A transaction cost economics approach to investigating the control of wholly owned foreign subsidiaries

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A thesis submitted for the degree of Doctor of Philosophy

2012

Discipline of Accounting
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Certificate of Authorship/Originality

I certify that the work in this thesis has not previously been submitted for a degree, nor has it been submitted as part of requirements for a degree except as fully acknowledged within the text.

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Signature of Student

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Acknowledgements

I would like to thank my supervisors Professors Zoltan Matolcsy and Dr Francesco Giacobbe for their supervision and acknowledge their contributions to this thesis. Zoltan and Francesco have been a great source of encouragement and guidance to me throughout the PhD program. I greatly appreciate this and all the time they have spent guiding me throughout this process.

I would like to thank all the visiting academics at the UTS Business School Discipline of Accounting who have provided valuable feedback and suggestions on the thesis. In particular, thank you to Professor Teemu Malmi who provided critical and constructive feedback which has played an important role in this thesis and my learning experience.

Thank you to the participants at the conferences, workshops and doctorial colloquiums this research was presented at for their helpful, valuable and constructive feedback and suggestions: the 2009 Accounting and Finance Association of Australia and New Zealand (AFAANZ) conference and doctoral colloquium; the 2009 Monash University Forum for Management Accounting (MONFORMA) doctoral colloquium; the 2010 British Accounting Association conference and doctorial colloquium; the University of NSW seminar series; the 2011 American Accounting Association (AAA) Management Accounting Section Research and Case Conference and Institute of Management Accountants doctoral colloquium; the 2011 Global Management Accounting Symposium (GMARS) Emerging Scholars Forum; the 2012 British Accounting for Finance Association (BAFA) conference; and the 2012 AFAANZ conference.

Thank you to all my colleagues at UTS for the feedback, suggestions and support they have provided regarding this thesis. In particular, thank you to Dr Jonathan Tyler for his insightful guidance, advice and direction. I have really enjoyed working with Jonathan over the last few years and it has been a great learning experience. I would also like to thank Dr Matthew Peters for his valuable advice, feedback and suggestions, particularly concerning the survey development, administration and data analysis.

Thank you to all of the interviewees who provided their valuable time, despite busy schedules, that allowed the case study data to be collected. They provided critical data and important insights, invaluable to the completion of this thesis. In addition, thank you to all

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Abstract

This thesis investigates the transaction cost economics (TCE) theory of management control conceptualised by Speklé (2001) in the context of wholly owned foreign subsidiary (WOFS) operations controlled by multinational corporation headquarters. Investigating this theory provides the basis of a comprehensive understanding of management control system choices, specifically in the WOFS context where activity traits (uncertainty, asset specificity and ex-post information asymmetry) are of particular relevance. Mixed methods are applied in this study to rigorously investigate the theory. First, a series of five case studies are conducted and used to comprehensively examine the control archetypes proposed in the theory. The evidence from the case studies suggests headquarters exercise the control archetypes proposed in the theory; however, combinations rather than single and distinct control archetypes are exercised by headquarters. In addition, not all control archetype choices are associated with activity traits as the theory proposes. Second, data was collected through a cross sectional survey questionnaire to test Speklé's (2001) theory. Factor analysis of the control archetype construct indicators demonstrates that the five control archetypes proposed in the theory are representative of headquarters' control choices. However, the data indicates headquarters use multiple rather than distinct control archetypes which is inconsistent with Speklé's (2001) theory, but consistent with the case study suggestions. The ordinary least squares (OLS) regression results indicate that the association between activity traits and control archetypes proposed in Speklé's (2001) theory are supported in some cases, but not in all. In particular, results and action controls are widely exercised by headquarters, inconsistent with Speklé's (2001) propositions. This thesis contributes to theory through applying the TCE theory of management control in the context of WOFS operations, facilitating a comprehensive approach to understanding control choices. This provides guidance to practice concerning important factors, activity traits, influencing control archetype choices.

Chapter 1: Introduction

1.1   Objective

This thesis addresses the research question as to whether the transaction cost economics (TCE) theory of management control (Speklé 2001) explains the choice of management control systems in the context of multinational corporation headquarters controlling wholly owned foreign subsidiary (WOFS) operations.   The geographical distance between the headquarters and the WOFS operations creates control problems for companies associated with the limited knowledge of the foreign context, the increased exposure of assets to risk, and limits the ability to assess performance outcomes.   These control problems appear to align with the activity traits proposed in TCE theory which are important determinates of headquarters' management control system choices (Agbejule 2005; Carlsson, Nordegren & Sjoholm 2005; Hofstede 1984; Mason 2007; Moilanen 2007).   Accordingly, the WOFS operations context is an appropriate setting to investigate Speklé's (2001) theory.   The objective of this thesis is to test the TCE theory of management control conceptualised by Speklé (2001) using two methods: (i) a series of case studies; and (ii) a statistical analysis based on cross section survey data concerning headquarters control of WOFS operations.

1.2   Motivation

Substantial challenges and problems are faced by a range of organisations when controlling operations, particularly in the WOFS operations context, including limited knowledge of foreign operational contexts, increased exposure of assets to risk, and limited ability to assess performance outcomes (Haldma & Lääts 2002; Mason 2007; Wakefield, Giacobbe & Booth 2010).   Given these challenges and problems, substantial and comprehensive guidance regarding control choices in academic literature would be of significant value (Haldma & Lääts 2002; Mason 2007; Wakefield, Giacobbe & Booth 2010).   However, there is limited guidance in the literature providing direction on the management control system choices through comprehensive frameworks which address both control determinants and associated management control system choices.   Speklé's (2001) call to investigate and test the TCE theory of management control is consistent with the need to address the limited guidance in literature.   The first motivation of this thesis is the limited guidance in literature concerning comprehensive control frameworks and the opportunity to investigate and test Speklé's (2001) theory to address this.

The second motivation of this thesis stems from the importance of WOFS operations as a means of expansion for multinational corporations (Hansen 1999; Holm & Sharma 2006; Kostova & Zaheer 1999; Lane & Lubatkin 1998; Teece, Shuen & Pisano 1997; Vermeulen & Barkema 2001). The importance of WOFS operations is particularly relevant in developing economies and reflects the expansion of Australian companies abroad. Statistics show direct investment by Australian companies in foreign operations increased tenfold over the last ten years (Australian Bureau of Statistics 2011), as reported in Figure 1.1, much of this investment accounted for in developing economies. A large proposition of this investment is in WOFS operations, which is attributed to the removal of government barriers to market entry (Guse, Bremmers & Omta 2005; Papyrina 2007; Southworth 1994; Yan & Gray 1994). In addition, prior learning and experience in foreign markets gained by multinational corporations through engagement in international joint ventures (IJV) encourages these organisations to make the transition to WOFS operations (Li et al. 2000). The substantial and long term nature of investment in WOFS operations, in contrast to the short to medium term investment in IJV, highlights the importance of these entities as a means of expansion and ongoing operation for multinational corporations (Cuypers & Martin 2007; Steensma et al. 2005). Despite the importance of WOFS operations, the large body of literature concerning the control of foreign subsidiaries rarely differentiates between IJV and WOFS operations (Jaussaud & Schaaper 2006). The IJV context has unique implications on headquarters' control choices associated with shared control, bargaining power and competing partner interests (Giacobbe 2007; Gomes-Casseres 1989; Talay & Cavusgil 2008). This differs from the WOFS operations context where headquarters are reliant on tangible and intangible resources within a corporation as the basis of competitive advantage and viability in foreign markets (Jaussaud & Schaaper 2006). Accordingly the WOFS operations context warrants separate investigation.

Figure 1.1 – Foreign direct investment by Australian companies globally
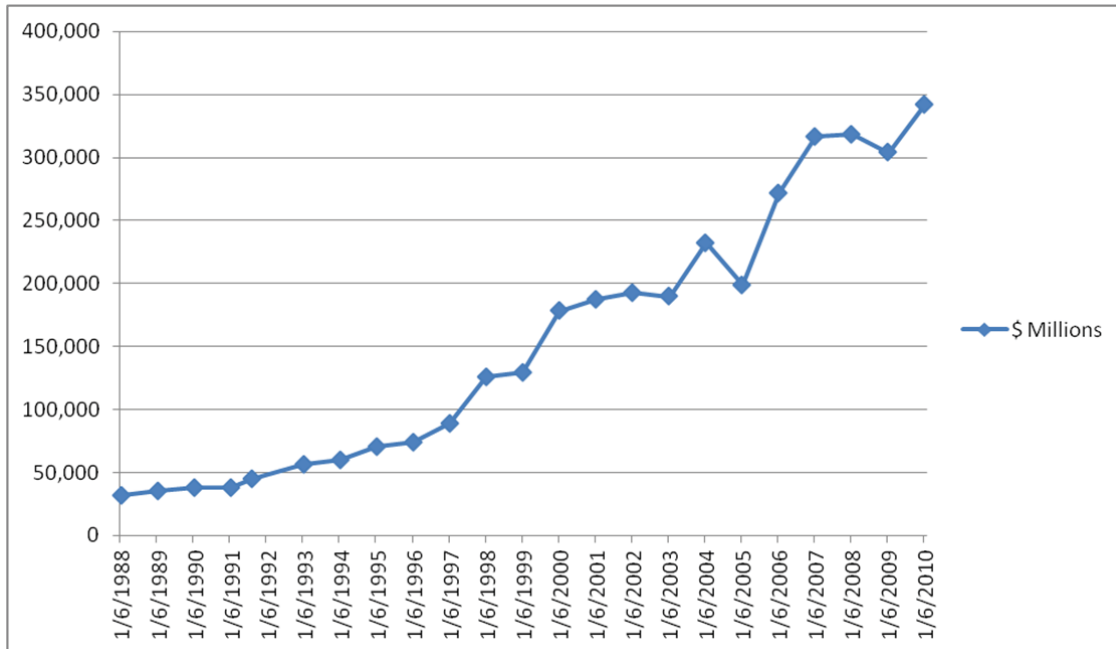
Controlling foreign, rather than domestic, wholly owned subsidiary operations from a distance may increase the problems faced by headquarters (Hassel & Cunningham 2004). In particular, headquarters may face the following problems in the context of WOFS operations at a distance:

- unfamiliarity of headquarters with unique WOFS operations associated with foreign market dynamics and characteristics, limiting the ability of headquarters to monitor and direct operations. This contrasts to the significant experience and understanding headquarters generally have regarding domestic operations (Zaheer & Mosakowski 1997);

- increased exposure of assets invested by headquarters in WOFS operations to loss associated with lower transparency of WOFS operations and possible opportunistic decisions or bounded rationality of subsidiary management. Protection of assets from a distance is far more problematic and costly compared with the domestic operations context where accountability is easier to enforce (Merchant & Van der Stede 2007);

- headquarters' ability to assess performance outcomes relative to WOFS competitors is limited at a distance, due to unfamiliarity with foreign markets and subsidiary operational activities (Monteiro, Arvidsson & Birkinshaw 2008).

1.3   Activity traits and management control systems in the WOFS context

Varying levels of information held by headquarters relating to WOFS operations, regarding processes and outcomes and the protection of assets associated with specific subsidiary resources, are control problems associated with factors important to the success of these entities (Spicer & Ballew 1983; Williamson 1979; Williamson 2005).   These control problems are frequently associated with factors including subsidiary competitive positioning and integration with others entities (Hansen 1999; Holm & Sharma 2006; Lane & Lubatkin 1998; Miles & Snow 1978; Nilsson 2002; Teece, Shuen & Pisano 1997).

The TCE theory (Williamson 1979) proposes three activity traits which appear to capture the control problems faced by headquarters in the context of WOFS operations; uncertainty, asset specificity, and ex-post information asymmetry. The consistency between these activity traits and the control problems faced by headquarters suggests the WOFS operations context is an appropriate setting to investigate the TCE theory of management control. The activity traits are detailed and explained as follows:

- Uncertainty relates to headquarters' lack of ex-ante knowledge of WOFS operations activities and defined by the specificity of intended performance. Uncertainty arises in many cases due to the difficulty headquarters have in coping with foreign market dynamics and characteristics in the context of WOFS operations (Hansen 1999; Holm & Sharma 2006; Kostova & Zaheer 1999; Lane & Lubatkin 1998; Teece, Shuen & Pisano 1997; Vermeulen & Barkema 2001). A number of characteristics describing multinational corporations appear to be more problematic due to the increase in uncertainty relating to WOFS activities and processes. Examples of a factor relating to uncertainty includes subsidiary networking with local organisations which, while important for subsidiaries to access resources that are both tangible and intangible, may be more problematic when controlling from a distance due to the limited knowledge of business networks and associated expectations in the foreign context (Andersson & Forsgren 1996; Ditillo 2004; Kostova & Zaheer 1999; Tallman & Fladmoe-Lindquist 2002). In addition, WOFS competing through prospector based competitive strategies may be more problematic due to greater difficulty understanding the dynamics of competition in a foreign market from the headquarters' perspective and the unique practices undertaken at the subsidiary level as a result (Goold, Campbell & Alexander 1994; Kober, Ng & Paul 2007; Nilsson 2002; Porter 1987).

