown below in table 2.3

Contractual Norms	Relational Norms
Role Integrity	Role Integrity
Mutuality	Preservation of the Relation
Implementation of Planning	Harmonization of Relational Conflict
Effectuation of Consent	Supracontract Norms
Flexibility	
Contractual Solidarity	
The Linking Norms: restitution, reliance, and expectation interests	
Creation and Restraint of Power	
Harmonization with the Social Matrix	

Table 2.3 Typology of Norms, adapted from Macneil (1980)

Macneil's (1980) typology, above, is well cited in the literature (Gundlach *et al* 1995; Heide 1994; Kaufmann and Dant 1992; Lee and Cavusgil 2006) and has come to represent a typological reference point in social exchange theory and in social science more generally. For example, while Macneil's (1980) field is law this typology similarly identifies with

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social psychology (Thibaut and Kelley 1959), and economics (Bendor and Mookherjeee 1990). Within the above classification a key difference between the two types of norms identified is the expectation of continuation. Contractual norms represent prescribed behaviour and are effective for a single transaction. Relational norms meanwhile contain an implicit assumption that exchange will continue.

Conformity to such norms meanwhile, requires effective social influence. Thibaut and Kelley (1959) identify three forms of influence, surveillance of the actor, the use of positive sanctions (combined with surveillance), and reward derived from the task. The effectiveness with which conformity is attained through these forms of influence is moderated by the dynamics of the social relation. For example where members are not 'open to view', where communication between members is weak, and where group cohesiveness is low, conformity may be expected to be lower (Thibaut and Kelley 1959).

2.3.5 Embeddedness

Embeddedness may be regarded as structural cohesiveness which operates at the interpersonal level. It is measured as a 'degree of connectivity' between members of the structure, or network (Thompson 2003). Because of the socialisation implicit in this process it is anticipated that embeddedness will limit opportunism, or 'malfeasance', supplanting general morality as the moderator of opportunism as is regarded by neoclassical economists (Granovetter 1973).

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Embeddedness differs further from neoclassical perspectives in its implicit future orientation. While prior interaction is responsible for higher levels of social capital and an increased propensity to act altruistically (Cook and Emerson 1978), cooperation has also been attributed to 'anticipated future interaction' (Heide and Miner 1992). Thus we see congruence between futurity of embeddedness and futurity of relational norms described above in section 2.3.4.

Social capital may be regarded as the product of elevated levels of trust and commitment (Coote *et al* 2003) and represents one of several componants of embeddedness (Uzzi 1996). Tie strength, complimentarity, and information exchange are also key componants of embeddedness (Granovetter 1973; Heide and John 1990; Liao and Welsch 2002). Complimentarity and information exchange frequently represent antecedent determinants of embeddedness. Tie strength however may influence both current and future performance of the relationship. Weak ties are beneficial in avoiding exclusivity of linked actors which may 'inhibit interactive learning and innovation' as potential links are 'locked out' (Thompson 2003). Over time the process of information exchange reduces the complimentarity effect by creating an overlap in knowledge and skills resources. This is the basis for the much cited work of Burt (1992) on the effectiveness of structural holes, i.e. a situation characterised by little overlap or potential for new network links (Heide and Miner 1990).

A temporal dimension to the operation of embeddedness can therefore be identified. Embeddedness promotes cooperative practices

which include 'economies of time, integrative agreements, Pareto improvements in allocative efficiency, and complex adaptation' (Uzzi 1997). While embedded social relations act to promote successful cooperation early in an alliance, the utility of cooperation between the same partners begins to decline over time. So, although the positive effects of embedded behaviour persist, the utility of their contributions to alliance performance declines. It is important to comment however, that this position is not without contention. In particular the position outlined above is sometimes viewed as overly simplistic. The structure of the network (structural embeddedness) is considered only part of the picture with the quality of relationships (relational embeddedness) also having an impact on alliance performance (Moran 2005).

2.3.6 Power

In social exchange theory power plays an important contingent role providing the 'potential to influence others' action' (Emerson 1976). Where power is more or less symmetric among alliance partners, social norms and procedural justice may be expected to ensure conformity to the mutual agenda and limit opportunistic practice. Indeed joint dependence, a manifestation of power symmetry, has been found to be mediated by embeddedness factors including trust and joint action (Gulati and Sytch (2007). Where power asymmetry is evident, social sanctions may be less effective. Restraint in the use of power under these circumstances may be explained instead by 'equity or justice concerns', or the role of 'emergent interpersonal commitment' (Emerson 1978). While the former has echoes

of the morality earlier attributed to neoclassical economic perspectives, the latter supports the notion that power restraint corresponds with cohesiveness (Thompson 2003), strong ties (Granovetter 1973), or duration of the relationship (Uzzi 1997).

2.3.7 Section Summary

Social exchange theory is described in this section both in terms of its origins, as a school of thought emerging from the late 1950s, and as a concept. The conceptual definition is outlined collectively through the works of Homans (1958), Thibaut and Kelley (1959), and Blau (1964) and while each lends a particular perspective - reward in exchange, social sanction among groups, and inequity in exchange, respectively - singularity is achieved through the commonality of the themes in these works. Specifically these themes are said to include 'reward, reinforcement, cost, utility' (Emerson 1976).

Social exchange theory is also defined, in part, by what it is not. It is neither classical economic exchange, nor an act of pure benevolence but is somewhere in between (Blau 1964). This introduces an element of contextual realism to the description of transactional exchange. In consequence, and taking the interorganisational context, the definition of social exchange theory could be altered from Emerson's (1976) 'movement of valued things [ ] through social process' to transactional exchange through social process. While this is a more narrow definition it serves a purpose within the exchange context.

Whether context specific or not, the mechanisms of social exchange are explored in norms, embeddedness, and power. Norms are given as expectations of behaviour and while Macneil (1980) differentiates between contractual and relational norms, both share implicit expectations of continuity. It is this futurity in the social exchange process which is a contingent condition for the effective functioning of the exchange mechanisms. Embeddedness, particularly relational embeddedness is dependent upon a temporal dimension while power may develop through repeat interaction as well as through antecedent advantage. This importance of futurity further defines social exchange by differentiation from economic exchange. Economic exchange carries an assumption of futurity where a rational case exists for it. Social exchange theory facilitates future exchange where market imperfection exists and the rational case is difficult to make.

2.4 Alliance Literature

2.4.1 Introduction

The literature on interorganisational alliances is less categorical than the antecedent theory outlined in previous sections of this chapter. This section addresses this literature by outlining the principal areas of empirical work and the theory on which it draws. The first sections (2.4.2 – 2.4.4) follow the prescriptive approach of transaction cost analysis. Section 2.4.5 attempts to outline a significant development in the empirical work on interorganisational alliances through which strict boundaries become eased,

and perspectives drawing on multiple theoretical standpoints (neoclassical, and exchange theory) merge.

Subsequently (sections 2.4.6 – 2.4.9) an attempt is made to outline empirical work more readily associated with an exchange theory perspective, and to highlight the interweaving of the hitherto opposing and exclusive perspectives of transaction costs, and exchange theory as represented in the alliance literature.

2.4.2 Complementarity and Compatibility

The principal concern of this study is the performance of interorganisational alliances and not their formation. However the wider context of an alliance is clearly of some importance and *ex ante* factors in particular help to indicate the ordering which might be attached to alliance components.

Alliance formation may be driven by a number of objectives, including strategic, cost saving, or learning-based objectives (Chung *et al* 2000; Kale *et al* 2000). The selection of a partner is consequently predetermined to some extent by their suitability as providers of these objectives. Suitability is typically measured in the alliance literature by the constructs of compatibility and complementarity.

Complementarity within an alliance may be regarded as a situation of mutual utility where each partner enjoys access to the complementary resources of the other in a process of 'quasi-internalization' (Kale *et al* 2000). The degree to which resources of one firm are useful to another depends in turn of the transferability of the resources. There is frequently

an implicit assumption of resource homogeneity, however in practice a firm's resources may be regarded as 'continuously heterogeneous' (Das and Teng 2000). The manifestation of this heterogeneity is outlined by Das and Teng (2000) as three resource characteristics, 'imperfect mobility, imperfect imitability, and imperfect substitutability'. It follows therefore that the degree of imperfection will act as an indirect measure of transferability.

Compatibility among alliance partners is reliant upon two factors, 'resource-based interdependence' and 'social compatibility' (Sakar *et al* 2001). Hence it is immediately possible to see the potential for overlap between compatibility, and complementarity through their emphasis on resources. They distinguishable however since they operate at different stages. Complementarity is a structural aspect of an alliance and operates *ex ante* while the resource component of compatibility is operational and thus occurs *ex post* (Sarkar *et al* 2001). Social compatibility is not exclusively *ex ante*, or *ex post* however, and may change over time and so care should be taken to measure both components of compatibility at the same alliance life-stage.

2.4.3 Monitoring and Control

The idea that alliance partners must be monitored is one rooted in the behavioural assumptions outlined in transaction cost analysis. The dual risks of opportunistic behaviour and uncertainty are perceived to exist (Parkhe 1998). Within the above context, monitoring acts both to measure activity and as a disincentive to opportunistic activity (Yilmaz and

Kabadayi 2006). Other control mechanisms are identified and are set out in this section. Typologies of control mechanisms vary in the alliance literature. In order to look at these mechanisms according to their common groups, and for clarity, three control mechanism types are identified here as contracts, asset specific investments, and relational control mechanisms.

Contracts are a natural partner to monitoring since they set out the terms of reference by which an actor in an alliance may be measured, and performance judged. The prospect of pecuniary clause being enacted or, recourse to more severe legal action, acts as a disincentive to opportunistic activity (Williamson 1983).

Where specific assets are invested in the alliance the disincentive shifts to the potential loss associated with the non-redeployable assets and the mechanism invoked is the unilateral withdrawal of the partner with lower specific asset exposure (Jap and Ganesan 2000). Monitoring is thus less of an imperative where both sides of the alliance commit specific assets since a mutual dependence is created and neither party can exit without loss through a condition otherwise referred to as credible commitments (Williamson 1983).

By contrast, a purely relational coordination mechanism would operate on the basis of trust that partners would refrain from opportunistic behaviour (Poppo and Zenger 2002). This coordination mechanism operates much in the same way as embeddedness outlined in section 2.3.5 with behavioural expectations and social sanctions (Granovetter 1973). As an alliance control mechanism however, relationalism is extended to mean the operation of a type of clan structure demonstrating a high degree of

solidarity (Fryxell *et al* 2002; Ouchi 1980). In addition to solidarity Jap and Ganesan (2000) identify information exchange and participation as key relational characteristics, while Bradach and Eccles (1989) include trust.

These control mechanisms work to control an alliance and ensure that the buy option selected by a firm is effective. An alternative to buying is to internalise an activity thus adopting a hierarchy approach which is the opposite form of control mechanism from markets, sometimes called ideal types (Williamson 1975). Activity exists between these ideal types where a firm adopts both make and buy sourcing approaches. This control mechanism is commonly termed plural form governance (Bradach and Eccles 1989; Cannon *et al* 2000; Heide 2003; Parmigiani 2007). The motivation in adopting plural forms governance may differ according to whether the firm chooses to make and buy simultaneously, i.e. splitting production between the two sourcing routes, or concurrently, i.e. sourcing unrelated amounts from each option (Parmigiani 2007). Reasons for the former approach might include tackling issues of information asymmetry (Heide 2003), or as a process of 'taper integration' (Harrigan 1988) while the latter may occur in a franchise situation in which franchises are variously owned and licensed by a firm (Bradach and Eccles 1989).

2.4.4 Opportunism and Asset Specificity

Investment in transaction specific assets by one party makes them vulnerable to opportunistic behaviour on the part of the other party (Williamson 1983). The issue in asset specificity therefore becomes one of how to safeguard transaction specific investments. To a greater extent this

is achieved through the control mechanisms outlined in the above section. Contracts may prevent, or at least facilitate recompense in the face of opportunistic behaviour. Investment in transaction specific investments by the other party will effectively eliminate the likelihood of unilateral opportunism where the assets are of similar value. Relationalism should limit opportunistic behaviour in situations of one-sided transaction specific investment, however this is likely to be moderated by the solidarity of the relationship and the potential reward from acting opportunistically. It is generally the case that expectations of opportunism increase in the one-sided investment scenario, and perceptions of commitment decrease (Jap and Ganesan 2000).

2.4.5 New Dominant Logic

The area between the two ideal types of governance form, between markets and hierarchies, is a much visited terrain in the alliance literature and a territory claimed by more than one camp. Network theorists point to the lack of scrutiny and intervention on the one hand, and the lack of self interest activity on the other, illustrating their definition of network organisation (Thompson 2003). Those taking a resource-based perspective consider that the focus on power distinguishes it from the economic efficiency concerns of transaction cost perspectives (Pfeffer and Salancik 2003). While relational governance protagonists define the area as sufficiently relationship focussed to warrant independent definition (Egan 2008).

A commonality exists however among these views and across extant literature more generally in defining this space by reference to its difference from the traditional transaction cost-based market description. Consequently there is an implicit assumption that at the heart of interorganisational alliance theory is the exchange of goods and, that positions such as those outlined above represent a deviation from this toward a service focus (Vargo and Lusch 2004). While this is frequently taken as a natural extension of the theory, Vargo and Lusch (2004) take issue with the notion that this emerging and increasingly important focus for marketing continues to be founded on the 4 Ps exchange of goods principle. The proposition they put forward is that since marketing is increasingly concerned with service rather than industrial production then a new logic should be introduced to replace the increasingly obsolete old one. Central to this position is a redefining of services marketing, away from 'residual [activities], value added services, [or classic] service industries, such as health care', and towards services as 'the application of specialized competences [ ] through deeds, processes, and performance for the benefit of another entity or the entity itself.' (Vargo and Lusch 2004).

It is a bold statement to claim that error exists in the premise of decades of empirical work. Responses to Vargo and Lusch's (2004) work address this to some extent claiming that this might represent a convergence of thought and environmental development (technology) which eventually crystallizes signaling a 'tipping point' validating an otherwise radical shift (Day 2004). The result of this tipping point presents a view of marketing logic in which everything is 'service-centred' and co-

produced solutions replace the make-and-sell 'goods-centred' approach (Hunt 2004). Vargo and Lusch (2004) underpin their new paradigm with a series of eight principles, or 'foundational premises' which they claim does not replace the traditional marketing mix but facilitate the 'reorientation' of marketing scholars. In more recent work an operationalisation of the new logic is proposed with two dimensions, goods-dominant logic and service-dominant logic with the former concerned with tangible and the latter intangible activities (Vargo and Lusch 2008)

The new dominant logic represents a useful bridge within the current context between transaction cost alliance literature and the following section which deals with alliance literature with a relational foundation. Vargo and Lusch (2004) outline an important distinction between exchange-based relational perspectives which have hitherto been located along a continuum between transaction orientation and benevolent relationalism, and exchange-based relationalism as a separate and concurrent form of alliance marketing. In doing so they provide a neat typology for the two dimensional alliance literature outlined here and clarify the interaction between the two.

2.4.6 Relational Approaches to Interorganisational Alliances

2.4.6.1 Co-Marketing Alliance

Co-marketing alliances are cooperative arrangements by two or more organisations which maintain their distinct identities (Varadarajan and Rajaratnam 1986). Typically non-equity alliances, they are horizontal contractual relationships 'taken by firms whose respective products are

complements in the market place' (Bucklin and Sengupta 1993). Viewed from a strategy perspective co-marketing alliances represent a market expansion option and offer an alternative to internal development, merger or acquisition (Varadarajan and Rajaratnam 1986). The essence of the co-marketing alliance is that they operate at the same level to promote common market goals through the 'pooling of resources' what has also been called 'symbiotic marketing' (Adler 1966). This form of alliance can be likened to a strategic alliance where the strategy is marketing focused rather than company wide. While a contractual dimension to the co-marketing alliance exists, the cooperative nature and absence of hierarchy indicate that this is predominantly a relational oriented arrangement.

2.4.6.2 Networks

It is perhaps fitting that a structural arrangement such as the network which has an ill defined morphology should also lack a consensual description in the literature. Key attempts to define networks are drawn from specific theoretical standpoints such as the nature of the interaction (IMP Group 1990), an environmental contingency perspective (Achrol 1997), a governance perspective (Thorelli 1986), and relational perspectives (Hite and Hesterly 2001; Thompson 2003). Meanwhile an extensive body of literature focuses on the efficacy of networks from a knowledge sharing and social ties perspective (Dyer and Nobeoka 2000; Uzzi 1997), from a resource perspective (Pfeffer and Salancik 2003), and from a strategy perspective (Gulati *et al* 2000b).

An important development in network theory, and something of a seminal work is Thorelli's (1986) treatment of networks as the structure that exists 'between markets and hierarchies'. In particular an attempt is made to describe the focal network as a mediator between the firm and the market. This represents a textual augmentation of Williamson's (1975) 'ideal types' arrangement. Another significant development meanwhile places the Williamsonian arrangement as one part (the atmosphere) of an interaction approach (Ford 1990; Hakansson and Johanson 1990; IMP Group 1990). Relationalism is a characteristic element of networks with factors already familiar to this text such as solidarity, altruism, reciprocity, and trust regarded as 'key to the reason why networks exist' (Thompson 2003).

2.4.6.3 Relationship Marketing

Relationship marketing follows neatly from the discussion of networks and can be regarded as a focus on the interaction between nodes within the network (McLoughlin and Horan 2000). At this level the interaction is chiefly dyadic although similar network characteristics are evident since the dyad may be regarded as a 'special case of networks' (Iacobucci and Hopkins 1992). The distinguishing characteristic of relationship marketing is the pure focus on the interpersonal interaction rather than the transaction (Thorelli 1986). As such relationship marketing is defined as a process of 'developing and maintaining successful relational exchanges' (Morgan and Hunt 1994).

Customer relationship marketing (CRM) is a recent and specific development in the application of relationship marketing. CRM adopts a strategic approach to the management of relational interactions with three stages, customer acquisition, customer retention, and customer care (Hollensen 2003). In essence CRM is an explicit treatment of the relational interaction as a process with implicit futurity, as distinct from a transaction specific focus (Morgan and Hunt 1994).

2.4.7 Relationalism and Cooperation

From a transaction cost perspective relationalism increases efficiency of the transaction reducing the need for monitoring and control and thus reducing costs (Williamson 1975). Similarly relationalism is regarded as an important factor in reducing uncertainties in an interaction 'episode' (IMP Group 1990). Outside of these buyer-seller contexts relationalism is also a key component of other interactions such as co-marketing alliance activity (2.4.6.1).

Relationalism provides some explanation for the occurance of cooperation between firms. While reference is made to cooperation between organisations, relational interaction takes place at the interpersonal level and is dependent upon trust (Morgan and Hunt 1994; Zaheer *et al* 1998). Trust therefore augments the 'disproportionate' focus on power and conflict in explanations of relationalism (Morgan and Hunt 1994). Controversy exists in respect of the specific role of trust as a compliment or substitute to control (Lui and Ngo 2004).

2.4.8 Coopetition and Boundary Spanning

Cooperation is facilitated in part by the relational activities outlined above. A more complete view of cooperation would describe a reciprocal development, or co-creation, of structure in addition to social capital (Hakansson 1987). This cooperative framework is not exclusive however and does not restrain organisations from other simultaneous competitive activities. This apparent contradiction, where organisations are said to cooperate and compete simultaneously, is known as 'coopetition' (Bengtsson and Kock 2000). The logic of conducting these conflicting activities rests on the principal that resource heterogeneity exists, such that each firms unique resources are sometimes best employed in cooperation with another organisation, and sometimes can be best deployed as a competitive advantage (Bengtsson and Kock 2000). This paradox in competitive/cooperative activity among organisations is an increasingly common phenomenon in the contemporary marketing environment and is indicative of a move from neoclassical interorganisational behaviour and towards functional specialisation and greater reliance on interorganisational interactions (Achrol 1997).

Ideas of co-specialisation, coopetition, and functional specialisation are well represented in the networks literature (Achrol and Kotler 1999; Bengtsson and Kock 2000; Capaldo 2007; Dyer and Nobeoka 2000; Ford 1990; Gulati *et al* 2000b; Hakansson and Snehota 1990; Hite and Hesterly 2001; Iacobucci and Hopkins 1992; Mattsson 1997; Ritter *et al* 2004; Salancik 1995; Uzzi 1997) and while the current work seeks to retain a focus on interorganisational alliances at the level of the dyad, an overlap

between the two literatures at this point is both inevitable and constructive. In particular the issue of boundary conditions is relevant to networks, and to interorganisational alliances. Under the conditions outlined above interorganisational alliances increasingly look like network forms of relationship. Under relational conditions a boundary is defined by the 'quality of the relationship and the shared values that govern them' (Achrol 1997). It is this definition which represents an area of overlap between interorganisational boundaries and those of networks.

The premise of this position is strongly dependent on the notion outlined above that interorganisational alliances are increasingly characterised by cooperative interactions. This is a practical proposition after the establishment of the coopetition paradox and thus a case is made for increased focus on boundary issues.

Closeness between two organisations may result in boundary spanning, thus effectively merging the organisations at the level of, and for the duration of, the interaction. Closeness is a multidimensional construct and may represent both cognitive interaction (such as knowledge exchange), and affective interaction (such as unilateral adaptation) (Ferguson *et al* 2005). A logical extension from this theory is that organisational boundaries become increasingly amorphous where the number and complexity of concurrent interorganisational activities take place and that the interorganisational landscape may be better envisaged as a continuum varying from concentrated overlap to distinct space between organisations mediated by time and activity.

2.4.9 Knowledge Transfer and Performance

The relational interaction outlined is dependent upon knowledge transfer between partners in order for the interaction to function effectively. The interaction may vary in duration, however for present purposes, and in line with the description above the interaction is assumed to be ongoing. Knowledge exchange may be moderated by the degree of relationalism among the partners and is specifically contingent on the following factors:

'1) Knowing what that person knows

2) Valuing what that person knows

3) Being able to gain timely access to that person's thinking

4) Perceiving that seeking information from that person would not be too costly'

Borgatti and Cross (2003) p.440

Knowledge exchange is a reciprocal process in which each organisation shares proprietary assets (Kale *et al* 2000). Since knowledge is a heterogeneous resource and reciprocity may vary over time, asymmetry can be expected and with it the inherent risk of opportunism (Dyer and Nobeoka 2000). The moderating impact of relationalism is ordinarily effective in this situation and while formal controls may dominate early in the relationship (Inkpen and Currall 2004), over time relational capital develops and represents a safeguard against knowledge exploitation (Kale *et al* 2000). As the relationship develops formal controls become substituted by trust (Morgan and Hunt 1993). Knowledge exchange becomes a learning process in which learning and trust 'coevolve' and become a central feature of the relationship (Inkpen and Currall 2004).

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The knowledge exchanged will be transaction specific and while some knowledge will be common to an organisation's general operations much of it will be limited to the specific aspects of the transaction. This allows an organisation to manage a descrete allocation of knowledge to each transaction thus facilitating the coopetition activities outlined above. This may be of particular use in the case of key operational knowledge which can become the property of all partners without jepeordising other, separate organisational activities while also facilitating good information flow (Dyer and Nobeoka 2000).

The effectiveness of knowledge transfer represents a proxy indicator of performance of the transaction, and by implication, of the organisations individually. In situations of power asymmetry such as buyer-supplier transactions, effective knowledge exchange will benefit both partners with the supplier benefiting the most (Kotabe *et al* 2003). The effectiveness of knowledge transfer may also be affected by the closeness of the partners with procedural elements including cohesion and range facilitating good knowledge exchange to a greater extent than structural elements such as tie strength (Reagans and McEvily 2003).

2.4.10 Section Summary

A duality can be identified in the alliance literature. In this section, two principal areas of alliance literature have been identified and are linked to the theoretical antecedents of transaction cost economics and social exchange theory. Neither of these meta-narratives is represented in pure form however. Rather, each represents a transgression from the ideal type

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to a middle ground where elements of both merge through varying empirical evidence which seeks to support specific configurations of alliance activity. From this heterogeneous landscape two key, and opposing, premises emerge; a make and sell based approach to alliances, and a co-produced solutions approach (Hunt 2004). Vargo and Lusch (2004) introduce a dual typology and with it additional clarity. The make and sell approach is firmly associated with the transaction cost approach with relationalism augmenting formal control and trust reducing opportunism. This is presented as a position inherently limited by its association with an alliance perspective (transaction costs) which is increasingly challenged by an evolving interorganisational environment. Co-produced solutions, or service centred approaches represent the other half of Vargo and Lusch's (2004) duality and facilitate clearer analysis of cooperative practice including co-marketing alliances, networks, and relationship marketing.

Finally an additional explanation is developed through which the changing morphological detail of interorganisational boundaries is described. In essence alliance activity takes place across boundaries which are defined by the 'quality of relationships and shared values' rather than ownership and resource allocation (Achrol 1997). This important contextual observation gives a perspective to the operational change which may evolve in the market centred co-production scenario.

2.5 Interorganisational Coordination and Performance

2.5.1 Introduction

The literature described so far in this chapter addresses both the theoretical rationale and the operational forms of interorganisational alliance activity. Principal typologies of operational forms are identified and these distinctions now represent a basis for examining the empirical literature relating to the coordination of interorganisational alliances. The main coordinating approaches echo those operational forms of activity already outlined. However, a tighter description is arrived at and viewed exclusively from a coordination perspective.

The relative merits of one coordinating approach over another, the efficacy of an approach, is generally measured according to alliance outcomes. The treatment of alliance performance in the literature as a key outcome is discussed along with coordinating approaches in this section.

2.5.2 Formal Coordinating Approaches

2.5.2.1 Neoclassical Contract

Neoclassical contract law differs from classical contract law by allowing for uncertainty. Classical contingent claims contracting on the one hand is comprehensive in describing and discounting future contingencies and is based on 'legal rules, formal documents, and self-liquidating transaction' (Williamson 1979). The law governing contract then gives remedy for breach of promise (deviation from the terms of the contract), and recognises a duty of performance (Macneil 1980). Neoclassical contract law on the other hand recognises that not all contingencies can be

anticipated, appropriate adaptations will not be evident until the situation arises, and that 'hard contracting' may give rise to 'veridical disputes' (Williamson 1979). The common strength of both forms of contracting is the calculative framework that economics lends to the perspectives. In neoclassical contract law therefore, and under conditions of uncertainty, this calculativeness also represents something of an 'Achilles' heel' since it cannot address all possible circumstances (Williamson 1993). The idea that calculativeness and relationalism can be combined in a single approach introduces a hybrid form of contract-based alliance coordination. From a transaction cost perspective this approach recognises the reality of transaction contexts and factors in the environment with the transaction by allowing for human behaviours including opportunism and bounded rationality (Williamson 1975). From a relational exchange theory perspective this allows for the effect of relational norms, principally solidarity, role integrity, and mutuality (Kaufmann and Stern 1988; Macneil 1980).

The distinction between classical and neoclassical contract law is particularly significant for the present efforts to apply a typology to approaches of alliance coordination. Any departure from discrete contracts signals the substitution of relational coordination to some degree (Heide 1994). Neoclassical contracting therefore represents a less pure form of coordination by contract, incorporating a degree of relational coordination. One may argue that a continuum exists with this form of alliance coordination at one end, and a purer form of relational coordination with little formal contract, at the other (Kaufmann and Stern 1988; Macneil

1980). However what is not clear is whether coordination approaches are positioned along such a continuum by degree, or whether distinct approaches can be identified which act concurrently and discretely. A third option is that categorical forms may exist at threshold points along the continuum which can be described and measured.

Thus neoclassical contracting can be differentiated from other forms of alliance coordination approaches by its characteristic formality and principal reliance on the contract for the terms of conduct and as a control mechanism. Deviation from terms caused by unforeseen circumstances may be guided by general terms in the contract and rely on relational interaction, or negotiation. There is little evidence in the literature that classical contract law operates effectively as a singular coordinating approach. Classic contracting neither 'serves nor reflects' reality and provides limited safeguards (Gundlach 1994). Neoclassical contract law provides a coordinating approach through which the 'skeletal promises' of the contract can be augmented through relational coordination (Yovel 2000).

Importantly a neoclassical contracting approach to alliance coordination is that it purports to present safeguards against opportunism and the effects of bounded rationality. At this level it functions to support the make and sell approach and defend it against anticompetitive behaviour and asymmetric advantage (Joskow 2002; Porter 1980; Williamson 1975). Thus the alignment between neoclassical contract law and the transaction cost approach is clear.

2.5.2.2 Procedural dependence

Under circumstances of greater power symmetry and perhaps lower uncertainty, formal alliance coordination approaches may be less driven by the operation of safeguards and more by the effective exchange according to prescribed roles. The contingent circumstances which may lend themselves to this scenario can involve non-hierarchical alliances such as co-marketing alliances, strategic alliances, and joint ventures (Luo 2008a; Robson and Dunk 1998; Varadarajan and Rajaratnam 1986; Venkatesh *et al* 2000).

It may be reasoned that under these circumstances a greater degree of relationalism will occur and may manifest as cooperative behaviour such as adaptation. If this coordination approach is positioned at a midpoint along the continuum outlined above then there is little reason to consider that partners will act with excessive forbearance and benevolence and therefore that any adaptation will need to be reciprocated (Ganesan 1994). Power asymmetry is frequently derived from unilateral asset specific investment thus under procedural dependence, conditions are likely to be characterised by mutuality in asset specific investments where they occur, as well as adaptation (Kale *et al* 2000; Williamson 1991).

2.5.3 Relational Coordination

Relational coordination is the 'antithesis of discreteness' (Macneil 1980) and so operates at the opposite end of the continuum and involves 'highly complex roles' rather than discrete transactions (Kaufmann and Stern 1988). The logical extension to this is that contracts are seen to be

ineffective and substituted wholly by relational norms and social capital (Uzzi 1996). However laws still exist and contracts, albeit generic or implicit will still occur such that formal governance may operate as a background or remote form of co-ordination. This is therefore a relational-based coordination approach. In essence relational coordination is more concerned with the exchange of information than of rights as would be the case in neoclassical contract coordination (Sobrero and Schrader 1998).

It is important to note that the heterogeneity of perspectives on alliance coordination brings with it some semantic inconsistency. In particular the description of relational coordination here is close to what Sobreo and Schrader (1998) term procedural coordination in their meta-analysis. Semantic variation is therefore inevitable and is only remarked upon here to issue clarity and remind the reader that terms used in this text are used consistently with the descriptions given here.

An established position within the literature is that trust operates as a substitute to control (Madhok 1995; Nooteboom 2007). This position is however widely challenged by those who consider that trust operates in conjunction with control (Das and Teng 1998; Poppo and Zenger 2002). Others consider that the complementary function is contingent on the type of trust (Lui and Ngo 2004; Fryxell *et al* 2002). While these perspectives vary they do however provide tentative support for the position set out above that elements of contractual co-ordination operate remotely under relational-based coordination.

Trust is a key element of relational alliance co-ordination and an important safeguard which acts to maintain successful relational exchanges

(Fryxell *et al* 2002; Lui and Ngo 2004; Morgan and Hunt 1994). In particular trust promotes information exchange either indirectly by contributing to close tie formation which moderates information sharing (Reagans and McEvily 2003), or as a safeguard by which alliance partners can have confidence that the knowledge exchanged will not be misused (McEvily *et al* 2003). It is erroneous however to regard trust as a one dimensional construct. Trust is both multidimensional and multilevel. Two dimensions of trust are identified in the literature, goodwill and competence trust (Fryxell *et al* 2002; Lui and Ngo 2004; McAllister 1995). The multidimensional nature of trust is of particular importance in the appropriation of trust interaction and operates at both interorganisational level and the interpersonal level (Zaheer *et al* 1998).

2.5.4 Alliance performance

In determining the relative efficacy of a given alliance co-ordination approach some measure must be taken of its outcome. Alternatives among outcome measures abound. Acquisition costs (Noordewier *et al* 1990), strategic performance and market performance (Lee and Cavusgil 2006), financial performance (Lado *et al* 2008) all represent valid albeit unidimensional measures. In an overview of the development of marketing measures over time Clark (1999) identifies a clear progression from financial measures to non-financial measures, the latter of which includes market share, customer satisfaction, and input measures. Multiple measures are a somewhat later development and facilitate a multidimensional development of the performance measure.

The use of a multidimensional construct of alliance relationship performance has the advantage of allowing the development of a measurement scale which is appropriate to the specific research context. The application of the multidimensional performance construct has become increasing common in the empirical literature (Fergusen *et al* 2005; Krishnan *et al* 2006; Lui and Ngo 2004; Sarkar *et al* 2001). This further facilitates measurement of the specific unit of analysis under investigation, i.e. the alliance relationship.