- Asset specificity relates to the degree assets can be redeployed to an alternative use without sacrificing productive value (Williamson 1979). Asset specificity arises from the unique resources needed to compete in a market, exposing headquarters to risk greater loss from any opportunistic behaviour by subsidiary personnel (Williamson 1979). These resources include tangible and intangible assets. The use of corporation specific assets related to leveraged approaches to corporate strategy and/or interdependences of a subsidiary within a multinational corporation increase asset specificity of resources relative to other firms in the foreign context (Goold, Campbell & Alexander 1994; Miles & Snow 1978). The distance from WOFS operations increases the difficulty headquarters face when minimising the risk of asset losses (Zaheer & Mosakowski 1997).

- Ex-post information asymmetry is defined as the extent headquarters is unable to evaluate performance outcomes due to informational differences (David & Han 2004). This inability may be due to headquarters' unfamiliarity with local market dynamics. For example, interdependences with local businesses and prospector based competitive strategies may result in greater subsidiary integration in a foreign market context which could be significantly different to headquarters' home country environment. This limits headquarters' ability to assess the relative performance of a WOFS from a distance and increases ex-post information asymmetry.

There is a diverse body of literature presenting and examining a range of different management control system frameworks. However the management control system frameworks considered in previous studies are generally quite narrow, providing limited guidance on more comprehensive sets of control choices. A framework is needed which builds on extant literature to comprehensively capture the range of management control system choices available and provide direction relating to the application of different management control system choices relating to variation in control problems (Busco, Giovannoni & Scapens 2008; Dossi & Patelli 2008; Henri 2006; Jaussaud & Schaaper 2006; Malmi & Brown 2008). Simons' (1994) provides a comprehensive control framework, although limited direction concerning the link between control problems and appropriate management control system choices.

Comprehensive management control system frameworks are provided by Merchant and Van der Stede (2007) and Speklé (2001) which link factors affecting control to management

control system choices. Merchant and Van der Stede (2007) propose a framework, a development of Ouchi's (1979) behavioural and output control framework, identifying knowledge of the process and/or results as determinants of control choices. Speklé (2001) goes a step further by asserting different combinations of the three activity traits, drawn from TCE theory, leading to different sets of management control systems (MCS) called control archetype choices. Control archetypes refer to distinct sets of control mechanisms designed to address control problems arising from the presence of different activity traits. For example, Speklé (2001) proposes that an action oriented machine control archetype is appropriate in the presence of low uncertainty and high asset specificity. This archetype comprises of limited autonomy extended to subsidiary management, standardised policies to be followed, and a focus by headquarters on monitoring compliance with these policies. This archetype fits with the ability of headquarters to protect highly specific assets given high ex-ante knowledge of subsidiary operations associated with low uncertainty. This is one of five control archetypes in Speklé's (2001) theory which link control problems, described by activity traits, to control archetypes. The TCE theory of management control conceptualised by Speklé (2001) is used in this study. It appears to provide a more comprehensive and cogent specification of management control system choices which are linked to activity traits pertinent in describing control problems of WOFS operations, the focal context of this study. Accordingly, Speklé's (2001) theory provides an appropriate starting point for the investigation of headquarter control choices relating to WOFS operations.

1.4   Research method

The choice of research method is determined by the theoretical development of the research area investigated in this thesis. The TCE theory of management control was initially examined by Kruis (2008). However, this study goes a step further by investigating the links between activity traits and control archetypes proposed which have not been tested in the hierarchical organisational context (headquarters and subsidiary management levels in this study). In addition, the review of extant literature indicates there is no research providing substantial direction on management control system choices of headquarters regarding the control of WOFS operations. A two-stage research method is adopted in this study to investigate Speklé's (2001) theory in the context of controlling WOFS operations.

First, five case studies are conducted and used to investigate the link between activity traits and control archetypes. This exploratory approach allows this study to initially examine in

depth the TCE theory of management control in the context of controlling WOFS operations from a distance. This is appropriate given the limited investigation of both the TCE theory and management control, and the control of WOFS operations. Possible support and/or deviations from the associations predicted by Speklé (2001) are identified through the case studies, informing further investigation. Second, a cross sectional survey questionnaire is designed and administered to collect data enabling empirical testing of Speklé's (2001) theory. This empirical approach is important to confirm support and/or deviations from the TCE theory of management control. The two-stage research method allows this thesis to more comprehensively address the limited theoretical development concerning the context investigated (Modell 2005, 2009).

The appropriateness of these control archetype choices proposed by Speklé (2001) is determined by the variation in activity traits defining control problems faced by headquarters. This theory aligns, according to associations expected between activity traits and control archetypes, with the contingent ideal type fit configurational interpretations of Doty, Glick and Huber (1993). Speklé (2001) proposes mutually exclusive control archetypes rather than multiple and varying control archetype use; however, both the case study and survey data analysis are necessary to confirm whether this is representative of reality (Modell 2005, 2009). The measurement of control archetypes, particularly from a statistical perspective, should be sufficiently informative to identify whether multiple or hybrid archetypes are used in practice and therefore whether contingent hybrid type fit testing is appropriate (Doty, Glick & Huber 1993). This is necessary to test Speklé's (2001) theory and importantly to achieve the objective of this thesis.

1.5 Key findings

This thesis finds the TCE theory of management control is partially supported in the context of WOFS operations controlled by multinational corporation headquarters. The five case studies conducted allow the theory to be examined comprehensively and suggest activity traits affect the control archetype choices of headquarters. The control archetypes conceptualised by Speklé (2001) are represented in the case study data. However, a number of deviations from the theory are suggested. First, headquarters appear to exercise a combination of different control archetypes in a given situation, rather than single distinct control archetypes proposed in Speklé's (2001) theory. Multiple control archetypes may be critical to facilitate adequate control of WOFS operations at a significant distance from the

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headquarters. Second, not all associations between activity traits and control archetypes are consistent with the predictions of Speklé (2001). Definitive conclusions cannot be reached on the basis of the case studies due to the exploratory nature of this research method. However, the suggestions provided in the case studies allow the theory to be tested empirically in a more appropriate manner, as well as aiding the interpretation of empirical results.

The testing of the theory using ordinary least squares (OLS) regressions based on data gathered through a cross sectional survey questionnaire provides limited support for the theory. An important part of the theory testing is the validity of the control archetype constructs. The factor analysis of the indicators of control archetype constructs demonstrates the control archetype conceptualisations by Speklé (2001) are valid and representative of distinct control choices. The resultant control archetype constructs are used as the basis of determining measures which reflect the proportion each control archetype accounts for in total headquarters' control choices. The descriptive statistics concerning these measures indicate headquarters do use multiple control archetypes as a means of control in the majority of cases, consistent with the suggestions of the case studies. The choice of these control archetypes appear to be affected by the activity traits observed in line with Speklé's (2001) predictions in some cases, but not all. Deviations from the theory concerning activity trait effects on control archetype choices are explained and justifiable with reference to the case studies conducted and extant literature.

The TCE theory of management control is quite informative concerning control choices in the WOFS operations context, despite the deviations observed. The results in this thesis suggest revisions to the theory may be required for future applications in the context of controlling WOFS operations and other hierarchical organisational contexts.

1.6 Contribution

This study contributes to literature by reporting whether or not the TCE theory of management control is relevant in the context of WOFS operations controlled by multinational corporations. The case studies demonstrate the theory is relevant in capturing the factors affecting the control archetype choices, and the actual control archetypes themselves. The OLS regression analysis affirms this is the case. This study addresses the lack of comprehensive control frameworks in the context of WOFS operations, and facilitates

a much more integrative approach to considering control choices in this and other hierarchical organisational contexts. The ability to apply this theory is also enhanced by this study through the development control archetype measures which build on those used in prior studies. The development and appropriateness of these control measures is informed by the case study analyses suggestions and affirmed through the statistical analysis.

This study seeks to contribute to practice through the comprehensive nature of the TCE theory of management control investigated; this may provide direction to practitioners concerning management control system choices. The focus on important determinants of control choice in association with the definition of distinct control archetype choices may provide an informative and integrated approach for headquarter managers to consider when controlling WOFS operations.

1.7 Thesis structure

This thesis is structured as follows. Chapter 2 describes and justifies the relevance of the TCE theory of management control in the context of WOFS operations controlled by multinational corporation headquarters. Chapter 3 examines the TCE theory in the WOFS operations context with reference to five case studies. Chapter 4 tests the theory using statistical modelling based on cross sectional survey data. Chapter 5 presents alternative variable specification and testing. Finally, Chapter 6 presents the conclusions and implications of this thesis.

Chapter 2: Transaction cost economics theory of management control

2.1   Introduction

The objective of this chapter is to explain the transaction cost economics (TCE) theory of management control in the context of WOFS operations. The theory provides a comprehensive and cogent perspective regarding control choices based on three activity traits, appropriate to the context of WOFS operations controlled by multinational corporation headquarters. The motivation of this chapter is to justify the relevance of TCE theory of management control in the WOFS operations context. The theory is also critically reviewed with reference to extant literature. This chapter contributes to this thesis by specifying the propositions associated with the theory which are investigated in an exploratory and confirmatory manner in later chapters of this thesis.

2.2   Transaction cost economics theory of management control

2.2.1   Control problems facing headquarters

The problems headquarters face when controlling WOFS operations from a distance are captured through the activity traits in TCE theory (Williamson 1979, 2005). These activity traits are uncertainty, asset specificity, and ex-post info-asymmetry; this section describes the relevance of each justified in the context of WOFS operations.

Uncertainty relates to headquarters' lack of ex-ante knowledge of activities and processes, and is defined by the specificity of intended operational performance (Spekle 2001). The higher the uncertainty, the less ex-ante knowledge headquarters have concerning WOFS operations and the less intended performance can be specified (Kruis 2008). Uncertainty is highly relevant and problematic in the context of controlling international operations due to the unfamiliarity of headquarters with subsidiary practices and processes associated with foreign markets, particularly regarding government regulations, local customs and business networks (Boerner & Macher 2001; Rindfleisch & Heide 1997). This unfamiliarity arises in many cases from the distance between headquarters and WOFS operations (Agbejule 2005; Carlsson, Nordegren & Sjoholm 2005; Hofstede 1984; Mason 2007; Moilanen 2007). Higher uncertainty directly reduces headquarters' ability to program activities due to the limited ex-ante knowledge available (Speklé 2001). Therefore, bounded rationality, referring to the limited ex-ante information to make informed decisions is an issue where uncertainty is high; this limits headquarters' ability to provide direction to WOFS operations.

Distinct control problems occur when uncertainty is combined with a second activity trait, asset specificity (Williamson 1979). Asset specificity is defined as the degree to which it is possible to redeploy an asset to an alternative activity and relates to the opportunity costs associated with the redeployment (Williamson 1979). High asset specificity means alternative applications of assets are limited and the opportunity costs associated with redeployment is high (Williamson 1985). The international context where a WOFS operates at a distance may further limit the ability of headquarters to apply assets to alternative uses, raising the opportunity cost of redeployment. Opportunistic behaviour, defined as self interest of subsidiary personnel at the expense of another organisational unit, increases the possible losses associated with assets of high specificity (Williamson 1975). This is particularly the case and problematic when controlling from a distance given employees may perceive it easier to engage in opportunistic behaviour with headquarters relatively limited in their ability to deal with it. It is expected headquarters use management control systems (MCS) to avoid or minimise the risk of loss associated with opportunistic behaviour.

Where asset specificity is moderate, setting targets, performance evaluation and rewards based on market benchmarks may be appropriate (Merchant & Van der Stede 2007; Speklé 2001). High asset specificity may be related to tighter action and results control through administrative targets, and rules and regulations, due to absence of market benchmarks and greater potential for opportunistic behaviour (Merchant & Van der Stede 2007; Speklé 2001). Examples of high asset specificity in the context of WOFS operations include operations serving a small number of customers who have outsourced production of specific components, and subsidiary staff trained for specific roles at WOFS operations (Wakefield, Giacobbe & Booth 2010; Williamson 1991). It should be noted asset specificity varies from moderate to high levels in an absolute sense in the hierarchical organisational context. Assets of low specificity would instead most efficiently be controlled through market structures and are therefore not relevant in the hierarchical organisation context (Speklé 2001).

The third activity trait in TCE theory is ex-post information asymmetry[1] (Williamson 1979). Ex-post information asymmetry refers to the extent headquarters is unable to evaluate performance achievements at the subsidiary level due to informational differences between

[1]Note: both the terms information impactness and information asymmetry are referred to in Speklé (2001). The degree of information impactness relates to the difficulty in information transfer and directly determines ex-post information asymmetry (Williamson 1975). To maintaining consistency with literature, the term ex-post information asymmetry is used in this thesis.

these two organisational levels. Information asymmetry may lead to opportunistic subsidiary personnel behaviour which headquarters need to address (Kruis 2008). The distance between headquarters and subsidiary operations in the international context may increase the potential for opportunistic subsidiary management behaviour. The effects of ex-post information asymmetry on the management control system are expected to be significant. High ex-post information asymmetry means outputs are difficult to assess and therefore results oriented controls are ineffective, suggesting controls which are less formal in terms of target setting and performance evaluation are more appropriate (Speklé 2001).

The three activity traits appear relevant in the context of WOFS operations given the implications of the distance separating headquarters and subsidiary operations which may relate to increased uncertainty, difficulties in reallocating highly specific assets, and high ex-post information asymmetry as explained above. In addition, these activity traits are relevant in the context of firms involved in a broad range of industries. Uncertainty is associated with headquarters' ex-ante knowledge of activities and processes, relating to firms in all industries including mining (exploration and extraction methods), manufacturing (material procurement and processing), retail (inventory purchasing, marketing activities, sales and support) and financial services (appropriate internal control and fund management). To maintain a competitive advantage, regardless of industry involvement, unique resources difficult to relocate to alternative activities are held, increasing asset specificity (Henri 2006). For example, exploration and extraction expertise (mining), unique processing equipment (manufacturing), retails systems and distribution networks (retail trade) and proprietary knowledge (service sector) demonstrate the broad applicability of asset specificity to firms in different industries. Finally, ex-post information asymmetry is related to the distance between headquarters and WOFS operations, regardless of industry involvement (Miller & Eden 2006; Zaheer & Mosakowski 1997). The broad applicability of the activity traits indicates Speklé's (2001) theory can be investigated in the context of multinational corporations controlling WOFS operations in a variety of industries.

2.2.2 Management control archetypes and activity traits

The TCE theory of management control conceptualised by Speklé (2001), and refined in the hierarchical organisational context by Kruis (2008), is the control conceptualisation applied in this study. The theory consists of five control archetypes, proposed as solutions to the problems arising from uncertainty, asset specificity, and ex-post information asymmetry

(Speklé 2001). This theory provides a comprehensive means of considering different control choices through an archetype approach, consistent with calls from literature (Otley 1980; Widener 2007). The investigation of control using Speklé (2001) may allow the development of a much more integrated approach to considering control in the specific context of WOFS operations, building on the suggestions of prior literature (Busco, Giovannoni & Scapens 2008; Dossi & Patelli 2008; Henri 2006; Jaussaud & Schaaper 2006; Malmi & Brown 2008; Sandelin 2008). Consistent with the WOFS operations context controlled by headquarters investigated in this study, the control archetypes relate to the hierarchical organisations.

The following sections describe and justify the five archetypes forming Speklé's (2001) theory in the context of variation in activity traits. A series of testable propositions based on the theory are stated. Extant literature is then discussed in the context of associations proposed, allowing Speklé's (2001) theory to be critically reviewed and any potential deviations noted.

2.2.2.1. Archetype 1: Arm's length control

Arm's length control is characterised by a high level of autonomy extended to subsidiary management within a framework of targets, monitoring, evaluation and rewards based on market benchmarks. Accordingly there is heavy emphasis on market benchmarks to direct and motivate subsidiary management when using this archetype.

According to the TCE theory of management control, arm's length control is appropriate where uncertainty is low from headquarters' perspective and asset specificity of WOFS operations is moderate (Speklé 2001). The possession of widely available and transferrable assets means competition in the same or a similar market sector is more likely, leading to the availability of relevant market benchmarks (Speklé 2001). Bounded rationality and opportunistic behaviour at the subsidiary management level are low given the low uncertainty and moderate asset specificity (Williamson 1979). Accordingly, Speklé (2001) argues it is appropriate to extend high autonomy to subsidiary management and that monitoring, evaluation and rewards based on market benchmarks are a sufficient means of control.

Therefore it is proposed:

P1: *Low uncertainty and moderate asset specificity are associated with arm's length control.*

Literature suggests controlling operations from a distance is associated with higher uncertainty from the headquarters' perspective than would normally be the case at the domestic operational level. However, there are situations where this may not be the case, one for example relates to the choice of competitive strategy (Chenhall 2003; Langfield-Smith 1997). To facilitate price competitiveness, high consistency in WOFS activities is necessary to drive production efficiencies necessary to keep costs low (Chenhall & Langfield-Smith 1998; Miles & Snow 1978). Further, multinational corporations competing on the basis of price are expected to have expertise regarding efficient and cost effective operations which are applied consistently to all operations. Continuity and consistency of operations means headquarters have lower uncertainty concerning WOFS operations and key performance indicators comparable to market benchmarks are used as a means of control (Birkinshaw, Toulan & Arnold 2001; Dunning 1993; Kruis 2008). The homogeneity of the product markets, generally associated with competing on the basis of price and the ability to serve a large number of alternate customers, means asset specificity is lower, risk of opportunistic behaviour is limited, and accordingly headquarters' discretion to extend high autonomy to subsidiary management is appropriate (Speklé 2001).

Literature also suggests uncertainty and asset specificity faced by headquarters is related to subsidiary integration in a local market. A subsidiary integrated only to a limited degree is argued to enhance headquarters' ability to process information relating to foreign operations, consequently lessening the degree of uncertainty regarding foreign operations (Ghoshal, Korine & Szulanski 1994; Hansen 2002; Schulz 2001). Limited integration is particularly noted in instances of where competitive strategy is based on product price and efficiency throughout the multinational corporation. Literature argues that limited foreign market integration and associated low uncertainty enhances the ability of headquarters to use accurate performance measures and use appropriate market benchmarks to monitor, evaluate and reward subsidiary management (Tihanyi & Thomas 2005; Ungson, Braunstein & Hall 1981). Limited integration means there is less pressure to tailor assets to market and environment dynamics of a foreign context, reducing the asset specificity of WOFS operations (Abdel-Kader & Luther 2008; Andersson, Bjorkman & Forsgren 2005). Whether limited subsidiary integration positively affects performance is another matter; however, it is

expected in such situations that asset specificity reduces opportunity costs associated with asset redeployment, and extending high autonomy to subsidiary management from headquarters' perspective does not expose a corporation to excessive risk. Accordingly this literature appears to be consistent with Speklé's (2001) theory.

2.2.2.2.   Archetypes 2 & 3: Results and action oriented machine control

Two types of machine control archetypes are conceptualised by Speklé (2001); results and action oriented machine control. Results oriented machine control is characterised by extending high autonomy to subsidiary management with an emphasis on providing direction through targets internally developed by headquarters. These internal targets form the basis of monitoring, evaluating and rewarding subsidiary management. Action orientated machine control is characterised by low to moderate levels of autonomy extended to subsidiary management and clear standardisation of behaviour expected. Headquarters place strong importance on compliance with standardised behaviour through closely monitoring subsidiary operations.

According to Speklé (2001), a machine control archetype is appropriate under low uncertainty and high asset specificity. High asset specificity means the protection of assets from opportunistic subsidiary personnel behaviour is important for headquarters, particularly due to the distance from WOFS operations (Speklé 2001). There is greater risk of loss associated with opportunistic decisions when asset specificity is high given the limited alternative use of assets and visibility of WOFS operations from headquarters' perspective. The high ex-ante knowledge of subsidiary operations provides headquarters a means of controlling subsidiary operations in the pursuit of mitigating opportunistic behaviour. According to Speklé (2001), headquarters' choice of action or results oriented machine control is dependent its ability to define meaningful and sufficiently restrictive output targets. Following this line of argument, Kruis (2008) proposes the level of ex-post information asymmetry determines the choice of either action or results oriented machine control where uncertainty is low and asset specificity is high.

Restrictive targets provide an important means of addressing risks relating to high asset specificity and associated opportunism. Results oriented machine control is the most relevant control archetype if headquarters can define sufficiently restrictive output targets, according to Speklé (2001). Results oriented machine control is comparatively more efficient from

headquarters' perspective, given the substantial costs of exercising action oriented machine control from a distance. The use of market benchmarks is not appropriate or available where asset specificity is high due mainly to the absence of direct competitors performing similar activities (Speklé 2001). Based on these transactional attributes, results oriented machine control is characterised by moderate to high autonomy extended to subsidiary management within a framework of clearly defined responsibility centres. These responsibility centres, or WOFS operations in this study, are controlled through the use of internally developed performance targets by headquarters used as the basis of assessing and rewarding subsidiary management.

Therefore it is proposed that:

P2a: *Low uncertainty, high asset specificity and low ex-post information asymmetry are associated with results oriented machine control.*

In cases where it is not possible to quantify output targets, results oriented machine control is not appropriate (Kruis 2008; Merchant & Van der Stede 2007). Where asset specificity is high, action oriented machine control is necessary to guard against the greater risk of losses associated with opportunism through rules, procedures and standardisation of subsidiary management behaviour (Speklé 2001). The cost of exercising such control at a distance may be substantial; however, the benefits of mitigating the potential for opportunism in the foreign operational context appear worthwhile (Williamson 1979). Low uncertainty allows headquarters to set relevant action controls. Based on these transactional attributes, the action oriented machine control archetype is characterised by low to moderate autonomy extended to subsidiary management, with clear specification and monitoring of standardised behaviour (Speklé 2001).

Therefore it is proposed that:

P2b: *Low uncertainty, high asset specificity and high ex-post information asymmetry are associated with action oriented machine control.*

Literature suggests that corporations adopting an activity sharing approach to corporate strategy, where subsidiaries operate within the same or related areas of business, is an

example where headquarters may face low uncertainty, but high asset specificity, concerning WOFS operations (Goold, Campbell & Luchs 1993; Porter 1987). Involvement in related areas of business increases the ability of headquarters to acquire and process information widely applicable to subsidiaries, thereby lowering uncertainty (Chandler 1962). Low uncertainty and high ex-post information regarding WOFS operations appear to enhance headquarters' ability to identify and assess key performance indicators (Argyres 1995; Nilsson 2002; Park 2002; Zenger & Hesterly 1997). This indicates that headquarters can define meaningful and restrictive outputs where possible. The narrow scope of focal business activity involvement associated with an activity sharing corporate strategy suggests higher asset specificity given the development of corporate specific resources relating to physical, intangible and human resources (Anand & Singh 1997). The identification and assessment of key subsidiary performance indicators by headquarters under an activity sharing corporate strategy is consistent with Speklé's (2001) proposal that high asset specificity is associated with results oriented machine control (Argyres 1995; Nilsson 2002; Park 2002; Zenger & Hesterly 1997). However, it should be noted that the use of results oriented machine controls may also be widely applicable when controlling from a distance (Dossi & Patelli 2008).

Internal subsidiary integration is argued to create synergies with entities throughout the corporation, increasing the level of ex-ante information held by headquarters, lowering uncertainty, but also increasing the asset specificity of WOFS operations due to the links established between entities within the corporation (Andersson & Forsgren 1996). The benefits of recognising synergies between entities in a corporation creates incentives for headquarters to take advantage of the low uncertainty regarding subsidiary operations to specify operational and decision making processes at the subsidiary level (Baliga & Jaeger 1984; Freeland 1996; Gupta & Govindarajan 1991; Hill, Hitt & Hoskisson 1992; Williamson 1975). Speklé (2001) argues that headquarters have a preference towards exercising results oriented control due to the efficiencies of doing so; however, the difficulties of separating the performance of internally integrated subsidiaries may limit the ability to apply sufficiently restrictive targets (Keating 1997; Lambert 2001). Consequently it appears optimal in this situation for headquarters to standardise behaviour through action oriented machine control.