2.5.5 Section Summary and the Research Implications for the Current Study.

There is a tendency among the literature considered here to report positive outcomes and associations. The extant literature adequately demonstrates the effective operation of contractual-based coordination approaches. These approaches operate under conditions associated with transaction cost perspectives. Hierarchical make and sell arrangements are shown to be served well by the contractual based approach to alliance coordination. As the conditions which characterise the transaction cost approach are replaced with other, more equitable, conditions such as power symmetry and cooperative intent, the emphasis on contract is reduced and that of relational coordination increased.

A continuum is described along which this progression can be plotted and for the convenience of typological explanation, and because the empirical literature lends itself to the arrangement, three discrete relational approaches are described. Contract-based coordination is followed by

procedural coordination, and finally by relational coordination. Relational alliance coordination is characterised by a preponderance of relational emphasis with contractual coordination operating, so to speak, in the background. While evidence is provided for the increasing link between relationalism and alliance performance at this end of the continuum little empirical evidence is provided for the role and performance outcomes of the limited contractual coordination. In line with the assumptions of transaction cost perspectives, contractual coordination appears to be largely *presumed* to function. The absence of empirical evidence for this presents a significant and substantial avenue for further research into the function of contractual coordination under cooperative alliance conditions, in which relationalism is predominant.

2.6 Conclusion

The literature on interorganisational alliances is extensive, multidisciplinary, and progressively divergent. This chapter identifies the theoretical anchors for the field, maps out the contemporary empirical literature and imposes an alliance coordination lens to limit the focus and describe a specific context and rationale for future research in general and the current investigation in particular.

The theoretical anchors are described in sections 2.2 and 2.3, institutional economics, and social exchange theory respectively. The institutional economics section takes the theoretical underpinnings of the alliance literature and describes the economic decision making origin. Section 2.2 is largely a discussion of the supplanting of neoclassical

economics by transaction cost theory which is argued to be more realistic in respect of its marketing context. The section is dominated by a discussion of transaction cost theory and the method by which the transaction costs framework establishes the relative merit of pursuing market transactions over internalising activities.

Social exchange theory is in many ways antithesis to institutional economics. Section 2.3 describes the principal development of the theory and goes some way in identifying areas of commonality between the two meta-theories. Also described are the principal differences between the theories. It is established that institutional economics carries an assumption of futurity only where a rationale case exists for it. Social exchange theory meanwhile facilitates future exchange where market imperfection exists and the rational case is difficult to make.

The broader alliance literature draws on the theories of institutional economics and social exchange theory to a large extent. Other theoretical perspectives such as resource dependence theory are also in evidence and in section 2.4 the alliance literature is described, and an attempt is made to establish a typology. The merging and overlapping of the literature is brought into focus by relating it to the principal antecedent theories already discussed. From this a two dimensional typology is established with a make and sell alliance perspective on the one hand and a more cooperative perspective concerned with co-produced solutions on the other (Hunt 2004). Of particular importance in this section is the establishment of a duality which extends beyond the perspectives outlined and to the logic underpinning them. The concept of a new dominant logic is used to inform

the discussion of these perspectives and is linked with the evolving marketing environment to address the direction of developments in alliance co-ordination theory (Vargo and Lusch 2004). A further element of futurity to emanate from this section is the description of the effect on boundary conditions of the trend in cooperative interplay between organisations.

The penultimate section is a focus on the coordinating approaches to alliance activity and their operational function. These approaches are described in the context of a continuum ranging from a broadly contract-based approach at one end to a broadly relational-based approach at the other. An intermediate condition is identified providing a trichotomous typology of discrete coordinating approaches. The absence of specific treatment of contract co-ordination within the relational-based approach is identified as an area for attention in future research generally and this research in particular.

CHAPTER THREE

Conceptualisation of the

Research Model

Chapter Three: Conceptualisation of the Research Model

Chapter Contents

3.1 Introduction

The coordination of interorganisational relationships is described in terms of theoretical antecedents, contextual application, and logical perspective in the previous chapter. A continuum is described between exclusive and somewhat ideal types of formal and relational approaches to the coordination of interorganisational relationships. Importantly an attempt is made, through the extant literature, to describe the mid-range of this continuum. Termed *Procedural Coordination* in section 2.5.5, this mechanism is loosely outlined as a combination of the contractual and relational coordination approaches which works in conjunction with the purer forms of coordination. However, the contemporary literature underpinning this is diverse in approach, providing empirical evidence which is inconsistent in its context and, perhaps in consequence, inconsistent in its findings. Furthermore a bias in the logical foundation of the approaches exists towards a transaction cost perspective with a common assumption that the hierarchical context (buyer - seller) is of singular importance. The fact that such a logical underpinning is not representative of the foundation for interorganisational relationships undermines the findings of some empirical work and reduces the prospect for an emerging universal consensus.

The theoretical anchors are two-fold. Institutional economics and its unlikely bedfellow exchange theory, continue to inform and provide a platform for contemporary thinking in the area of interorganisational relationships. This ontological derivation does not change in the present

context and represents an important commonality between extant empirical work and this study.

The emphasis of much prominent work in the field (Brennan *et al* 2003; Cannon *et al* 2000; Carson 2007; Das 2006; Geyskens *et al* 2006; Heide 2003; Heide and John 1988; Kotabe *et al* 2003; Reuer and Arino 2007; Wathne and Heide 2000; Williamson 1991; 1993) is placed on a hierarchical, buyer-seller, and frequently equity-based relational context. While insightful at this level, any interpretation of the link between coordinating mechanisms and performance are inherently limited and so lack universal comment. At a practitioner level the evolution of management techniques in response to the increased frequency and reduced duration of such relationships, and significantly the universal shift toward service-based activity further limits the insight available from empirical work generated from the contextual perspective outlined above. By adopting a context which is not hierarchical, buyer-seller, or equity based the present study seeks to limit contextual bias and obtain a clear view of the action of coordinating mechanisms.

The contextual application is closely allied with the logical perspective. Indeed the assumptions for each study are derived from this context. For example a hierarchical context brings with it transaction cost assumptions about limited rationality and risks of opportunistic behaviour (Williamson 1975). These assumptions are well established and have a legitimate foundation of empirical work which spans several decades. However the fact that these assumptions tell only part of the story has been a concern for much of this time, and has provided a focussed agenda for

research since Cook and Emerson's (1978) work on the function of commitment in explaining the differences between economic exchange and social exchange theory.

Cook and Emerson's (1978) comments in this area appear to have been less of a clarion call and more a point at which a key issue comes into focus and from which empirical work with an exchange agenda could finally gain purchase. The empirical work spanning the intervening thirty or so years comprises these two incongruent logical perspectives and goes some way to explain the sense of dichotomy which characterises work in this area. The advent of the work of Vargo and Lusch (2004) represents a further point from which clarity may ensue, a 'tipping point' Day (2004) and an important component in the foundation of the current work.

This chapter documents the definitions of established coordination mechanisms along with a new coordinating mechanism, procedural dependence which, it is argued, explains the coordinating activity at the mid-point of the continuum described above. The interaction of these mechanisms, or constructs, is proposed and a conceptual model described.

3.2 Construct Definitions and Hypotheses Development

3.2.1 Contractual Coordination

Contractual coordination, or contractual governance are terms used interchangeably in the literature and refer to a formal approach to interorganisational relationship coordination. The application of this approach varies considerably in the operational detail. A definition of this formal approach to interorganisational relationship coordination may include terms such as 'hard, explicit, formal, and written contracts.'

(Ferguson *et al* 2005). Additionally attempts can be made to measure pertinent concepts including asset specificity, opportunism, and formal exchange (Sobrero and Schrader 1998).

At its core however, is the notion of a 'legal bond' which sets out the 'expectations and obligations of parties' (Cannon *et al* 2000). Within the present study a definition is sought which is close to this and so positioned at the 'transaction end of the transaction-relational continuum' (Ferguson *et al* 2005). However, contractual definitions vary in law according to their application. The present definition is guided by the transaction costs antecedent theoretical position which advocates the use of neoclassical contract, and observes both *ex ante* and *ex post* temporal considerations (Williamson 1975; 1985). The emphasis here is both to outline the roles for each party, and to be explicit in guiding action in future events in what Macneil (1980) terms 'presentiation'.

Within the present study contractual coordination is defined as *an explicit written contract detailing roles and obligations ex ante, and avenues for dispute resolution ex post.*

As a construct within the present model contractual coordination is presented in a pure form with two dimensions. Formality, or contract complexity, refers to the degree to which terms of an alliance are specified *ex ante*. This is also termed as contractual complexity, and 'detailed contract drafting' in the literature (Wuyts and Geyskens 2005). As a dimension of contractual coordination within the current study formality facilitates a measure of the magnitude of contractual coordination.

Safeguards within the context of the contract increase the ease with which penalties can be incurred, effectively '[changing] the pay-off structure by increasing the cost of self-interest activities' (Lui and Ngo 2002). These safeguards are particularly important in non-equity alliances where asset specificity functions as a transaction costs safeguard (Lui and Ngo 2002). The inclusion of this dimension within the contractual coordination construct complements formality by providing a measure of *ex post* contractual activity. This is closely aligned with the transaction costs agenda of including 'ex post deterrents' (Parkhe 1993).

3.2.2 Complementarity

Complementarity receives much attention in the literature. A common application of complementarity in the extant empirical work is the analysis of fit in alliances. The central element of these approaches is the establishment of complementary differences between alliance partners (Harrigan 1988), between the organisation and its strategy (Vorhies and Morgan 2003), or between organisational cultures (Sarkar *et al* 2001). A characteristic focus emerges on dimensions including shared goals, similar values, technology, and resource needs (Whetten 1977).

Contributions centre on the performance outcomes for organisations, or for the alliance relationship itself. The latter is especially the case in studies of joint ventures where the complementary differences are held to be the raison d'etre of the alliance. As organisational learning takes place the differences in the knowledge and skills held by each of the alliance organisations becomes increasingly similar and the

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complementarity is held to be less effective, and the relationship less profitable over time (Park and Ungson 1997).

According to the transaction cost rationale a buy decision must imply that the costs of monitoring and control are not sufficiently high to warrant internalising the activity (Williamson 1985). Applying this logic to the present study an explanation is required to justify the apparent lack of credible commitments such as transaction specific assets in a scenario in which opportunism must be assumed to be an existing hazard. As a formal coordinating mechanism, contractual coordination does not address this. Instead complementarity is introduced as an antecedent condition. In the absence of equity in the relationship it is reasoned that some prior assessment must be made before a contract is entered into and deemed acceptable from a transaction cost perspective.

The application of complementarity as described above does not provide an explanation for its function under the present circumstances however. The empirical work outlined above draws on social exchange theory. The present application takes a transaction costs approach and employs complementarity as a measure of firm incongruence. While the above approach will assess the benefits of complementary differences, also termed 'structural holes' (Zaheer and Bell 2005), the present application defines complementarity as *a measure of the similarity of scale and competence of the organisations under investigation*. The implication of this is that complementarity as defined here provides an indication that the partner organisation is likely to operate to similar professional standards as

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are the norm within the wider industry and so may be regarded as falling within an acceptable level of risk.

Thus: H_1 organisational complementarity is positively related to the employment of contractual coordination.

3.2.3 Relational Coordination

While contractual coordination achieves relative consistency in the definitions applied to it in the literature, this is less frequently the case for relational coordination. In line with the description of the relational literature discussed in chapter two, definitions of relational coordination are consigned to that-which-is-not-contractual coordination. While this statement may appear dramatic, a brief review of the literature relating to the characteristics of relational coordination gives an indication of the breadth of the classification. The journey from Macneil's (1980) social contract becomes a literary equivalent of a heteroscedastic dispersion and includes norms (Cannon *et al* 2000), embeddedness (Uzzi 1999), adaptation (Brennan *et al* 2003), exchange (Kotabe *et al* 2003), power (Gulati *et al* 200b), trust (Fryxell *et al* 2002; Luo 2002), commitment (Morgan and Hunt 1994; Sarkar *et al* 2001), and knowledge transfer (Kale *et al* 2000).

An objective of the present study is to establish a definition of the relational coordination mechanism which is both discrete and concise. In order to settle on a clear definition of relational coordination particular attention is paid here to the function of trust in both the formation (competence trust), and maintenance (goodwill trust) of the

interorganisational relationship (Rousseau *et al* 1998). Trust also features widely in existing work on the contrast between contractual coordination and relational coordination (Bradach and Eccles 1989; Granovetter 1985; Poppo and Zenger 2002). As described in chapter two, relational coordination may be viewed as a function of trust and exchange (Macneil 1980; Uzzi 1996). Such a perspective draws the focus away from broader temporal considerations such as embeddedness and towards the principal collaborative characteristics. Relational coordination is defined here as *a function of the principal interpersonal characteristics necessary to engender benevolent interaction.*

Relational coordination is operationalised using trust and exchange. Trust is multidimensional and the key components of goodwill, and competence trust are employed here as two dimensions of the relational coordination construct. Technical exchange is taken as a third dimension and represents the final element of interpersonal interaction through direct interpersonal contact which is continuous in nature (Kotabe *et al* 2003).

Direct interpersonal contact cannot operate as part of a coordinating mechanism until the interorganisational relationship has been established. This gives some intuitive indication of directionality of a relationship between relational coordination and contractual coordination. Further evidence is provided in the literature for contractual coordination as a dominant initial coordinating mechanism which yields to relational coordination as trust evolves and exchange takes place (Fryxell *et al* 2002; Poppo and Zenger 2002; Poppo *et al* 2008; Styles and Ambler 2003).

Thus: H_2 Contractual coordination is positively related to relational coordination.

3.2.4 Procedural Dependence

Procedural dependence is not a construct which appears in the literature. It is a novel construct representing a key contribution of this study. Procedural dependence is a coordination mechanism representative of a midway point along the contractual/relational continuum. That is, a function of dimensions which represent a balance of contractual oriented factors (asset specific investment), relational factors (adaptation), and relative power symmetry (power dependence). Something which is conceptually similar to the construct of procedural dependence outlined here is 'procedural coordination' (Sobrero and Schrader 1998). While Sobrero and Schrader (1998) agree with some of the dimensions specified in the present definition (adaptation), other dimensions do not fit and the key commonality is found to be conceptual.

Procedural coordination is differentiated from contractual coordination through its 'process-oriented perspective' (Sobrero and Schrader 1998). The definition of procedural dependence in the current study is aligned with this, and also extended by differentiating it from relationalism. Thus a definition is arrived at both by specifying the construct dimensions and by clarifying how it is distinct from other constructs.

Procedural dependence is therefore defined as *a process of visible reciprocal exchange between partners in a relationship which takes place at the operational level and is in evidence on a day to day basis.*

A central tenet of this coordinating mechanism is that it seeks to equalize exposure of both parties (Heide and John 1988) at the operational level and in so doing reduces the perception of opportunism 'by a show of good faith' (Parkhe 1993).

Procedural dependence is proposed here as a variant on formal coordination but is distinguished from contractual coordination which functions at a different level. While procedural dependence functions at the operational level, contractual coordination functions at a higher level. Another distinction between the two formal mechanisms is that procedural dependence can only operate *ex post* while contractual coordination functions *ex ante* and *ex post*. As a formal coordinating mechanism procedural dependence is also antecedent to relational coordination.

Thus: H3 Procedural dependence is positively related to relational coordination.

3.2.5 Performance

The purpose of the theoretical model is to set out the relationships which will be examined. This investigation focuses on the efficacy of alliance coordination approaches and thus the model includes a measure of outcome. Alliance performance is used as the outcome measure in the model.

Two options exist for the selection of a performance outcome measure within the model. Firstly a categorical measure could have been used for example describing whether the alliance activity (project) was completed on time, or whether the project was completed to budget. Secondly a multidimensional approach could be taken assessing an aggregation of factors which might relate to actual, and perceived performance. Difficulties exist with the former approach since completing a project on time or to budget may be a poor indicator of the efficacy of the alliance. A perfectly amicable alliance may have augmented the original project with *ex post* changes which, while satisfactory to both parties, may take the project over time and budget. Similarly efficient work born out of a good alliance may bring the project to conclusion ahead of time. Early cessation of the project may also have been the outcome of a failing alliance where both parties exit early by mutual agreement. On a methodological level, the use of nominal data as an alliance performance measure would impose constraints on later analysis of the model. While mutli-item interval data can be used (Lambe *et al* 2002) the emphasis may still fall on proxy measures of individual firm performance rather than alliance performance. Additionally, and of particular importance to structural equation modelling is the concern to avoid the use of formative rather than reflective indicators (Jarvis *et al* 2003).

Since the outcome measure is performance of the *alliance* rather than the project, efforts are made to establish more representative measures. Two suitable dimensions of alliance performance were identified from the literature. The subjective measure of perceived alliance

performance facilitates an assessment of the satisfaction of the performance of the alliance. It is a 'commonly used' measure for this purpose and also goes some way to address the reliability issues associated with categorical measures of alliance performance as outlined above (Lui and Ngo 2004). While this dimension provides an assessment of alliance performance from a goal oriented perspective, the other dimension augments overall performance by introducing a perceived alliance effectiveness approach. Perceived alliance effectiveness is concerned more specifically with the success with which both organisations worked together. Perceived alliance effectiveness is defined as 'the extent to which *both* firms are committed to the alliance and find it to be productive and worthwhile.' (Bucklin and Sengupta 1993).

Alliance performance is defined here as *satisfaction with the project outcomes attributable to the alliance relationship.*

Performance is the universal outcome measure and as such must be placed after the coordinating mechanisms already outlined. The link between trust and performance (Luo 2002), and between exchange and performance (Kotabe *et al* 2003) is established in the literature.

H_4 There is a positive relationship between relational coordination and alliance performance.

3.3 Conceptual Model

The conceptual model shown below in figure 3.3 illustrates the arrangement of the five key concepts and their hypothesised relationships.

The model progresses previous conceptualisations of the function of alliance coordination mechanisms at two levels. Firstly the conventional contractual coordination and relational coordination constructs are shown in sequence rather than leading individually to performance. This antecedent-consequence arrangement illustrates the theoretical position that contractual coordination is the initial coordinating mechanism employed in the absence of goodwill trust which exists minimally, or not at all, at the outset of the alliance. As goodwill trust develops between alliance partners the requirement for safeguards reduces, and as technical exchange takes place the requirement for formality in contractual specificity similarly reduces (Fryxell *et al* 2002; Poppo and Zenger 2002).

Secondly the novel construct of procedural dependence is introduced and illustrates an operational level of coordination with the same chronological pattern as contractual coordination. The function of the procedural dependence construct is dependent on mutuality which represents a form of operational safeguard (Sobrero and Schrader 1998). This represents a symmetry of commitment in the absence of contractual safeguards and of goodwill trust.
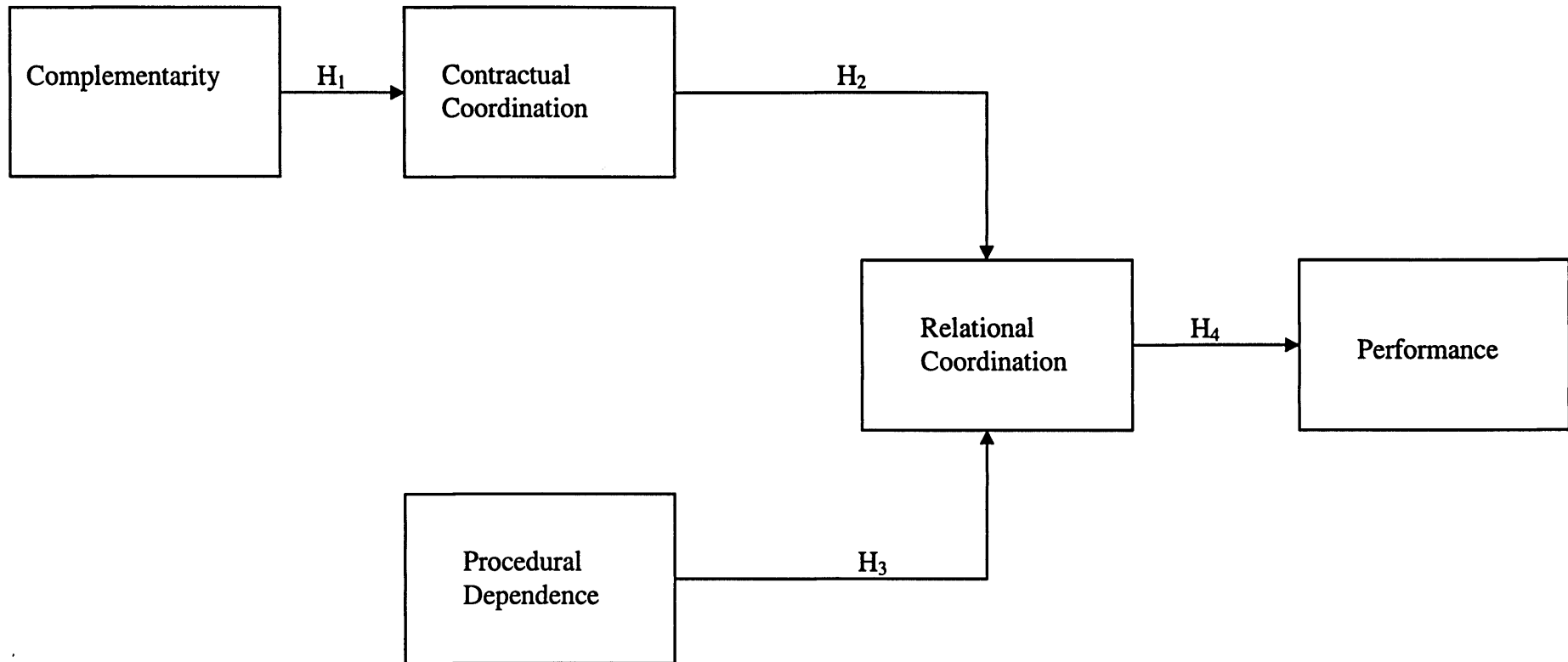
Figure 3.3 Conceptual Model of Interorganisation Alliance Coordination Mechanisms and Performance Outcome

3.4 Conclusion

Addressing theoretical antecedents, contextual application and logical perspectives the conceptual model outlined in this chapter proposes a novel configuration of alliance coordinating mechanisms and includes a novel construct. The configuration is achieved with specific regard to purity of the constructs in order that their function in relation to each of the other mechanisms can be seen clearly. The novel construct of procedural dependence is proposed to demonstrate the coordinating activity at the midpoint between contractual and relational approaches. The function of contractual coordination in a non-equity context will also be assessed together with the complementarity construct applied to a transaction costs context. Each construct is defined and a hypothesis is presented outlining the relationship between the principal constructs.

CHAPTER FOUR

Research Design and Empirical

Methodology

Chapter Four: Research Design and Empirical Methodology

Chapter Contents

Chapter Four: Research Design and Empirical Methodology

4.1 Methodological Approach

4.1.1 Philosophical Antecedents

The purpose of the thesis is to contribute to knowledge in a particular area of business research. Since the interpretation of events is mediated by the observer some error or bias may be introduced. It is therefore of value to examine briefly the epistemological positions from which we may attempt to describe knowledge and thus to clarify the points of entry for error and bias in order that they may be addressed. The derivation of knowledge from the world around us is a substantial field of study in its own right and not one to which I propose to contribute here. Rather it is of value to orientate the methodological approach within this field.

In addressing the process of research through philosophical perspectives two key areas of fallibility can be identified which are of particular concern from a methodological perspective. The first is the issue of interpretation, and the second, description.

4.1.1.1 Interpretation

Interpreting the world around us and establishing how we know what we know forms the central occupation of philosophical works spanning the centuries. Two key themes, rationalism and empiricism emerged in the 17th century and represent a foundation for current debate. Descartes, as a figurehead of rationalism postulates that knowledge exists independently, *a priori*, of experience (Gaukroger 1995). While around the same time Locke provided support for the opposing empiricist view of

knowledge being obtained *a posteriori*, from experience (Blackburn 1996).

At a superficial level one might view this as a conflicting position of objectivity (*a priori*) versus subjectivity (*a posteriori*) and this is helpful in highlighting an early example of the classic dichotomies which are important in methodology and manifest over time, variously but not exclusively as rationalist/empiricist, positivist/phenomenologist, and quantitativist/qualitativist. While not perfect substitutes these pairings are none the less thematic echoes which characterise contemporary methodological debate (Churchill and Iacobucci 2005; Hussey and Hussey 1997; Malhotra 1999; Phillips 1987). In the Critique of Pure Reason, Kant harmonises the opposing positions of rationality and empiricism through a process of reasoning he terms 'transcendental deduction' thus bridging the dichotomy but not eradicating it (Dent 1993). Indeed the boundaries between rationalism and empiricism shift through the literature notably through the works of Comte and Hegel (Blackburn 1996; Phillips 1987) but the fundamental distinction between objective knowledge and observer-interpreted knowledge remains, and represents something of a lynch pin in the epistemology upon which contemporary methodology is founded.

4.1.1.2 Description

The second area of fallibility is the way in which we represent knowledge. Language, according to Wittgenstein, has limits which include oversights in relation to primitive elements of the phenomena being described (Pears 1985), in other words an assumption that words have fixed meanings overlooks softer messages which may be contained in the sentences.

Postulating a phenomenological approach and furthering Wittgenstein's position Husserl advocates the need 'not to think but to look' to 'pay more attention to the contours of the actual phenomena, and less to preconceptions about what they must be like.' (Blackburn 1996; Husserl 1999). In essence this is a pro forma for a Kantian transcendentalism, a blend of rationalism and empiricism in linguistics. In addition to an explanation of the principles of structural linguistics, Saussure (1983) provides a deeper technical appraisal of this linguistic blend, taking not just the meaning of the word and its chronological order but its association with other words in order to decipher meaning in what he terms synchronic relationships.

The discourse divides on the question of whether language describes knowledge, or whether knowledge is the product of language. Logical positivists including Wittgenstein postulate the latter position (Blackburn 1996; Pears 1985). Saussure's comment that 'the link between a word and the concept it stands for is arbitrary' (Nooteboom 1992) is a forthright position, however when blended with the views of others such as Kant, Husserl and Wittgenstein it provides us with a simple indication that a fallibility exists in the application of preconceptions to the interpretation of language. This represents something of an over simplification of the field of structural linguistics but none the less serves our purposes in identifying a key methodological issue.

4.1.2 Methodological Antecedents

Wittgenstein and the Vienna circle made key contributions to scientific methodology by questioning the prevailing orthodoxy of nineteenth century thinkers, namely that scientific enquiry starts with an unprejudiced observation of fact followed by inductive inference which would arrive at some universal truth (Blaug 1980). However the Vienna circle was short lived and in particular an attack on Wittgenstein's verification principle signalled the end of logical positivism as a prominent account of scientific enquiry. The attack came from Karl Popper with the declaration that 'the essence of science is testability' (Phillips 1987). In doing so Popper established the concept of falsifiability, that a theory is right if alternatives cannot be shown to work, as the cornerstone for modern scientific investigation. Popper's work also came to mark the turning point between the old dominant and broadly held scientific philosophies and the cascade of contemporary perspectives including those of Polanyi, Kuhn, and Feyerabend (Blaug 1980).

This fundamental shift in emphasis was accompanied by the growth in momentum of interpretivist approaches to scientific research formed against a backdrop of anti-formalism which held that logic alone frequently yields 'unrealistic models of human affairs' (Phillips 1987). This heralded the advent of postmodernism changing the landscape of scientific investigation to one of methodological alternatives to which Wittgenstein and Saussure had made important contributions to the foundations of post-modernism. The division remains a contemporary one in which meaning is either verified from theory using causal research designs (*a priori*), or is

theory is generated from an interpretation of events (*a posteriori*) in which '[c]ommunication rather than consciousness is taken as the basis of knowledge' (Nooteboom 1992).

The emergence of social science as a discipline throughout this time was reinforced by the pioneering work of the Chicago school and contributed to a schism between methodological approaches (Denzin and Lincoln 2000). The development of methods specific to these approaches such as grounded theory (Glaser and Straus 1967) established further their separate identities and a broadly dichotomous typology emerged. Methods became affiliated to qualitative or quantitative schools, or paradigms (Hussey and Hussey 1997). It is reasonable to conclude that the classification represents an attempt to impose some order over what is in reality a multitudinous and multidirectional evolution of approaches to scientific method which largely defies rigid classification. The development of a schism about these two schools gained ground through mutual criticism of the opposing positions. In reality however much work draws at least some influence from both sides (Phillips 1987).

Contemporary methodological approaches are typically classified as exploratory, descriptive or causal each of which may make use of either qualitative or quantitative methods but with a predominance of qualitative method used in exploratory approaches and quantitative used in descriptive and especially in a causal approach (Churchill and Iacobucci 2005). Exploratory research is akin to the interpretivist approach outlined above and may be regarded principally as pursuing the generation of ideas and insight (Churchill and Iacobucci 2005). Descriptive research designs seek

to elicit the relationship between variables while causal designs place emphasis on cause and effect, however there is considerable overlap between these two approaches. If the boarders between the methodological approaches are difficult to describe, typical characteristics are less so, and it can be said that exploratory research frequently establishes hypotheses and research priorities, descriptive research describes segment characteristics and makes generalisations to the population while causal research establishes a time-order of variables and eliminates other explanations (Churchill and Iacobucci 2005)

4.1.3 Methodological Approach and Justification

Selection of a methodological approach is guided by a number of factors. The researcher as agent will have preferences determined by their meta-narrative positionality and individual social perspectives. Methodology can be defined at this level as an 'intricate set of ontological and epistemological assumptions that a researcher brings to his or her work' (Prasad 1997). The agenda is refined however by the broad objectives outlined in the previous section, namely the generation of ideas and insight (exploratory), describing the relationship between variables (descriptive), or establishing cause and effect (causal) (Churchill and Iacobucci 2005). These objectives can be informed by the desired contribution to the extant literature and so to a greater extent the methodology will be drawn from that literature since new contributions must by definition be based upon existing work which, in a Newtonian sense stands 'on the shoulders of giants' (Furman and Stern 2002).

The antecedent literature to this research has a dual focus of transaction costs and transaction relations which is in line with Bagozzi's (1984) general theory of marketing. The resultant methodological orientation is similarly multifaceted. Transaction cost analysis is well established in its application to marketing and draws on institutional economics. Transaction relations, meanwhile draws on exchange theory and represents the increasing importance of relations in marketing (Nooteboom 1992). A descriptive approach facilitates the identification of relationships between the key variables under analysis and allows extrapolation of these findings to the population. This is in line with extant literature (Lui and Ngo 2004; Poppo and Zenger 2002; Varadarajan and Jayachandran 1999; White and Lui 2005) and provides for generalisability which is a key aim of the research.

4.1.4 Overview and Selection of Methods

The identification of a theoretical gap in the existing empirical work, supported by conceptual work, establishes a phenomenon to investigate and a theory to be tested. This process of theory testing requires a precise definition of constructs in order that they might be accurately measured (Roth and Menor 2003). Where a construct is a function of other 'factors of interest' then multiple regression correlation is an appropriate technique to use (Cohen *et al* 2003). However these techniques which include exploratory factor analysis are essentially descriptive techniques thus making hypothesis testing difficult (Byrne 2001). Where a more complex arrangement of hypothesised relationships between latent constructs is to

be analysed then structural equation modelling (SEM) is a preferable technique in which exogenous (independent variables) constructs become endogenous constructs within the structural model (Byrne 2001). SEM is selected here and applied using Amos 6 software.

A mail survey technique is employed for data collection. The mail survey has several benefits over interviews including low cost where a large, geographically disperse, sample is used. A large sample is required in this instance to provide a large number of usable responses with a view to increasing the power of the analysis to acceptable levels. Power is described as function of the statistical significance of a Type 1 error (failure to reject the null), the sample size used for analysis, and the effect size being examined (Hair *et al* 2006). The desired number of usable responses to be included in the analysis (n) is > 200 where power is .80 and statistical significance (α) is set at .05 (Cohen *et al* 2003). Additionally the limited observer involvement (interviewer bias) and consistency of respondent interaction provides improved reliability over comparable methods such as interviews. Social aspirant bias is also limited where personal interaction is minimal (Dillman 2007). Key disadvantages of mail surveys include lower response rates (as compared to interviews), an increased likelihood of missing data and the possibility of non-response bias (Diamantopoulos *et al* 1991).

4.2 Definition of Population and Sample

4.2.1 Methodological Principles

The population is the 'precisely defined' group of entities about which inferences are to be made (Hussey and Hussey 1997). Typically the population will exhibit some commonality across activities, characteristics or context (Chisnall 1992). The definition of the population is theoretically derived and will be relevant to the researcher's requirements which relates directly to the definition of the problem under investigation (Churchill and Iacobucci 2005; Malhotra 1999). Having delimited the population according to specific requirements a list of the population members will form the sampling frame (Hair *et al* 2003).

While in principle it is possible to analyse every member of the population, or sampling frame (census) it is frequently impracticable and, where a representative sample can be derived, is of limited benefit relative to the resource implications (Hair *et al* 2003). Sampling techniques fall into either of two categories, probability or non-probability. For the purposes of a descriptive research design, probability techniques are of interest and include simple random, systematic random, stratified, cluster and multistage techniques (Hair *et al* 2003). The selection of a specific technique should be guided by the sampling frame format. For example where no significant order or grouping of entries exists, a simple random or systematic random approach can be taken. Systematic random sampling carries the additional potential hazard of periodicity where an order exists (De Vaus 2002). An exception to this is alphabetical ordering which is regarded as random (Hair *et al* 2003). Where an order or grouping of entry

characteristics exists, stratified, cluster or multistage approaches will achieve a more representative sample.

Deriving a truly representative sample however, is not possible since 'by chance alone there will be differences between the sample and the population.' (De Vaus 2002). These differences are caused by sampling error which typically decreases (not proportionately) as the sample size gets bigger (Silver 1997). Indeed, the only perfect sample is the population itself. Nevertheless it is possible to obtain a representative sample and the level of error does not present an obstacle to making inference from the sample to the population if the difference between is known. This can be calculated using estimators such as the means and the standard deviations (Phillips 2000). Ultimately the representative sample allows for an accurate inference of the population behaviour without allowing these inferences to be biased by individual exceptions (exception fallacy). It is similarly important to note that individual behaviour can not be inferred from the aggregate sample data (ecological fallacy) (Hempel and Oppenheim 1948).

4.2.2 Contemporary Methodological Perspectives on Measurement

While chance can contribute to the introduction of (error) variance this does not imply that all variance is beyond control. Variance can accumulate throughout the research process and if it is unchecked may contribute to a nebulous research conclusion. At a statistical level non-significant results and failure to establish model fit are potential adverse outcomes of extraneous error summed up by Cohen *et al* (2003) as 'garbage in, garbage out'. While this phrase is typically related to data

entry, the condition of the data is arguably determined from an early stage. In consequence steps taken to minimise error can be taken early in the research process. Attention to strategy and project planning at this stage generates a holistic approach in which the need for additional measurement and analysis is minimised (Khurana and Rosenthal 1999). This complements the more frequent focus on statistical analysis post instrument administration (Malhotra and Grover 1998).

Key factors remain however in respect of the population and its influence on variance. Smaller (absolute) sample sizes are liable to a higher level of sampling error. Where heterogeneity is high in respect of the population characteristics under investigation a larger (relative) sample size is preferable since the possibility of sampling error increases under these conditions (De Vaus 2002).

The population selected must exhibit (measurement) characteristics of the phenomenon under study. Limiting the population to one consisting of similar characteristics, such as a single industry or sector will increase reliability but reduce generalisability and so a balance must be struck in line with the research aims. It is important to identify the key characteristics under study if the unexpected effect of unmeasured mediators or moderators is to be avoided.

The response rate will determine what proportion of the sampling frame will ultimately constitute the sample. While this cannot be known in advance some estimate can be made based on similar studies on similar populations. Current examples may be preferable although a series of response rates over a longer period would represent a comprehensive

indication of response rates and inform the researcher of any emerging trend.

The establishment of a representative sample frame from the population does not in itself guarantee a representative response since a bias may exist among those who respond when contrasted against those who don't (Armstrong and Overton 1977). The problem of non-response bias is recognised as an important one and one which is difficult to control for. Non-response generally presents two potential problems, a reduction in sample size to an unacceptable level, and bias. Bias can be avoided through survey design, and checked *post hoc*, where a bias is identified it may be possible to rectify the situation by weighting the sample on the bias characteristic (De Vaus 2002).

4.2.3 Empirical Antecedents

In selecting an appropriate sample from the sample frame and having addressed issues of sampling technique, the sample size must be decided upon. In principle the size of the sample can be guided by the final number of responses required for the analysis. This is achieved by estimating the response rate and calculating the sample size required from this figure.

The literature offers little in the way of formalised procedures for estimating response rates and so an attempt is made here to estimate the response rate based on those reported in similar studies in the same field. An assessment of a large number of studies would facilitate generalisability, however it would be less reliable as a specific indicator to this study. Instead a cohort of studies was selected from the most
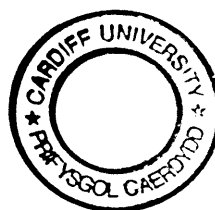
influential empirical literature in respect of this study. Of eleven studies selected nine reported the response rate (Brennon *et al* 2003; Fryxell et al 2002; Kotabe *et al* 2003; Lee and Cavusgil 2006; Luo 2002; Parkhe 1993; Sakar *et al* 2001; Sivadas and Dwyer 2000; Wuyts and Geyskens 2005). Kotabe *et al* (2003) report two response rates, one for each of two countries in which the study was conducted. The response rates are described below in   figure   4.1
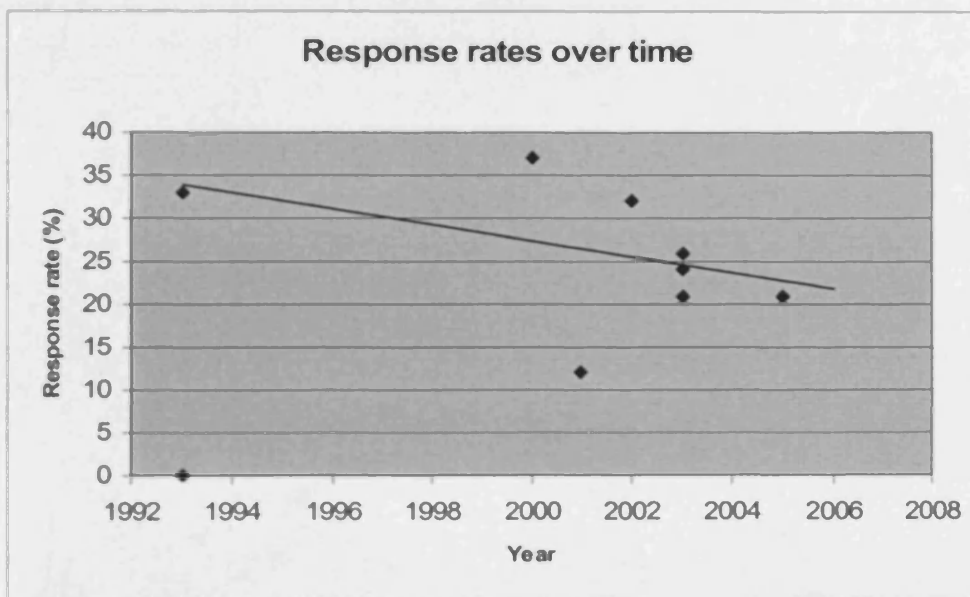
Figure 4.1 Response Rates among Antecedent Empirical Studies

In considering these response rates care was taken to check the definition of the response rate in each case. The Council of American Survey Research Organizations (CASRO) established a standardised definition as follows:

Number of completed interviews with responding units
_____

Number of eligible responding units in the sample

(CASRO 1982; Wiseman and Billington 1984).

96

Each of the nine studies uses this definition. Of the nine studies one, Parkhe (1993) employs the tailored design method for survey research (Dillman 2007) as employed in the current study and reports a higher than average response rate of 33%.

Further considerations include the context of each of these studies. Six studies were conducted in the United States, and one each in China, Japan, and the Netherlands. The cultural disparity between those studies and this one potentially reduces their reliability as indicators of response rate. However as a broad indication the conservative figure of 20% response rate is taken as a basis for the calculation of sample size.

A figure of > 200 useable respondents is considered suitable in structural equation modelling (Cohen *et al* 2003) which necessitates a sample size of 1000 assuming a 20% response rate. To allow for a margin of error this figure was increased to 1200.

4.2.4 Definition of Population

In line with the research aims the population is delimited to an industry in which the phenomenon under investigation, non-equity co-marketing alliance performance, can be examined. This research took British architecture as the industrial setting for data collection. The alliance between the architect and the building contractor fits the description above and has been used in key antecedent studies including Lui and Ngo (2005) White and Lui (2005), and seminal work by Williamson (1975). Practicing architects in the UK may become members of the Royal Institute of British Architects (RIBA). RIBA has chartered status and as such is an

institutional body to which the majority of practicing UK architects are affiliated (RIBA 2005). The institute holds a directory of members and architectural practices. The population was taken as the membership of RIBA affiliated architectural practices in the UK. At the time the database was compiled this sample constituted 3080 practices.

Within each practice a senior architect was selected as the key respondent. Seniority was established by position which included the titles of Managing Director, Director, Principle, Senior Partner, Partner, and any management positions including but not limited to Regional Practice Manager, and Design Group Manager. Additional checks were added in the form of *post hoc* checks which asked respondents to rate their level of knowledge of the project, their degree of involvement, and their confidence in answering the questions. Validating the credentials of the respondent in this way serves to reduce the likelihood of common method variance (CMV), defined as the artificial inflation of 'observed correlations between [ ] two types of variables' largely as a result of reporting on temporarily distinct variables at the same point in time or, pertinent to this study, by the same respondent on the behaviour of himself and on the behaviour of another actor (Lindell and Whitney 2001). The unit of analysis is the relationship between the architect practice and the building contractor and the key respondent reported on this relationship.

4.2.5 Definition of Sample

The sample comprises 1200 respondents each from an individual architectural practice, or branch of a firm of architectural practices drawn

from the alphabetically ordered practice membership list of the Royal Institute of British Architects (RIBA) using a systematic random selection approach. Respondent firms were not pre-selected by size or by any factor other than their inclusion on this list.

4.2.6 Access

To paraphrase Dillman (2007) access is the act of getting the survey questionnaire to the respondent. The factors that determine this include correct contact details, a mailing which looks professional (standard stationery and formatting) and legitimate (University frank and headed paper) in order to increase the prospects that it will get past gatekeepers such as secretaries, and addressed to the respondent by name (Dillman 2007, Hussey and Hussey 1997). To this end contact details were cross checked against individual member listings at the Royal Institute of British Architects (RIBA) both to verify the practice at which the prospective respondent worked and to complete some information such as first name in place of initials. Additionally twenty telephone calls were made to check the accuracy of the contact details independently of the RIBA database. This found 100% correspondence. A further effort to verify the validity of contact details was made by visiting 100 practice websites and cross checking the contact details with those available from RIBA. This process used a somewhat self selecting sample of practices with websites and found a 98% correspondence between details. The envelopes were franked using the University mail department and the first page of each communication was typed on headed paper.

4.2.7 Ethics

The information sought in this study is of a non personal nature and is concerned with ordinary issues of day to day management. Consequently, the main ethical issues are concerned with balancing the needs of consent, confidentiality and openness in respect of the study findings. Irrespective of the nature of the information sought it is often the case that respondents prefer the option of anonymity (Dillman 2007), with this in mind each questionnaire is sent out without an individual identifier. This is consistent with the information given to the respondent and no deception is used. Respondents are invited to receive a summary of the study findings and to do so they must complete their contact details on the questionnaire. This is combined with entry to the incentive prize draw for a case of wine and an assurance, that the identifying information is not used for any other purpose, is given. Implicit consent is given in completing the questionnaire and so no additional paperwork is provided for this purpose.

Contact details are comprehensive and the respondents are invited to make contact at any stage to address any concerns or for further information. Overall provision is made for a range of respondents from those who wish to maintain total anonymity to those who wish to engage in participation at a higher level.

4.3 Item Selection

The latent constructs in the model are operationalised by the observed variables. These observed variables are specified by the application of a measurement scale which is typically obtained in one of two ways. Firstly a

new measurement scale may be developed through a multistage approach. This involves specifying the domain through an evaluation of the literature, the generation of the initial items, and several subsequent stages in which data is collected, the items are pretested and re-worked (purified), tested again and assessed for reliability and validity (Menor and Roth 2004). Early work on scale development specifically addresses the issue of validity and was born from a concern that marketing research had become largely a routine exercise in repetitive use of under-assessed measures contributing to the view that marketers were 'choking on their measures' (Churchill 1979). The six stage scale development approach outlined by Menor and Roth (2004) is closely based on Churchill's (1979) eight stage approach.

While validity is now an issue which receives equal attention to reliability in measurement development and application, the order in which this is done varies. Validity is frequently assessed after data collection. Menor and Roth (2004) caution against this however and argue that additional effort paid to the early stages, particularly the domain specification can pay dividends in later data analysis. In particular it is argued that time spent on this 'fuzzy front end' where the extant research must be explored and synthesised will avoid measure misspecification issues later on (Menor and Roth 2004). Reliability is not greatly influenced by the measure development process and is more reliant on the measure characteristics. The measure development process is more exclusively concerned with 'developing valid measures' (Churchill and Peter 1984).

The second approach to obtaining appropriate measurement scales is to use existing scales. This process has the benefit of being a shorter process since some assessment of measure reliability already exists. Effort must still be extended in the assessment of domain specification since measures may not transfer to a new setting and automatically retain validity (Churchill and Iacobucci 2005). For this reason the same rationale for increased attention to domain specification exists as is set out above.

In some instances handbooks of measures exist which contain sets of measures, details of the validity and reliability levels obtained, and the sources from which they have been derived. A relevant handbook was identified in the present study (Bearden and Netemeyer 1999) however none of the measures listed addressed the required domain and so measures from this handbook were not used.

The use of existing scales was still preferred over the alternative option of developing new scales. The rationale for this was that suitable sets of scales had already been identified in the literature, in many cases in a similar research setting as is used in the current study. Where the research setting was similar it was reasoned that there was a better possibility of attaining similar reliability and validity levels to the original study and so similar research settings were preferred over non-similar research settings, other factors being equal.

Measures from existing research were selected on the basis of a series of these other factors. This included reported reliability results above .70 (Nunnally 1978). An assessment was made of the wording of the items in order to ensure a close match between the wording of the measure and

the behaviour being measured (face validity) and this was subsequently checked through additional procedures (see section 5.3.3.1). The use of reflective indicators (the latent construct is reflected in the measures being used) rather than formative indicators (measures that cause change in the latent construct) was adopted since the aim in this study is to employ a principle component model rather than a composite latent construct model (Bollen and Lennox 1991). An assumption exists among much empirical work that indicators are reflective and are thus treated accordingly in these studies. This may be erroneous in many cases according to Jarvis *et al* (2003) and so particular attention was paid to the reflective/formative nature of indicator items in the measurement selection process irrespective of how and whether this status was reported by the author. This is of particular importance in the use of structural equation modelling since model misspecification will ultimately invalidate the meaning of the structural model (Anderson and Gerbing 1992).

The use of complete measures was preferred and where possible employed. However domain specificity required the removal of some items from a measure in some instances and the augmentation of the measure with new items in others. This represents the classic trade off between reliability and domain validity (Churchill and Peter 1984). Older measures are generally avoided in order to minimise the possibility of using obsolete items where the domain has evolved, and to circumnavigate measurement practice which is no longer regarded as sound such as the use of double barrelled items. A reasonable estimate was made that an age limit of ten years would, on balance, be likely to achieve these aims. In some instances

established items are used in something close to their original form in more recent studies. In these instances they are attributed to the more recent study and assessed accordingly.

Other considerations included the lack of disclosure of measures by authors, a cautionary approach to the reported levels of reliability and validity, and semantic inconsistency among construct titles with the result that useable measures may exists in less probable locations.

On balance the approach taken employing the above considerations represented a combining of key elements of the measure development approach (literature guided and domain clarification) within the chosen method of using established measures.

4.4 Model Operationalisation

4.4.1 Complementarity

The measure used to reflect complementarity is a complete measure taken from Murray and Kotabe (2005). The three item measure reflects the similarity of capabilities among the alliance partners antecedent to contract formation. Murray and Kotabe (2005) report a Cronbach's alpha of 0.92. The measure has also been used by Harrigan (1988) and Park and Ungson (1997) however the measure is attributed to the more recent study and the Cronbach's alpha used from this study. The wording is adapted in a minor way to reflect the context more accurately as it differs from their Fortune 500 sample frame.

1. Overall, your firm and the building contractor had dissimilar resource capabilities

2. Overall, your firm and the building contractor had dissimilar management capabilities

3. Overall, your firm and the building contractor had dissimilar asset size

[Note: All reverse coded.]

4.4.2 Formality

Formality is defined here as the degree to which roles and responsibilities of each organisation are detailed in the contract. The measure is taken in complete form from Wuyts and Geyskens (2005) and modified slightly to reflect the context which is slightly different from their industrial context drawn from the Standard Industrial Classification codes 35 and 36 (industrial machinery and electronic equipment respectively). Wuyts and Geyskens (2005) obtain a Cronbach's alpha of 0.86.

1. Your contract with the client precisely defined the role of your firm and that of the building contractor

2. Your contract with the client precisely defined the responsibilities of your firm and that of the building contractor

3. Your contract with the client precisely stated how both your firm and the building contractor was to perform

4. Your contract with the client precisely stated what would happen in the case of events occurring that were not planned

4.4.3 Safeguards

Safeguards are defined here as the extent to which the contract facilitates explicit legal redress in the event of *ex post* difficulties. The safeguards

measure was taken in complete form from Lui and Ngo (2004) and altered marginally for clarity. The setting for the study is very similar with the alliance between architects and building contractors in Hong Kong forming the setting for their research. The Cronbach's alpha is not reported but the appropriate fit in research setting and the fact that this measure was adapted from Parkhe (1993) gave some credibility to its use. It is attributed here to the recent Lui and Ngo (2004) study. Terms were again amended marginally for clarity.

1. Your contract with the client was a standard building contract

2. Your contract with the client included the right to audit all relevant records through a quantity surveyor

3. Your contract with the client included the designation of certain information as confidential and subject to proprietary provisions of the contract

4. Your contract with the client included a legal redress clause

5. Your contract with the client detailed standard provisions of the extension of time claim

6. Your contract with the client included loss and expense standard contractual claims

4.4.4 Adaptation

Adaptation is defined for the present study as changes to the design and procedures undertaken by either organisation in the interest of the alliance activities. The measure is taken from Brennen *et al* (2003) and adapted with moderate changes in terminology and duplicated such that responses

are obtained from both parties in the alliance. This ensures that mutuality is maintained in the data. Brennen *et al* (2003) do not report the Cronbach's alpha value. The setting is automotive and telecommunications industries. The principal rationale for the selection of this measure is that it corresponds well with the domain.

(*adaptation by the architect*)

1. The design itself had been especially altered

2. There had been changes to your design process

3. There had been changes to the production, planning and programming process

4. Changes had been made to financial or contractual terms and conditions after the project had started

5. Changes had been made to your design procedures

6. Your organisation structure had been altered

7. There was a greater exchange of information with this company than with others

(*adaptation by the building contractor*)

8. There had been changes to their building process

9. There had been changes to the production, planning and programming process

10. Changes had been made to financial or contractual terms and conditions after the project had started

11. Changes had been made to your design procedures

12. Your organisation structure had been altered

13. There was a greater exchange of information with this company than with others

4.4.5 Power Dependence

Mutual power dependence has an operational focus and reports the dependence from the perspective of both partners in the alliance and is defined here as symmetrical reliance by alliance partners on one another. The measure is taken from Sivadas and Dwyer (2000) and repeated from the perspective of each alliance partner to achieve mutuality within the data. One item is removed because of its low level of relevance to the specified domain. The setting for the research of Sivadas and Dwyer (2000) is the healthcare sector. Minor alterations were made to the wording to create contextually specific items. The Cronbach's alpha is not reported. The items fit the domain well and are used in a previous study (Anderson and Narus 1990) but attributed here to the more recent study by Sivadas and Dwyer (2000).

1. The building contractor provided vital resources you would have found difficult to obtain elsewhere

2. Your firm provided vital resources that the building contractor would have found difficult to obtain elsewhere

3. Much of the success or failure of the project can be attributed to the building contractor

4. Much of the success or failure of the project can be attributed to your firm

5. It would have been difficult to replace the building contractor at the half way point

6. The project would have suffered greatly if the building contractor had pulled out at the half way point

4.4.6 Asset Specificity

Asset specificity is defined using Lui and Ngo's (2004) definition that asset specificity is 'mutual commitment and the lock-in of cooperating parties'. The measure is developed by Lui and Ngo (2004) from the same measure used by Ganesan (1994) and while the former report a weak reliability with a Cronbach's alpha of 0.60, Ganesan (1994) report a Cronbach's alpha of 0.76. The measure is adapted slightly both to more accurately reflect the domain, and to bring the items a little closer to the original (Ganesan 1994) format with a view to improving the reliability. In order to establish mutuality the measure is repeated for each alliance partner. The context is construction for Lui and Ngo (2004), and retailer/supplier for Ganesan (1994). The measure is attributed to the more recent study by Lui and Ngo (2004) despite the lower Cronbach's alpha reported in this study and contingent on adaptation of the items toward the original wording in an effort to generate an improved measure of internal consistency.

(architect adaptation)

1. You made significant investments in trained staff dedicated to your relationship with the building contractor

2. If you had switched to a competing building contractor at the halfway point, (supposing the contract permitted this) you would have lost a lot of the investment made in this relationship

3. You had invested substantially in personnel dedicated to this relationship

4. If you decided to stop working with this building contractor at the halfway point, (supposing the contract permitted this) you would be wasting a lot of knowledge regarding their method of operation

5. The building contractor made significant investments in trained staff dedicated to its relationship with your firm

6. If the building contractor had switched to a competing architect at the halfway point, (supposing the contract permitted this) they would have lost a lot of the investment made in this relationship

7. The building contractor had invested substantially in personnel dedicated to this relationship

8. If the building contractor decided to stop working with your firm at the halfway point, (supposing the contract permitted this) they would be wasting a lot of knowledge regarding your method of operation

4.4.7 Affective Trust

Affective trust is defined here as the propensity to act with forbearance and benevolence. Affective trust occurs at the interpersonal level and this is consistent with the level of measurement adopted so far. Despite some indication that interpersonal and interorganisation trust can be 'intertransferable' this is not considered to be the case here and an interpersonal level approach to affective trust measurement is adopted (Luo

2002). The measure is taken from Luo (2002) who use a general industrial setting in China and report a Cronbach's alpha of 0.82. The measure is only marginally altered for clarity and otherwise used in its original format.

1. My counterpart could always be counted on to act as I expected

2. My counterpart is trustworthy

3. My counterpart and I could always find appropriate solutions through compromise when conflicts arose

4. In a tough time of partnership operations, my counterpart and I relied on, and got help from each other

5. I always felt confident when my counterpart told me he would do something

6. My counterpart and I always shared information and experience about management and even personal life

7. My counterpart always shared or took responsibility for managerial or operational problems even if he should not be obligated for these

8. My counterpart and I engaged in important activities even if these activities were not explicitly documented

4.4.8 Cognitive Trust

Cognitive trust is defined here as faith in the competence of the alliance partner. Cognitive trust is measured at the interpersonal level as is the case with other measures since this represents the level at which the alliance operates. The measure is taken from Fryxell *et al* (2002) who report a Cronbach's alpha value of 0.89. Fryxell *et al* (2002) in turn take the measure from McAllister (1995) who report a similar Cronbach's alpha

value of 0.91. Both studies use a general industrial setting based in the United States. The measure is not altered for this setting save some marginal changes for clarity and is attributed according to this study's self imposed ten year restriction on measure inclusion, to the more recent study by Fryxell *et al* (2002).

1. Both the building contractor and our own firm addressed project issues with professionalism and dedication

2. Both the building contractor and our own firm due to their track record, had no reason to doubt each other's competence to fulfil their obligations

3. Both the building contractor and our own firm could rely on each other not to make their part of the agreement more difficult by careless work

4. Both the building contractor and our own firm were trusted and respected at the time by companies that do <u>not</u> do business with them

5. Both the building contractor and our own firm were considered to be trustworthy by companies that conducted business with them

6. Both the building contractor and our own firm if they actually knew more about each other's activities, they would have been concerned and try to monitor them

4.4.9 Information Exchange

The measure for information exchange is taken from Kotabe *et al* (2003) who examine US and Japanese automotive suppliers. For present purposes information exchange is defined as the sharing of technical knowledge essential to the operation of the alliance. Kotabe *et al* (2003) report a

Cronbach's alpha of 0.83. The measure is used in complete form with marginal changes for the purpose of clarity.

1. You had a close relationship with the engineers and technical staff of the building contractor

2. In the development process, direction of communication was bilateral rather than unilateral

3. Frequent contact between us and the building contractor's engineers was important

4. Through informal discussion, the building contractor often communicated important engineering information to us

5. Communication with the building contractor began early in the development process

6. Non-written communications often reduced lead time in the development process

4.4.10 Perceived Performance

Perceived performance is a reflective measure of satisfaction with the alliance performance and is drawn from Lui and Ngo (2004) who in turn draw the measure from Saxton (1997), with two additional items taken from Sakar *et al* (2001). Lui and Ngo report a Cronbach's alpha value of 0.92, while Sakar *et al* (2001) report a value of 0.86. The items are modified slightly to create a domain specific measure, and for reasons of clarity and the measure is attributed accordingly to the two more recent studies.

1. Both your firm and the building contractor overall, were satisfied with this project

2. Both your firm and the building contractor considered that the goals of this project were achieved

3. Both your firm and the building contractor considered that this project added to the long-term success of your firms

4. Both your firm and the building contractor consider that this project was completed to high professional standards

5. Both your firm and the building contractor are proud of the project

6. Both your firm and the building contractor consider that overall the project was efficiently carried out

7. Both your firm and the building contractor consider that the venture was profitable for our firms

4.4.11 Perceived Effectiveness

Perceived effectiveness is defined for the purposes of this study as the quality associated with the alliance. The measure is adapted from Ferguson *et al* (2005) with significant alterations to the wording of items to represent the present domain requirements which differ from the banking industry setting originally used. The Cronbach's alpha reported by Furguson *et al* (2005) is 0.88.

1. Considering the way the project went, your firm would recommend the building contractor (assuming indemnity)

2. Considering the way the project went, your firm would recommend the construction manager of the building contractor to colleagues (assuming indemnity)

3. Considering the way the project went, your firm would continue to use the building contractor's services

4. Considering the way the project went, your firm would use the building contractor's future services

5. Considering the way the project went, your firm thinks that the building contractor offers high service quality

6. Considering the way the project went, your firm is very satisfied with the building contractor's services

4.5 Instrument Design

4.5.1 Overview

The self administered questionnaire is the vehicle for obtaining the data for the analysis and the design of the questionnaire will determine the efficacy with which this is done. The broad function of the questionnaire in achieving this effectiveness is two fold. Firstly the questionnaire should be designed in such a way as to elicit as high a response rate as possible, and secondly it should draw data with a minimum of measurement error (Dillman 2007). The following sections address these considerations focussing on five key areas of questionnaire design.

4.5.2 Questionnaire Wording

The questionnaire is not a blank canvass on which we may paint any request for information which meets our requirements. Rather the questions must be tailored to the respondents acknowledging their idiosyncratic predisposition to providing information. Dillman (1978) considers that the question content should be shaped around five areas from which we wish to derive information from the respondent, behaviour, beliefs, knowledge, attitudes, and attributes. It is reasonable however to ensure that questions are not asked which cannot be answered, in other words questions about which the respondent is not eligible (through competence or otherwise) to answer. Additionally allowance should be made for the respondent's ability to recall the information we require accurately and reliably, and finally to ask questions that the respondent is prepared to answer (Dillman 2007). Failure to accommodate these considerations in forming the questions may impact negatively response rate with the respondent becoming disengaged with the questionnaire, a higher proportion of systematic missing data where unanswerable questions are skipped, or invalid answers where respondents without accurate knowledge provide an answer either through altruistic intent or through social aspirant motives. In addition to validity the questions should lack ambiguity in order to provide a greater level of reliability such that the same question asked more than once, or to more than one respondent elicits the same interpretation of its meaning (de Vaus 2002).

A decision must also be made in respect of the structure of the question. The questions can be open ended eliciting a lengthy answer

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which will require interpretation, or closed ended providing concise and readily comparable answers with either ordered or unordered response formats.

Forming questions which meet the dual criteria of maintaining a good response rate and reducing measurement error is a process which Dillman (2007) calls combining words and structure. He offers a series of nineteen broad ranging guidelines for this process. De Vaus (2002) offers a similar list of seventeen entries. While each of these guidelines has resonance with the current research, the following seven guidelines are selected as being particularly relevant for the present context.

- *Choose simple over specialised words*
- *Choose as few words as possible*
- *Use complete sentences*
- *Avoid vague quantifiers where more precise estimates can be obtained*
- *Provide appropriate time referents*
- *Ensure each question is technically accurate*
- *Avoid double barrelled questions*

Table 4.1 Central Guidelines for Constructing Survey Questions. Adapted from Dillman (2007) p.51

A final area for consideration in establishing the wording and structure of questions is the requirements of the proposed analysis technique. The use of Structural Equation Modelling brings certain assumptions which must be met, including issues of discriminant validity among and within construct measures. This is achieved where each question, or item, within the measure is shown to represent some unique variance as part of the total

explained variance of the construct (Cohen *et al* 2003). For this reason the use of 'simple' words over specialised words as in the first item of guidance in table 4.1 may lead to unintentional overlap between items and a failure to attain discriminant validity. Because difficulty exists in satisfying SEM assumptions in respect of measures it is common to use measures from extant empirical work where the context is comparable and the reliability and internal consistency can be established as satisfactory. Some adaptation to the individual items may be necessary in order to ensure their appropriateness in the new context and so an iterative balancing act evolves with the aim of preserving the items in their original arrangement while ensuring that they make sense to the respondants and are technically accurate (point six in table 4.1). Finally caution is exercised in the use of older empirical work where stringency in validity and reliability requirements can be lower, for example the use of double barrelled questions may be employed in older measures while considered inappropriate in contemporary empirical work (point seven in table 4.1).

4.5.3 Response Format

Response format addresses the dual area of attitude measurement and response scaling. Before exploring the process of scale selection it is meaningful to establish what is meant by attitude. Arriving at a definition of attitude may be considered a 'minimal prerequisite' in the 'development of valid measurement procedures.'(Fishbein and Ajzen 1975). A consistent feature of definitions of attitude in the literature is a 'predisposition to respond to an object' and represents intent (Baker 1991; Churchill 1987;

Churchill and Iacobucci 2005). De Vaus (2002) however places more emphasis on the desireability of a favourable outcome. These features appear to draw directly from Fishbein and Ajzen's (1975) definition,

'A learned pre-disposition to respond in a consistently favourable or unfavourable manner with respect to a given object'

Fishbein and Ajzen (1975) p6.

which combines evaluative consistency with a general pre-dispositional behaviour toward the object. The specific reference to evaluative consistency is differentiated from other types of consistency (response consistency, response-response consistency). It implies an overall pattern of behaviour rather than limited stimulus-response behaviour. This forms the foundation for the 'more general behavioural disposition' to act (Fishbein and Ajzen 1975). This is an important consideration in the current study where the questionnaire design and subsequent analysis require that the respondent be able to vary specific responses while holding an overall evaluative consistency.

A further important point arising from the process of defining attitudes is that evaluative consistency, above, is affective. While this is appropriate for many items, others within this analysis specifically require cognitive responses. We may regard these as derived from beliefs rather than attitudes although it can be noted that the two are acquired simultaneously (Fishbein and Azjen 1975). Beliefs are derived from one's interpretation of events either observed (descriptive beliefs) or unobserved

(inferential beliefs). A further category can also be identified. Information belief is an interpretation of unobserved events and is mediated to us through a third party (Fishbein and Azjen 1975). Clearly some level of ambiguity can exist within this broad categorisation of belief derivations although consistency occurs because respondents are likely to be conditioned (socially) to share a common response to a set of discrete stimuli (Fishbein and Azjen 1975). This further supports the use of carefully chosen words with clear meaning in constructing the questionnaire. As outlined in the previous section this is likely to bolster question reliability.

Attitude measurement is conducted by eliciting responses on a continuum or scale indicating the degree of affiliation with statements of beliefs or intents. These are taken as a proxy for attitude measurement. The measurement scale varies in sophistication and may be nominal, ordinal, interval or ratio with the level of sophistication determining the level of analysis which is possible (Hussey and Hussey 1997). The following table summarises the relative attributes of each scale type.

Scale Type	Has Hierarchy	Difference Between Values is Equal	Fixed Zero Point
Ratio	✓	✓	✓
Interval	✓	✓	✗
Ordinal	✓	✗	✗
Nominal	✗	✗	✗

Table 4.2 Summary of Scale Attributes

Measurement scales may be discrete, indicating direction (yes/no) or continuous, indicating both direction and intensity (for example: to what extent do you agree with the following statement...) (Hair *et al* 2003). A further categorisation of scale is the distinction between metric and non-metric. Metric scales are higher order scales comprising interval and ratio scales, Non-metric are less powerful and comprise nominal and ordinal scale types discussed above. The selection of a scale is determined to a greater extent by the choice of analysis technique and the type of data required by these techniques. Since that has already been established for the current study and in the interest of economy, examples of interval ratio (metric) scales are the only ones to be explored here.