Literature related to internal subsidiary integration suggests that where asset specificity is high, headquarters have a preference to prescribe quite direct control through standardised behaviour, only extending low autonomy to subsidiary management (Chandler 1991). This is

related to the significant risk of large opportunity costs in cases of premature termination of subsidiary operations due to corporate wide implications (Collis & Montgomery 1997; Freeland 1996; Williamson 1975). However, it is unclear whether the general association between asset specificity and action oriented machine control argued in literature is applicable to all cases, including that of WOFS operations. The particular context of WOFS operations may limit the ability to effectively direct operations, particularly concerning highly specific assets (Hassel & Cunningham 2004). Asset specificity may not only be associated with subsidiary integration internally, but also external integration with organisations in the market the subsidiary operates (Andersson & Forsgren 1996). It is unlikely that headquarters have the depth of knowledge of highly specific assets tailored to a unique environment to effectively use action oriented machine control to direct WOFS operations (Monteiro, Arvidsson & Birkinshaw 2008; Zaheer & Mosakowski 1997). Rather than protecting highly specific assets, headquarters may direct asset use in a suboptimal manner at a distance. Accordingly, the applicability of action oriented machine control at a distance may be limited, meaning there is no association with activity traits. In contrast results oriented machine control may generally be a relatively more efficient and applicable control archetype when controlling from a distance, suggesting the wide use of this control archetype (Merchant & Van der Stede 2007). Further investigation is warranted to investigate these competing arguments in Speklé (2001) and other literature.

A further possible inconsistency with Speklé's (2001) theory is noted in literature regarding the distinct choice of either results or action oriented machine control. While the literature discussed above suggests the applicability of results rather than action oriented machine control in the WOFS operations context, literature relating to activity sharing corporate strategy suggests low uncertainty is associated with: results oriented machine control, through the identification and assessment of key performance indicators; and action oriented machine control, through the implementation of corporate specific routines and processes (Argyres 1995; Nilsson 2002; Park 2002; Zenger & Hesterly 1997). Therefore further investigation is warranted to examine whether results and action oriented machine control are distinct archetypes, in addition to the applicability of these archetypes in the WOFS operations context.

2.2.2.3. <u>Archetype 4: Boundary control</u>

Boundary control is characterised by extending a high degree of autonomy to subsidiary management with clear guidelines delineating behaviour and activities not to be engaged in. Headquarters closely monitor compliance with these boundaries and take action against subsidiary management if and when they are breached.

Boundary control is appropriate where uncertainty and ex-post information asymmetry are high from the perspective of the headquarters (Speklé 2001). Programming subsidiary activities is challenging or not possible at the headquarters' level where uncertainty of subsidiary operations is high, particular given the distance from foreign operations. If information regarding performance is not available or clear, ex-post information asymmetry is high and the ability to use performance targets and evaluation as means of control is very limited. According to Speklé (2001), the only option for headquarters in this case is to rely on boundary controls, clearly specifying subsidiary management's domain of responsibility. Defining subsidiary management's domain of responsibility minimises the risks associated with bounded rationality or opportunistic decisions and it should prevent WOFS management from taking action or making decisions exposing the corporation to risk. Based on these transactional attributes, the boundary control archetype is characterised by extending high autonomy to subsidiary management within a framework of certain boundaries (Speklé 2001).

Therefore it is proposed that:

P3: *High uncertainty and high ex-post information asymmetry are associated with boundary control.*

Literature suggests high integration of a subsidiary in the environment it operates (including customers, suppliers and local business networks) is related to high uncertainty and high ex-post information asymmetry from headquarters' perspective. To maintain integration, subsidiaries must continually evolve consistent with changes in the environment it operates; this increases the difficulty headquarters face in processing information at a distance and providing clear direction to WOFS operations (Ghoshal, Korine & Szulanski 1994; Hansen 2002; Schulz 2001). It appears appropriate to extend high autonomy to subsidiary management given the uncertainty in such situations (Martinez & Jarillo 1989). High

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integration is also associated with increased ex-post information asymmetry from the perspective of headquarters (Forsgren et al. 1995; Håkansson & Snehota 1995). The ability of headquarters to use the most relevant performance measures where a subsidiary is highly integrated is difficult, due to the ambiguity of the foreign environment and associated subsidiary activities (Tihanyi & Thomas 2005; Ungson, Braunstein & Hall 1981).

Speklé (2001) argues that boundary control is appropriate in this case to mitigate corporate exposure to excessive risk associated with subsidiary management decisions and activities, given the limitations high uncertainty and high ex-post information asymmetry place on control choices. However, boundary control is a relatively direct form of control which places behavioural constraints on management at the subsidiary level. Literature argues such a direct control requires ex-ante knowledge and low uncertainty of subsidiary operations and accordingly relevant risks (Merchant & Van der Stede 2007). In addition, ex-post information asymmetry appears important in the retrospective identification of risk (Williamson 2005) and accordingly where refinement of boundaries is required. Speklé's (2001) central argument concerning the appropriateness of boundary control is that there are no other alternatives where both uncertainty and ex-post information are high. However, whether imposing boundaries relatively blindly, where both uncertainty is high and ex-post information is low from headquarters' perspective, is an appropriate solution is not clear. Evidence of boundary constraints used in situations of high uncertainty and ex-post information asymmetry is not widely reported in the literature. It may be appropriate to combine boundary with other elements of other archetypes, including those that are results oriented as a means of monitoring operations (Muralidharan & Hamilton 1999; Ouchi 1979). Such combinations could be applicable in instances where activity traits vary outside the high or low extremes defined in Speklé's (2001). However, use of multiple control archetypes departs from the distinct conceptualisations in the theory.

2.2.2.4. Archetype 5: Exploratory control

Exploratory control is characterised by high autonomy extended to subsidiary management with relevant targets emerging and established during the period, forming the basis of monitoring and evaluating performance achievement. There is also significant emphasis placed on assessing and rewarding subsidiary management on the basis of long term performance achievement in this archetype.

According to Speklé (2001), exploratory control is appropriate where uncertainty is high and ex-post information asymmetry is low from the perspective of headquarters. Extending high autonomy to subsidiary management through exploratory control appears appropriate due to the high uncertainty and accordingly possible bounded rationality associated with headquarters' directions. To effectively control WOFS operations, Speklé (2001) argues headquarters rely on ex-post information to assess subsidiary performance achievement. The theory proposes relevant performance targets are established during the period as the basis of assessing long term performance achievement.

Therefore it is proposed that:

P4: *High uncertainty and low ex-post information asymmetry are associated with exploratory control.*

Literature suggests integration of WOFS operations into a multinational corporation has distinct implications on the activity traits headquarters face when controlling from a distance (Andersson & Forsgren 1996; Goold, Campbell & Luchs 1993; Porter 1987). Low integration is associated with high uncertainty, limiting headquarters' ability to acquire WOFS information. High uncertainty is associated with extending high autonomy to subsidiary management, rather than headquarters providing explicit direction, inappropriate in this context (Baliga & Jaeger 1984; Freeland 1996; Gupta & Govindarajan 1991). However, the ability of headquarters to set relevant targets during the period is less clear where uncertainty is high. Literature suggests headquarters face low ex-post information asymmetry where corporate integration is low. Low integration generally means subsidiary performance does not need to be separated from the rest of overall corporation performance using complex transfer pricing arrangements, enabling the use of long term performance evaluation (Keating 1997; Lambert 2001). Literature regarding WOFS subsidiary integration indicates high uncertainty, and low ex-post information asymmetry appears to be associated with the autonomy extended to subsidiary personnel and assessment of long term performance elements of exploratory control consistent with Speklé (2001). The association with targets established during a period as information emerges, as proposed where exploratory control is used, is less clear.

To establish relevant targets, even during a period generally requires low uncertainty relating to WOFS operations (Merchant & Van der Stede 2007; Ouchi 1979). The results oriented machine control and exploratory control archetype are similar regarding target setting importance, even though the process of setting targets in each is very different. Therefore exploratory control may be associated with low rather than high uncertainty, in contrast to Speklé's (2001) prediction. In addition the number of headquarters facing situations of high uncertainty and low ex-post information asymmetry may be limited.

2.2.2.5.   TCE theory of management control summarised

Based on the interpretation of Speklé's (2001) theory in the context of WOFS operations, it appears there are distinct levels of activity traits which are related to distinct control archetypes choices. Figure 2.1 summarises the associations expected (based on the propositions) between activity traits and control archetype choices based on the interpretations of Speklé's (2001) theory in the hierarchical organisational context. This figure is adapted from Kruis (2008); however, it is modified to include clearer delineation concerning situations where results and action oriented machine control are expected to be appropriate.

Figure 2.1 – Speklé's (2001) TCE theory of management control

Uncertainty		Control archetype	Ex-Post Information Asymmetry	
High		Boundary Control (P3)	High	Ex-Post Information Asymmetry
		Exploratory Control (P4)	Low	
Low		Arm's Length Control (P1)	Machine Control: Action Oriented (P2b)	High
			Results oriented (P2a)	Low
	Moderate	High		
	Asset Specificity			
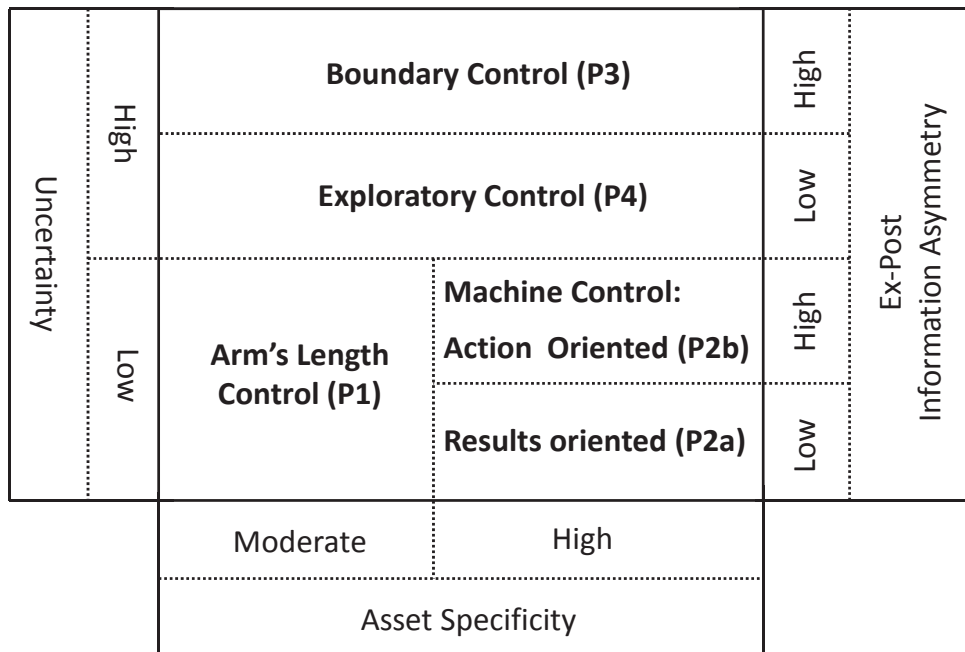
2.3 Conclusion

The TCE theory of management control appears to provide a relevant framework relating to the problems caused by activity traits and distinct control archetypes proposed to address these problems. The literature appears consistent with some assertions of the theory, but not all. In particular the use of combinations of multiple control archetypes in given situations and limited applicability of action but wide applicability results oriented machine control are possible inconsistencies with the theory. In addition, the use of boundary control where uncertainty and ex-post information asymmetry are high and the use of exploratory control where uncertainty is high may not be the case and are debatable. The theory has never been examined or tested in a hierarchical organisational context, such as headquarters' control of WOFS operations investigated in this study. Accordingly, an exploratory research method is relevant to initially examine the theory in the context of WOFS operations.

Chapter 3: Theory examination – control of wholly owned foreign subsidiaries

3.1   Introduction

The objective of this chapter is to examine the effect of activity traits associated with WOFS operations on the control choices of multinational corporation headquarters. This chapter examines the TCE theory of management control through a series of five case studies. The TCE theory of management control is applied in this study because it provides a comprehensive means of investigating the effect of WOFS operations on control choices, providing direction on effective control choices (Cohen & Levinthal 1990; Hansen 1999; Holm & Sharma 2006; Lane & Lubatkin 1998). The TCE theory of management control links activity traits (uncertainty, asset specificity, and ex-post information asymmetry) to management control archetypes designed to address these problems (Speklé 2001).