4.5.3.1 Thurstone's Equal Appearing Scale

The equal appearing scale was developed by Thurstone in the 1920s and remains popular largely because it is easy to administer and respond to (Baker 1991). In principle the respondent completes the scale by indicating which of a series of items they agree with. The score is then calculated as the average of those items selected.

The construction of the scale is an iterative process and involves the use of a panel of judges whose task is to place a series of statements about an object in order of degrees of favourableness in relation to the object. The resulting number of piles of items is used as the indicator of the number of points which should be given to the scale. The piles are then scored by the judges and a median value established for each item. Those items demonstrating excessive variance (wide ranging opinion) are

discarded according to what Thurstone termed the 'criterion of ambiguity (Fishbein and Azjen 1975). A further criterion, the criterion of irrelevance, is also a prerequisite for satisfactory item selection and involves the assessment of a respondent's score against their attitudes. The difficulty of knowing a respondent's attitude in order to perform this measurement led to the development of an alternative procedure in which the respondent's score is compared with the probability of the item's endorsement. This is derived from the premise that items with similar scores will exhibit similar levels of endorsement (Fishbein and Azjen 1975).

The complexity of the scale development process remains a key criticism of the Thurstone Equal Appearing Scale (Baker 1991; Churchill and Iacobucci 2005; Fishbein and Azjen 1975). The judges employed in the construction of the scale should be representative (Fishbein and Azjen 1975) however a second key criticism of the approach is that frequently they are not truly representative (Baker 1991). It was in response to such criticisms that Likert developed the summated rating scale in the 1930s (Fishbein and Azjen 1975).

4.5.3.2 Likert's Method of Summated Ratings

The likert scale poses the questions as statements and asks the respondents to rate their level of agreement or disagreement with the statement. The likert scale has the advantage of being simple to code as well as being straight forward to administer (Hussey and Hussey 1997) especially in mail questionnaires (Baker 1991). While the Likert scale has the advantage of

offering richness of data for individual responses this is lost where it is used in summated form (Baker 1991).

Strictly speaking the Likert scale is ordinal since the distance between the intervals is not known to be equal (Baker 1991; Fishbein and Azjen 1975). However it is common in management research to treat Likert scales as interval scales primarily because empirical evidence suggests that respondents treat the intervals as equal in magnitude (Hair *et al* 2003). In any event if the working assumption of equal intervals is wrong then the resultant measurement error will have an attenuative effect on the construct correlations. Hence the approach is accepted partly on the basis that it is 'statistically conservative' (Churchill and Iacobucci 2005). However, this may increase the likelihood of a type II error (failing to show an association where one exists) occurring. The level of a type II (beta) error can calculated using sample size and power and the level judged according to empirical precedent. Typically this may be around .20 although it will be guided by the acceptable level allocated to the type I error (Cohen *et al* 2003). Type I and type II errors will be minimised by increasing the power of the test but must also be balanced since extremely low values of one will inflate the other (Hair *et al* 2003).

The choice of response options on the Likert scale is influenced both by the desire to increase reliability and the need to measure variance at a level suitable to the statistical techniques used. Intuitively it may be considered that the more points on the scale the more these dual agendas will be positively served, and up to a level this is true. The greater the number of points used 'the more precision you get' (Hair *et al* 2003). Little

consensus exists over the number of points on the scale which will bring an optimum level of accuracy which is able to be revealed in analysis. Extant literature variously uses five and seven point scales to similar extent. The relative merit of a seven point scale over a five point scale may however be minimal. From five points on the scale improvements in the Cronbach's alpha are seen to 'level off' (Hinkin 1995). It should be noted that among the empirical studies examined in Hinkin's work a similar proportion used seven point scales as used five point scales illustrating a lack of consensus in the literature which continues. A similar situation is demonstrated in the empirical work from which the measures used in this study are derived. Four use five point scales (Fryxell *et al* 2002; Kotabe *et al* 2003; Sarkar *et al* 2001; Sivadas and Dwyer 2000), while three use seven point scales (Kale *et al* 2000; Lui and Ngo *et al* 2004; Luo 2002) with two studies not reporting the measurement scales used. No temporal trend is apparent within these figures and so it is not possible to ascertain whether one is becoming more popular than the other. A seven point scale was finally chosen for this study largely on the grounds that it may increase reliability and in any case would not reduce it.

Both the five point scale and the seven point scale make available a middle point of no directional preference. This is desirable in self administered questionnaires to avoid forcing the respondent to express a position which they don't hold (De Vaus 2002). Finally the seven point scale is used consistently through the questionnaire to avoid the problem of inequality of weighting among scales. This in turn avoids the need to

standardise (z-score) the items before conducting analysis increasing efficiency in the analysis and reducing the possibility of extraneous error.

4.5.3.3 Osgood's Semantic Differential Technique

The semantic differential technique relies on a bipolar adjective scale where respondents are requested to indicate their preferences toward an object in relation to opposing attributes along an incremental scale (Baker 1991; Churchill and Iacobucci 2005). As with the Likert scale it can provide data on a seven point scale. The paired adjectives however reveal limited information. While a useful attitude scaling technique, the semantic differential approach is more generally adapted in marketing to assess product attributes, product profiles and as a comparator to competitor products (Churchill and Iacobucci 2005). It also gives a rating to attributes which may not be important since each set of attributes is equally rated, although this is also true of the Likert scale. Ease of use for the respondent is likely to assist in gaining a higher response rate while the use of equal spacing implies equal distances between scores (Hair *et al* 2003). In these respects the scale differs little from the Likert scale.

A key limitation with the semantic differential technique is the ineffectiveness of summing up a concept with two opposing adjectives. Fishbein and Azjen (1975) cite seminal work in this area by Osgood, Suci and Tannenbaum (1957) who identify three dimensions on which a set of bipolar adjectives will load. These are evaluation, potency, and activity. While this may, *prima facia* present an opportunity to rate a concept where a suitable set of pairs of adjectives can be identified a further problem

exists. The loading of the adjectives varies between the above three dimensions for different concepts. Consequently the paired adjectives cannot be assumed to represent the same thing when used in a multi-construct analysis. Thus the information imparted by bipolar sets of adjectives is limited further in what it reveals about a respondent's attitude, to an evaluative, potency, or activity perspective (Fishbein and Azjen 1975).

The Likert summated scale is selected for the present study. The rationale for this is drawn from the apparent suitability of the technique for use with pre-established items comprising explanatory statements together with its suitability for use with mail questionnaires. These considerations contribute to an improved level of efficiency in respect of time and other resources when contrasted with the other available techniques explored. Reliability is another key feature of the Likert scale which can be largely attributed to the item purification process (inductive or deductive) and results in an association between the use of Likert scales and high reliability (Churchill and Peter 1984). Finally empirical antecedent is a further significant factor in the decision to use the Likert scale. The likert scale is ubiquitous in empirical research in the area of marketing alliances with 78% of empirical studies from which the items for this study were drawn using a Likert scale.

4.5.4 Stylistic Consideration in the Design of the Questionnaire

An objective of good questionnaire design, as outlined earlier, are to reduce non-response and reduce measurement error. The layout, design, and

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stylistics of the questionnaire attend principally to the former of these two objectives although issues relating to both will be addressed in this section. When the questionnaire has reached the respondent then much of the work towards eliciting a response has been done. The next step is for the respondent to look favourably on the questionnaire in order that they will engage with it, commit to it, then complete and return it. It is the application of good design which will achieve this maximising the opportunity afforded by this one opportunity (within the current study's time frame) to elicit these responses (Hair *et al* 2003). Good design will generate positive impressions, from a clear and easy to interpret layout ensuring that key messages are selected for attention, through to a logical ordering and use of sense-making questions in order to avoid cognitive dissonance and maintain engagement (Chisnall 1985). A marketing approach is useful in ascertaining what style and layout will best suit the proposed respondents. The questionnaire can then be tailored to the purpose. The Tailored Design Method, described by Dillman (2007) provides guidance on how this might be achieved.

While Dillman's (2007) Tailored Design Method is used as a general guide to inform the survey design in the current study several contributors offer methods for approaching questionnaire design specifically (Baker 1992; Churchill and Iacobucci 2005; De Vaus 2002; Dillman 2007; Hair *et al* 2003). Baker's (1991) four stage approach addressing length, complexity, layout, and wording is employed here.

4.5.4.1 Length

The length of the questionnaire is important and the shorter the questionnaire the better since this makes it easier to complete as well as easier to code when returned (Churchill and Iacobucci 2005). A longer, or seemingly longer questionnaire risks disengaging the respondent and must be balanced against the relative merits of removing questions which may be valuable to the data gathering process. Within the current research care was taken to limit questions to essential ones and to avoid unnecessary repetition except where this was for purposes of verification of internal consistency (Baker 1991). However the questionnaire in its final form ran to eleven pages which appeared to be a lengthy task. In order to mitigate this impression somewhat the instruction page made reference to the brevity of the task with comments including 'The questionnaire should take about ten minutes to complete', 'Please move through the questions rapidly', and emphasis was placed on the ease of response with the comment 'ticks are generally asked for'.

Additionally care was taken to avoid low value questions (screening or control questions) which were sensitive or arduous in nature and would have jeopardised the prospect of completion for 'very little improvement in one's understanding of the key issues' (Baker 1991).

4.5.4.2 Complexity

The same issues of respondent disengagement apply to the complexity of the questionnaire. Instructions for completion were set out carefully and were included for assessment in the pre-test. Where instructions where

needed for individual questions they were included in a concise and standardised way to reduce the effort required by the respondent for interpretation. Finally questions were grouped in headed sections to give an initial indication of the theme and splitting questions across pages was avoided in line with guidance from Hair *et al* (2003).

4.5.4.3 Layout

Complexity in layout is addressed above. Other considerations include numbering pages and questions which assists with the coding process and also provides a point of reference in the event of respondent queries or feedback. Numbering of individual questionnaires is avoided however since this lack of anonymity is likely to increase non-response (Churchill and Iacobucci 2005). Baker (1991) proposes six further points as basic principles in considering layout. These are clarity, legible typeface and question spacing, sufficient space for answers, clear instructions, inclusion of all possible answers for selection, and keeping instructions next to the questions to which they apply. These points informed the layout of the present questionnaire.

Clarity and legibility was assisted in the present questionnaire with the use of 12 font Times New Roman type face and the introduction of spacing between questions and larger spacing between sets of questions. Adequate space is provided for answers and where appropriate units are specified for numeric responses avoiding the problem of having unattributed numerals as a response (for example months or years).

The style of the questionnaire is broadly simple and uncluttered. The layout is A4 single-sided with a single staple fastening in the top left corner. This has the advantage of being low cost in terms of printing and assembling. A more sophisticated style may have been achieved using a different size format and assembly however a compromise was struck on the basis of limited resources. This basic booklet arrangement is included in Dillman's (2007) list of recommended booklet types and is a style he recommends for tighter budgets.

4.5.4.4 Wording Style

The key issues of concern in the wording of the questions are the avoidance of poor phrasing and the use of simple and unambiguous words. Poor phrasing of a question will lead to inaccurate responses (measurement error) and/or a tendency for the respondent to skip the question (item non-response) (Churchill and Iacobucci 2005). Simple words will ensure that the question is accessible to the respondent who may not have the same understanding of esoteric terminology as the researcher does. Care should be taken in the simplification of the wording to avoid ambiguity. This is especially important in achieving consistency and hence item reliability (Hair *et al* 2003).

4.5.5 Question Order

A common theme of this section is respondent engagement with the questionnaire and the issue of question ordering is no exception to this. At one level the process of answering questions in a questionnaire is

comparable to a conversation, with the associated social norms of exchange determining the level of engagement and creating a sense that the respondent is being listened to (Dillman 2007). A poor arrangement of questions in which the respondent has to answer questions which have no obvious sequence violates these social norms and also limits the quality of responses by failing to foster a train-of-thought in the respondent. So a sequencing of similarly themed questions is important.

The ordering of these themed clusters of questions takes three stages, open with easy questions, use the middle section for the substantive questions and place objectionable questions at the end (Baker 1991; Chuchill and Iacobucci 2005; Dillman 2007; Hair *et al* 2003). The logic of opening with easy questions is to allow the respondent to become involved with the questionnaire quickly such that an engagement is already established before more difficult questions (those requiring a more considered response) are addressed. Placing the objectionable questions at the end avoids disengaging the respondent before other key questions have been answered and may allow for the respondent to become more inclined to answer these questions in light of previous questions and progressive engagement.

The present study did not use personal and objectionable questions such as income, sexual behaviour, breaking of laws, religious activities, or political affiliation (Dillman 2007) and so no objectionable questions were listed at the end. The final section was used instead to ask post hoc validity questions. Easier questions were placed at the beginning focussing on a simple profile of the respondent and their company.

A final consideration is the inclusion of reverse coded questions to limit the possible effect of response pattern bias. This was a particular consideration in the themed groups of questions where such aberrant respondent behaviour was a genuine concern. However some concern also exists in relation to validity of reverse coded items. Negatively worded items generally exhibit lower loadings than positively worded items on the same factor (Hinkin 1995). A balance was struck and some reverse coded items were included (4 in total) as part of a series of steps to reduce common method variance (Slater and Atuahene-Gima 2004).

4.5.6 Addition of Controls and Post Hocs

The post hocs used at the end of the questionnaire were added to ascertain the eligibility of the respondent to provide accurate answers to the questionnaire. Worded sensitively to avoid offence, three questions asked respondents about their level of knowledge of the project about which they responded, their degree of involvement with the project, and their level of confidence in answering the questions. The latter of the three questions was added to augment conventional reliance on the first two which are derive from Campbell's (1955) original criteria (Heide 2003).

The use of controls such as previous history between alliance partners and the duration of the project were added to facilitate checks for common method bias and systematic bias (Silver 1997).

4.6 Pre-Test

4.6.1 Pre-Test Rationale

It is of value to define the pre-test before describing its method particularly in view of the inconsistency in the literature between the terms pre-test and pilot study. Some commentators use the terms interchangeably (Baker 1991; De Vaus 2002a; Hussey and Hussey 1997). Where a distinction is made between them the pre-test is regarded as an appraisal through a variety of formalised and informal methods to check for errors. Common among these methods is the use of an interview in which the researcher (or a representative) asks the respondent to complete the questionnaire before asking them about aspects of the questionnaire. The presence of the interviewer also permits observations to be made while the questionnaire is being completed which may assist in identifying areas of the questionnaire where respondents may get confused, their attitudes, and reactions to questions (Churchill and Iacobucci 2005; Malhotra 1999).

A Pilot study is more commonly defined as a formalised mini-study, where 'the questionnaire [is administered] on a trial basis [ ] to determine how well [it] works' (Churchill and Iacobucci 2005). Dillman (2007) quite clearly differentiates between the two terms along these lines and presents a more formalised outline for the pilot study as a small study using a sample of between 100 and 200 respondents from the target group with the questionnaire sent out in the same way as would be done in the full survey administration. The objective of this method is to test all aspects of the administration and additionally to provide data to allow the

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estimation of 'response rates, item non-response, and variable distributions.' (Dillman 2007).

Whichever way it is defined, the importance of conducting some sort of test of the questionnaire before the final administration is unanimously regarded as an imperative. 'Data collection should *never* begin without an adequate pre-test of the instrument' (Churchill and Iacobucci 2005), 'a questionnaire should not be used in a field survey without adequate pre-testing' (Malhotra 1999), 'the questionnaire as a whole must be evaluated rigorously before final administration (De Vaus 2002).

While a pilot study may be desirable it is not always practicable when faced with resource limitations and so a greater reliance is placed on the pre-test to highlight errors or omissions. Many of the errors are likely to occur at the macro level, overlooked by the researcher who has spent a large proportion of time concentrating on the detail and may miss otherwise obvious errors. Failure to rectify these 'silly' mistakes can result in an unprofessional instrument being administered with consequences for response rate and measurement accuracy (Dillman 2007). The pre-test offers a robust approach through the use of a variety of respondent categories. In addition to respondents representative of the target group, academics, other informed individuals, and individuals with no connection to the research or research subject can each offer a valuable contribution. The latter groups will frequently identify 'obvious' errors overlooked by those with greater knowledge and experience in the field simply by virtue of their fresh-eyed approach (Dillman 2007).

When feedback has been gathered, amendments can be made where necessary and with regard to the integrity of carefully established and purified items. The pre-test process is an iterative one however and it is of use to repeat the pre-test with the amended questionnaire in order to ensure that no errors have been overlooked in the first assessment or indeed introduced through amendment. With regard to resource limitations repeating this process several times will increase the standard of the questionnaire albeit with diminishing returns with subsequent iterations.

4.6.2 Pre-test Administration

The present study makes use of a pre-test similar to that described above. As with the main survey administration, the pre-test can also be subject to respondent non-response and so the method of approach was tailored to take account of this eventuality. In total four areas of expertise were identified and respondents sought from each. The first group contained architects taken from the target sample, the second included academics in the field of marketing and strategy research at the host institution, the third comprised academics in the field of architecture while the final group was drawn from type setters and binders. The pre-test process took four weeks.

The selection of architects for the first group was an obvious and necessary choice which provided an opportunity to observe the reactions of intended respondents to the questionnaire as well as gaining their specific comments on ease of use, time to complete and clarity of the terms used. An interview approach was chosen for this reason and also to facilitate an exchange between the researcher and respondent in a frank atmosphere in

which criticisms were invited and prompted through the use primarily of open-ended questions. Two architects were selected from the target sample on the basis of location. Both were practicing in Cardiff and this provided convenient access for the researcher. The lack of geographic representation was not an issue since a sample of two could not be considered representative of this population in any event. Care was taken to encourage an acceptance by the respondent to be interviewed in both cases. Other architects in a similar proximity could have been approached if the first two had refused. The removal of a large number of Cardiff architects would have potentially created a sample bias. Each respondent approached was then removed from the sample frame for the main survey. The approach was made by telephone in the first instance during this conversation the identity of the caller, affiliation, and their role in the study were explained along with the purpose of the study. The respondent was then invited to participate in a brief interview. This technique was supported by the local psychological association which existed between the university and the architectural practices. In each case this was mentioned by the architects as a motivation in their decision to participate. The interviews lasted 40 minutes and 30 minutes. The interviews were not recorded, instead notes were taken and the interview written-up in a more comprehensive style immediately following the interview.

Three academics in the marketing and strategy section of the host institution were asked, and agreed, to review the instrument. The questionnaire was emailed to them and responses returned by email. Further informal discussion also took place face to face within the

timeframe of the pre-test. These respondents were asked for overall impressions (style and layout), comments on question ordering, and for their opinions on the items used to measure the key constructs. This latter instruction was designed to test for face validity items which had been generated from the literature (Parkhe 1993).

Academics from the field of architecture have a unique perspective in respect of this study combining their academic position with a good understanding of architectural practice. This position makes academics in this field sensitive to the dual agenda of the instrument which is to procure meaningful data using carefully derived items which should not appear meaningless (and so pointless), or nonsensical to the respondent. In view of this three academics were asked to comment on any aspects of the instrument which might be improved to assist the respondent while having regard for the integrity of the questionnaire items. One from three academics approached, responded.

Finally advice was sought from type setters and binders with experience in questionnaire layout design. The advice sought focussed on consistency within presentation and positioning of the typewritten contents to improve readability. Advice was not sought on page arrangements, colour of paper, or cost savings since these are areas identified by Dillman (2007) as 'well intentioned' but ultimately flawed suggestions (coming from printers) which are based on an aesthetic, cost-based, or simply opinion-based rationale rather than an empirical one.

4.6.3 Instrument Review

The initial reaction from the architects to the questionnaire was to express some concern over the apparent length of the questionnaire, however after they had read the instructions on the cover page they seemed content that the task would not be arduous. Each respondent took approximately ten minutes to complete the questionnaire which was in line with estimates derived from the researcher's prior self-administered checks. In response, an estimate of ten minutes for completion was included in the questionnaire instructions.

Both respondents considered the questionnaire easy to use in respect of the clarity of instructions and the layout for responses. Some concern existed about the use of two terms in the questions which were considered ambiguous. The terms were partner and firm. The term partner was used in the context of alliance partner, however it became clear that the same term was frequently used by architects in reference to practice partners thus identifying an internal rather than external relationship and in any case, a relationship other than that intended by the researcher. Similarly the use of firm as a generic term for company was confused by the respondents for a firm of architects which then led to confusion where the building contractor was referred to as a firm in the questionnaire. The term counterpart was substituted for partner, and company for firm.

Another suggestion was to specify a time frame for the completion of the project under discussion. Narrowing the focus to projects completed within the last five years made the comments relevant to the companies in their contemporary form. This was added to the instructions. Finally an

anomaly was identified in the item which asks for the duration of the project. Two phases are recognised by architects, the time from the first approach of the client, and secondly the time taken for the project 'on site', *i.e.* when the building is under construction. The item was split to allow responses for each of these time frames.

The responses from academics in the marketing and strategy section at the host institution offered extensive comments. These were too numerous to be listed here but can be summed up as follows. A large number of typographical errors were identified and a series of formatting issues were raised. The formatting issues included the addition of higher resolution institution logos and the alteration of some phrasing in order to create a more professional appearance and presentation. No alteration to the question order was suggested by these respondents. Some conversation took place on the issue of items used for the constructs, however after consideration and reference to the literature no changes were made.

The architecture department of the host institution provided one respondent from three requests. The issues raised by the respondent identifies likely areas of difficulty for respondent interpretation. Although questions were identified which, it was suggested, may have been unclear to the architect these questions were broadly unambiguous. That is, although the architect may not have felt confident in understanding fully the premise of the question, there was really only one possible interpretation. This was considered acceptable in several situations in order to maintain the integrity of the items. A balance was struck between the respondent feeling at ease on the one hand, and the items remaining faithful

to their constructs and thus maintaining validity, on the other. Further typographical errors were also identified by this respondent.

One respondent was contacted at the host institution's print department and after receiving the questionnaire gave feedback focussing on consistency and typographical error. Several minor points were raised including the lack of consistency in the use of higher case lettering, section numbering and lettering. Amendments were made in response to these comments along with typographical amendments. Collectively these points raised the standard of the finalised questionnaire and demonstrated the usefulness of using four pre-test iterations in weeding-out typographical errors in particular.

In conclusion the pre-test process was responsible for the removal of a great deal of extraneous error in the questionnaire which would otherwise have transferred at some level to the dataset. Typographical and formatting amendments clearly contribute to the professional appearance of the instrument and avoid striking a dissonant chord with the respondent. Some items contain considerable ambiguity and where this was identified (as with the use of the terms partner and firm) amendments were made. In other examples a low level of clarity was tolerated where ambiguity was not considered a problem and where making amendments risked reducing item validity. The pre-test was not repeated with any of the groups both because each group received an iterative amendment such that amendments were checked (with the exception of the last group), and because suggestions for further amendments became increasingly minor and so

were at a level at which the dilemma between amendment and item integrity had been reached.

4.7 Survey Administration

4.7.1 Sampling

The sample was compiled using a systematic random selection from a list of 3080 architectural practices. A total of 1200 practices were selected from the alphabetical list of affiliated practices taken from the Royal Institute of British Architects (RIBA) directory. The senior members of staff were featured on the search results from the RIBA website and used to compile a shortlist of possible respondents for each practice. Two further steps were taken in order to arrive at a single named respondent for a practice. Firstly the shortlist of potential respondents was checked for eligibility. The personal membership details of each senior practice architect was checked on the RIBA individual membership list to establish that the practice given as their place of work was the same on both lists. Secondly attempts were made to establish the most appropriate contact from the shortlist. This was done by visiting the practice website (where available) and taking as an indication either an explicit listing of one of the potential respondents as an appropriate contact and senior figure, or by establishing from their title or profile that they were likely to be the most appropriate informant. The criteria for making this judgement involved balancing seniority with likely project management roles. The most senior architect was not always the most appropriate since their eligibility as a respondent depended in part on their involvement as key practice contact

with a project completed in the preceding five years. Practices without websites were typically smaller practices and frequently had one senior architect who was the only suitable (eligible) respondent. While this screening and selection process contained the possibility of making imperfect selection of respondents its main purpose, the limitation of errors in identifying an eligible respondent through incorrect contact details, was achieved. Further checks for typographical errors in address details were also completed during this stage by cross referencing the practice details with the individual member details, and the practice website (where possible). A number of typographical errors and anomalies occurred in particular where practices where relocating. These were identified and corrections made. Where anomalies could not be rectified using these three sources other databases were used including, but not limited to, FAME companies database and local business directories. The vast majority of anomalies were rectified with little effort. A very small minority of practices in the selected sample required extensive searching, primarily internet based to establish contact details, or consistency within the listings of contact details. Follow-up phone calls were generally made in these more difficult cases to ensure that the details, of the practice and the respondent, were correct. Following this screening and selection process twenty telephone calls were made at random from the sample list (with those already telephoned removed) in order to derive an indication of the accuracy of the contact details. Each of the twenty calls confirmed correct contact details and an appropriate contact. Apart from the two instances just described telephone contact was not preferred since it is time intensive

and limited to office hours and additionally, because the alternative method employed was effective.

4.7.2 Level of Measurement

The unit of analysis was the alliance and this was measured at the level of the project manager or key operational decision maker. Clarity in identifying the level of measurement avoids misspecification in the study. Misspecification occurs where 'a construct is theoretically attributed to one level when it was measured at another level' (Currall and Inkpen 2002). For example measurement might take place at the interpersonal level while the theory refers to the interorganisational level. While Currall and Inkpen (2002) consider this problem in the context of a multi-level theory approach, Klein *et al* (1994) consider this hazard of mismeasurement an 'important priority' for both single and multi-level analysis. 'Theory', they assert 'describes the target' while 'measurement describes the actual source of the data', each construct has a level and so level issues will always be encountered. While Klein *et al* (1994) identify three levels, organisation, group, and individual, Currall and Inkpen (2002) identify the misspecification of the interpersonal measurement for interorganisational theory testing a commonplace misnomer in alliance research. This methodological fallacy weakens interorganisational alliance research where it is not addressed.

Items were checked in the item purification stage for this misspecification error. This was achieved by checking the wording of each item to check that it was referring to the same level as the latent construct.

This was completed by the researcher and by the academics in the marketing and strategy section of the host institution as part of the face validity checks.

A second issue in measurement is the use of single versus multiple informants. As alluded to above, the need for multiple informants is clearly necessary where a multi-level approach is taken. However a case may also be put for multiple respondents in the current (single-level) research where measurement is taken from both sides of the alliance. Advantages of this multiple informant approach include improved validity since the respondent will report on experience rather than impression and better reliability since factors such as impression bias may be limited.

Difficulties exist in the use of multiple informants however. Kumar *et al* (1993) identify two areas, selections problems, and the perceptual agreement problem. The selection of more than one respondent adequately qualified to comment on the phenomenon under investigation can be an arduous task and is frequently cited as a reason for using a single respondent (Kumar *et al* 1993). Where information is drawn from more than one respondent the information may demonstrate disagreement. Where this results from a lack of respondent competence the information can be identified and removed. However, more commonly a perceptual difference exists (Anderson and Narus 1990). This 'informant bias' may be addressed by representing each response as a dimension of the 'latent trait', or by taking an aggregation approach using an 'un-weighted average', or by establishing a consensual approach in which the respondents establish a 'shared position' on contentious items (Kumar *et al* 1993).

An additional difficulty with multiple informants is gaining access. This is a particular problem in the current study where access to existing respondents would need to be augmented with information of, and an introduction to, alliance counterparts. The introduction of these more difficult requests is likely to impact negatively on response rate in the mail survey context (Dillman 2007). Since the estimate for response rate was at 20% a lower figure would have reduced the power of subsequent analyses. Thus a balance was struck and a single informant approach chosen.

4.7.3 Communication Strategy

Respondents were contacted by mail with using a systematic series of mailings in four waves. A small number (27) of respondents were contacted by telephone in advance of this as part of the verification of contact details although a representative (typically a secretary) was typically spoken to and no invitation was offered to participate at that stage. Telephone pre-notification does increase response rate but primarily because it is an additional contact rather than because of the nature of that contact (Dillman 2007) although some dispute this (Jobber and O'Reilly (1998). In consideration of cost implications a telephone pre-notification was not employed here. The mailings consisted, in order, of a pre-notification letter, the questionnaire with covering letter, a first reminder containing a second copy of the questionnaire, and a final reminder containing a letter only. This arrangement follows closely that set out by Dillman (2007) in his tailored design method for mail surveys. Dillman also advocates the use of a fifth 'final contact' sent out a week after the

fourth contact by special delivery, or contact made by telephone. This was not employed in this study due to cost since anonymity would necessitate contacting both those who had responded and those who had not. An additional small and intuitive consideration was that Dillman is American and that some cultural distinction should be made between American and British respondents, the latter of which would more quickly reach a threshold of tolerance of unsolicited contact attempts and so are more likely to take offence at an overbearing style with a five wave mailing than their American counterparts.

It is the implementation process which has the greatest impact on response rate, more so than a well constructed questionnaire (Dillman 2007). Additional elements to this process which lead to higher response rates include the inclusion of pre-paid return envelopes and the personalisation of correspondence (Dillman 2007; Jobber and O'Reilly 1998). The pre-paid envelopes may have a higher perceived value where they carry a real stamp however a free-post address was used for the purpose in consideration of cost limitations (£744 as compared to £56 actually paid), and still represented a token consideration to the respondent. Personalisation of the correspondence was achieved using the mail merge software function on Microsoft Word. This facilitated personally addressed letters in each mailing wave, increasing the likelihood that the communication would reach the intended and carefully selected respondent in each case.

Dillman (2007) also suggests the use of a token financial incentive to induce response by fostering a relational exchange dynamic. Although

some evidence is found to the contrary (Diamantopoulos and Schlegelmilch 1996) the response rate influence of this technique receives broad support in the literature (Jobber and O'Reilly 1998). The $1 bill serves as a low cost, non-coin, answer to this in America, the nearest equivalent in the UK is a £5 note which is prohibitively costly. A 5 euro note was briefly considered however it is still overly costly and may convey an unintended political comment to the respondent given the contentiousness of the recent UK debate on adoption of the single European currency. Acknowledging the potential positive impact on response rate of an incentive, and by way of a compromised solution a prize draw for a case of wine was established into which respondent could self-select entry on their questionnaire by completing their contact details with assurance of anonymity in every other respect.

Finally, other considerations include the content of the covering letters and their format. Dillman (2007) gives an outline for the content structure for the cover letter for each wave of the mailing. This was used as a template for the cover letters used in this survey. Additionally improved response rate is attributed to 'granting anonymity, varying the type of appeal, personalising the covering letter by using handwriting, and giving a detailed project description' (Jobber and O'Reilly 1998). Each of these four areas was addressed in the covering letters used in the existing study with the use of a personal signature on each letter using blue ink, to the varied style of comment used for each wave. Examples of the covering letters are attached in appendix 1 - 4.

The response rate considerations outlined above have each been addressed in the design of the survey and in its implementation. Some compromises were made where resources dictated however no factors have been ignored. The inclusion of these response rate factors create a coherent approach which is more readily interpreted by respondents as being similar to formats which they may previously encountered and is in line with their own general perceptions of what constitutes a survey worthy of reponse (Diamantopoulos *et al* 1991).

4.7.4 Additional Validity Checks

Issues relating to the eligibility and competence of the respondent to provide the information asked for in the questionnaire have been addressed above. The selection of respondents based on their position as main contact or project manager is a generic measure and the first of two methods for evaluating the competence of the respondents according to Kumar *et al* (1993). The second is to include measures to which they self-report on their competence. These post hoc checks were included at the end of the questionnaire and facilitated the removal of some respondents with low levels of self-reported competence while providing increased confidence in the remainder.

CHAPTER FIVE

Survey response and

Preliminary Analysis

Chapter Five: Survey Response and Preliminary Analysis

Chapter Contents

5.1 Survey Response

5.1.1 Response Rates

A total of 1200 architects, each from a separate firm, selected from the database of the Royal Institute of Chartered Architects (RIBA) were sent questionnaires. This generated 257 responses of which 204 were usable. Unusable responses included those where the questionnaire was not enclosed with the reply or was not completed (20), those which were completed by respondents who scored below the threshold in the post-hoc questions indicating their competence to answer, and their confidence in completing the questionnaire (11), and those questionnaires containing greater that 6.5% missing data (22).

Data from the pre-test suggest that 50% of architect firms in the sample were ineligible to respond. This is because two forms of architect-building contractor alliance exist, the traditional procurement route and the design and build procurement route. Each firm specialises in one at the exclusion of the other and only the traditional procurement route was suitable for the current analysis. The obvious benefits of pre-screening the respondents, to obtain a purely eligible sample, were outweighed by the cost and time implications of contacting each firm before survey administration. The introduction to the questionnaire states explicitly that the firm should only respond where a traditional procurement route is used. Consequently the response rate is expressed as 204 as a proportion of 600 giving a figure of 34.0%. This is in line with the CASRO (1982) method for calculating response rates which gives the response rate as the product

of the total number of completed responses divided by the total number of *eligible* respondents.

The timing of the survey administration was arranged to avoid national holidays and the month of August when it was reasoned that people may be absent from their places of work thus impairing the response rate. This is a difficult point to substantiate generally, with little consensus in the literature. In the case of the population under investigation, the pre-test suggests that working practice tends toward traditional holiday closure and standard UK office hours and so support the pursuit of this conventional wisdom that holiday times are best avoided.

Guidance on the day of the week on which a survey should arrive with the respondent in order to elicit a higher response rate is similarly inconclusive. Indeed the conflict in opinion is matched only in magnitude by the fervour with which commentators will claim their position and as such, advice on these issues represents something approaching lore rather than empirical rationale. Dillman (2007) recommends the latter approach and concludes that the time of year is not significant and neither is the day of the week except to avoid days where a heavy post load can be expected. He cites the first working day after a holiday as an example and within this study Mondays (or Tuesdays where they followed a bank holiday) were taken to present such a hazard and so avoided. Tuesdays were selected as preferred arrival days for the questionnaire and the survey was administered in late March and early April.

The university post department was used which presented particular difficulties in targeting the preferred day of the week. For a Tuesday

delivery the surveys were posted on a Friday to allow for internal processing time. Efforts were made to verify that the delivery time for each mailing was in line with expectation. With each of the four mail shots an identical letter was sent to the home address of the researcher (not the institute address since internally addressed post would not pass through the system in the same way as externally addressed post). On arrival, the item of test-post was dated and the result recorded. Each test post arrived on the anticipated day. While exogenous factors such as internal delay of delivery at the targeted firm or absence of the targeted respondent are likely to have occurred these were marginal concerns about which little could be done. Overall, it was felt that the vast majority of mail shots arrived with their targeted respondents within the anticipated time frame. Further evidence of this was can be seen in the response distribution graph in figure 5.1 below.
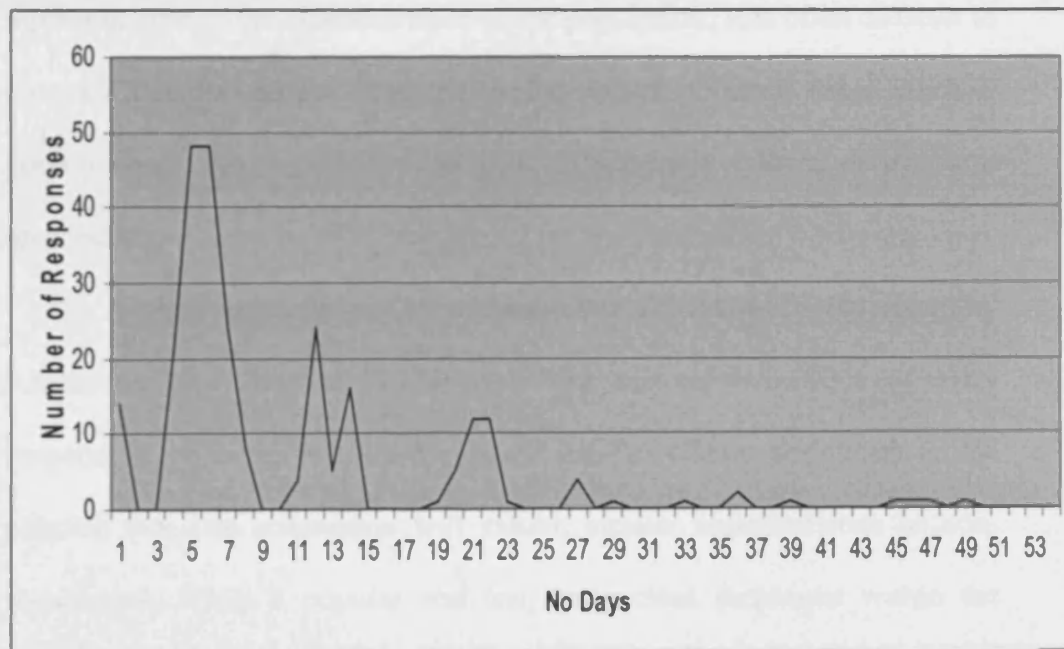

Figure 5.1 Response Rate by Day

The high concentration of the responses at the beginning, in particular for the days five and six suggest a uniform date of receipt drawing replies simultaneously from early responders. The zero readings for days two and three, and similarly days nine and ten are weekends when no post was received through the postal service. Two further spikes can be seen (days twelve to fourteen, and days twenty one and twenty two) and represent responses to the first and final reminders.

5.1.2 Non-Response Bias

Non-response bias occurs when a difference exists between those within the sample who respond and those who do not. Where such a difference exits it represents a systematic bias and reduces the generalisability of the findings since the properties of the sample can no longer be said to be representative of the characteristics of the population. It is often difficult to compare the two groups (responders and non-responders) since much is known about the responders and little is generally known of the non-responders.

A common technique to accommodate this has been developed by Armstrong and Overton (1977) in which the characteristics of early responders are compared with the characteristics of late responders on the premise that late responders will exhibit similar characteristics to non-responders. While a popular and frequently cited technique within the literature, much criticism exists in respect of the premise that late responders and non-responders are similar and its use, one suspects, is often out of necessity rather than by virtue of its high standing as a

technique particularly in situations where little is known about non-responders. The current study has some knowledge of non-responder characteristics and so avoids this technique and instead makes a direct comparison between responders and non-responders. This is in line with key empirical antecedent studies influencing the design of this study (Fryxell *et al* 2002; Kale *et al* 2000; Lui and Ngo 2004; Luo 2002; White and Lui 2005; Wuyts and Geyskens 2005)

Firm size was compared between the two groups. The number of employees was used as the proxy variable for firm size and a t-test comparing group means performed. The respondents' sample of 204 was compared to 100 randomly selected non-responders as per the method employed by Wuyts and Geyskens (2005). The difference between group means is not significant at the 5% level ($p = .598$) which is taken as evidence of the absence of problematic non-response bias. Other information available in respect of the non-responders was geographical location. This data was non-parametric and so a t-test could not be performed. Instead, a non parametric approach using a visual comparison of geographical distribution was performed to augment firm size as the principal non-response check. This approach provides weaker conclusions than the first, however since limited data in respect of the two groups is available it was considered prudent to examine the data available to eliminate non-response bias concerns. Using the postcode prefix letters the respondent and non-respondent groups were divided into two broad geographical UK regions classified here as 'north' and 'south'. The

respondents to non-respondents distributions are detailed in Table 5.1 below.

	North	South
Respondents Group	29.2%	26.6%
Non-Respondents Group	70.8%	73.4%

Table 5.1.2 Geographic Distribution of Respondents and Non-Respondents

The geographical distribution shows a broad concurrence between responders and non-responders and does not give any indication that non-response bias is a particular problem.

5.1.3 Respondent Demographics

A demographic profile of the responses can be made across three categories, the age and experience of the respondent, the size of the firm, and the scale of the project. The size of the firm is indicated by turnover and by the total number of employees. The scale of the project is indicated by the duration of the project. The age of the respondents was measured categorically and established the following profile.

	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75
Age	0 0%	4 2.0%	8 3.9%	13 6.4%	18 8.8%	29 14.2%	53 30.0%	44 21.6%	26 12.7%	5 2.5%	4 2.0%

Table 5.1.3.1 Age Distribution among Respondents

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The distribution of respondents held no surprises with a majority of respondents (51.6%) falling in the two categories covering the age range 51 – 60 years. This age bracket is likely to reflect the seniority required to qualify these respondents as decision makers in a given project. A decline in the number of respondents in age groups above these brackets may be explained by the shift of some of the most senior staff to director level roles in which pre-testing showed they have fewer operational roles and so are less well placed as respondents. Similarly the proportion of respondents over 60 is likely to be fewer as they reach retirement, or take early retirement. At the lower end of the age scale no respondents below the age of 25 were identified.

Experience among respondents is measured using the number of years the respondent has practiced as an architect as a proxy. This is a ratio measure and while not directly comparable with the categorical age related data above the following table shows a similar distribution with a clustering of more experienced decision makers. A total of 104 (51%) of respondents had been an architect for between 25 years and 35 years.
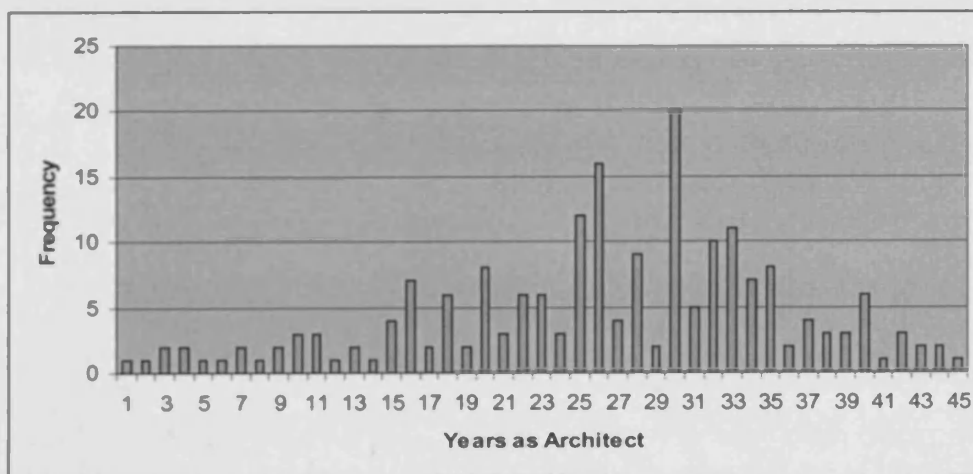

Table 5.1.3.2 Frequency Distribution of Respondent Experience

Organisation size as measured by turnover ranged from £28,000 to £14 million. While sensitive, 95% of respondents disclosed the turnover of their organisation facilitating a representative assessment of organisation size by turnover. The majority, (51.8%) were small organisations with a turnover of £350, 000 or less. A sizable majority (80.5%) had a turnover of £1 million or less.

A further measure of organisation size is the total number of employees. The number of employees ranged from 1 to 230, however a similar pattern of clustering occurred with the majority (50.5%) having 6.5 (full time equivalent) staff or fewer. A sizeable majority (82.4%) report having 20 (full time equivalent) staff or fewer. Both measures of organisational size concur and indicate that the majority of organisations are small.

The size of the project is measured here using the duration of the project as a proxy indicator. The value of the project could also have been used as an indicator although would have been susceptible to distortion where, for example, a small project may have been located in an expensive location. Duration of the project is also susceptible to distortions, for example, delays attributable to factors outside the relationship. However duration is a proxy measure which is more closely with the study of relationships.

The range of time taken for the projects reported by the respondents ranged from 6 months to 13 years. The majority of projects (50.3%) had a total duration of 2 years and 2 months or less. A large majority (83.4%) of projects had a total duration of 4 years or less. The distribution above this

point may be described as a long tail with fairly consistent intervals. One exception exists in the highest value of 13 years which appears to be something of an outlier. Since the data do not assume a normal distribution it is not possible to determine the outlier status using the standard deviation, however the highest value is 63% higher than the next highest value. A reasonable interpretation of typical project duration among the respondents would be between 6 months and 4 years.

5.2 Data Preparation

5.2.1 Purpose

The data preparation stage is an important if frequently under attended subsequent analysis (Hair *et al* 2006). The more advanced analysis techniques to be used here will run irrespective of whether or not underlying assumptions are met so the onus is on the researcher to establish that the data meet minimum requirements at this stage in order to avoid a situation where conclusions are established on the basis of an invalid statistical solution.

5.2.2 Data Editing

5.2.2.1 Respondent Checks

Data editing is the first step in the data preparation stage. Firstly, unusable and ineligible questionnaires were removed. This process involved discarding questionnaires from the analysis which were either returned in a spoiled condition or returned uncompleted (rather than incomplete). This gave a sample of 237 which was considered for further editing.

The next step was to remove those questionnaires which fell below the eligibility criteria in respect of the respondents' knowledge and ability to answer the questions (Kumar *et al* 1993). Eligibility of the respondent is first checked through the targeting of those respondents whose job title indicates suitable knowledge and involvement in the project concerned. This is then verified through post hoc measures indicating the respondent's level of knowledge of, and involvement in the project, as well as their confidence in answering the questions. This addresses the possibility that the questionnaire may be passed to another, less suitable respondent, or that an inappropriate respondent has been targeted.

The threshold for inclusion for the level of knowledge and level of involvement was set at a score of 5 or above on a seven point scale (7 = high), those scoring 4 or below were rejected. A lower threshold was set for the respondent's confidence in answering the questions with those respondents reporting a value of 4 or above being included. These thresholds are conservative interpretations of those used across prior empirical work. Where these post hoc questions are used in extant empirical studies (Heide 2003; Heide and Miner 1992; Stump and Heide 1996) little explicit guidance is evident to indicate the level at which the threshold should be set.

Composite values of the residual respondents, *i.e.* after below-threshold respondents were removed, averaged 6.2 on a seven point scale (7 = high) in a study by Stump and Heide (1996), and 6.5 on the same scale in a study by Heide and Miner (1992) for measures of knowledge and involvement. In the current study the equivalent composite score for the residual

respondents is 6.7. These thresholds were not applied collectively, in other words, violation of one of the three thresholds led to rejection of the questionnaire. This process removed 11 questionnaires leaving a total of 226.

5.2.2.2 Missing Data Analysis

The next stage in the data editing process was the removal of those questionnaires containing an unacceptable level of missing data. The antecedent studies which inform this study do not report levels of missing data and little guidance was evident in the literature more broadly to indicate the level of missing data which might be expected. The number of variables potentially determining the level of missing data is high and ranges from use of incentives, through the nature of the survey format, to the nature of the respondent (Dillman 2007). In consequence the usefulness of antecedent missing data levels, were it available, is limited since each study administration is unique. The level of missing data within these 226 questionnaires was low with 373 missing responses, or 1.40%. Cohen *et al* (2003) regard missing data of < 3% to be a very small amount. Since respondents behave with individuality, with some displaying a greater propensity to omit responses than others, a normal distribution of missing responses across respondents and questions was not expected. Evidence of this can be seen with some questionnaires having high levels of missing data while others had none. The range was 0 (0%) to 26 (22%) missing responses. Missing data may occur systematically and evidence of this was also sought.

The distribution of missing values across questionnaires followed a curvilinear distribution with few missing data in a large number of cases and a large number of missing data in few cases. This is illustrated in figure 5.2 below.
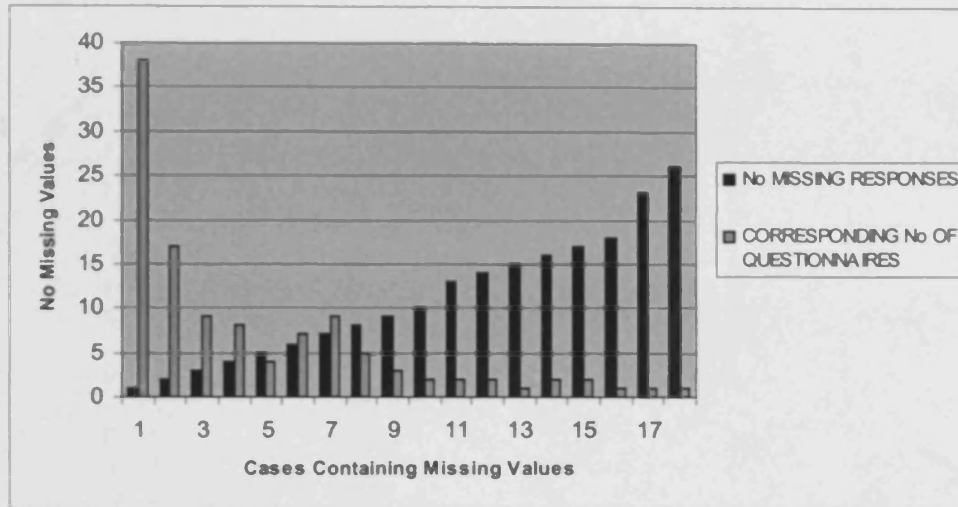

Figure 5.2 Listwise Distribution of Missing Data

The concern at this stage of data editing is to make a modest reduction in the overall level of missing data from the already low level, and in particular to remove individual cases exhibiting unacceptably high levels of missing data (listwise deletion). Little empirical precedent was found in the literature to guide the level of missing data which could be regarded as unacceptable when measured by subject although Hair *et al* (2006) suggest a 10% threshold. Achieving this upper limit was not difficult so attention was shifted to establishing a lower threshold and balancing this against the need to maintain a minimum sample size (*n*). As already stated an *n* of 200 or above is desirable to maintain sufficient power for the subsequent multivariate analysis (Cohen *et al* 2003). By reducing the threshold for missing data per case to 5.5%, or 7 missing

responses, the residual *n* is 204. Thus twenty two cases were removed and the missing data for the data set was reduced by 56.4% to 146 missing responses.

Where the missing data is found to be systematic in nature it may be considered that a systematic bias will in consequence be carried through into the analysis. An appropriate treatment in such cases is the removal of variables, the removal of subjects (listwise deletion), or the exclusion of subjects from each analysis where the missing data would be featured (pairwise deletion) (Byrne 2001; Cohen *et al* 2003). The possibility of the presence of systematic bias in the distribution of missing values was assessed by variable. Figure 5.3 below, shows the distribution of missing data across questions (pairwise).
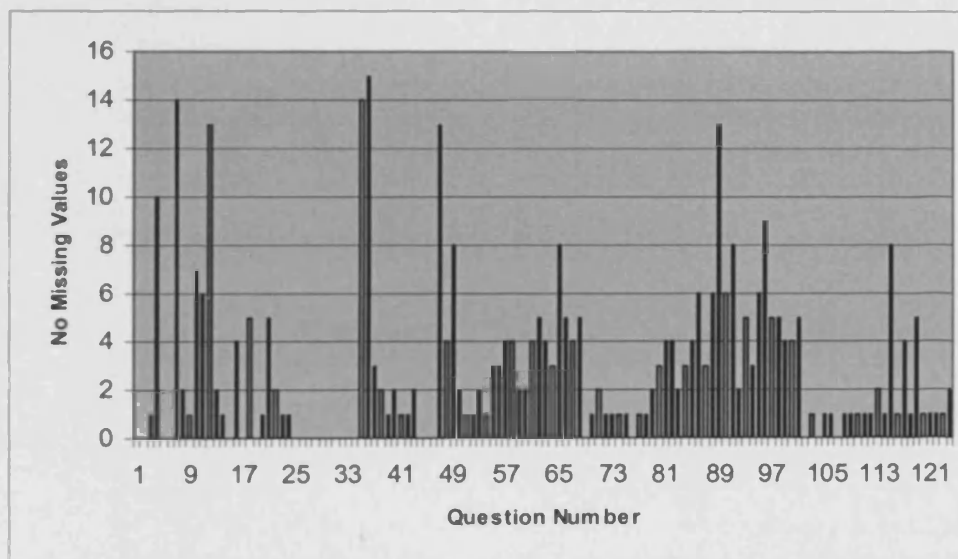

Figure 5.3 Pairwise Distribution of Missing Data

The mean of the missing values for all 124 questionnaires is 3.1. The mean value among only those questions exhibiting missing responses is 3.7. The distribution is non-normal and so outliers cannot be assessed

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using the standard deviation method (Silver 1997). A visual check of the distribution shown above does not reveal any extreme values and no further cases are deleted. Non-response bias in respect of particular questions was therefore eliminated since these remaining missing data were considered to be non-systematic (Silver 1997).

5.2.2.3 Formatting Checks

The remaining data were checked to ensure that the questionnaires were completed using valid codes, for example giving an answer to questions on duration of activities in years and months rather than proportions of years *i.e.* 2.5 years. Where such responses where given the response format was changed to facilitate data entry. The format of the questionnaire was straight forward and so led to few such errors and hence few subsequent amendments. One other type of formatting error to occur was the writing of an impromptu comment in response to the question rather than a tick or cross in a corresponding pre-formatted box. Where this occurred a note was taken of the comment and a missing entry recorded. An attempt to establish a trend in such responses was made since such a trend would suggest a systematic error in the instrument, however none was found.

5.2.3 Treatment of Missing Data

Listwise deletion of cases exhibiting excessive missing data (> 5.5%) was performed. The remaining missing values do not exhibit any pattern and are regarded for the purposes of further treatment as missing completely at random (MCAR).

A number of methods may be employed in the treatment of the residual missing data, ranging from more conservative techniques such as a listwise approach where only cases with complete data are used through to techniques to replace the missing data such as mean, or regression imputation (Hair *et al* 2006). A key disadvantage with the listwise technique is the reduction in sample size. Since the number of cases containing complete data totals less than 200, which is our minimum sample size for the multivariate analyses to be conducted, the listwise deletion approach is effectively ruled out. Calculating replacement values is an alternative approach and is a widely used technique allowing the use of the full data set for further analysis (metric variables only, imputation cannot be performed on non-metric data) and avoids the problem of varying sample size for each calculation which occurs with a pairwise approach (Hair *et al* 2006).

A number of imputation techniques were considered. Hot deck imputation, using a value from another case that is deemed similar, also referred to as pattern matching imputation (Byrne 2001; Cook and Campbell 1979; De Vaus 2002a) but was excluded largely due to the difficulty of identifying similar cases. Potential similarities may occur in the profile of the organisation, the trend in responses, and the nature of the project. However the latter of these was largely unknown and so reliable assumptions could not be made about the overall similarity of the cases. Cold deck imputation was rejected because other data measuring the same variables in the same setting was not available. Similarly case substitution was also impracticable.

Two further methods of missing value treatment are expectation maximisation (EM), and full information maximum likelihood (FIML). EM is an iterative approach which performs an expectation estimation for the current distribution, followed by a maximum likelihood estimation. The latter parameters are then used in the next iteration of the expectation step and the process is repeated until there is convergence in the parameter estimates (Olinsky *et al* 2003). Advantages include better estimates than with listwise deletion and more accurate estimates than with pairwise deletion (Graham and Donaldson 1993; Olinsky *et al* 2003; Malhotra 1987). FIML is a 'direct model estimation method' which performs maximum likelihood estimation using restrictions on parameters across the whole model rather than just the equation in question (Olinskey *et al* 2003). In common with other imputation techniques described here a key advantage is the maintenance of the sample size and hence power, which is particularly important in the structural equation modelling approach (Byrne 2001).

Mean substitution and regression imputation are other key missing value replacement techniques and have the advantages of being relatively simple techniques which allow the amended data set to be treated as complete. However disadvantages exist with these popular techniques. Firstly variance becomes understated since both techniques effectively regress the valid data to produce the new value. Mean substitution also distorts the distribution of values and reduces the observed correlation since all missing values are given the same substitute value (Hair *et al* 2006). Regression imputation on the other hand reinforces the existing

relationships effectively making the data more like the sample and so less generalisable. This disadvantage may be deemed acceptable under certain circumstances but the technique cannot be applied where there is no covariance between variables (Byrne 2001; Hair *et al* 2006). Byrne (2001) also quotes work by Arbuckle and Wothke (1999) which suggests that the reliance of structural equation modelling on variance and covariance makes mean substitution inappropriate for this method. For this reason and because several regression imputation disadvantages do not hold for this dataset (sufficient correlations between variables exist, the sample is large enough to generate a prediction, predicted values would not fall outside the valid range) the regression imputation technique was selected.

The first stage in the regression imputation was to establish a dependant variable against which to regress. The variable with the least missing data was selected which in this case was performance 'perf'. The items were averaged to obtain one series of values against which the other, independent, variables could then be regressed, each in turn to provide the value for substitution. The results were corrected to one decimal place and entered in the dataset. At the one decimal place level, and with such a small amount of missing data it was considered that little difference in values would exist between the regression imputation and mean substitution techniques. To illustrate this, the mean value was also calculated for each variable. The difference between values in each case was less than 0.1 and when corrected to one decimal place most values were the same. Those which differed did so by not more than 0.1. The regression imputation are adopted and included in the dataset.

Despite the relative merits of one technique over another in the process of missing data treatment, at the low levels of missing data evident in the current data set these merits are largely not evident. Indeed this may be the case up to 5% of missing data rendering selection among methods of limited importance (Roth and Switzer 1995). What is instrumental is the substitution of data values to establish a complete dataset for further analysis, established here using the regression imputation above.

5.2.4 Outliers

Outliers are extreme values in a distribution and may exert an undue influence on statistics (Cohen *et al* 2003). In measures of central tendency outliers have the effect of 'distorting the picture provided by the summary statistic' while in bivariate and multivariate analysis outliers may alter the regression coefficient thus altering the reported correlation between variables (De Vaus 2002a). An outlier may occur through error or may be a genuine indication of particular population characteristics. Once identified the reason for the outlier occurring should be determined before any treatment is decided upon. Because of the potential impact on statistics outliers are typically treated, including those which do not occur through error, where the system of analysis is not designed to test for the exogenous causes of the outlier (Silver 1997).

Univariate outliers can typically be identified using a scatter plot however where large amounts of data are used or in the case of multivariate analyses this is inappropriate (De Vaus 2002a). Multivariate options are of concern in the current study and approaches centre on the examination of

variance of individual values. Standardized Residuals, Mahalanobis Distance, The Leverage Statistic, and Cook's Distance are among the methods which may be employed to identify multivariate outliers (Cohen *et al* 2003). The Mahalanobis Distance method is employed here to identify possible outliers.

5.2.5 Normality

Normality of distribution is defined as the clustering of variable scores about the arithmetic mean in a 'symmetrical, unimodal pattern known as the bell-shaped, or normal curve' (Hair *et al* 2006). While of general interest in understanding the distribution pattern of a data set, normality of distribution becomes a particular concern where the use of a given statistic assumes normality as a feature of the data. These statistical tests include 'Pearson's correlation, analysis of variance, t-tests, multiple regression, discriminant analysis and factor analysis' and so is of concern in the present study (De Vaus 2002a). Identifying normality of distribution can be achieved by a histogram plot with a normal curve superimposed to facilitate a visual check, or through the use of skewness and kurtosis statistics which are the statistical components of normality. Problematic non-normality may be indicated by a skewness value greater than +/- 1 (Hair *et al* 2003). Equivalent values for kurtosis are given variously as +/- 1 by De Vaus (2002a), and as +/- 3 by Hair *et al* (2003) indicating both a lack of consensus and the interpretative nature of these statistics.

It is possible to calculate the significance of both skewness and kurtosis values by comparing the observed distribution with a hypothetical

normal distribution for example using the *Kolmogorov-Smirnov* Z test. However, the question of normality is still open to interpretation even where such tests indicate significant non-normality, not least because the sample size can influence the significance value. This is because the standard error calculation includes N and in consequence the null hypothesis is more likely to be rejected as a result of minor deviations from normality with a higher value of N (Hair *et al* 2006; Tabachnick and Fidell 1989).

The implications of the above considerations are that no absolute position exists in which non-normality can be identified as a problem. Indeed even where non-normality is identified, and particularly in larger samples (> 100, De Vaus 2002a) recourse to a visual examination of the histogram and the magnitude of the skew and/or kurtois deviation from zero may be more important than the significance level (Tabachnick and Fidell 1989).

Having identified non-normality several options are available in response to the problem. De Vaus (2002a) suggests the use of non-parametric tests as an alternative in some instances along with data transformation, or simply to use the statistical method with non-normal data. The latter approach risks degrading the solution somewhat, however the extent to which this is the case is not clear and is regarded as having less severe effects than previously thought and in particular where the sample size is greater than 100 it may be regarded as 'reasonable' to use non-normal data (De Vaus 2002). Transformation of the data is an option however and where it improves normality may reasonably be assumed to

avoid the possible degradation of the solution presented by the use of non-normal data.

Problems exist however in the use of transformed data in structural equation modelling. The relationships identified within the model established with non-linear data must be interpreted in their non-linear form creating difficulties in interpretation and inconsistency in the model where some variables are transformed and others are not. The current data do not show evidence of problematic non-normality with skew values ranging from 0.025 to 1.646 with 66.7% of values lower than 1.00, and kurtois values between 0.011 and 1.538 with 74.4% of values below 1.00. While a minority of items are within the range for transformation according to some narrators (+/- 1.00, De Vaus 2002a), transformation of data in the current study would bring with it difficulties in interpretation which would be disproportionate to the level of non-normality adjusted for. For these reasons the moderately non-normal data is not transformed here.

5.3 Reliability and Validity Assessment

5.3.1 Overview

In order to establish confidence in the outcome of the statistical solution minimal prerequisites of reliability and validity must be achieved. Reliability is a measure of how consistently something is measured (Hair *et al* 2006). Where inconsistency occurs it is due to the presence of error (assuming the theoretical rationale is sound) and this will typically manifest as variation among repeated measures of the same variable due to

error. Conversely more reliable measures (those with less error) will demonstrate greater consistency (Hair *et al* 2006). Variables will consist of the true measure plus error. Those variables with minimal error are more stable and so less likely to 'degrade' an analysis (Tabachnik and Fidell 1989).

While reliability is concerned with how a variable is measured, validity is concerned with what is measured. Validity is the degree to which the measures represent, or capture, the theoretical construct being measured (Hair *et al* 2006). For a variable to exhibit acceptable validity it is necessary to have demonstrated reliability, reliability therefore is a 'necessary but not sufficient condition for validity'. (Hair *et al* 2006).

5.3.2 Reliability

5.3.2.1 The Sampling Technique

The sampling technique represents an early potential point of entry for measurement error. Such sampling error can be minimised where a systematic technique is followed.

5.3.2.1.1 Sampling

The sampling protocol is described in detail in the previous chapter (4.5.1). Within this protocol particular steps were taken to reduce the likelihood of introducing sampling error. Firstly the sample was taken using a systematic random selection technique from a database which accurately represents

the population to which the study will generalise. Contact details were checked for errors before the survey was administered. This step reduced the possibility of error both through the amendment of incorrect details reducing the spurious exclusion of potential respondents, and facilitating a check of the processing system used to aggregate and apply the contact details thus reducing the prospect for undetected systematic error to occur.

Each respondent identified in a company was reviewed to ensure that they were the most appropriate key informant. This augmented the selection of key informants from a singular selection criteria based on their title to one in which their involvement in projects was taken into account. This process, while time consuming, avoided systematic bias which might otherwise have been introduced by the use of singular selection criteria based on title. The rationale for this potential systematic bias was established in the pre-test. The title of 'director' was originally chosen as a suitable professional salutation which, where used, would be taken as indicative of a senior executive with responsibility for architectural projects of the sort about which responses were to be sought. However, comments from architects during the pre-test indicated that in larger firms the title of director commonly denoted an individual who took an administrative and general managerial role in the organisation. In such situations this informant would not be well placed for the role of key informant for a particular project and a systematic bias caused by lower response rates (or high levels of missing values) might be anticipated from larger firms where the title of director is used as a default selector. Thus the review of the key

respondents prior to the survey administration assisted in the avoidance of such systematic error.

5.3.2.1.2 Postal Service Check

Much of the measurement error which occurs in survey research may be avoided through steps such as those outlined above. However, other error may derive from mechanisms outside the immediate control of the researcher. Tabachnik and Fidell (1989) suggest of missing data that such problems occur when exogenous factors occur, and add in humorous style that this occurs when 'rats die, respondents become recalcitrant, or somebody goofs'. A similar range of circumstances may contribute to measurement error. While no rats were used in this study the possibility of somebody *goofing* was a prospect at the point when the control of the survey administration was placed beyond that of the researcher.

The release of 4500 communications in four waves presented a possibility for some deviation from the expected timetable of delivery for example as a result of unanticipated idiosyncrasies of the postal system. In this instance, variation in the delivery time may contribute to measurement error through the staggered delivery of survey communications. The resulting responses would erroneously be classified as early or late respondents and conclusions potentially drawn, based on that classification. Importance was attached to the day of arrival of survey communications and so checks were made to ascertain the standard delivery time using the university postal system.

Test letters were posted with each batch which were identical in everyway (size, weight, style of envelope) and addressed to the researcher's home address. The date of arrival was logged. These checks verified that the mailings arrived in a good condition within the anticipated time frame with a majority of mailings arriving on the targeted day and a minority arriving one day later. No measurement could be taken of the time from arrival at the office of the respondent to the point at which they received the communication, so to speak on-their-desk. Retrospective checks (glut of early responses) indicated that a large number of surveys reached the desk of the respondents on the targeted day and were completed and returned on the same day (see distribution of responses in section 5.1.1).