As noted in Chapter 2, there is a lack of substantial research concerning comprehensive management control system choices particularly in the context of WOFS operations (Abernethy, Bouwens & Lent 2004; Andersson & Forsgren 1996; Chenhall 2003; Langfield-Smith 1997; Luo 1999). Specifically, Speklé (2001) calls for the TCE theory of management control to be investigated and tested consistent with the need for the development of more comprehensive control frameworks. An exploratory analysis through a series of case studies is an appropriate starting point of the investigation given Speklé's (2001) theory has received limited investigation previously, particularly in the context of WOFS operations (Ahrens & Dent 1998).

The case studies suggest that the associations between activity traits and control archetypes are aligned with Speklé's (2001) predictions in many cases; however, not in all cases. There appears to be deviations notable in the context of controlling WOFS operations, including the use of multiple rather than distinct control archetypes. In addition, the use of results and action oriented machine control appear widespread in this context. The examination in this chapter provides a theoretical contribution concerning the applicability and relevance of the TCE theory of management control in explaining control choices, particularly in the context of WOFS operations. The suggestions of the case studies have important implications for testing Speklé's (2001) theory in the WOFS context; in particular, empirically testing the theory more informatively using regression analysis based on data gathered through a cross section survey questionnaire at a later stage.

The remainder of this chapter is structured as follows. Section 2 presents the research method used to examine Speklé's (2001) theory; Section 3 presents the theory examination based on the case study analyses; Section 4 presents the theory examination discussion; and Section 5 details the conclusion.

3.2   Research method

Case studies of five firms are undertaken for the purpose of examining the TCE theory of management control in the context of WOFS operations. The selection of a number of firms is necessary to comprehensively investigate the TCE theory of management control, specifically to understand how different combinations of activity traits affect control archetype choices (Ahrens & Dent 1998; Dyer & Wilkins 1991; Eisenhardt 1989; Yin 1988). Background research was conducted on a series of firms concerning expected activity traits from headquarters' perspective concerning WOFS operations. Firm selection was based on those expected to have unique sets of activity traits allowing the comprehensive investigation of Speklé's (2001) theory. The firms selected and expected activity traits are as follows:

- Corporation A is a large multinational headquartered in the United States engaged in the research, development, design, manufacturing and distribution of products in the regulated consumer products industry. The focal examination for the purpose of this case is how the US headquarters controls the Australian subsidiary operations. The similarity of operations worldwide and the distributional focus of the Australian subsidiary operations mean uncertainty and ex-post information asymmetry is expected to be low from the headquarters' perspective. The unique resources developed by the corporation, tailored to the products developed, manufactured and distributed, means asset specificity is expected to be high from the headquarters' perspective. A results oriented machine control archetype is expected in this case given the low uncertainty, high asset specificity and low ex-post information asymmetry. Both the financial controller and the associate director of finance at the subsidiary were interviewed.

- Corporation B is also headquartered in the United States and involved in the regulated consumer products industry. However, this corporation is structured very differently; product line units operate individually at the subsidiary level in each case. Accordingly, due to the central focus on regulated consumer products and the unique resources associated with this focus, low uncertainty and high asset specificity are

expected. However, the operation of multiple product units at the subsidiary level is expected to make evaluation of performance far more difficult from the headquarters' perspective, which may be associated with high ex-post information asymmetry. An action oriented machine control archetype is expected in this case given the low uncertainty, high asset specificity and high ex-post information asymmetry. The employees interviewed are involved in the financial control of the subsidiaries.

- Corporation C1 is a company headquartered in Australia comprising of four divisions, all involved in property related businesses: property development; construction; investment; and property management. Subsidiaries are highly integrated in the markets they operate. The operational activities of subsidiaries vary all over the world and it is expected this increases uncertainty and ex-post information asymmetry from the headquarters' perspective, suggesting a boundary control archetype is used in this case. A senior manager involved in the financial control at the headquarters level was interviewed.

- Corporation C2 is also a company headquartered in Australia and is involved in the property sector. Corporation C1 and C2 are in the same corporate family; however, the focus of operations and control of subsidiaries are distinct, warranting investigation as separate companies. Subsidiaries in Corporation C2 focus on price competitiveness facilitated through cost minimisation. The consistency of subsidiaries worldwide may reduce headquarters' uncertainty and the extent of unique resources used by each subsidiary. Accordingly it is expected that uncertainty and asset specificity is relatively low from the perspective of headquarters concerning the subsidiaries, suggesting an arm's length control archetype is used in this case. The same senior manager as in the case of Corporation C1 was interviewed. The manager is involved in a corporate support division and therefore has knowledge of both Corporation C1 and C2.

- Corporation D is a company headquartered in Australia and adopts a portfolio approach to corporation strategy, owning a range of different businesses involved in different industries. The large range of business is expected to increase the uncertainty headquarters faces regarding subsidiary operations. The subsidiaries owned by the corporation appear to be well established, which may allow headquarters to monitor critical performance indicators as part of performance evaluation, lowering the ex-post information asymmetry faced. An exploratory control archetype is expected in this case given the high uncertainty and low ex-post

information asymmetry. The senior manager interviewed in this corporation is involved in corporate risk and compliance at the headquarters level and previously held a number of positions in different subsidiaries owned by the corporation. Accordingly he has a clear understanding of how and why the corporation controls subsidiaries in particular ways.

- Corporation E is a company headquartered in Australia, involved in the development and manufacturing of bionic devices. Subsidiaries produce different components and perform research and development in different areas increasing asset specificity; however, they are all related to the bionic device. The focus of all subsidiaries on the bionic device means it is expected that headquarters have limited uncertainty and ex-post information asymmetry relating to these operations. A results oriented machine control archetype is expected in this case given the low uncertainty, high asset specificity, and low ex-post information asymmetry. The Chief Executive Officer (CEO) of this corporation was interviewed. This CEO has worked in a number of different positions with the corporation and is heavily involved with and knowledgeable of the subsidiary activities.

As detailed above, interviewees at Corporations C, D and E are at the headquarters level, while interviewees relating to Corporations A and B are at the subsidiary level. Multiple perspectives relating to the control of WOFS operations by headquarters, through these case studies, are important to holistically investigate Speklé's (2001) theory. It is important to note the activity traits mentioned above are expectations based on background research; however, the data from the case study interviews allows the actual level of activity traits to be determined and whether there are any associations with control archetype choices for the purpose of analysis.

To collect the case study data, semi structured interviews were conducted during 2010. Interviewees were not asked directly about the level of activity traits and effects on control archetypes choices. Rather they were asked more generally to explain what factors they feel affect management control choices (Ahrens & Dent 1998). Interviewees were never asked, for example, what the level of uncertainty is and whether this is related to action oriented machine control exercised. Using such terminology may confuse interviewees and if Speklé's (2001) theory is valid, the relevant activity traits and control archetypes should emerge from the answers provided by interviewees (Eisenhardt 1989). The interviews were

transcribed and analysed through conducting a content analysis by coding all the interview transcripts based on factors describing the corporations, activity traits, management control systems and performance (Yin 1989). Data throughout the interview transcripts was reconciled to ensure the consistency of data gathered using the coding system, and interviewee comments and answers were followed up to check the accuracy of interpretations.

For the purpose of interpreting and coding the case study data, the following activity trait definitions, consistent with the descriptions in Chapter 2, are noted:

- Uncertainty: headquarters' lack of ex-ante knowledge of WOFS activities and processes, defined by the specificity of intended performance (Williamson 1979).
- Asset specificity: degree to which an asset can be redeployed to an alternative use without sacrificing productive value (Williamson 1991).
- Ex-post information asymmetry: the extent headquarters are unable to evaluate subsidiary management performance achievement due to informational differences between headquarters and WOFS operations (David & Han 2004).

The full description of the case study findings and suggestions, with the relevant quotes from the interviews, is provided in Appendix 1 of the thesis.

3.3 Theory examination

This section presents the case study analyses related to the propositions introduced in Chapter 2.

3.3.1. <u>Archetype 1: Arm's length control</u>

All lines of business in Corporation C2 are property related; however are involved in distinct activities. The corporation's WOFS operations adopt a defender approach to competitive strategy, focusing on cost minimisation and competitive pricing rather than product innovation. Subsidiaries operate in a large number of different regions around the world. However, the processes undertaken by each subsidiary are consistent, particularly concerning building design, planning and completion of projects. The consistency of processes allows headquarters to easily hold ex-ante information regarding subsidiary operations, thereby the company experiences low uncertainty. The majority of construction project work at the subsidiary level is subcontracted and, accordingly, there is very little investment in physical

assets associated with product delivery. Product innovation is limited and accordingly intangible assets associated with design and planning expertise are relatively minimal. Accordingly asset specificity of subsidiary operations is at moderate levels in an absolute sense (relatively low in the hierarchical organisational context).

The control of WOFS operations by Corporation C2 headquarters is characterised by high autonomy extended to subsidiary management within a clearly defined framework of project approval and monitoring. Subsidiary management have the autonomy to plan and complete projects as appropriate, with headquarters only intervening with regard to project approval. Market benchmarks based on direct competitors' project pricing and costs, heavily influenced by market demand and economic activity, are used by headquarters as the basis of setting targets for subsidiaries, evaluating performance and determining rewards. Market benchmarks are available due to the strong subsidiary focus on competitive pricing rather than differentiated products. These market benchmarks are relied on extensively, with headquarters regarding projects with negative margins as acceptable consistent with these benchmarks. Headquarters' low uncertainty regarding subsidiary operations enables project approval and monitoring; extending high autonomy to subsidiary management is appropriate due to moderate asset specificity and limited risk of loss associated with opportunistic decisions or bounded rationality. Accordingly these controls align with Speklé (2001) relating to arm's length control, consistent with Proposition 1.

While arm's length control aligns with predictions in this case, it also appears that the distance separating headquarters and WOFS operations leads to the use of elements of action oriented machine and boundary control archetypes. This includes minimum standards directing operational processes and behavioural constraints concerning areas of responsibility. These controls minimise risks associated with accepting low profit margin projects and guard against any pressure to cut safety standards to minimise cost in some regions. The use of a number and different elements of control archetypes is not consistent with Speklé (2001), but may be necessary in the context of control problems associated with WOFS operations at a distance.

3.3.2. Machine control

The WOFS operations of both Corporation A and B are relatively similar and consistent worldwide, with foreign subsidiaries primarily involved in the distribution of regulated consumer products. The Australian based WOFS operations examined in both corporations are distribution arms not involved in the design, development or manufacture of products sold. This reduces headquarters' uncertainty to low levels, particularly due to the similarity of subsidiary operations worldwide. However, it is important to note that subsidiary management must still address the unique environment in which they operate in at a distance from headquarters, including regulatory and compliance factors.

Subsidiaries are heavily dependent on the intellectual property developed and held at the headquarters that forms the basis of competitive product offerings distributed at the subsidiary level. Training programs is one of the few areas of specific asset development from a human relations perspective at the subsidiary level. Asset specificity is moderate (relatively low in the hierarchal organisation context), due to the distributional focus of subsidiary operations rather than the development of intellectual property associated with product offerings, but not as low as observed in Corporation C2.

Ex-post information asymmetry from headquarters' perspective is low in both cases due to headquarters ability to assess performance in the stable local business environment in which subsidiaries operate. In addition, ex-post information asymmetry is further reduced by the clear guidelines relating to the information subsidiary management is required to report to headquarters. Finance departments at the subsidiary level have a clear role in conveying performance information to headquarters and there is also a strict policy of 'no surprises' at the time of reporting. Personnel from headquarters frequently visit WOFS operations and the flat management structure in both corporations promotes greater transparency of performance outcomes.

The control of subsidiaries in both Corporations A and B is first characterised by centralised decision-making and direction by headquarters, including product pricing, senior management recruitment and investment in operations. This centralisation is important because bounded rationality or opportunistic decisions by subsidiary management in one location could have potentially damaging consequences for operations elsewhere due to the high interdependence of WOFS operations globally. Headquarters have also implemented

extensive and inflexible standardisation of subsidiary processes relating to the vast majority of operational activities, including purchase ordering and staff recruitment, which reduces the risk of loss through specifying good business practices. These controls align with an action oriented machine control archetype, which is relevant given the low uncertainty faced by headquarters in the context of Corporation A and B subsidiaries.