5.3.2.2 Construct Reliability

5.3.2.2.1 Test-Retest

The test-retest procedure is the process by which the same phenomenon is measured a second time using the same instrument. Since reliability is a test of the consistency of the method this procedure is a logical approach to testing reliability of the instrument (and procedures) and is 'intuitively the most straight forward way of assessing reliability' (De Vaus 2002a). Problems exist however since the research setting is itself rarely the same twice and so a reduction in the correlation may occur spuriously, derived from exogenous factors. De Vaus (2002a) identifies four principle limitations to the test-retest procedure. Firstly it is frequently not possible,

or practicable to administer the survey to the same sample on two occasions. Secondly difficulty exists in differentiating between difference caused by exogenous factors and those caused by measurement error. Third, the initial process of responding to the survey may have caused changes in the sample, and finally where the gap between test and retest is short the respondent may recall answers and so artificially inflate reliability.

In the current study, a large proportion of the respondents requested a complimentary summary of the results and this was taken as an opportunity to retest using a limited selection of questions as an appendix to the summary, along with a request that the respondent return these questions to assist with validation of the study findings. These appendix questions were numbered in order to successfully link them to the original response and this fact was made clear to the respondents in order to obtain implicit consent (the choice to contribute to the study constituting consent). This addressed the first of the obstacles outlined above. The change in the sample over time was minimal since the same respondent was asked to report on the same completed building project as used for responses in the original survey.

A control variable (year of completion) was added. A level of uncertainty could not be avoided in respect of changes among those respondents who were retested since they may have reflected on the project after the first survey response and any conclusions could then influence their approach in the retest responses. A particular hazard existed in the presentation of the study findings along with the retest questions, however

this could not be practicably avoided. Finally memory influence in the retest responses was avoided by administering the retest 18 months after the original survey was sent to them. On balance the collective rationale of this approach gives confidence to the reliability of the technique in the present context.

In order to increase the likely response rate questions were limited to one side of A4 paper. The paper was coloured distinctively from the remainder of the report with a view to highlighting it as a point of action for the respondent to engage with. In total 155 sets of retest questions were sent out eliciting a response of 24 (15.5%). The questions were selected from two important constructs in the structural model, relational coordination and performance. The return address was detailed at the bottom of the page and the identifying number, unique to each question page, was placed some way in from the edge of the page with a view to avoiding the possibility of respondents tearing this identifier off and rendering the response unusable. The data were found to be highly correlated suggesting that there is no difference between groups.

5.3.2.2.2 Internal Consistency

While the test-retest approach is concerned with the reliability of individual items, further reliability checks can be made in respect of the measures, or groups of items used to indicate a latent construct. Where these items collectively describe the latent construct it is reasonable to assume that they will correlate and so the consistency with which this occurs becomes the

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focal point of interest rather than the consistency with which a single item is answered over time (De Vaus 2002a). Several techniques exist to check internal consistency (average inter-item correlation, average item-total correlation, split-half correlations) however the coefficient, or Cronbach's alpha is commonly used in the literature and is often regarded as the most suitable measure of internal consistency (Churchill and Iacobucci (2005); De Vaus 2002a). Similar in logic to the split half method Cronbach's alpha is more thorough, taking each possible arrangement of split half coefficients and finding the average coefficient the correlation of the split halves is calculated. Coefficient values above 0.7 for the Cronbach's alpha is generally considered the minimum value necessary to demonstrate adequate internal consistency (Nunnally 1978), however this is not a universal position, Hair *et al* (2006) regard values between 0.6 and 0.7 to be at the lower end of acceptability.

5.3.3 Validity

5.3.3.1 Content Validity

Content, or face validity is the extent to which the measures used reflect the domain of the construct under investigation (Churchill and Iacobucci 2005). The correspondence between the measurement scale and the construct is assessed subjectively in particular using expert judges and pre-tests (Hair *et al* 2006). In the current study both of these methods were used, as is described in the previous chapter (4.4.2). The items were found to accurately represent the constructs under investigation. This can be

attributed in part to the fact that where possible, complete measures were taken from antecedent empirical work, in some instances from the same industrial setting, and always from relatively recent work or using older sets of measures which had been revised through more recent work and for which satisfactory reliability estimates were reported. The principle threat to content validity came from the modification of items and measures for this study and it was for these aspects of the instrument that expert judges and the pre-test were of particular importance to the establishment of content validity.

5.3.3.2 Construct Validity

Certain assumptions exist antecedent to measurement testing in respect of the constructs and their interactions. These assumptions are arrived at through the assessment of extant empirical and conceptual work and are informed to some extent by intuition and pre-testing. Thus we might expect measures to behave in a particular way and construct validity is the degree to which this is the case (Churchill and Iacobucci 2005). The fact that measures might demonstrate relationships unsupported by the theory however, does not automatically invalidate the measures since the theory could be erroneous or perhaps, incorrectly interpreted. Rather, construct validity is one of the range of validity checks which guides the researcher and highlights areas for particular attention and cross checking. Where multiple measures are used to identify a construct further 'sub-types' of construct validity can be employed, convergent, discriminant and nomological validity, are described below (De Vaus 2002a).

5.3.3.3 Convergent Validity

Since a number of items are used to indicate a concept it should be expected that the values for each item will correlate with that of the remaining items. Assessing the validity of the items in this way, convergent validity, is defined as 'the degree to which two measures of the same concept are correlated' (Hair *et al* 2006). Convergent validity can be implied through the satisfactory assessment of internal reliability using the Cronbach's alpha (Nunally 1978, Ping 2004), demonstrating that the shared variance among items in greater than .50 in each case, or through a factor loading of > .40 (Hair *et al* 2006).

5.3.3.4 Discriminant Validity

It is common within a conceptual investigation to have more than one concept which, while similar, is nevertheless distinct from other concepts. The degree to which 'two conceptually similar concepts are distinct' is a measure of discriminant validity (Hair *et al* 2006). This is of particular importance where multidimensional higher order constructs are posited. Within this study discriminant validity is assessed by comparing the average variance extracted (AVE) with the standardised squared correlation between constructs (Fornell and Larcker 1999). Where the AVE is greater than its corresponding squared correlation discriminant validity is held to have been established.

5.3.3.5 Nomological Validity

Nomological validity is concerned with the validity of the relationships between the constructs. Having established that the measures are valid indicators of the constructs they purport to measure through convergent and discriminant validity, nomological validity is the remaining component in the assessment of construct validity (Anderson and Gerbing 1988). Podsakoff and Mackenzie (1994) advocate an assessment of the correlation between a construct and the underlying components of the construct to which it is purported to relate.

5.3.3.6 Common Method Variance

Common methods variance (CMV) is the spurious inflation of construct co-variance frequently attributed to aspirant, or social desirability, effects of the respondent and regarded as common among self report measures (Lui and Ngo 2004). The introduction of such 'systematic variance' may manifest itself in problematic common method bias, *i.e.* at a level which invalidates research conclusions. Common method bias (CMB) is defined as 'the magnitude of the discrepancies between the observed and the true relationship between constructs that results from common method variance' (Doty and Glick 1998). Common Method Bias is a problem of the measurement method rather than of the constructs used and is a particular problem in behavioural research (Podsakoff *et al* 2003).

Measures may be taken to control this issue. Avoidance of single informant self report format is an obvious albeit dramatic approach, and

given the variety of well reasoned motives which exist in selecting the methodological approach (large sample number, resource constraints) this may constitute a disproportionate response. Options to identify and treat CMV, centre on the establishment of evidence of spurious covariance. The Harman post hoc one factor test establishes a single factor as evidence of common method variance (Slater and Atuahene-Gima 2004). Where CMV is established it may be addressed by calculating the amount of variance due to CMV and partialling this from the covariances (Podsakoff and Organ 1986). By measuring the covariance of two theoretically uncorrelated constructs the variance attributed to CMV can be established, the observed covariances are inflated 'by the square of the common method correlation', the proportion of variance to be partialled can then be calculated (Lindell and Whitney 2001).

5.4 Descriptives

The following tables describe the descriptive statistics for each of the measures. The mean, standard deviation and percentage distribution for each point on the likert scale is reported and brief description of this follows each table. The key contribution that these tables make is to identify the directionality of the responses for each item and the consistency for the distribution for each item.

Table 5.4.1 Descriptive Results for Complementarity

		Scale Description		Response Scales						
		Mean	Sd	1	2	3	4	5	6	7
Complementarity	sim 1 – similar resource capabilities	3.8	1.76	9.8	17.6	16.7	22.5	12.3	13.2	7.8
	sim 2 – similar management capabilities	4.0	1.65	6.4	12.3	22.1	23.5	12.7	15.2	7.8
	sim 3 – similar assets size	3.6	2.11	20.6	21.1	10.8	11.3	9.8	12.3	13.2

The descriptive statistics for complementarity show a generally even balance of responses across the likert scale with mean values close to the central score of 4. The descriptive statistics for asset size deviate from this trend marginally with a lower mean value and a higher standard error reflecting the loading of results at the extreme ends of the scale. This indicates a strong sense among respondents of similarity or difference among the asset sizes of the alliance organisations.

Table 5.4.2 Descriptive Results for Contractual Coordination

	Scale Description		Response Scales						
	Mean	Sd	1	2	3	4	5	6	7
Formality									
form 1 – defined roles of both firms	5.5	1.75	4.9	4.9	2.9	12.3	9.8	25.5	39.7
form 2 – defined responsibilities of both firms	5.5	1.70	4.4	3.9	4.9	11.8	9.3	28.4	37.3
form 3 – defines performance of both firms	5.1	1.90	8.3	5.4	3.9	17.2	13.7	19.6	31.9
Safeguards									
safe 1 – standard building contract	5.7	1.98	7.8	7.4	1.0	5.4	3.4	21.1	53.9
safe 2 – includes right of QS audit	4.4	2.40	22.5	8.3	4.9	13.7	2.5	17.2	30.9
safe 4 – includes legal redress clause	5.0	2.12	12.3	7.4	2.9	10.3	7.9	26.5	32.8
safe 5 – provisions for extension of time claim	5.5	2.01	10.3	5.9	8.3	4.9	2.0	25.0	43.6
safe 6 – loss and expense standard claims	5.3	2.15	12.3	7.4	1.0	7.4	5.9	23.5	42.6

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The descriptive statistics for Formality exhibit a general trend toward the use of formality, with means ranging from 5.1 to 5.5. There is a distinct clustering at the higher end of the scale with over 30% on the highest value of the scale for each of the three items. Safeguards offers less consistency with weighting on values at either end of the scale. The weighting is still high (> 30%) on the highest value, however a clustering also occurs at the lowest end of the scale with most values on the lowest score rating above 10%. This distribution is reflected in the standard deviation which is correspondingly higher at a range of 1.98 to 2.40.

Table 5.4.3 Descriptive Results for Procedural Dependence

		Scale Description		Response Scales						
		Mean	Sd	1	2	3	4	5	6	7
Adaptation	Tadapt 1 – Mutual tailored design	3.3	1.45	9.8	17.7	20.1	23.1	20.1	7.4	2.0
	Tadapt 2 – Mutual changes to work process	3.6	1.38	6.4	14.7	18.1	29.4	20.1	9.8	1.5
	Tadapt 3 – Mutual *ex-ante* contractual/financial changes	3.0	1.67	18.6	24.0	18.6	15.2	11.3	8.4	3.5
	Tadapt 4 – Mutual change to design procedures	2.7	1.41	19.1	27.9	18.1	18.7	12.2	2.5	1.5
	Tadapt 5 – Mutual change to organisational structure	2.1	1.21	31.4	41.2	10.8	10.7	3.5	2.0	0.5
Power	pow 2 – provided vital resources	4.4	1.72	6.9	9.8	11.3	22.1	20.1	18.1	11.8
Dependence	pow 3 – success/failure down to contractor	4.9	1.48	2.9	2.9	8.3	25.0	19.6	26.5	14.7
	Pow 4 – success/failure down to your firm	5.4	1.19	0.0	2.0	2.5	19.1	23.0	33.8	19.6
Asset Specificity	Taspec 13 – Mutual investment in dedicated personnel	3.6	1.37	7.4	12.3	22.1	32.9	15.7	8.3	1.5
	Taspec 2 – Mutual exposure to non-recoverable assets	4.9	1.74	3.9	5.4	10.3	16.2	12.7	22.6	28.9
	Taspec 4 – Mutual level of project-specific knowledge	4.7	1.78	5.9	6.9	8.8	16.2	17.1	21.5	23.5

The descriptive statistics for adaptation, power dependence, and asset specificity reflect a consistent distribution. Adaptation has mean values ranging from 2.1 to 3.6 indicating a preponderance of lower values for adaptation. The consistency of this is reflected in standard error values ranging from 1.21 to 1.67. Power dependence is weighted positively with mean values ranging from 4.4 to 5.4. Asset specificity is similarly positive although investment in personnel scores a little below the mid score of 4.0 with a mean of 3.6. The standard deviation for power dependence and asset specificity reflects a consistent distribution with values ranging from 1.19 to 1.78.

Table 5.4.4 Descriptive Results for Relational Coordination

	Scale Description			Response Scales						
		Mean	Sd	1	2	3	4	5	6	7
Goodwill Trust	gt 1 – Could count on counterpart to act as expected	5.1	1.59	3.9	4.9	8.3	12.3	20.1	33.8	16.7
	gt 4 – Mutual reliance in tough periods of project	5.2	1.50	3.4	4.4	2.9	15.7	20.1	35.8	17.6
	gt 6 – We shared info & experience & personal life	4.2	1.80	7.8	13.2	13.2	19.6	14.2	22.1	9.8
	gt 8 – We engaged in undocumented activities	4.8	1.64	5.4	5.9	6.4	17.6	27.0	23.0	14.7
Competence Trust	ct 2 – addressed project with professionalism/dedication	5.6	1.22	1.5	1.0	2.9	9.3	22.1	40.2	23.0
	ct 4 – trusted and respected by unlinked companies	5.0	1.18	1.0	2.0	3.9	28.9	27.4	28.9	7.8
	ct 5 – trusted and respected by linked companies	5.5	1.22	1.0	2.0	3.4	12.3	24.0	39.2	18.1
Exchange	exch 1 – close to technical staff of alliance partner	4.7	1.47	2.9	6.4	9.3	21.1	27.5	24.0	8.8
	exch 2 – bilateral communication	4.7	1.39	2.5	5.4	10.3	19.6	30.4	25.0	6.9
	exch 3 – frequent contact was important	4.7	1.59	3.4	8.8	8.8	16.7	25.5	25.0	11.8
	exch 4 - informal communication important	4.5	1.54	2.9	9.3	15.2	19.1	26.0	19.1	8.3
	exch 5 – communication began early in process	4.2	2.04	9.8	21.1	9.8	7.8	13.7	23.0	14.7

The descriptive results for goodwill trust, competence trust, and exchange each reflect a consistently positive loading with mean values ranging from 4.2 to 5.2 for goodwill trust, from 5.0 to 5.6 for competence trust, and from 4.2 to 4.7 for exchange. Additionally the majority of responses is clustered around value 5 and 6 on the likert scale. An exception to this is exchg 5, which reflects the importance of early communication in the alliance. Responses for this item are less consistent and load at either end of the scale with a standard deviation of 2.04 which reflects this less consistent pattern of loading.

Table 5.4.5 Descriptive Results for Performance

	Scale Description		Response Scales						
	Mean	Sd	1	2	3	4	5	6	7
Perceived Performance									
percv 3 – project added to firm success	5.6	1.55	3.4	2.9	5.9	5.9	12.3	36.8	32.8
percv 4 – completed to high professional standards	5.8	1.38	2.0	2.0	5.9	3.9	10.3	42.6	33.3
percv 5 – proud of the project	6.1	1.20	2.0	0.5	2.0	3.9	10.8	38.2	42.6
percv 6 – efficiently carried out	5.4	1.57	3.4	4.9	5.9	4.4	20.1	36.3	25.0
percv 7 – profitable for both firms	4.8	1.84	7.4	7.4	8.3	15.7	17.6	22.1	21.6

The descriptive statistics for performance reflect a consistent pattern of positive response by respondents in respect of the alliance performance. Mean values range from 4.8 to 6.1 and the majority of responses are clustered on the highest two values on the likert scale. The standard deviation scores range from 1.20 to 1.84 reflecting the consistency in the distribution of responses.

5.5 Conclusion

This chapter has described the survey response, data preparation, reliability and validity assessment, and preliminary analysis of the data. The response rate and distribution is discussed in section 5.1 together with the assessment of non-response. A satisfactory response rate of 34.0% is reported which is above the expected level based on antecedent work and described in chapter four. Non-response bias was assessed by comparing firm size and geographical location among responders and non-responders. No difference was found between the two groups.

A process of data preparation was conducted in section 5.2 with respondent and formatting checks conducted in the first instance to reduce the impact of human error on the quality of the data set. Subsequently for formal checks for missing data, outliers, and normality were conducted to establish a dataset which conforms to the assumptions of the structural equation method. Missing data was reduced from an initial low level to a very low level of 0.61%.

Reliability and validity assessment is addressed in section 5.3 with an assessment of the administration procedure followed by a more formal

assessment of the measures, constructs, and common method variance. Finally the descriptive results are set out in section 5.4 in tabular form with the mean, standard deviation and percentage weighting on each point of the likert scale for each item.

CHAPTER SIX

Measurement Model

Development

Chapter Six: Measurement Model Development

Chapter Contents

6.1 Introduction

Chapter six represents step one of Anderson and Gerbing's (1988) two-step approach to structural equation modelling, specifying the relationship between the measures and their constructs prior to step two the assessment of the relationships between constructs in step-two (dealt with in chapter seven).

The process of assessing the relationship between measures and their constructs is dealt with sequentially. An Exploratory Factor Analysis is run for each construct and the dimensionality assessed against that already posited. This process is used to inform scale purification. Secondly the relationship between constructs is assessed using the purified scales. This is arranged here with two separate confirmatory models. The model fit is assessed for adequacy. Finally the reliability and validity of the proposed measurement model is assessed. This is a critical element of the Anderson and Gerbing (1988) two-step approach since reliability and validity assessment at this stage ensures a valid assessment of structural paths in the second step. Directionality is verified by broader reference to the theory.

6.2 Exploratory Factor Analysis, Measure Development and Scale Purification

6.2.1 Exploratory Factor Analysis Overview

Exploratory Factor Analysis (EFA) facilitates the identification of factors for each construct and so augments the theoretical factor structure proposed. This procedure checks the factor structure and provides an indication of the dimensionality of the measures. A rotational solution, in

the present study a varimax rotation, is sought and provides an optimal factor solution. EFA is of particular value where those measures have been developed within the study, and where existing measures have been augmented with additional items or are employed in a different context from that for which they were developed. Deviation from the anticipated factor structure may present as either multidimensionality within a measure, and/or shared variance among items from different measures (cross loading).

Identification of the factor arrangement both identifies potential difficulties such as those outlined above, and facilitates the re-specification of measures through the deletion of items in order to obtain distinct factors with no problematic cross loading. Particular attention is paid to the likely impact on content validity of changing the measures by the removal, aggregation, or switching of items. This assessment of content validity avoids the unintentional, and undesired shift away from a theory-led model and towards a data-led version. While statistically sound, a data-led specification may result in a theoretically unsubstantiated solution (Byrne 2001). Thus this iterative process of measure re-specification can be justified on the grounds that even simple factors are 'rarely tidy' (Churchill and Iacobucci 2005).

6.2.2 Complementarity and Contractual Coordination

The EFA for complementarity and contractual coordination presents a three factor solution with Eigenvalues above 1. Total variance explained is 64.68%. Communalities are each > .5. Complementarity is distinct and

one-dimensional with no significant (> .4) cross loading. Contractual coordination gives an expected two factor solution with some cross loading among items. The cross loading occurs for safeguard 5 (.445), and safeguard 6 (.429) showing a moderate but significant cross loading. Of greater concern is Safeguard 3 which has a cross loading value of .921. Close inspection of the items reveals Safeguard 3 to be phrased differently than the other items within the measure and also to correspond poorly with other items reflecting the contractual coordination latent construct. These both represent possible reasons for the different loading of the item. Additionally they provide a rationale for the exclusion of this item. While Safeguard 3 is excluded, Safeguard 5 and Safeguard 6 are not excluded. These latter two items are consistent in their meaning with other items in the measure (except Safeguard 3) and as such demonstrate content validity. The low magnitude of these items' cross loading facilitates a judgement to include the items which is considered unlikely to prove problematic in subsequent analyses. Retention also serves to maintain the explanatory power of the measure. With the removal of Safeguard 3 variance explained increases to 68.42%.

Complementarity is thus specified as:

     Sim 1
     Sim 2
     Sim 3

Contractual Coordination is re-specified as:

Formality:

> Form 1
> Form 2
> Form 3
> Form 4

Safeguards:

> Safe 1
> Safe 2
> Safe 4
> Safe 5
> Safe 6

6.2.3 Procedural Dependence

Procedural Dependence is proposed as a three factor latent construct. The initial EFA however identifies four factors and suggests a total explained variance of 55.58%.

Adaptation is the first of the lower order constructs and loads quite neatly in the EFA with the exception of Tadapt 6 which has a significant cross loading (.400) and a communality of .436. The remaining items in the measure ranged in magnitude from .771 to .879 accentuating the impression that Tadapt 6 is an aberration. Inspection of the items in the coding sheet reveals that this item more closely describes information exchange rather than organisational adaptation and so, both on grounds of content validity and statistical validity, Tadapt 6 is removed.

Power Dependence loads across two factors in the EFA. Close inspection of the items reveals that Power 1, Power 5 and Power 6, which load on a separate factor, are phrased somewhat differently from the other items in the measure. This effectively splits the measure in two. Of the three items

listed above Power 5 and Power 6 load strongly (.892 and .913 respectively) while Power 1 has a smaller magnitude (.512) and presents evidence of cross loading. The content validity of these items indicates concurrence between Power 5 and Power 6 but not with Power 1. Thus this three item factor appears inappropriate to take forward.

The remaining factor containing Power 2, Power 3, and Power 4 has no obvious cross loading and demonstrates consistent content validity. Importantly these three items align more closely with the definition of Power Dependence. This factor is selected and taken forward into the next stage of the analysis.

Asset Specificity loads neatly into a single factor with magnitudes ranging from .785 to .863. There is no obvious indication of cross loading. An inspection of the items in the coding sheet does however indicate a potential problem with the items Taspec 1 and Taspec 4 which are nearly identical. Two options are available, one is to drop one of the questions, and the second option is to aggregate them. Since there is no particular reason to drop one question over the other, and in order to maintain variance in the analysis the decision is taken to aggregate these items, creating a new item, Taspec 13.

The new specification for the constructs is as follows:

Adaptation:

Tadapt 1
Tadapt 2
Tadapt 3
Tadapt 4
Tadapt 5

Power Dependence:

    Power 2
    Power 3
    Power 4

Asset Specificity:

    Taspec 2
    Taspec 4
    Taspec 13

Communalities for this factor model are each above .5 and total explained variance increases to 67.94%.

6.2.4 Relational Coordination and Performance

Relational Coordination together with Performance is proposed as a five factor structure. The initial exploratory factor analysis gives five factors with Eigenvalues above one. Significant cross loading is evident across some of these factors however and this is described here. Goodwill Trust (gt) loads consistently into the first factor. Of concern however is that project performance (perf) also loads onto the same factor. Perf also cross loads into another factor but with a lower magnitude, ranging from .400 to .511. The magnitude for the perf items in the first factor ranges from .726 to .818. The implication of this is that goodwill trust and project performance are measuring the same latent construct. The key concern here is that content validity should be established for these constructs. On inspection goodwill trust demonstrates good content validity. Project performance however, while superficially measuring a different construct, has clear similarities with the goodwill trust measures. Remedial action is focussed on the removal of one of these scales. Since goodwill trust has the

better content validity, and reflects a latent construct of more central importance to the theoretical contribution of the study, and since a universal measure of performance is still achievable using the remaining performance construct, the decision is taken to remove the project performance measure from the model. Goodwill trust items gt 2, gt 3, gt 5, and gt 7 cross load onto another factor and do not share content validity with the remaining items. These items are removed to establish one-dimensionality.

Competence trust (ct) has broad consistence in one factor, however items ct 1, ct 3, and ct 6 demonstrate significant cross loading. Items ct 1 and ct 3 appear to measure trust at a different level (interorganisational) and so are removed on the grounds that they demonstrate insufficient face validity. Item ct 6 is styled differently from each of the other items in the scale and does not consistently reflect competence trust as defined here.

Technical Exchange (exch) offers a consistent loading on one factor with the exception of one item, exch 6 which is phrased differently to the remaining items in the measure and perhaps does not accurately reflect technical exchange and so it removed.

Finally the remaining performance measure, perceived performance satisfaction (percv) loaded well onto a single factor with the limited exception of items percv 1, and percv 2. These items demonstrate significant cross loading and a lower magnitude than the remaining items in the measure. While these items could be argued to measure specific performance elements, they are phrased differently from the remaining items which are more adequately aligned with overall performance

satisfaction. If there had been three items cross loading in this way it would have been possible to investigate the introduction of another construct, thus reintroducing a second dimension to the overall performance construct. However with only two items this was not appropriate and these items were removed.

Relational Coordination is thus re specified as

Goodwill Trust

gt 1
gt 4
gt 6
gt 8

Competence Trust

ct 2
ct 4
ct 5

Exchange

exch 1
exch 2
exch 3
exch 4
exch 5

Performance is re-specified as

Performance

percv 3
percv 4
percv 5
percv 6
percv 7

The new variance explained across these four factors is 69.42% and the communalities are each greater than .5.

6.3 Confirmatory Factor Analysis

6.3.1 Confirmatory Factor Analysis

Confirmatory factor analysis (CFA) checks the 'degree to which the data meet the expected structure' by assessing how well the measures represent the constructs with which they are conceptually linked (Hair *et al* 2006). Thus the benefits of the re-specification process described above in section 6.2 include increasing the likelihood of a achieving a satisfactory fit between the actual model specified and a hypothetical model of perfect fit. The measurement model is assessed through confirmatory factor analysis in two parts with the construct measures outlined above in section 6.2.

6.3.2 Confirmatory Factor Analysis – Part One

The first CFA comprises complementarity, contractual coordination, and procedural dependence.

Construct	Lower-order contruct	Measure	Standardised Loadings	Composite reliability	Cronbach's alpha	r^2
(Complementarity)	Complementarity	sim1	.47	.91	.71	64.35
		sim 2	.71			
		sim 3	.51			
Contractual Coordination	Formality	form 1	.93	.98	.92	69.40
		form 2	.94			
		form 3	.81			
	Safeguards	safe 1	.55	.93	.81	
		safe 2	.45			
		safe 4	.53			
		safe 5	.96			
		safe 5	.87			
Procedural Dependence	Adaptation	Tadapt 1	.87	.86	.88	67.94
		Tadapt 2	.91			
		Tadapt 3	.70			
		Tadapt 4	.76			
		Tadapt 5	.61			
	Power Dependence	power 2	.56	.81	.61	
		power 3	.66			
		power 4	.55			
	Asset Specificity	Taspec 2	.93	.97	.84	
		Taspec 4	.84			
		Taspec13	.68			

Notes: (lower order construct)

Table 6.3.2 Confirmatory Factor Analysis Part One – Factor Results

Table 6.3.1 above shows the factor results for part one of the factor analyses. The results are consistently good with composite reliability values ranging from .81 to .98 and total variance explained (r^2) by the construct ranging from 64.35 to 69.40. Results for Cronbach's alpha show

good reliability (>.70 (Nunnally 1978)) with one exception, Power Dependence which has a value of .61. This value falls in the .60 to .70 range which Hair *et al* 2006 identify as the 'lower end of acceptability'. Low values such as these may be explained to some extent by the low number of indicators in the measure which in this case is three indicators, representing the lower cut-off for inclusion. However other measures including Formality and Asset Specificity also have three items per measure in this study and so further assurance of the suitability of the Power Dependence measure is sought. Hair *et al* (2006) continue in their commentary on this matter and state that values in this range (.60 to .70) are acceptable where 'other indicators of a model's construct validity are good'. In this instance the Power Dependence measure has good content validity and the CFA model validity is shown to be good in the following section. For these reasons, and additionally, considering the contribution of this measure to the latent construct of Procedural Dependence the measure is included and carried forward to the structural model analysis.

The incremental fit indices for the CFA model indicate a good overall fit with $\chi^2 = 331.763$, $df = 204$, $\rho = .000$. Fit indices for the model are in excess of the desired .90; an IFI value of .94, a Tucker Lewis Index (TLI) of .94, and a Comparative Fit Index (CFI) of .94. Additionally the absolute fit index, the Root Mean Squared Error of Approximation index (RMSEA), also indicates a good fit with a value of .056 which falls in the desired range between .04 and .08 (Hair *et al* 2006).

These fit indices indicate that the data fit the model well. This can be interpreted as support for the theoretically proposed factor structure and

indicates that the measures are good indicators of the constructs to which they relate.

6.3.3 Confirmatory Factor Analysis – Part Two

The second CFA comprises the remaining part of the conceptual model, relational coordination and performance.

Construct	Lower-order contruct	Measure	Standardised Loadings	Composite reliability	Cronbach's alpha	r^2
Relational Coordination	Goodwill Trust	gt1	.75	.96	.84	66.34
		gt 4	.88			
		gt 6	.73			
		gt 8	.77			
	Competence Trust	ct 2	.70	.94	.79	
		ct 4	.71			
		ct 5	.89			
	Exchg	exch 1	.73	.96	.81	
		exch 2	.83			
		exch 3	.63			
		exch 4	.71			
		exch 5	.54			
(Performance)	Performance	percv 3	.80	.98	.90	74.20
		percv 4	.87			
		percv 5	.84			
		percv 6	.91			
		percv 7	.73			

Notes: (lower order construct)

Table 6.3.3 Confirmatory Factor Analysis Part Two – Factor Results

The lower order constructs in this second CFA each indicates good reliability with the composite reliability ranging from .94 to .98, and the Cronbach's alpha values ranging from .79 to .90 where the lower limit for values in the 'good' range is .70 (Nunnally 1978). Additionally total explained variance is 64.34% for Relational coordination, and 74.20% for

Performance, indicating that the majority of variance is explained by items in the measure.

The fit of the model is satisfactory with $\chi^2 = 256.384$, $df = 117$, $\rho = .000$. Incremental fit statistics also indicate a good model fit with an IFI value of .93, a TFI value of .92, and a CFI value of .93, all above the .90 threshold. The absolute fit index indicates a good fit with a RMSEA value of .077, falling inside the desired range of .04 to .08.

Overall this CFA represents a satisfactory alignment between the measures and the constructs that they purport to identify and this is reflected in the reliability and fit statistics.

6.4 Reliability and Validity Assessment

6.4.1 Reliability and Common Method Bias

Reliability obtained through the data collection and administration procedure is addressed in chapter five (5.3.2). Construct reliability is assessed through the test-retest procedure, assessment of internal consistency of the measures, and implied through the absence of common method bias.

6.4.1.1 Test-retest

Test-retest is assessed through the administration of follow-up questionnaires. The follow-up questionnaires are a shortened version of the original questionnaire and include indicator questions, i.e. select questions which represent the important constructs and allow an interpretation that common method bias is absent across the questionnaire more generally

rather than simply absent from a limited section. This process is outlined in detail in chapter five (5.3.2.2.1). A comparison of the second-wave of twenty three questionnaires, with the results from the original questionnaires shows that they are highly correlated and are significant at p = .01 indicating an absence of common method bias.

6.4.1.2 Assessment of internal consistency

Assessment of internal consistency is achieved through the Cronbach's alpha statistic and is outlined in the CFA results in section 6.3 above. All measures with the single exception of the Power Dependence measure attained a Cronbach's alpha value of >.70 indicating adequate internal consistency for each measure. The exception, Power Dependence, falls in what is regarded by Hair *et al* (2006) as the 'lower end of acceptability' and is in need of additional support through the demonstration of validity if it is to be included. Validity is addressed in the next section and is found to be satisfactory and so provides a justification, along side broader considerations including the importance of this construct to the central latent construct of the study, for inclusion of this measure.

6.4.1.3 Common Method Bias

A discussion of Common Method Bias is contained in chapter five (5.3.3.5) and is tested for here using the Harman Single Factor test (Slater and Atuahene-Gima 2004). This process involves placing all measures into a single un-rotated factor analysis. An absence of common method bias is indicated where many factors are identified and the first factor accounts for

less than 20% of variance. In the case of the present study 32 factors are identified and the first factor accounts for 19.84% of variance satisfying the criteria for establishing an absence of common method bias.

6.4.2 Validity Assessment

Validity is addressed in general terms in chapter five (5.3.3) and a specific account of the assessment of content validity using expert judges is reported. In this section validity of the model is tested through the assessment of convergent and discriminant validity.

6.4.2.1 Convergent validity

Convergent validity is demonstrated by the factor loadings. Each item in a factor loads significantly (implied by loadings of .4 and above) and above the minimum magnitude of .5 (Hair *et al* 2006). Of a total of 39 items, 34 had values above the ideal value of .70, while 5 achieved the minimum of .50 or above. While the removal of items below the .70 level would have resulted in stronger convergent validity, unintended consequences including the reduction of the number of items in a measure to below three, and the reduction of internal consistency of some measures would have out-weighed any advantage.

Validity is not an absolute concept but is evidenced collectively by a series of indicators. In keeping with this notion a second indicator of convergent is the establishment of internal consistency, i.e. a Cronbach's alpha value of .70 or above for each measure which is established in section 6.4.1.2 above and implies convergent validity (Nunally 1978, Ping 2004). A final

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indicator employed here to establish implied convergent validity is an average variance extracted value above .50 (Fornell and Larcker 1981). This indicates that more than half of the variance attributed to the item is shared with other items in the measure. These results can be seen in table 6.4.2 below.

6.4.2.2 Discriminant Validity

Discriminant validity is defined as the degree to which 'two conceptually similar concepts are distinct' (Hair *et al* 2006). Evidence for discriminant validity is established where the average variance extracted (AVE) is shown to be greater than the squared correlations between constructs (Fornell and Larcker 1999). This is examined in this study and the AVE is shown to be greater than each relevant squared correlation. The results are summarised below in table 6.4.2.

	complmt	form	safe	adpt	powdep	aspec	Gtrust	ctrust	exchg	perf
complmt	.876									
Form	.010	.967								
Safe	.057	.482	.868							
Adpt	.004	.007	.008	.861						
powdep	.000	.003	.007	.029	.769					
aspec	.005	.006	.001	.094	.088	.950				
gtrust	.003	.002	.009	.004	.000	.222	.919			
ctrust	.014	.029	.001	.000	.001	.063	.392	.913		
exchg	.006	.000	.004	.024	.010	.208	.381	.210	.909	
Perf	.012	.007	.001	.004	.003	.185	.608	.356	.233	.950

Table 6.4.2 Average Variance Extracted and Squared Correlations

6.5 Conclusion

This chapter has assessed the relationship between the measures and their respective constructs based on step one of Anderson and Gerbing's (1988) two-step approach to structural equation modelling. The factor structure was first assessed using EFA. Areas of mis-specification were identified through the evidence of cross loading among items. The results indicated likely problem items which were then assessed on their merit as conceptual indicators of the construct described. This important process allows assessment of the items, and the measures, on theoretical, rather than data led grounds. This subtle distinction is particularly important to apply to the analysis is a theoretical rather than data-led solution is to be arrived at. The latter represents a theoretically unsubstantiated outcome which makes a poor, or erroneous contribution (Byrne 2001).

The assessment above found broad agreement with the factor analysis derived problem items. The measures were thus re-specified through the removal of items and the factor analysis rerun. Satisfactory factor solutions were arrived at for each of the measures and these measures were then carried forward for CFA.

The CFA assessed the relationship between the measures and their respective constructs. Two CFAs were conducted by dividing the conceptual model in two. This over arching approach to CFA assesses the relationship between measures and the related constructs for more than one construct at a time with out the need for repetitive testing at the individual construct level. The implication of a good model fit at the multi-construct model level is that fit is also good at the individual construct level. Internal

consistency and variance explained were found to be satisfactory for each measure. The fit statistics for both models were also satisfactory confirming that the measure-construct arrangement theoretically proposed was supported by the data.

Reliability and validity were checked at this stage. Reliability is established by the test-retest technique in which no significant difference is found between the original questionnaire responses and the *post hoc* questionnaires. Additionally internal consistency (Cronbach's alpha) were above .70 for each measure except Power Dependence. A Cronbach's alpha value of .61 was accepted as acceptable both by reference to Hair *et al* (2006) and because other validity indicators suggested that this measure was not problematic.

Convergent validity is established in this chapter through the satisfactory values for internal consistency, through significant factor loadings and because the average variance extracted is greater than .50. Discriminant validity meanwhile is established through the Fornell and Larcker (1999) approach which tests for AVE values greater than the squared correlations between constructs.

The outcome of the analysis in this chapter has established satisfactorily that the (re-specified) measures are sound, and they reliably and validly represent the constructs to which they relate. The implication of this outcome is that the latent constructs can be taken forward for assessment in the structural model.

CHAPTER SEVEN

Structural Model

Chapter Seven: Structural Model

Chapter Contents

7.1 Introduction

Structural equation modelling (SEM) is a confirmatory approach which is used here to assess the conceptual model postulated in chapter three. One of the key strengths of SEM is the requirement for theory driven proposed relationships (Tabachnicck and Fidell 2007). These relationships must first be postulated before they can be confirmed using the technique. In particular SEM will not propose causality (Hair *et al* 2006). The software used here (AMOS 6.0) will assess the confirmatory factor models and the structural model simultaneously and will provide output for solutions, whether theoretically substantiated or not. The onus is therefore on the researcher to implement a systematic approach which avoids the potential pitfalls of such a user friendly approach. Since the technique will in principle also facilitate exploratory work such as testing different models after a model has been estimated (Tabachnick and Fidell 2007) one of these pitfalls can include drifting a-theoretically towards an exploratory (and data-led) solution. As an exploratory approach this would be acceptable if appropriate precautions, for example assessment of Type 1 error inflation, are taken. The outcome of succumbing to such pitfalls includes the risk exists of generating an invalid solution.

The two-step SEM approach represents a systematic and procedural solution to avoiding these pitfalls and has been employed here. The early stage of step one, exploratory factor analysis, is clearly an exploratory approach which then becomes confirmatory in the subsequent confirmatory factor analyses and structural modelling stages. This process can be described as largely confirmatory and represents a practical solution to the

problem that initially 'specified measurement models almost invariably fail to provide acceptable fit' (Anderson and Gerbing 1988).

Chapter six completes step-one with the confirmation of the measurement model factor structures demonstrating convergent and discriminant validity, and providing an essential platform for structural assessment in step two of the process. The assessment of the structural model assesses the theoretically proposed relationship between the indicator constructs and the latent constructs with which they are associated, and the proposed relationships between the latent variables, or nomological validity (Anderson and Gerbing 1988, Hair *et al* 2006).

7.2 Operationalisation of the Structural Model

The structural model is shown in figure 7.2 below. The model comprises five operationalised constructs highlighted in the diagram with grey shading. Two of these constructs are lower order (complementarity and performance). The remaining three are higher-order latent constructs. Contractual coordination is operationalised using the measured constructs formality and safeguards. Procedural dependence is operationalised using the measured constructs of adaptation, power dependence, and asset specific investments. Relational coordination is operationalised using the measured constructs of goodwill trust, competence trust, and exchange. The hypothesised relationships between constructs are indicated on the diagram.
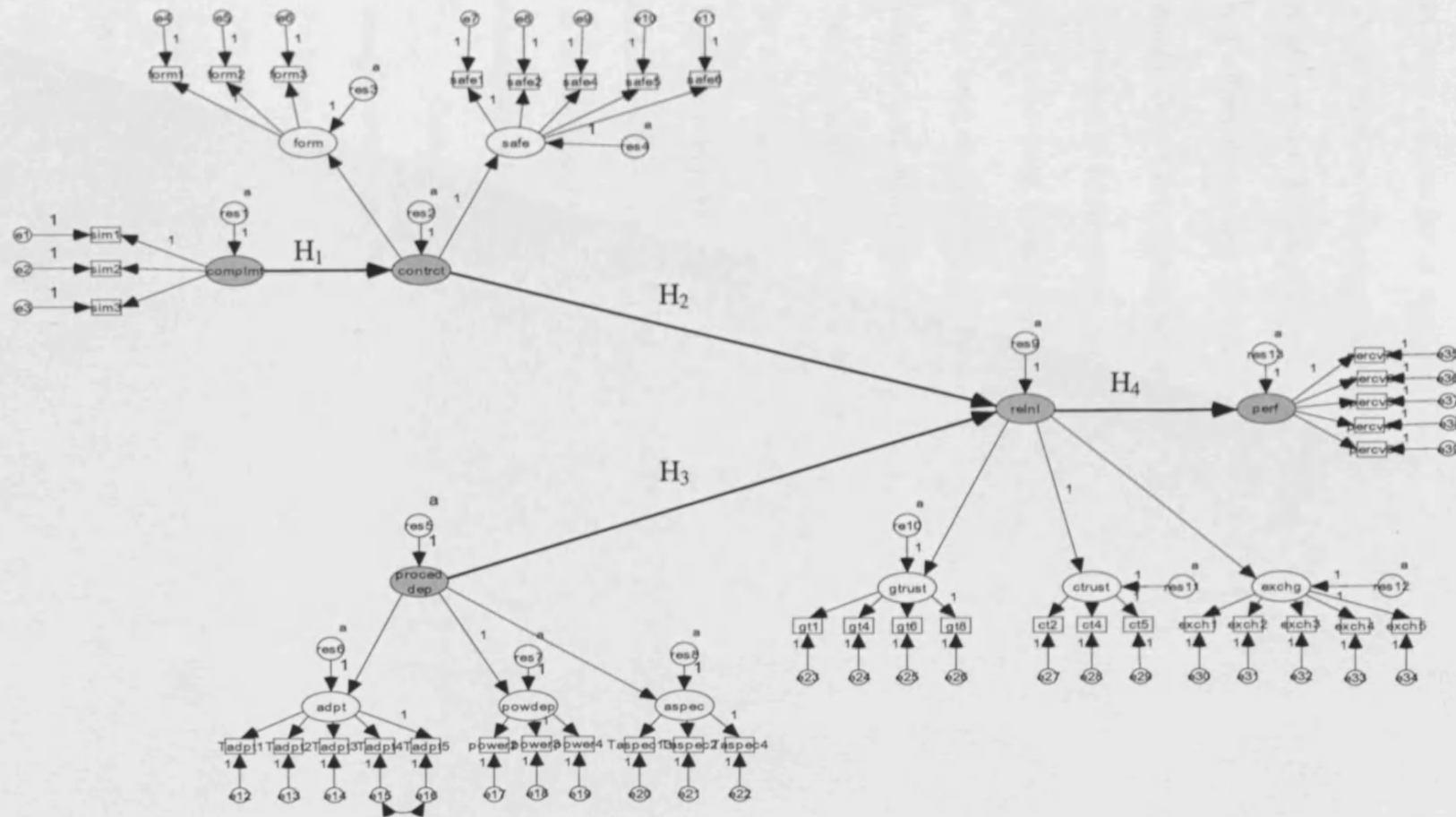
Figure 7.2 Structural Model of Interorganisational Alliance Coordination Mechanisms

7.3 Model Fit

Two assessment outcomes are derived from the structural model, model fit indices, and results of the hypothesised relationships between constructs. These may be considered as exclusive outcomes since a good fit for the model is not the same as a strong relationship between variables. AMOS 6.0 offers thirty two fit statistics and so some selection is necessary to establish a reasonable range of statistics to report, and in order to avoid a kitchen sink approach to reporting model fit. Precedent among pertinent empirical work is taken as a guide and five fit indices are selected which take into account the various features of the structural model including sample size (Comparative Fit Index), model complexity (Tucker Lewis Index), model fit relative to a null model (Incremental Fit Index), degrees of freedom (Root Mean Square Error of Approximation) and difference between actual and expected frequencies (Chi square). This selection of fit indices is both representative of the range of model fit considerations, and in line with recent empirical precedent (Jap and Anderson 2003; Luo 2002; McAllister 1995; Xu *et al* 2006; Goerzen 2007).

Good fit has conventionally been indicated by values for the comparative fit index (CFI), Tucker Lewis Index (TLI), and Incremental Fit Index (IFI) above .90 (Byrne 2001) and in some cases for the CFI, > .95 (Hu and Bentler 1999). The Root Mean Square Error of Approximation (RMSEA) is regarded as good at values < .05, and acceptable at values between .05 and .08 (Byrne 2001). Hu and Bentler (1999) take a slightly higher upper limit of .06 for the range of values which might be considered to represent a good fit. On balance and taking a conservative judgement the

present model is regarded here as demonstrating a satisfactory fit, χ^2 = 1136, df = 701, ρ = .000, CFI .90, TLI .90, IFI .90, and a RMSEA value of .055.

The notion that such an absolute cut off can exist for the assessment of fit for the structural model is controversial. Bollen (1989) refers to the .90 commonly applied as 'arbitrary' and suggests that lower values for fit indices may be acceptable where the model is relatively better than previous attempts, and so makes a contribution through the improvement of existing models. The current model is novel and so would qualify well on this reckoning. Others argue for the acceptability of lower fit index values where the model is less complex. Morgan and Hunt (1994) settle for a CFI of .89 rather than choosing a CFI of .96 where the latter lacks parsimony. Thus the threshold levels for model fit are taken in the current study as well established guides and no sacrifice of the model representativeness is made in order to achieve the satisfactory fit.

7.4 Hypotheses Tests

The second assessment of the structural model outcome is the hypothesised relationships between constructs. The first of these hypotheses H_1, *'organisational complementarity is positively related to the employment of contractual coordination'* has a standardised estimate of .23 and is significant at the 1% level. Support is found for this relationship indicating that organisational complementarity is an antecedent condition in order that contractual coordination is established.

The second hypothesis H_2, *·contractual coordination is positively related to relational coordination'* has an insignificant standardised estimate of .04 and a critical ratio of .537 indicating an insignificant covariance between the two constructs. This hypothesis is not supported and the relationship indicated in the literature between contractual coordination and relational coordination is found not to hold for this dataset and so by implication for non-equity, collaborative alliances.

The third hypothesis H_3, *·procedural dependence is positively related to relational coordination'* has a standardised estimate of .53, significant at the 1% level. This hypothesis is supported and a positive relationship is thus established between the new construct of procedural dependence and relational coordination.

The fourth hypothesis H_4, *·there is a positive relationship between relational coordination and performance'* has a standardised estimate of .84 and is significant at the 1% level. This hypothesis is supported and is in line with the consistent findings in the extant empirical work of a positive

relationship between relational coordination and alliance performance. The findings are summarised in table 7.4 below.

Path	Hypothesis	Standardised Estimate	t	Supported
Complementarity – Contractual Coordination	H₁ +	.23**	2.401	Yes
Contractual Coordination – Relational Coordination	H₂ +	.04	.537	No
Procedural Dependence – Relational Coordination	H₃ +	.53 **	5.519	Yes
Relational Coordination – Alliance Performance	H₄ +	.84**	9.262	Yes

* ρ < .01   ** ρ < .001

Table 7.4 Hypotheses Results

7.5 Conclusion

This chapter has assessed the nomological validity of the structural model and found the model to be valid. A group of five fit indices have been applied and represent both the specific features of the structural model (sample size, model complexity, fit relative to a null model, degrees of freedom and Chi square difference), and the approach taken by pertinent antecedent empirical work. The results of the fit assessment demonstrate a satisfactory model fit.

The theoretically proposed relationships between constructs have also been tested and support found for hypotheses one, three, and four. Hypothesis two is not supported and highlights an unexpected outcome

which has not been indicated by existing theory. The support for hypothesis three represents the establishment of a relationship not previously identified between the novel construct of procedural dependence, and relational coordination.

The implications for the study of the outcomes of this chapter are two-fold. Firstly the second step of the Anderson and Gerbing (1988) two-step approach to structural equation modelling has been fulfilled and the model found to demonstrate validity. Secondly, results have been achieved for the hypotheses. The theoretical implications of the hypotheses results are explored in the following chapter.

CHAPTER EIGHT

Conclusions, Limitations, and

Implications

Chapter Eight: Conclusion, Limitations, and Implications

Chapter Contents

8.1 Conclusion

8.1.1 The purpose of the thesis

A stated aim of this research has been to further the understanding of the function of interorganisational alliance coordination mechanisms, and to assess the validity of the transaction costs premise upon which much of interorganisational research is founded. This generic aim requires that an insightful treatment be undertaken of the alliance hierarchies literature which derives largely from seminal works of the 1970s and 1980s (Harrigan 1988; Porter 1980; Williamson 1975). Over time, technology, society, and business practises have evolved and the applicability of the dominant perspectives referred to above has become less certain. The rationale for this thesis is the belief of the author, and the indication of extant empirical work that a mismatch has developed in this area between the principals and methods used to assess interorganisational alliances and the nature of those alliances.

It would be naïve and erroneous to state that the field of interorganisational research has not addressed these developments. Indeed the quality of research on interorganisational alliances is such that the field is quite crowded. Many of the key issues have been addressed at length, such as the role of trust (Morgan and Hunt 1994), the mechanisms of control (Heide and Miner 1992), and the costs of control in cooperative alliances (White and Lui 2005). Vargo and Lusch (2004) herald the advent of a new era in the study of interorganisational alliances with their outline of a 'new dominant logic' in alliance research. This insightful work describes a paradigmatic shift in the focus of interorganisational alliance

research from a hierarchical transaction costs perspective, to a cooperative approach in which organisational boundaries become increasingly amorphous as the focus shifts to the efficacy of exchange rather than issues of control. In providing this perspective Vargo and Lusch (2004) draw a limit to the horizon of much that is contained within contemporary research in the field, and simultaneously present a seminal reference point for new research.

The agenda of this thesis has therefore been to make an early contribution to this newly defined field. The principal contributions of the study, and the manor in which this aim has been fulfilled is through the clarification of the new interorganisational alliance domain and the theoretical foundations underpinning it, the analysis and interpretation of business activity taking place in this arena, the typological classification of coordinating mechanisms operating within this context, and an original contribution to the understanding of these mechanisms through the introduction of the procedural dependence interorganisational alliance coordinating construct.

8.1.2 Empirical Examination of the Conceptual Model: Hypotheses Testing

At the centre of the thesis is a set of conceptualised constructs and associated relationships which, it is postulated, are key components in the coordination of interorganisational alliances. The definitions and factor arrangements for these constructs are derived from a range of contemporary empirical work, the culmination of a broad spectrum of empirical investigation in the large field of literature that represents

interorganisational alliances. Additionally the relationship between these constructs, together with constructs representing antecedent and outcome conditions is similarly conceptualised in the model in chapter three. This synopsis represents both a broad agenda for research and the focus of the current study. Following extensive assessment of the underlying accuracy of the model; assumptions for the data (chapter five), and reliability and validity assessment of the measurement model (chapter six), the hypothesised relationships between constructs are examined in chapter seven. The implications of these results are discussed here.

Add a comment here on model fit – satisfactory..

8.1.2.1 Hypothesis One

Organisational complementarity is positively related to the employment of contractual coordination

Contractual coordination is a typical component of an alliance relationship. The contract represents the initial structure about which the role of parties within the alliance can be defined (Cannon *et al* 2000; Sobrero and Schrader 1998). The transaction cost rationale for contractual coordination is the limitation of the potential for opportunism among alliance partners especially under conditions of asymmetric asset specific commitment and uncertainty (Williamson 1985). The context for the current study is characterised by non-equity conditions and a low level of asymmetry and so an alternative rationale is postulated.

The absence of transaction specific equity commitments reduces the attractiveness of the alliance for prospective partners and so some other

explanation must be found to justify the formation of an alliance, and a contract. These antecedent conditions are reasoned here to centre on the reckoning by partners of the suitability of their prospective counterparts. Relational explanations abound for this process however contractual coordination is transaction, rather than relational, in theoretical approach and so an explanation consummate with this perspective is sought.

The explanation proposed in chapter three is that under non-equity conditions the formation of a contractual relationship must be conditional on some assessment of suitability of the prospective partner. From a managerial point of view this may be reduced to price and the associated profitability margin. However from an alliance perspective suitability may be measured in terms more closely associated with the likelihood that the partners will be able to work effectively with one another for the duration of the alliance, or project.

Similarity between organisations signals implicit desirable characteristics in a partner organisation. For example a similar size of organisation may signal a similar level of professionalism in the managerial approach, and by association may signal a comparable level of competence. Collectively these types of similarity represent the construct of complimentarity as defined here in chapter three. While these signals do not constitute tests of the characteristics there is likely to be an alignment with organisational experience of previous alliance partnerships. Furthermore an element of risk may be perceived in forming a binding contractual relationship with an organisation of dissimilar size or managerial expertise. It is likely that the propensity to fail to fulfil

obligations may differ among partners exhibiting such characteristic differences as those outlined above. Thus, a disincentive can exist to create a binding relationship (contract) between alliance partners where dissimilarity exists. This last point may also be interpreted as a reason to increase the level of formality; that is to say increase contractual complexity under conditions of increased uncertainty however, this only carries where the decision to create a contract has been made. The rationale is applied here to the antecedent context.

The hypothesis that *organisational complementarity is positively related to the employment of contractual coordination* is supported in the structural analysis and so we can conclude that complimentarity is an effective antecedent condition to the formation of contractual coordination in the context of non-equity interorganisational alliances.

8.1.2.2 Hypothesis Two

Contractual coordination is positively related to relational coordination

The terms of a contract cannot be endlessly explicit and so this condition of bounded rationality imposes a limit to the efficacy of the contractual coordination approach. It is held more broadly in the literature on interorganisational alliances that 'something more than formal contracts' must be at work in order to explain positive alliance performance (Poppo and Zenger 2002). Relational coordination is conventionally regarded as the counter part to contractual coordination and is described extensively here in chapters two and three. Contributions to the explanation of the nature of the interaction of contractual and relational coordination abound,

and a further contribution is made here with specific reference to the contextual conditions within which these mechanisms operate.

Key areas of explanation centre on the substitute/compliment debate with much attention given to the role of relational coordination as a substitute for contractual coordination (Bradach and Eccles 1989; Dyer and Singh 1998; Granovetter 1985; Uzzi 1997). More recent attention to the potential for both of these coordination types to act in concert has gained credibility (Lui and Ngo 2004; Poppo and Zenger 2002). Of particular importance to the current study is the non-equity horizontal alliances at the centre of these latter studies. The middle ground argument for plural forms of coordination in which contractual and relational coordination function simultaneously to reduce transaction costs also gains much attention in the literature (Cannon *et al* 2000; Heide 2003).

The present study is particularly informed by the horizontal non-equity alliance context. The starting position is that the contractual and relational coordination function in a complementary manor. However posited here is a temporal ordering of the coordination mechanisms. Contractual governance is given as antecedent to relational coordination. Principal components to this rationale are the development of relational characteristics, including goodwill trust (Lui and Ngo 2004), embeddedness (Uzzi 1997), and information exchange (Poppo and Zenger 2002). Similarly evidence is presented to support a nomological association between contractual coordination (safeguards) and trust (Morgan and Hunt 1994). Consequently hypothesis two considers that *contractual coordination is positively related to relational coordination.*

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This hypothesis is not supported in the structural assessment of the model. A likely explanation for this is that contractual coordination and relational coordination operate at different levels. Contractual coordination functions both at the outset of the alliance and as a background factor which is not employed, in an operational sense, on a daily basis. Relational coordination however, as with procedural dependence and alliance performance is evident and employed at an operational level on a day-to-day basis. What can be concluded is that contractual coordination is not positively related to relational coordination.

8.1.2.3 Hypothesis Three

Procedural dependence is positively related to relational coordination

Procedural dependence is an important construct in the present study and represents both an original contribution and one that is central to the study. As with contractual coordination, procedural dependence is posited as antecedent to relational coordination. This is based on the same logic as with contractual coordination, namely the temporal conditions necessary for the development of trust and to a lesser extent information exchange. The dimensions of procedural dependence, adaptation, power dependence, and asset specificity can be employed at the outset however.

Support is found for hypothesis three, *procedural dependence is positively related to relational coordination* indicating that procedural dependence functions at an operational level providing the foundation for relational dimensions, in particular goodwill and competence trust. Goodwill trust is established by the visible signalling by alliance partners

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of the completion of their obligations. The notion of operational level activity is illustrated here through the day-to-day nature of these goodwill-evoking actions. Competence trust is similarly signalled by the satisfactory completion of an obligation which is immediately available for the counter part to assess. Information exchange is a voluntary action encouraged by the receipt of positive signals from the procedural dependence dimensions.

8.1.2.4 Hypothesis Four

There is a positive relationship between relational coordination and alliance performance

A key indication of the function of relational coordination in the literature more generally is the link between it and performance. The performance measure used however differs across empirical work. The measure of performance employed in this study is that of perceived alliance performance (Lui and Ngo 2001; Poppo and Zenger 2008; Sarkar *et al* 2001).

Support is found for the positive relationship between relational coordination and perceived alliance performance indicating that perceived alliance performance is the output for the model of associated coordination mechanisms. The high correlation between relational coordination and perceived alliance performance can be attributed to the similarity in measure items. While discriminant validity is established there exists none-the-less between positive sentiments expressed in the measure of perceived performance and those of goodwill trust in particular. This is a natural

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alignment since both constructs occur subsequent to the positive signalling described by the procedural dependence construct.

8.1.3 Outcomes of the Study

8.1.3.1 Description of the interorganisational landscape: a new dominant view

Frequently the literature review will contribute little to a study other than a contextual description of the research setting. Where the literature is well cited and the landscape of empirical work is widely known it is likely that this will suffice (Churchill and Iacobucci 2005). Where the empirical work is less well known or a trend cannot be easily discerned a review of the literature may add particular value to a study. Under these circumstances a more systematic and thorough approach may be taken. Where heterogeneity exists among study findings a meta-analysis may bring insight and reveal commonalities. This 'analysis of analyses' also controls for the qualitative value of individual studies (Glass 1976). A systematic analysis of the literature does not however have to be statistical, and where a synthesis of heterogeneous perspectives is sought a typological assessment may be appropriate.

A contribution of the present study is the typological assessment of the interorganisational alliance literature with specific reference to theoretical foundations. A dichotomy is established with literature derived from neoclassical economic perspectives on the one hand, and those drawing on social exchange theory approaches on the other. Little evidence was found in the literature for a similar synthesis of extant empirical work.

The framework for the present analysis is based upon this typological review of the literature.

8.1.3.2 The conceptualisation of the procedural dependence coordinating mechanism

As already suggested a dichotomy can be identified in the literature with hierarchical approaches to alliance coordination and relational approaches. The mid-ground is characterised by a varied array of empirical and conceptual work. Common purpose is evident among this work in the effort to explain alliance activity albeit from differing perspectives. In particular, whether the approaches act simultaneously as complements, or exclusively as substitutes (Das and Teng 1998; Poppo and Zenger 2002; Uzzi 1996). This is particularly the case for trust and safeguards. Within this study it is regarded that a third form of alliance coordination mechanism can be identified which is distinct from the pure relational approach with trust dimensions. This construct is developed theoretically in chapter three and operationalised in chapter six. This construct, procedural dependence, is representative of the mid-ground between the polar opposite mechanisms of contractual coordination and relational coordination. However this construct described the midground in exclusive terms rather than as a product of an interaction of contractual coordination and relationalism.

Central to the original contribution of this construct is the level at which it operates. Contractual coordination mechanisms and their associated safeguards operate as a remote form of sanction-based

coordination (Williamson 1975). Relational coordination is not remote and influences operational activity at the day-to-day level, however relational coordination does not explain coordination where it occurs under conditions of suboptimal relational capital, for instance in the mid-ground posited above. Procedural dependence therefore explains the coordination of interorganisational alliances at the operational level through behaviours based on moderate asset specific investment (non-equity assets including learning), reciprocal adaptation, and symmetry of power. Thus a cooperative coordination mechanism is described which is theoretically located between established coordination mechanisms, and which drives performance.

8.1.3.3 A contextual interpretation of the role of procedural dependence

The research setting for this study is a non-equity horizontal alliance. The setting was chosen largely because it is representative of the cooperative and non-hierarchical alliance domain which is reasoned to be increasingly commonplace (Achrol 1997). Within this context the procedural dependence construct operates as a series of reciprocal and visible actions by both parties on a regular, day-to-day basis. The stage-based reciprocity acts within the alliance to persuade each partner in the alliance that action is both necessary for, and the result of, comparable efforts made by the other partner.

Procedural dependence is clearly differentiated from contractual coordination in this context. Contractual coordination is based on a series of prescribed actions however the terms of the contract cannot be endlessly

explicit and so the contractual terms operate as a framework for operational action as opposed to the visual and reciprocal based activity which is the case in procedural dependence alliance coordination. Relationalism is crucial for alliance performance but is insufficient for guidance of operational activities. Within this context, relational coordination has a mediating role between procedural dependence and alliance performance.

8.1.3.4 An agenda for future research

The procedural dependence construct introduced by this study functions well in the present analysis and supports the conceptual development. The structural model fit could be improved however and an avenue for further research presents itself in respect of scale development in part to address this. The scales used are representative of dimensions more commonly associated with the less pure forms of coordinating mechanisms of contractual coordination and relationalism. Greater attention could be focussed on the specification of the domain represented by procedural dependence and the existing dimensions improved and/or augmented with new dimensions. This would be particularly advantageous in creating a higher level of generalisability of the construct. While the construct works well in the construction industry setting, other settings may involve reciprocal activity which is less frequent or less visible. Development of new scales should focus on behaviour as the domain rather than contextual conditions in order to achieve this.

8.1.4 Conclusion of the Study

The act of standing on the shoulders of giants is frequently more of a theoretical balancing act than an opportunity to enjoy the view as one tries to make sense of, and synthesise the great work that has gone before. It is therefore a laudable aim, if a somewhat modest one to make an incremental contribution to the field. The field in this study is that of interorganisational alliances and is of itself a synthesis of the fields of neoclassical economics and social exchange theory.

The contribution of neoclassical economics to the field of interorganisational alliances cannot be understated. Indeed, subsequent developments specifically Williamson's (1975) development of the transaction costs approach stack up on top of the neoclassical work and casts a great shadow of influence over the alliance field which is frequently difficult to avoid. Changing environmental influences in marketing research brings into question the appropriateness of the status quo. This study has explored this issue in detail and found inadequacies in transaction costs explanations. Within the preferred contexts of buyer-supplier dyadic interaction transaction costs approaches offer good explanations of activity. In more cooperative contexts such as horizontal non-equity alliances this study finds that other explanations also carry.

The horizontal, cooperative alliance activities are becoming more common place and present a case for new forms of explanation in this area. Hence the study presents a scenario of certain conditions under which transaction costs explanations are subject to relative redundancy. This is attributable at least in part to the temporal divide between the establishment

of the transaction costs approach and the current business environment. The present study is clear in presenting a view of this temporal division in terms of events rather than just time. The information technology revolution has led to a paradigmatic change in the marketing research context.

The response among researchers is to examine alternative factors in the explanation of alliance coordination activity. The long established opposing view to neoclassical economic approaches is the social exchange approach. Much existing empirical work focuses on the relative interaction of exchange-based approaches with neoclassical economics approaches. When these studies are read in aggregate an impression is formed that the social exchange approaches must be proved in relation to transaction costs approaches. This is the effect of the shadow over the field. Neoclassical approaches are rarely challenged on their assumptions in this way.

A fundamental aim of this study has therefore been to challenge the orthodoxy and it has done this by conceptualising coordination mechanisms appropriate to their contextual domain. Whether the outcome of the research has been that neoclassical assumptions have been set entirely to one side in this conceptualisation process is largely a matter of interpretation. The use of procedural dependence construct dimensions such as asset specificity would suggest not. The definition of this asset specificity as non-equity suggests a possibility. What is clear however is that a domain specific conceptualisation has been achieved, assessed, and interpreted in terms of alliance coordination activity.

The incremental extension of the research can be seen therefore as two fold. A move from beneath the shadow of neoclassic dominance to a more objective viewing platform is important as much for the credibility it lends to the study as for the fresh insight it reveals, while the conceptualisation of an operational coordination alliance mechanism, procedural dependence, is an original construct which explains interorganisational alliance performance under cooperative, non-equity conditions.

8.2 Limitations

8.2.1 Practical limitations

Resources available for the research were modest and acted as a filter, restricting the size of the research project. A small stipend was available from the research council which covered stationary costs and some minor incidental expenses. This facilitated the mail survey up to 1200 targeted respondents, a limit set none-the-less for methodological reasons rather than pecuniary ones. A substantial increase on this number would however, have required a new level of expense funding since the time taken to physically print and prepare these surveys and associated mailings was considerable and any increase would have necessitated additional staff. Similarly an attempt to collect dyadic responses would have been resource intensive beyond the possibility of this study.

A less frequently stated study limitation but one which may be common enough to PhD research is the relatively low skills base from which the author starts. The research approach and methods used represent

a significant development of research skills over the course of the research project. The size and scope of the project was therefore limited to something close to its existing configuration for this reason. This is somewhat analogous to Penrose's (1995) assertion that managerial limits exist to the expansion of the firm. And so it is with the expansion of the research project, at PhD level at least.

8.2.2 Theoretical Limits

Limits exist to the generalisability of the study findings to other industries and settings. While confidence is expressed in the representativeness of the sample to the population, the population may not be generalised to other settings with the same setting. An argument for generalizing these causal relationships across different settings and measures, or external validity, can be made where background factors can be identified and included in the study (Calder *et al* 1982). It is considered in this study that such an exhaustive inclusion of background factors is not feasible and so the case for external validity is not made. A contribution of the study is more effectively represented by the contribution to future research directions, in which alternative settings and measures can be explored.