In addition, low ex-post information asymmetry allows headquarters to objectively monitor and evaluate subsidiary performance in both cases. Headquarters require extensive and frequent reporting, instigated through common performance measurement systems. This includes all line items in financial reports, relating to income statements and balance sheets, and key performance indicators. Bonuses awarded are objectively determined through a formula which is clearly communicated to subsidiary personnel. There is no flexibility in the application of these bonus determination formulas.

The case studies analyses of Corporation A and B suggest machine control is exercised in the presence of low uncertainty, consistent with Speklé (2001). However, there are a number of inconsistencies with the theory observed. First, asset specificity observed in both cases is moderate, given the limited intellectual property held on the subsidiary level, which indicates machine control archetypes are not a required or efficient means of control. The use of machine control where asset specificity is moderate suggests the association between these two factors is negative, opposite to expectations, or not significant. Second, headquarters use both action and results oriented machine control in situations of low ex-post information asymmetry. This suggests headquarters use action and results oriented machine control jointly, in contrast to the suggestions of Speklé (2001) and Kruis (2008). It is interesting to note the suggestions from the analysis of Corporation E, reported in Appendix 1, are also consistent with Corporation A and B analyses.

3.3.3. Archetype 4: Boundary control

All subsidiaries of Corporation C1 are involved in property related business lines and are highly integrated in the regions in which they are located. Unique strategic initiatives are adopted and products are frequently tailored to individual customer requirements, providing subsidiaries a competitive advantage in each region. This makes it difficult for the headquarters to be aware of the ex-ante processes and activities applicable, with the personnel at the subsidiary level having the relevant local market expertise to drive competitive

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initiatives. While subsidiaries operate in a range of different business lines, all are involved in property, enabling headquarters to hold at least basic knowledge of subsidiary operations and processes. The uncertainty headquarters faces in the case of Corporation C1 is higher than that of Corporation C2 subsidiaries due to the unique initiatives in each subsidiary; however, the common property related focus of subsidiaries means that uncertainty is at moderate rather than high levels from the headquarters' perspective.

Headquarters are able to broadly monitor and evaluate subsidiary performance given the focus on property related business lines. However, detailed monitoring and evaluation is difficult due to the high integration of Corporation C1 subsidiaries in each region. In addition, the range of strategic initiatives at various stages of implementation in these regions complicates the process of monitoring and evaluating performance. Accordingly the broad, rather than detailed, ability to monitor and evaluate performance suggests that headquarters face moderate ex-post information asymmetry.[2]

Headquarters extended a high level of autonomy to Corporation C1 subsidiary personnel within a clear framework of boundaries concerning minimum safety requirements and investment criteria. These delineated boundaries allow minimisation of exposure to corporate risk, particularly reputation effects, associated with bounded rationality or opportunistic decisions at the subsidiary level. Decision making is largely decentralised to subsidiary management, with only limited guidance influencing the strategic initiatives provided by the headquarters. The unique strategic initiatives of subsidiaries in markets around the world limit headquarters' ability to provide clear direction through consistent policies and procedures. Uncertainty at moderate levels allows headquarters to establish relevant boundary controls rather than providing explicit direction to subsidiary personnel.

Headquarters closely monitor compliance with boundaries set for safety standards to ensure they are followed by subsidiaries. The performance of subsidiaries is also monitored and evaluated based on progress towards targets set as part of the five year plan. The lengthy lead-time associated with projects which are at a distance from headquarters increases the ex-post information asymmetry and limits the ability of headquarters to closely monitor and evaluate the performance of subsidiaries outside broad financial metrics.

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[2] Note: Uncertainty and ex-post information asymmetry are predicted by Speklé (2001) to be the two activity trait determinates of boundary control use. Accordingly, asset specificity is not expected to be relevant and not examined in this case.

The case study demonstrates headquarters are exercising a boundary control archetype in line with the effects of uncertainty and ex-post information asymmetry suggested by Speklé (2001), consistent with Proposition 3. Headquarters also exercises elements of results oriented machine control, demonstrated by monitoring and evaluating subsidiary performance according to the five year plan. The use of boundary control and results oriented machine control elements appears to be a result of the moderate ex-post information asymmetry in this case. This observation contrasts with Speklé (2001) who argues headquarters exercise distinct control archetypes.

3.3.4. Archetype 5: Exploratory control

Corporation D adopts a portfolio management approach to corporate strategy as it owns a range of different businesses in different industries. The range of different business owned by Corporation D means there is limited synergies and integration between these subsidiaries. In addition, the range of different businesses limits headquarters' ability to hold relevant ex-ante information regarding the processes and activities each subsidiary performs, increasing the uncertainty headquarters face. However, headquarters only invests in subsidiaries already established which it has at least a basic understanding of, accordingly minimising uncertainty to moderate levels. While the range of different businesses owned limits headquarters' ability to form clear performance expectations, headquarters place high importance on facilitating clear and open communication with subsidiary management regarding performance achievement. This minimises ex-post information asymmetry to moderate levels.[3]

The control by headquarters is first characterised by high autonomy extended to subsidiary management concerning operational decisions. This autonomy is consistent with the expertise subsidiary management has relative to headquarters due to the large variety of businesses owned by Corporation D and the uncertainty faced by headquarters relating to each one. A broad 20 per cent return on capital target is set for all subsidiaries; however, headquarters realises some entities are not able to achieve this target in the short to medium term. It is the responsibility of subsidiary management to demonstrate how the broad return on capital target will be achieved. Accordingly relevant performance targets are established

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[3] Note: Uncertainty and ex-post information asymmetry are predicted by Speklé (2001) to be the two activity trait determinates of exploratory control use. Accordingly asset specificity is not expected to be relevant and not examined in this case.

during the period and monitored by headquarters. Headquarters focuses on the 20 per cent return on capital target in the long term as the basis for rewarding subsidiary management.

Headquarters extends high autonomy to subsidiary management, establish relevant targets during the period, and focus on long term rewards, indicating the use of an exploratory control archetype. Moderate levels of ex-post information asymmetry appear to enable headquarters' monitoring and evaluation of performance, consistent with Speklé (2001). However, the ability to establish relevant targets during the period may also be possible by the moderate, rather than high, level of uncertainty headquarters face concerning subsidiary operations in this case. Action oriented machine and boundary control elements are also present in the headquarters' control choices. This relates to the minimum standards and boundaries expected of subsidiary personnel, reflective of the moderate ex-post information asymmetry faced by headquarters.

The activity traits and associated control archetypes observed in each case corporation examined in this section are summarised in Table 3.1.

Table 3.1 – Activity traits & control archetypes observed in case studies

Corporation	Uncertainty	Asset specificity	Ex-post information asymmetry	Control archetype
A & B	Low	Moderate	Low	Results and action oriented machine control
C1	Moderate	Moderate	Moderate	Boundary and elements of results oriented machine control
C2	Low	Moderate	Moderate	Arm's length control and elements of action oriented machine and boundary control
D	Moderate	Moderate	Moderate	Exploratory and elements of action oriented machine and boundary control
E	Low	High	Low	Results and action oriented machine control

3.4   Theory examination discussion

It is argued in Speklé's (2001) TCE theory of management control that the choice of a distinct control archetype is determined by activity traits. The case studies suggest activity traits are related to control archetypes to certain extent; however, there are a number of potential deviations from the theory in the context of WOFS operations.

Multiple control archetypes appear to be adopted by firms in a number of cases, in contrast to the distinct single control archetype proposed by Speklé (2001). The distance between headquarters and WOFS operations appears to exemplify control problems faced (Hassel & Cunningham 2004), indicating effective control using multiple control archetypes is of high importance. This is particularly noted regarding the wide use of machine control elements. For example, both results and action oriented machine controls are used in Corporations A and B; results oriented machine and boundary control are used in Corporation C1; and action oriented machine and exploratory control are used in Corporation D. This suggests not only the use of combinations of control archetypes, but also the wide use of machine control regardless of activity trait levels in some cases. Machine control archetypes may be regarded as an important means of maintaining sufficient control of WOFS operations.

The use of multiple control archetypes is consistent with suggestions from literature, noted in the previous chapter. Accordingly it may be more appropriate to instead call archetypes 'dimensions' of control, given headquarters use multiple control dimensions rather than distinct control archetypes. However, the theory is yet to be tested using a confirmatory method and accordingly the term archetype will continue to be used in this thesis. Due to the inconsistency between the theory and case study suggestions, it is important to measure the control archetypes consistently with the theory (distinct choices), but also provide an indication as to whether multiple control archetypes are used. Equally, it is important to measure the degree headquarters use each control archetype as the dominant control choice when investigating the effects of activity traits.

A further inconsistency with Speklé's (2001) theory is that certain activity trait levels, in combination with control archetype choices, do not align with Speklé's (2001) predictions in some cases as suggested in literature reviewed in the previous chapter. For instance, the wide use of results and action oriented machine control suggests there is no significant association between activity trait variation and machine control archetypes in the WOFS context. In addition, the use of exploratory control may be enabled by ex-ante information, rather than an option where uncertainty is high – the opposite of theory predictions. Accordingly, while some case study suggestions are consistent with Speklé's (2001) theory, it remains an empirical question as to the direction and significance of association between activity traits and control archetypes.

3.5   Conclusion

This chapter examines the TCE theory of management control in the context of headquarters controlling WOFS operations through five case studies. While activity traits are related to control choices to a certain extent, there are deviations from the theory noted based on the case study analyses, suggesting a modified version of Speklé's (2001) framework is observed in practice. In particular, the use of multiple control choices and associations, inconsistent with Speklé's (2001) theory predictions, are the main deviations observed. Associations inconsistent with Speklé's (2001) predictions include the use of exploratory control being enabled by ex-ante information and the wide use of action and results oriented machine control, regardless of activity traits. While case studies are an exploratory technique and definitive conclusions cannot be reached, it is important to carefully note these deviations. This is particularly important from a method perspective if the theory is to be applied and tested further. Headquarters' use of multiple control archetypes suggests attempting to classify each firm as using one particular control archetype is inappropriate and will not lead to any relevant and informative suggestions or findings. The suggestions of the case studies now facilitate testing of Speklé's (2001) theory in a confirmatory manner. The next chapter uses confirmatory techniques, through regression analysis based on cross sectional survey data, to test and confirm whether the TCE theory of management control is or is not supported.

Chapter 4: Theory testing – control of wholly owned foreign subsidiaries

4.1   Introduction

The objective of this chapter is to investigate the effect of activity traits associated with WOFS operations on the control choices of multinational corporation headquarters using a confirmatory research method technique. To achieve this objective this chapter tests Speklé's (2001) TCE theory of management control using regression analysis based on cross sectional survey data collected in this study.

The motivation of this chapter is to build on existing studies and investigate a more comprehensive control framework in the context of WOFS operations (Abernethy, Bouwens & Lent 2004; Andersson & Forsgren 1996; Chenhall 2003; Langfield-Smith 1997; Luo 1999). Whilst Speklé's (2001) theory may provide important insights into the control of WOFS, the case studies reported in Chapter 3 provide evidence that there are possibly some deviations from the theory. This includes headquarters adopting multiple control archetypes and associations between activity traits and control archetypes differing from theory predictions. Building on the initial case study examination through using cross sectional survey data enables this study to apply a rigorous approach investigate Speklé (2001) theory in the context of WOFS operations. The results, based on OLS regressions using the survey data, confirm some support and also deviations from the theory in the context of WOFS operations consistent with the case study suggestions. It is important to note while multiple control archetypes are used by headquarters in given situations, the factor analysis of indicators of the control archetype constructs demonstrates the validity of Speklé's (2001) control conceptualisations.

This chapter contributes to practice by providing insights to managers relating to the applicability of TCE theory of management control to inform their control choices regarding WOFS operations.

4.2   Research method

A cross sectional survey questionnaire is the only practical method to collect data in this context given information on activity traits and management control system choices is not publically available data. After initial testing, a survey questionnaire was mailed in late 2011 to senior managers at Australian headquarters involved in the control of WOFS operations.

Data collected from a cross sectional survey questionnaire enables statistical modelling of the associations between activity traits and control archetypes described, consistent with the propositions described in Chapter 2. Such a confirmatory approach builds on the case study analyses reported in Chapter 3, enabling the generalisation of findings to a wider set of firms in the context of controlling WOFS operations from a distance (Brownell 1995).

The constructs and measures generated are consistent with Speklé's (2001) theory, while taking into account the deviations observed in the case studies. First, dummy variables are used to measure the levels of activity traits defined in Speklé's (2001) theory and importantly situations where particular control archetypes defined in the theory are argued to be appropriate. Second, measures of the degree headquarters use each control archetype are constructed. These measures are appropriate because they reflect the degree headquarters use each control archetype relative to others, and also indicate whether these distinct archetypes conceptualised in the theory are consistent with reality.

4.2.1   Survey method and development of the survey instrument

A survey questionnaire was developed following the guidance of Dillman (2000) who indicates appropriately structured questionnaires are a source of large scale, high quality data. Dillman (2000) details and justifies processes that should be followed to ensure high response rates and minimum survey errors. The following considerations are provided by Dillman (2000) as the basis of assessing each survey question:

    a. Does the question require an answer?

    b. To what extent do survey recipients already have an accurate, ready-made answer for the question asked?

    c. Can people accurately recall and report past behaviours?

    d. Is the respondent willing to reveal the requested information?

    e. Will the respondent feel motivated to answer each question?

    f. Is the respondent's understanding of response categories likely to be influenced by more than words?

Particular attention is directed towards considerations (b) to (d) above by carefully targeting the survey at senior managers (e.g. chief executive officers and manager directors) involved in the control of WOFS operations. Targeting the survey at senior managers at the headquarters is consistent with the organisational level investigated in this study, and ensures

the survey is sent to managers who are in the best position to provide accurate and relevant information. The questions included in the survey, particularly those relating to background information, were carefully considered so they did not request excessive corporate or personal information participants may not be willing or comfortable to provide for confidentiality reasons. The questions are presented as clearly as possible to address consideration (f) and based on questions used in previous studies, where in many cases the reliability of questions has already been confirmed. The descriptive and validity statistics of data from survey questions in prior studies provides indications of question reliability. However, the questions are revised where appropriate to ensure they are consistent in terms of wording and format with other questions in the survey, reducing questionnaire complexity from the perspective of respondents.

To ensure questions are as clear as possible the following recommendations from Dillman (2000) were followed when constructing questions:

a. use simple words
b. do not be vague
c. keep it short
d. be specific
e. do not talk down to respondents
f. avoid bias
g. avoid objectionable questions
h. do not be too specific
i. avoid hypothetical questions

After the initial draft of the survey was completed, the Dillman (2000) method was reviewed. Based on this review the following points were noted and addressed:

- Clear identification of survey start.
- Clear indication of where respondents should turnover, providing survey direction.
- Likert scales kept as consistent as possible to reduce confusion.
- Direction of Likert scales is consistent throughout the survey.
- Spacing between answer choices (in matrix) consistent.
- Simple, straight forward questions used and unnecessary length avoided.
- Words used in questions are generally understood by respondents.

- Connection between questions checked to ensure the interpretation of later question(s) not adversely affected.
- No unnecessary switching between question topics.
- Questions include both 'agree and disagree' rather than just 'agree' where appropriate to remove bias.
- No further questions included on the back cover of survey.

The survey was pretested in two stages. First, academics at UTS were asked to review and provide feedback on the clarity of the questions in the survey questionnaire. In total seven academics provided feedback on the survey. Four of the academics providing feedback were management accounting researchers who have all previously administered cross sectional survey questionnaires. Two academics were financial accounting and corporate governance researchers, and finally one academic was involved in information technology research outside of the business school. A variety of feedback was gained from the perspective of researchers involved in different areas. Academics provided feedback on potential research issues, general clarity of the questionnaire and ease of interpreting questions. Academics provided written feedback and discussions were also undertaken to clarify points raised. The following points were noted and addressed in this first stage of testing:

- Questions modified where appropriate so they are more direct, succinct and easier to understand.
- Selective bolding of distinct question elements to convey key question differences.
- Questions relating to headquarters and subsidiary management levels clearly identified and separated to avoid confusion.
- Likert scales clearly indentified at the start of each section to avoid confusion when completing questionnaire.
- Amount of white space in questionnaire increased through removing unnecessary table lines; faint lines included were appropriate. Increased white space gives the impression the survey is less complex.

After changes were made to the questionnaire, the second stage of testing was undertaken. Eight managers involved in headquarters' control of WOFS operations, consistent with the target participants, completed and provided feedback on the questionnaire. Feedback was positive, with participants commenting favourably on the relevance of survey questions in the

context of controlling WOFS operations. The following points were noted and addressed as part of the second stage of testing:

- Small modifications were made to some questions to improve clarity.
- Definition of some terms included in brackets to remove confusion.
- Inclusion of a new question relating to cash flow targets which may be important in the context of controlling WOFS.

Initial descriptive statistics and factor analysis of the test data collected was performed. The descriptive statistics indicated no significant biases, floors or ceilings in the data collected. In addition, the factor analysis of indicators forming constructs was in line with expectations. The small sample size indicates that no definitive conclusions can be reached; however, the initial examination of the data collected through the second stage of testing indicated it is valid and reliable. Therefore no changes were made to the questionnaire based on the analysis of the test data. However given some changes to the survey were made based on the feedback received, the data gathered during testing was not used in the main analysis, including testing of propositions.

Finally, the survey was sent to a Linguistician for review. Minor changes were made to the wording of some questions to produce the final version of the questionnaire.

The design and development of the cover letter and questionnaire took into account social exchange theory, consistent with Dillman's (2000) recommendations. This is important to increase the perceived rewards, decrease perceived costs, and promote trust in beneficial outcomes of participating in the study. The social exchange theory argues providing rewards upfront rather than ex-post rewards have a greater effect on response rates. However, participants in this study are senior managers where upfront rewards, such as vouchers and stationery, are of relatively limited material value. The reward for completing the questionnaire was clearly emphasised in the cover letter by explaining that an executive report detailing the findings of the study will be provided to participants. Managers in the second stage of testing indicated their interest in receiving the executive report as a clear motivation for participating in the study. Testing indicated that the questionnaire took less than 20 minutes to complete and all costs associated with returning the questionnaire were covered with prepaid envelopes. Participants were assured questionnaire responses remained anonymous. As a means of tracking who replied to the survey, participants were asked to

return a separate reply paid post card so they could be removed from the follow up list and ensure they receive the executive report. To reinforce participants' trust, the cover letter included the University of Technology, Sydney (UTS) logo and the names and contact details of the PhD candidate and supervisors. The mail out package was posted in a white envelope with the UTS logo on the front to remove any perception of a private marketing campaign.

A follow up letter was sent to all non-respondents three weeks after the initial survey was sent. This letter reminded respondents of the importance of the study, that participants would the executive report as a reward and provided a link to an online version of the survey questionnaire. The online version was an exact replication of the printed version of the survey. Calls were also made to non-respondents, starting at the time the follow up letters were sent out. The process of calling non-respondents was a very time consuming process as it involved negotiating through personal and executive assistants that manage access to senior managers (managing directors and CEOs in most cases). In many cases those contacted provided email addresses, and the letter of invitation to participate in the survey was then emailed to the relevant person. A third and final survey package, which included another printed copy of the questionnaire, was sent to non-respondents six weeks after the first reminder letter. The survey instrument including the questionnaire, cover letters and post card are provided in Appendix 2 of this thesis.

4.2.2 Sample

A listing of Australian companies with WOFS operations is not publically available. A listing of Australian companies with international operations overseas was purchased from Dunn and Bradstreet, a company specialising in the provision of commercial information. This list included companies and in most cases the names of relevant managers in Australia. The listing was verified by drawing information from the Company 360 database, DatAnalysis database, the Australian Stock Exchange (ASX) website and individual company websites. A search for each company in the list was performed using these three sources where possible to initially check if the company had WOFS operations. If a company had WOFS operations, publically available sources such as the company websites were used to identify the relevant managers, managing directors and CEO in most cases, of WOFS operations and the relevant postal address.

A total of 902 survey packages were posted on 20 September 2011, based on the companies from the Dunn and Bradstreet list that were confirmed to have WOFS operations. A total of 186 firms were removed from the sample because they replied indicating they either had no WOFS, they had dormant subsidiaries (employing zero people), or that their headquarters were located overseas. In addition a further 98 surveys were returned to sender and removed from the sample due to the manager leaving the company, headquarters moving address with new contact information unavailable, or the company closing down. From the remaining sample of 618 a total of 175 surveys were returned, equalling a response rate of 28.32 per cent. A total of 167 returned surveys were usable, with eight removed due to incomplete responses. These statistics are summarised in Table 4.1.

Table 4.1 – Summary of survey distribution and response rates

	Number of surveys
Surveys mailed out	902
Did not meet criteria (removed from sample)	186
Correct contact information unavailable (removed from sample)	98
Final sample after removals	618
Surveys returned before first reminder	42
Surveys retuned between first and second reminder	98
Surveys returned after second reminder	35
Total surveys returned	175
Unusable surveys (incomplete responses)	8
Usable surveys	167

Based on the survey responses, information on the response characteristics is available. Table 4.2 reports some of the general characteristics of respondents. The data indicates that managers who completed the questionnaire have been with a company for on average 9.759 years, a sufficient length of time to provide meaningful responses. Subsidiaries in the sample appear to be well established, with an average length of operation of 10.83 years. There appears to be a large variation in the size of both corporations and subsidiaries indicating a broad range of firms replied to the survey. A potential issue is the presence of subsidiaries employing zero people, indicating dormant subsidiary operations which are not relevant from a management control system perspective. It is unclear why surveys were completed with respect to subsidiaries employing zero people as management control system choices are not relevant in this context.

Table 4.2 – General response characteristics

	Minimum	Maximum	Mean	Median	Std. Dev.
Years with company (manager)	0	65[4]	9.759	6	10.291
Subsidiary age (years)	0	150	10.830	6	17.047
Corporation size (employees)	0	38,000	1897.080	160	5718.654
Subsidiary size (employees)	0	5,000	149.960	25	453.415

Table 4.3 reports the majority of respondents are senior managers, consistent with the target survey respondents at the headquarters level. These respondents indicate the data is relevant concerning the investigation of how multinational headquarters control WOFS operations.

Table 4.3 – Position of respondents

Position	Frequency	Percentage
Managing Director/ Chief Executive Officer (CEO)	62	37.13%
Chief Financial Officer (CFO)	29	17.37%
Financial Controller	15	8.98%
Functional Manager	11	6.59%
Executive Director	9	5.39%
Company Secretary	8	4.79%
Finance Manager	8	4.80%
Chairman	6	3.59%
General Manager	6	3.59%
Chief Operating Officer	3	1.80%
Group Accounting Manager	3	1.80%
Other	7	4.19%

Table 4.4 reports the industry involvement of both corporations and subsidiaries according to the Australian and New Zealand Standard Industrial Classifications. The table indicates a broad range of industries are included in the survey responses. The high percentage of mining involvement is expected and consistent with the significance of this industry for Australian corporations and investment in related operations overseas. There does not appear to be any significant bias in industry response rates.

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[4] One respondent indicated they have worked at their company for 65 years. The question is clearly stated in the survey to ensure participants did not provide their age rather than their length of time with the company. The mean and median values indicate participants interpreted the question correctly.

Table 4.4 – Industry involvement of respondents

Industry	Corporation		Subsidiary	
	Frequency	Percentage	Frequency	Percentage
Mining	46	20.4%	37	18.5%
Manufacturing	38	16.8%	27	13.5%
Other Services	26	11.5%	26	13.0%
Professional, Scientific & Technical Services	18	8.0%	19	9.5%
Information Media & Telecommunications	16	7.1%	15	7.5%
Finance & Insurance Services	13	5.8%	12	6.0%
Wholesale Trade	13	5.8%	16	8.0%
Construction	11	4.9%	10	5.0%
Electricity, Gas, Water & Waste Services	8	3.5%	8	4.0%
Retail Trade	7	3.1%	5	2.5%
Agriculture, Forestry & Fishing	6	2.7%	5	2.5%
Health Care & Social Assistance	6	2.7%	6	3.0%
Transport, Postal & Warehousing	6	2.7%	4	2.0%
Administrative & Support Services	5	2.2%	4	2.0%
Rental, Hiring & Real Estate Services	3	1.3%	4	2.0%
Accommodation & Food Services	1	0.4%	0	0.0%
Arts & Recreation Services	1	0.4%	1	0.5%
Education & Training	1	0.4%	1	0.5%
Public Administration & Safety	1	0.4%	0	0.0%

Table 4.5 reports on the region and number of subsidiaries in these regions (frequency) in the sample. A broad cross section of regions is included in the sample, representative of the diversity of regions Australian companies operate in.