Another inherent limitation of a descriptive study is that it must work with phenomena that are already known about and described at some level. It is implicit therefore that the nature of the antecedent work will be an influencing factor on the study, and where it is poor, may act as a limitation. The quality of the antecedent work is not the only limiting factor

however. An underdeveloped or controversial field of literature will also present limitations for the new study.

Assessment of individual studies is, of course, possible and a field of literature may be reviewed and the findings synthesised. The influence of this work will still guide the new study through an assessment of prior findings, an extension of existing work, or an assessment of dominant perspectives in the field. The current study enjoys the benefit of an extensive literature on, and contiguous to, the field of interorganisational alliances. The heterogeneity of this literature compels the current study to devote considerable effort to the description of the field, founding perspectives, and definition of the specific domain under investigation. This represents a limitation in terms of the focus of the research. However this is turned into an important contribution of the study.

8.2.3 Methodological Limitations

While specific limitations and attendant remedies are detailed in the methodology chapter (chapter 4), some key areas of methodological limitation relate to the overall study design and warrant comment here.

The use of self-report questionnaires carries inherent limitations to the potential response rate (Diamantopoulos *et al* 1991; Hair *et al* 2003). One consequence of this limitation is that many more surveys must be sent out than are needed in terms of sample size. Measures can and have been taken in this study to maximise response rate and an adequate response rate was achieved. Nevertheless this remains a limitation of the approach.

Another limitation to the self-report questionnaire is respondent selection. The survey is sent to a chosen respondent and there is no guarantee that the required respondent will complete the survey. Others may complete the survey on behalf of the respondent. This raises concerns over respondent eligibility to complete the survey. Measures are taken prior to survey implementation to re-check the contact details of potential respondents limit this, and post hoc questions can be included in the survey to rate the respondents' eligibility to answer the questions.

Single respondent format carries limitations of reliability. In the present study the architect was the single respondent and reported on projects which he/she directed. Typically the limitation inherent in using single informants can be overcome by locating second or subsequent informants which facilitates demonstration of reliability. Within the present research setting an obvious choice for the second respondent was the building contractor. However the commercial sensitivity of communicating directly with the corresponding alliance partner would have constituted an onerous task requiring a higher commitment of resources and so was discounted as an option. Second or subsequent respondents in the architects' practice were ruled out during pre-testing since many practices are sole practitioner architect firms, and the great majority of projects had just one key architect in the position of operational manager.

Finally limitations exist to generalisability of the study findings. The conceptualisation and measurement of the key constructs is context specific. It is likely that similar research settings, and in particular those operating in cooperative, non-equity alliances where alliance partners make

contact weekly or more frequently may reproduce similar findings. In this respect the limitation is not to the industry, as is often the case in research, but to the alliance form and characteristics of the research setting which may exist in other industries.

8.3 Implications

8.3.1 Contribution to Theory

As has been outlined above one of the key theoretical contributions is the typological assessment of the literature in the interorganisational alliance field and the particular reference to the theoretical foundations. The synthesis of the extant literature into a dichotomous classification and in particular the description of the commonalities within the literature established the framework both for the current study, and lends itself to subsequent research in the field.

The key conceptual development to come from the study is the procedural dependence construct. Defined as an operational interorganisational alliance coordination mechanism, this construct represents the reciprocal and visual operational activities which characterise interorganisational alliance behaviour on a day-to-day basis. This construct sits along side the much-measured relationalism, and contractual coordination mechanisms. As such it represents an early attempt to measure activity which is neither relational, nor hierarchical, neither market nor hierarchy, but is located at a discrete point between the two.

8.3.2 Contribution to Methodology

An effective, valid and reliable application of a methodological procedure is of itself a contribution to its further assessment and potential development by virtue of the fact that more evidence of its performance exists. Structural equation modelling is increasingly used in marketing research and some concerns exist about its correct use (Henley *et al* 2006). Key to these concerns is the potential for accurate specification of the measurement model. This has impact on the subsequent structural model and the meaningful nature of its findings. A mis-specified model may still be analysed and the results disseminated in bad practice. Consequently the accurate conceptualisation, specification and analysis of a structural equation model, represents a contribution to best practice.

In an extension to the theoretical contribution outlined in 8.3.1 the specification of measurement models where they are erroneously based on transaction cost assumptions could under some circumstances represent a mis-specification of domain. If this were to be the case, and the argument is not developed here, then the theoretical development of the field of alliance literature may also represent a methodological one.

8.3.3 Implications for Future Research

The increasingly common scenario in which cooperative alliance activity takes place requires pertinent research which is matched to the context. The present study contributes to this in two ways. Firstly, the study represents an analysis in itself of this important area. Secondly the typological

assessment of the existing literature establishes a new research domain and so an extension to the field of alliance literature (Vargo and Lusch 2004).

Further research in this area should focus in the first instance on repeating the findings, especially in similar contexts outside of the construction industry to test the limits to generalisability. Secondly new research should be active in defining the research domain with particular reference to the nature of the alliance. These efforts should assist in the clarification of what constitutes a cooperative alliance. Finally more work should be done on the development of measures. The measures used within this study are established and reliable but improvement could be made by making them more specific to the alliance type.

8.3.4 Managerial Implications

The findings are of particular importance to practitioners in the construction industry for two reasons. Firstly, the extant literature suggests the performance of co-marketing alliances is reliant on coordination exclusively by contract and relational approaches, while in reality a third element of coordination (procedural dependence) may play an important role. Secondly, both contractual and relational coordination approaches have limitations. Contractual coordination commonly functions as a back-up system, for use as a last resort where effective communication has faltered and litigation is viewed as the only alternative. On the other hand, while relational coordination is presented in the literature as the pro-active alternative to contractual coordination, in reality the relational dynamic between architects and building contractors is inherently limited by the

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different nature of the groups. The pursuit of mutual goodwill between desk-bound theorists and construction-site realists is something of a holy grail and an unlikely foundation for effective alliance coordination. The procedural dependence coordinating approach reduces the need for effective interpersonal communication since it relies on a series of incremental, reciprocated, and visible commitments where dependence is established by action rather than intent. This would act as a strong complement to partially effective forms of the other coordination mechanisms.

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APPENDIX

Appendix Contents

CARDIFF BUSINESS SCHOOL
Mark Toon BSc MSc MPhil CMI IFST
Director Cardiff Business School Survey
Cardiff Business School Cardiff University Aberconway Building
Colum Drive Cardiff CF10 3EU
T: 029 2087 4000 ex. 77243 E: ToonM@cardiff.ac.uk

CARDIFF
UNIVERSITY

PRIFYSGOL
CAERDYĐ

Russell Durrell
Director
Russell James Durrell,
The Corner House
2 Hambrook Street
Cheltenham
Gloucestershire
GL52 6LN

Direct Line: 029 20874000 ex. 77243
Mobile: 07784 839035
Email: ToonM@Cardiff.ac.uk

22nd March 2006

Dear Russell

Cardiff Business School Survey

A few days from now you will receive a questionnaire in the post with a request to complete and return it to us. The questionnaire is an essential part of an important study about the relationship between architects and building contractors that we are conducting here at Cardiff Business School.

I am writing in advance because we have found that people prefer to be notified before hand that they will be requested to take part in a survey. The project is designed to identify factors that improve the performance of relationships between architects and building contractors and will provide evidence to support improved business practice, and inform industry initiatives.

Thank you in advance for your consideration as it is only with the generous cooperation of business practitioners that our research can be successful.

Yours sincerely,

Mark Toon
CBSS Project Director

P.S. The survey will include an opportunity to receive a complementary summary of the study findings as well as a chance to enter a **prize draw** for a case of select wine, as a token of our thanks.

CARDIFF BUSINESS SCHOOL
Mark Toon BSc MSc MPhil CMI IFST
Director Cardiff Business School Survey
Cardiff Business School Cardiff University Aberconway Building
Colum Drive Cardiff CF10 3EU

T: 029 2087 4000 ex. 77243 E: ToonM@cardiff.ac.uk

CARDIFF UNIVERSITY

PRIFYSGOL CAERDYڱ

Brian Love
Director
Love Architecture,
14 Clerkenwell Green
London
EC1R 0DP

Direct Line:	029 20874000 ex. 77243
Mobile:	07784 839035
Email:	ToonM@Cardiff.ac.uk

24th March 2006

Dear Brian

Cardiff Business School Survey

A few days ago I wrote to you to let you know about an important national survey that is being conducted by a team of academics here at Cardiff Business School. I now enclose the survey concerning the relationship between architects and building contractors for completion and return.

You have been selected as the person best placed in your organisation to comment on your company's relationship with a building contractor with whom you completed a project within the last five years, and for which you were the main contact in your firm.

The questionnaire is anonymous and the answers you provide are treated in confidence. Where results are made available this will be in a summarised form such that individual respondents and answers cannot be identified. The nature of the information you will be asked for is largely attitudinal, no detailed financial information is requested and you are not asked to identify by name any contractors. It is the stated aim of this study to take very seriously issues of commercial confidentiality and ethics in the administration of the survey.

As a token of appreciation we would like to offer you a summary of the study findings along with a chance to win a case of select wines. Please complete your contact details in the space provided at the end of the questionnaire for this purpose. Your contact details will not be used for any other purpose.

If you have any particular queries please feel free to contact me on the direct phone number or email address at the top of the page and I'll be happy to answer your questions.

Thank you in advance for your contribution to this important study.

Yours sincerely,

Mark Toon
CBSS Project Director

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Cardiff Business School Survey
Architect – Building Contractor Relationships

Welcome to the Survey!

The Cardiff Business School Survey is looking in detail at the business relationship between the architect and the building contractor. In order to better understand the effective management of these complex relationships we have devised questions which range from the structure of the contractual arrangements, through to your perceptions and impressions of the relationship. The survey is novel in addressing this range of factors and it is anticipated that your contribution will further understanding in this area. While the immediate benefits of this study will be to academics working in this field, your profession will also benefit in time and as a contributor you will be invited to receive a summary of the overall findings of the study. Please take a moment to read the instructions below before proceeding.

Many thanks in advance.

Mark Toon
CBSS Project Director

Instructions

Please move through the questions rapidly as it is your initial response that we are interested in. However please also take the time to ensure that each question is answered fully as incomplete or missing answers will impact on the findings of the study. Most questions are designed with ease of use in mind, that being the case ticks are generally asked for. The questionnaire should take about ten minutes to complete.

For consistency it is important that you think of a construction project completed in the last five years for which you were the main contact or project manager in your company, then answer all questions with this project in mind. We are only interested in an example of the traditional procurement route where you and the building contractor were individually contracted by the client and not a design and build procurement example. The building contractor should be financially independent of your own firm and where more than one contractor was used you should select the main one.

When you have completed the questionnaire please return it as soon as possible in the pre-paid envelope to the address below:

Mark Toon	**Email:** ToonM@cardiff.ac.uk
CBSS Project Director	**Telephone:** 029 20874000 ex. 77243
Cardiff Business School	**Mobile:** 07784 839035
Freepost CF4117	
Aberconway Building	
Colum Drive	
CARDIFF	
CF1 1YZ	

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ECONOMIC
& SOCIAL
RESEARCH
COUNCIL

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Part A. The Nature of the Companies Involved

1. A little bit about you

- What is your job title?   _____

- How long have you worked for this firm?   _____yrs

- How many years have you worked as an architect in total?   _____yrs

- What is your highest level of education?   _____

- Please indicate the age group to which you belong (please tick)

21-25 ☐   26-30 ☐   31-35 ☐   36-40 ☐   41-45 ☐   46-50 ☐

51-55 ☐   56-60 ☐   61-65 ☐

- Do you have any specific training in business management (please specify)?

        _____

2. A bit about your firm

- What is the approximate turnover of your firm (your office, not group) for all activities?   £_____

- How many architects (full time equivalent) are employed by your firm?   _____

- How many staff in total (full time equivalent) are employed by your firm?   _____

- What was the total duration of the project about which you have chosen to answer?

        First call to completion   _____yrs _____mths

        On site to completion   _____yrs _____mths

- In what year was the project completed?   _____

- Has your firm worked with the building contractor since completing the project? (please tick)   Yes ☐

        No ☐

- If your firm has worked with the building contractor <u>before</u> the project, in which year did the very first project (from first approach rather than from on site work) with this building contractor start?

        _____

- Was the project about which you have chosen to answer an international project? (please tick)   Yes ☐

        No ☐

- Have there been any (other) international projects undertaken by your firm in the last 10 years?

        (please tick)   Yes ☐

        No ☐

- Besides architecture, does your firm undertake any other activities?

        (please tick)   Yes ☐

        No ☐

if yes, please list _____

3. About the context of your business relationship with the building contractor

- Compatibility of your firm and the building contractor

Using ticks please indicate the extent to which you (dis)agree with the following statements:

	Strongly Disagree 1	2	3	4	5	6	Strongly Agree 7
Overall, your firm and the building contractor had dissimilar...							
a) ...resource capabilities	□	□	□	□	□	□	□
b) ...management capabilities	□	□	□	□	□	□	□
c) ...asset size	□	□	□	□	□	□	□

- The similarity of company approaches to the job

Please indicate the extent to which you (dis)agree with the following statements:

	Strongly Disagree 1	2	3	4	5	6	Strongly Agree 7
a) The organizational values and social norms prevalent in the two firms were congruent	□	□	□	□	□	□	□
b) Senior managers from both firms involved in this project had compatible philosophies/approaches to business dealings	□	□	□	□	□	□	□
c) The goals and objectives of both firms were compatible with each other	□	□	□	□	□	□	□
d) Technical capabilities of the two firms were compatible with each other	□	□	□	□	□	□	□
e) The organizational procedures of the two firms were compatible	□	□	□	□	□	□	□
f) Employees of both firms had a comparable level of professional or trade skills	□	□	□	□	□	□	□
g) Resources brought to the project by each firm were very valuable for the other	□	□	□	□	□	□	□

- Prior Relationship

Please tick the number which best indicates the extent to which the following roles represent the building contractor's relationship with your firm prior to the project in question.

	Not at all 1	2	3	4	5	6	Very much so 7
The partner was a...							
a) ...client's building contractor on a previous job	□	□	□	□	□	□	□
b) ...client	□	□	□	□	□	□	□
c) ...fellow member of a client's partnering framework	□	□	□	□	□	□	□

	Not at all						Very much so
	1 ▼	2 ▼	3 ▼	4 ▼	5 ▼	6 ▼	7 ▼
d) ...my counterpart was known to me in a business context other than those detailed above	□	□	□	□	□	□	□
e) ...my counterpart was known to me personally	□	□	□	□	□	□	□
d) ...other (Please specify)	□	□	□	□	□	□	□

- **Size** (please tick)

	Much Smaller						Much Larger
	1 ▼	2 ▼	3 ▼	4 ▼	5 ▼	6 ▼	7 ▼
a) The size of your firm, at the time of the project, compared to the industry average was	□	□	□	□	□	□	□
b) The size of the building contractor at the time of the project compared to the industry average was	□	□	□	□	□	□	□

- **The business climate in our industry**

Please indicate the extent to which you (dis)agree with the following statements:

	Strongly Disagree						Strongly Agree
	1 ▼	2 ▼	3 ▼	4 ▼	5 ▼	6 ▼	7 ▼
a) In our kind of business, clients' product preferences change quite a bit over time	□	□	□	□	□	□	□
b) Our clients tend to look for new products all the time	□	□	□	□	□	□	□
c) We are witnessing demand for our products and services from clients who never bought them before	□	□	□	□	□	□	□
d) New clients tend to have product-related needs that are different from those of our existing clients	□	□	□	□	□	□	□
e) We cater for many of the same clients that we used to in the past	□	□	□	□	□	□	□
f) The market we operate in is complex	□	□	□	□	□	□	□
g) Regulatory changes affecting our client services often occur	□	□	□	□	□	□	□

Part B. About the trust aspects of your firm's relationship with the building contractor

- How you saw them, and how they saw you
Please indicate the extent to which you (dis)agree with the following statements:

	Strongly Disagree						Strongly Agree
	1 ▼	2 ▼	3 ▼	4 ▼	5 ▼	6 ▼	7 ▼
Both the building contractor and our own firm...							
a) ...addressed project issues with professionalism and dedication	□	□	□	□	□	□	□
b) ...due to their track record, had no reason to doubt each other's competence to fulfil their obligations	□	□	□	□	□	□	□
c) ...could rely on each other not to make their part of the agreement more difficult by careless work	□	□	□	□	□	□	□
d) ...were trusted and respected at the time by companies that do not do business with them	□	□	□	□	□	□	□
e) ...were considered to be trustworthy by companies that conducted business with them	□	□	□	□	□	□	□
f) ...if they actually knew more about each other's activities, they would have been concerned and try to monitor them	□	□	□	□	□	□	□

- About your relationship with your main counterpart
This will probably be the construction manager in the building contractor, however, if most of your contact was with another decision maker then use this relationship instead to answer the following questions. Please answer consistently with one contact in mind and indicate the extent to which you (dis)agree with the following statements

	Strongly Disagree						Strongly Agree
	1 ▼	2 ▼	3 ▼	4 ▼	5 ▼	6 ▼	7 ▼
a) My counterpart could always be counted on to act as I expected	□	□	□	□	□	□	□
b) My counterpart is trustworthy	□	□	□	□	□	□	□
c) My counterpart and I could always find appropriate solutions through compromise when conflicts arose	□	□	□	□	□	□	□
d) In a tough time of partnership operations, my counterpart and I relied on and got help from each other	□	□	□	□	□	□	□
e) I always felt confident when my counterpart told me he would do something	□	□	□	□	□	□	□
f) My counterpart and I always shared information and experience about management and even personal life	□	□	□	□	□	□	□

	Strongly Disagree						Strongly Agree
	1 ▼	2 ▼	3 ▼	4 ▼	5 ▼	6 ▼	7 ▼
g) My counterpart always shared or took responsibility for managerial or operational problems even if he should not be obligated for these	☐	☐	☐	☐	☐	☐	☐
h) My counterpart and I engaged in important activities even if these activities were not explicitly documented	☐	☐	☐	☐	☐	☐	☐

- Characteristics of the relationship between you and your counterpart more generally
These questions refer to the relationship that you identified in the question above
Please indicate the extent to which you (dis)agree with the following statements:

	Strongly Disagree						Strongly Agree
	1 ▼	2 ▼	3 ▼	4 ▼	5 ▼	6 ▼	7 ▼
The relationship between you and your counterpart was characterised by...							
a) ...a close, personal interaction	☐	☐	☐	☐	☐	☐	☐
b) ...mutual respect	☐	☐	☐	☐	☐	☐	☐
c) ...mutual trust	☐	☐	☐	☐	☐	☐	☐
d) ...personal friendship	☐	☐	☐	☐	☐	☐	☐
e) ...high reciprocity	☐	☐	☐	☐	☐	☐	☐

- Technical Exchange (during the project)
Please indicate the extent to which you (dis)agree with the following statements:

	Strongly Disagree						Strongly Agree
	1 ▼	2 ▼	3 ▼	4 ▼	5 ▼	6 ▼	7 ▼
a) You had a close relationship with the engineers and technical staff of the building contractor	☐	☐	☐	☐	☐	☐	☐
b) In the development process, direction of communication was bilateral rather than unilateral	☐	☐	☐	☐	☐	☐	☐
c) Frequent contact between us and the building contractor's engineers was important	☐	☐	☐	☐	☐	☐	☐
d) Through informal discussion, the building contractor often communicated important engineering information to us	☐	☐	☐	☐	☐	☐	☐
e) Communication with the building contractor began early in the development process	☐	☐	☐	☐	☐	☐	☐
f) Non-written communications often reduced lead time in the development process	☐	☐	☐	☐	☐	☐	☐

- Changes made by your firm to accommodate the building contractor
Please indicate the extent to which you (dis)agree with the following statements:

	Strongly Disagree 1	2	3	4	5	6	Strongly Agree 7
a) The design itself had been specially tailored	▢	▢	▢	▢	▢	▢	▢
b) There had been changes to your design process	▢	▢	▢	▢	▢	▢	▢
c) There had been changes to the production planning and programming process	▢	▢	▢	▢	▢	▢	▢
d) Changes had been made to financial or contractual terms and conditions after the project had started	▢	▢	▢	▢	▢	▢	▢
e) Changes had been made to your design procedures	▢	▢	▢	▢	▢	▢	▢
f) Your organization structure had been altered	▢	▢	▢	▢	▢	▢	▢
g) There was greater exchange of information with this company than with others	▢	▢	▢	▢	▢	▢	▢
h) Other changes, please specify							

- Changes made by the building contractor to accommodate your firm
Please indicate the extent to which you (dis)agree with the following statements:

	Strongly Disagree 1	2	3	4	5	6	Strongly Agree 7
a) There had been changes to their building process	▢	▢	▢	▢	▢	▢	▢
b) There had been changes to the production planning and programming process	▢	▢	▢	▢	▢	▢	▢
c) Changes had been made to financial or contractual terms and conditions after the project had started	▢	▢	▢	▢	▢	▢	▢
d) Changes had been made to your design procedures	▢	▢	▢	▢	▢	▢	▢
e) Your organization structure had been altered	▢	▢	▢	▢	▢	▢	▢
f) There was greater exchange of information with this company than with others	▢	▢	▢	▢	▢	▢	▢
g) Other changes, (please specify)							

Part C. About the formal arrangements that governed your relationship with the building contractor

- Your level of investment in the relationship
Please indicate the extent to which you (dis)agree with the following statements:

	Strongly Disagree						Strongly Agree
	1 ▼	2 ▼	3 ▼	4 ▼	5 ▼	6 ▼	7 ▼
a) You made significant investments in trained staff dedicated to your relationship with the building contractor	□	□	□	□	□	□	□
b) If you had switched to a competing building contractor at the halfway point, (supposing the contract permitted this) you would have lost a lot of the investment made in this relationship	□	□	□	□	□	□	□
c) You had invested substantially in personnel dedicated to this relationship	□	□	□	□	□	□	□
d) If you decided to stop working with this building contractor at the halfway point, (supposing the contract permitted this) you would be wasting a lot of knowledge regarding their method of operation	□	□	□	□	□	□	□

- The building contractor's level of investment in the relationship
Please indicate the extent to which you (dis)agree with the following statements:

	Strongly Disagree						Strongly Agree
	1 ▼	2 ▼	3 ▼	4 ▼	5 ▼	6 ▼	7 ▼
a) The building contractor made significant investments in trained staff dedicated to its relationship with your firm	□	□	□	□	□	□	□
b) If the building contractor had switched to a competing architect at the halfway point, (supposing the contract permitted this) they would have lost a lot of the investment made in this relationship	□	□	□	□	□	□	□
c) The building contractor had invested substantially in personnel dedicated to this relationship	□	□	□	□	□	□	□
d) If the building contractor decided to stop working with your firm at the halfway point, (supposing the contract permitted this) they would be wasting a lot of knowledge regarding your method of operation	□	□	□	□	□	□	□

- About your contract with the client

Your contract with the client will have shaped your relationship with the building contractor. To allow us to understand this please indicate the extent to which you (dis)agree with the following statements:

	Strongly Disagree						Strongly Agree
	1 ▼	2 ▼	3 ▼	4 ▼	5 ▼	6 ▼	7 ▼
Your contract with the client...							
a) ...was a standard building contract	□	□	□	□	□	□	□
b) ...included the right to audit all relevant records through a quantity surveyor	□	□	□	□	□	□	□
c) ...included the designation of certain information as confidential and subject to proprietary provisions of the contract	□	□	□	□	□	□	□
d) ...included a legal redress clause	□	□	□	□	□	□	□
e) ...detailed standard provisions of the extension of time claim	□	□	□	□	□	□	□
f) ...included loss and expense standard contractual claims	□	□	□	□	□	□	□
g) ...precisely defined the role of your firm and that of the building contractor	□	□	□	□	□	□	□
h) ...precisely defined the responsibilities of your firm and that of the building contractor	□	□	□	□	□	□	□
i) ...precisely stated how both your firm and the building contractor was to perform	□	□	□	□	□	□	□
j) ...precisely stated what would happen in the case of events occurring that were not planned	□	□	□	□	□	□	□

- Mutual Reliance

Please indicate the extent to which you (dis)agree with the following statements:

	Strongly Disagree						Strongly Agree
	1 ▼	2 ▼	3 ▼	4 ▼	5 ▼	6 ▼	7 ▼
a) The building contractor provided vital resources you would have found difficult to obtain elsewhere	□	□	□	□	□	□	□
b) Your firm provided vital resources that the building contractor would have found difficult to obtain elsewhere	□	□	□	□	□	□	□
c) Much of the success or failure of the project can be attributed to the building contractor	□	□	□	□	□	□	□
d) Much of the success or failure of the project can be attributed to your firm	□	□	□	□	□	□	□
e) It would have been difficult to replace the building contractor at the half way point	□	□	□	□	□	□	□
f) The project would have suffered greatly if the building contractor had pulled out at the half way point	□	□	□	□	□	□	□

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Part D. How the project went

- Perceived performance
Please indicate the extent to which you (dis)agree with the following statements:

Both your firm and the building contractor...	Strongly Disagree 1 ▼	2 ▼	3 ▼	4 ▼	5 ▼	6 ▼	Strongly Agree 7 ▼
a) ...overall, were satisfied with this project	□	□	□	□	□	□	□
b) ...considered that the goals of this project were achieved	□	□	□	□	□	□	□
c) ...considered that this project added to the long-term success of your firms	□	□	□	□	□	□	□
d) ...consider that this project was completed to high professional standards	□	□	□	□	□	□	□
e) ...are proud of the project	□	□	□	□	□	□	□
f) ...consider that overall the project was efficiently carried out	□	□	□	□	□	□	□
g) ...consider that the venture was profitable for our firms	□	□	□	□	□	□	□

- Completion Time

a) Was the project completed in the time scheduled? (please tick)   Yes □
                                                                        No □

- Futurity
Please indicate the extent to which you (dis)agree with the following statements:

Considering the way the project went your firm...	Strongly Disagree 1 ▼	2 ▼	3 ▼	4 ▼	5 ▼	6 ▼	Strongly Agree 7 ▼
a) ...would recommend the building contractor (assuming indemnity)	□	□	□	□	□	□	□
b) ...would recommend the construction manager of the building contractor to colleagues (assuming indemnity)	□	□	□	□	□	□	□
c) ...would continue to use the building contractor's services	□	□	□	□	□	□	□
d) ...would use the building contractor's future services	□	□	□	□	□	□	□
e) ...thinks that the building contractor offers high service quality	□	□	□	□	□	□	□
f) ...is very satisfied with the building contractor's services	□	□	□	□	□	□	□

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Part E. Validity Checks

Answering these three questions will help us to demonstrate the validity of the questionnaire. Please indicate the extent to which you (dis)agree with the following statements:

	Very Low 1	2	3	4	5	6	Very High 7
a) Please indicate your level of your knowledge of the project about which you chose to answer	□	□	□	□	□	□	□
b) Please indicate the degree of involvement that you had in the project about which you chose to answer	□	□	□	□	□	□	□
c) Please indicate your level of confidence in answering the questions on the project about which you chose to answer	□	□	□	□	□	□	□

Thank you for your time and contribution to this study. Each response makes a significant contribution to the accuracy of the study. We have taken a great deal of time and trouble to ensure that the study is robust and we anticipate valuable findings. For your complimentary copy of the summary of the study findings please complete your details below. Similarly for a chance to win a select case of wine, or simply to ensure that you are not sent any reminders, please also complete your details. These details will not be used for any other purpose.

Please send me a copy of the study findings   □

Please enter me into the prize draw for a case of select wine   □

I have completed the questionnaire so please do not send me any reminders   □

Name   ....

Company Address   ....

                                    ....

                                    ....

                                    ....

                                    ....

Telephone Number   ....
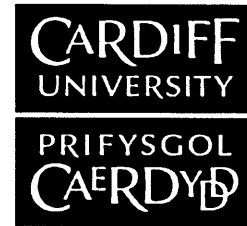
E-mail   ....

CARDIFF BUSINESS SCHOOL
Mark Toon BSc MSc MPhil CMI IFST
Director Cardiff Business School Survey
Cardiff Business School Cardiff University Aberconway Building
Colum Drive Cardiff CF10 3EU
T: 029 2087 4000 ex. 77243 E: ToonM@cardiff.ac.uk

CARDIFF
UNIVERSITY
PRIFYSGOL
CAERDY\$

Linda Jones
Director
Acanthus Holden Architects,
Waterman's Lane
The Green
SA71 4NU

Direct Line: 029 20874000 ex. 77243
Mobile: 07784 839035
Email: ToonM@Cardiff.ac.uk

March 31st 2006

Dear Linda

Cardiff Business School Survey

I wrote to you last week inviting you to contribute to an important study on relationships between architects and building contractors which is being conducted here at Cardiff Business School.

We have had an encouraging response to date but are keen to hear the views of each of the firms approached. I am writing to you again because we value your contribution to the study. Each questionnaire returned improves the accuracy of the results and so the success of the study depends upon the cooperation of each company.

If you have already returned your questionnaire then please accept our sincere gratitude. If not then please do so today.

The responses you give will be treated in the strictest confidence. No detailed technical or financial information is asked for and the results will be aggregated and treated in a summarised form and cannot be linked to individual questionnaires or answers.

To receive your complimentary summary of the results and to be entered into the prize draw for a case of select wine, don't forget to enter your contact details at the end of the questionnaire. These details will not be used for any other purpose.

Finally if I can be of any assistance then don't hesitate to contact me at the above address. Many thanks in anticipation.

Yours sincerely,

Mark Toon
CBSS Project Director

CARDIFF BUSINESS SCHOOL
Mark Toon BSc MSc MPhil CMI IFST
Director Cardiff Business School Survey
Cardiff Business School Cardiff University Aberconway Building
Colum Drive Cardiff CF10 3EU
T: 029 2087 4000 ex. 77243 E: ToonM@cardiff.ac.uk

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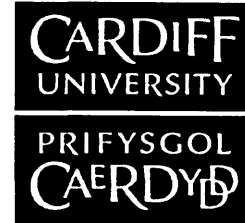
Bob Hall
Director
The Parr Architects,
133 Newhall Street
Birmingham
B3 1SF

Direct Line: 029 20874000 ex. 77243
Mobile: 07784 839035
Email: ToonM@Cardiff.ac.uk

April 7th 2006

Dear Bob

Cardiff Business School Survey

During the last month you will have received a questionnaire seeking your views on relationships between architects and building contractors.

Firstly if you have already returned your questionnaire then please accept our sincere gratitude. If you haven't completed the questionnaire then I would be grateful if you would do so today.

The study is drawing to a close and this is the last contact that will be made to elicit your response. Your contribution is essential for the accuracy of the results and is an opportunity for your comments to contribute to a better understanding of management practice and to inform industry initiatives.

If for some reason you have not received a questionnaire or it has been misplaced then please send me an email ToonM@cardiff.ac.uk, or call on 029 20874000 ex 77243 and I will get another one in the post to you today.

Yours sincerely,

Mark Toon
CBSS Project Director

Please answer the following questions in relation to the project about which you chose to comment on in the original questionnaire last year. You are not expected to be able to remember your exact responses, simply give what you consider to be accurate responses about the project.

Part A.

- In what year was the project completed?   _____

Part B. About the trust aspects of your firm's relationship with the building contractor

- How you saw them, and how they saw you
Please indicate the extent to which you (dis)agree with the following statements:

	Strongly Disagree						Strongly Agree
	1 ▼	2 ▼	3 ▼	4 ▼	5 ▼	6 ▼	7 ▼
Both the building contractor and our own firm...							
a) ...due to their track record, had no reason to doubt each other's competence to fulfil their obligations	□	□	□	□	□	□	□
b) ...were trusted and respected at the time by companies that do <u>not</u> do business with them	□	□	□	□	□	□	□
c) ...were considered to be trustworthy by companies that conducted business with them	□	□	□	□	□	□	□

Part C. How the project went

- Perceived performance
Please indicate the extent to which you (dis)agree with the following statements:

	Strongly Disagree						Strongly Agree
	1 ▼	2 ▼	3 ▼	4 ▼	5 ▼	6 ▼	7 ▼
Both your firm and the building contractor...							
a) ...overall, were satisfied with this project	□	□	□	□	□	□	□
b) ...considered that the goals of this project were achieved	□	□	□	□	□	□	□
c) ...considered that this project added to the long-term success of your firms	□	□	□	□	□	□	□
d) ...consider that this project was completed to high professional standards	□	□	□	□	□	□	□
e) ...consider that overall the project was efficiently carried out	□	□	□	□	□	□	□

Thank you. Please now return this page only, in the envelope provided, to:
Mark Toon, CBSS Project Director, Cardiff Business School, Aberconway Building, Colum Drive Cardiff, CF10 3EU