Table 4.5 – Subsidiary location

Region	Frequency	Percentage
North America	45	26.95%
Asia	37	22.16%
Oceania	34	20.36%
Europe	27	16.17%
Africa	18	10.78%
Middle East	3	1.80%
South America	2	1.20%
Other (not provided)	1	0.60%

4.2.3   Statistical modelling

The propositions in Chapter 2 are tested using ordinary least squares (OLS) regressions, enabling the association between control archetypes and activity traits to be investigated. The measurement of each variable is explained in this section, followed by the regression models used to test the association between these variables. All indicators in the survey questionnaire are based on five point likert scales.

4.2.3.1. Uncertainty

Uncertainty relates to headquarters' ex-ante knowledge of WOFS activities and processes and is defined as the specificity of intended performance (Williamson 1979). The specificity of intended performance relates to the degree headquarters can provide direction consistent with the goals and objectives of WOFS operations. Ambiguous goals and objectives are associated with limited headquarters' knowledge of subsidiary operations and practices, and accordingly high uncertainty concerning WOFS operations. To measure uncertainty, the following indicators are adapted from Kruis (2008) and Rainey (1983):

1. clarity of goals
2. specificity of goals
3. clarity of goals to outsiders
4. goals known to insiders

The overall clarity of WOFS goals from the headquarters' perspective links closely with these four indicators; therefore these are expected to be reflective indicators of uncertainty. The broad nature of these indicators means they are expected to be applicable to all industries of survey participants.

4.2.3.2. Asset specificity

Asset specificity is defined as the degree to which an asset can be redeployed to an alternative use without sacrificing productive value (Williamson 1991). Rather than using a number of different indicators to measure asset specificity, many studies use single indicators which vary according to the context investigated (David & Han 2004; Rindfleisch & Heide 1997); however, this study adopts a more comprehensive approach. Based on the review of literature and consideration of the organisational context investigated in this study, the following indicators are used to measure asset specificity (the extent to which the following factors at the subsidiary level can be reallocated to alternative uses if WOFS operations ceased):

1. employee skills (human)
2. training of employees (human)
3. physical assets (physical assets)
4. technological systems (physical assets)
5. product customisation expertise (product)
6. branding rights (brand name)
7. reputational capital (brand name)

These indicators are in line with Klein, Frazier and Roth (1990) who suggest both human and physical asset specificity are relevant in the context of international operations. In addition, the intangible assets relating to branding and product expertise are relevant in the contemporary business context, particularly for firms operating in information technology related sectors. Accordingly indicators related to intangible assets are also included to ensure the relevance of this construct to firms operating in these sectors (Henri 2006). These indicators are reflective as specificity of subsidiary operational activities are expected to affect the specificity of all assets used. For example, highly specific manufacturing equipment in many cases is related to unique training programs, specific employee skills, and specific technological systems to operate the equipment. The comprehensive and reflective nature of these indicators suggests they are broadly applicable to a variety of industries.

4.2.3.3.   Ex-post information asymmetry

Ex-post information asymmetry is defined as the extent the headquarters is unable to evaluate performance regarding what has been achieved due to informational differences (David & Han 2004). The level of ex-post information asymmetry is measured according to the relative information headquarters has, compared to subsidiary management, concerning performance achievements. The relative information of headquarters is measured using the following indicators relating to WOFS operations adapted from Dunk (1993):

1. reaching performance potential
2. impact of subsidiary management on performance
3. impact of external factors on performance
4. understanding subsidiary achievements

Headquarters' general knowledge of WOFS operations is closely related to these four indicators which are accordingly expected to be reflective indicators of ex-post information asymmetry. The indicators are expected to be applicable to all industries of survey participants.

4.2.3.4.   Activity trait dummy variables

To determine the final measures of the activity traits consistent with Speklé's (2001) theory constructs are first formed based on the factor analysis and aggregation of these reflective indicators described in the sections above, which then allow the determination of relevant dummy variables for each construct.

A simple additive aggregation method of construct formation for reflectively determined constructs is appropriate, with no loss in informational value from each indicator due to the reflective nature of each (OECD 2008). The simple additive method is applied through a summated score of indicators (or average value). Weighted methods of construct formation based on principle component analysis or factor analysis are not appropriate in this case as they assume each indicator provides unique construct value information. This is not the case concerning reflective indicators. The principle component analysis performed in this chapter (detailed in a later section of this chapter) demonstrates extracting unique indicators (or sets of indicators) to explain unique aspects of a latent variable is not possible due to the correlation between the indicators which is expected where they are reflective (OECD 2008).

Based on the continuous constructs explained above, dummy variables are then determined to measure the levels of activity traits. According to Speklé's (2001), distinct levels of low or high activity traits determine the choice of control archetypes. It should be noted that according to TCE theory asset specificity varies from moderate to high levels in hierarchal organisational context, but from a measurement perspective are treated as varying from low to high. If a control archetype is argued to be appropriate in situations of high levels of an activity trait, the dummy variable is assigned a value of 1 for Likert scale values above 3, and zero for Likert scale values 1-3. If a control archetype is argued to be appropriate in situations of low levels of an activity trait, the dummy variable is assigned a value of 1 for Likert scale values below 3, and zero for variables 3-5. The absolute value 3, rather than the construct median value, is used as the point of determination for high or low as it cannot be assumed that the construct median value is aligned with the determination of activity traits at truly high or low levels. The sample may not be perfectly split between high and low, so instead the absolute measurement of the activity trait levels should be relied on as a basis of dummy variable determination.

In addition to the measurement of individual activity traits, profiles of activity traits representative of situations where control archetypes are argued to be appropriate (Speklé 2001) are also measured through dummy variables. For each control archetype an activity trait profile variable is determined and assigned a 1 if activity traits are representative of situations where the control archetype is applicable, and zero if not representative. For example, the arm's length control activity trait profile dummy variable (AT_PROFILE_ARMS_DUM) is assigned a value of 1 if both uncertainty and asset

specificity are low as defined by the individual activity trait dummy variables, and zero otherwise.

4.2.3.5. Management control system

The management control system conceptualisation based on Speklé (2001) is summarised in Table 4.6.

Table 4.6 – Control archetypes summarised (Speklé 2001)

Dimensions	Arm's length control	Results oriented machine control	Action oriented machine control	Boundary control	Exploratory control
Structure	High autonomy extended to personnel	Moderate – high levels of autonomy within clearly defined responsibility centres	Low – moderate autonomy, clear hierarchy and areas of responsibility	High autonomy within clearly defined boundaries	High autonomy extended to personnel
Standardisation	Financial performance targets based on external benchmarks	Administratively and internally developed performance targets	Behaviour standardised, extensive procedures and policies governing behaviour	Emphasis on behaviour to be avoided	Relevant standards and performance targets established during period
Monitoring and performance evaluation	Performance assessed relative to external benchmarks	Performance assessed relative to internal administrative targets	Focus on monitoring compliance with standardised behaviour	Focus on operating within boundaries	Standards and targets used to assess long term performance throughout the period
Rewards and incentive structure	Performance dependent bonuses based on external benchmarks	Performance dependent bonuses based on internal administrative targets	Limited reward systems	Rewards based on compliance with boundaries	Long term performance determine career prospects

The measures to operationalise Speklé's (2001) control archetype conceptualisations are adapted from Kruis (2008). The management control indicators of the control archetypes are summarised in Table 4.7. The ticked boxes indicate the management control indicators used to measure each of the control archetypes listed across the top of the table. Four indicators are reversed to measure the relevant archetypes. The survey questions used to measure each management control indicator (MCI) are listed in Table 4.7. The indicators of each control archetype are expected to be reflective as they measure distinct control choices related to activity traits. The final indicators used to measure each construct are based on the factor analysis detailed later in this chapter.

Table 4.7 – Indictors of control archetypes (before factor analysis)

Dimensions			Indicators	Survey questions	Arm's length control	Results oriented machine control	Action oriented machine control	Boundary control	Exploratory control
Structure		1	Accountability/responsibilities defined	Reverse 14a		✓	✓		
		2	Autonomy extended to subsidiary management	22a-e	✓	✓	✓ (reversed)	✓	✓
		3	HQ management by exception	Reverse 18a-d	✓	✓			
		4	Transparency of information flow (between HQ and subsidiary)	Reverse 11g					✓
Standardisation	Action	5	Boundaries delineated	Reverse 14b				✓	
		6	Codification of actions (rules & instructions)	Reverse 14d,e			✓		
		7	Standardised systems	Reverse 23a-e			✓		
	Targets	8	Codifications of targets (internally determined)	Reverse (24a-g, 24i, 16a, 17a)		✓			
		9	Flexibility of targets	22f, (14c reverse)	✓ (reversed)				✓
		10	Broad HQ performance expectations	Reverse 16b					✓
		11	Emergent HQ performance expectations	Reverse 17b					✓
		12	Set limits on activities	Reverse 16c				✓	
Monitoring & performance evaluation		13	Adherence to codified actions (policies and procedures) monitored	Reverse (15a, 26d)			✓		
		14	Monitoring & evaluation based on codified targets	Reverse (25a-b&d, 11d, 26a-b)		✓			
		15	Monitoring & evaluation according to market benchmarks	Reverse (24h, 25c, 26c)	✓				
		16	Long term performance assessment	Reverse (26e, 26f-g)					✓
		17	Subjectivity in performance evaluation	22g, (14f reverse)					✓
		18	HQ periodically checking compliance with boundaries	Reverse (15b, 26d)				✓	
Rewards		19	Punishment for not complying with codified actions	Reverse 19b			✓		
		20	Rewards based on codified evaluation	Reverse 27a-b		✓			
		21	Rewards tied to market based performance evaluation	Reverse 27c	✓				
		22	Reward through promotion	Reverse (27d, 19a)					✓
		23	Subjectivity in reward determination	(27e reverse), 22h					✓
		24	Severe sanctions for crossing boundaries	Reverse 19c				✓	

To measure the extent firms use each control archetype, continuous control archetype measures are calculated, by factor analysing and then calculating a weighted average of the final indicators (consistent with the measurement of the continuous activity trait constructs described above). The final indicators of each control archetype are reported in Appendix 4. According to Speklé (2001), headquarters choose distinct control archetypes in accordance with activity trait levels. To measure the control archetypes consistent with the theory, a variable needs to be created which measures the degree headquarters use one control archetype relative to others. This measure, called the combination index, is calculated using the following formula:

$$\text{Combination index} = 1 - \frac{A2 + A3 + A4 + A5}{A1 + A2 + A3 + A4 + A5}$$

The formula captures the degree to which the focal control archetype (A1) is being exercised by the headquarters.

The measures of the extent to which each control archetype is used for each firm are substituted into the formula. For example, to measure arm's length control for a firm assume the extent to which a firm uses each of the control archetypes is as follows:

- arm's length control (A1): 4.5
- results oriented machine control (A2): 1.2
- action oriented machine control (A3): 1
- boundary control (A4): 2.3
- exploratory control (A5): 1.5

The following measure of the degree arm's length control is used by the headquarters is calculated by substituting the numbers into the equation as follows:

$$1 - \frac{1.2 + 1 + 2.3 + 1.5}{4.5 + 1.2 + 1 + 2.3 + 1.5} = 0.429$$

The combination index formula minimum value is 0.048 and maximum value is 0.556. The value of 0.429 in the case above indicates arm's length control is being used to a high degree, relative to other control archetypes. The advantage of the combination index measure is that it allows the data to 'speak' because values will be either or close to 0.048 or 0.556 if Speklé (2001) is correct concerning the choice of distinct control archetypes proposed, given a control archetype is either used or not used. Alternatively, if the control archetypes are really dimensions of control where multiple control archetypes are used in a given situation, there will be far more variation between the minimum and maximum values.

4.2.3.6. Ordinary least squares regressions

An ordinary least squares (OLS) regression approach has been adopted to test the associations between activity traits and control archetypes detailed in the propositions. An OLS regression is run for each control archetype. The dependent variable of each model is determined by the relevant control archetype combination index. The independent variables are based on the activity trait dummy variables. The ability to examine the effects of independent dummy variables (activity trait profile and individual activity traits) on

continuous combination index dependent variables through OLS regression means that this method of analysis is appropriate.

Proposition 1 predicts arm's length control is used in situations of low uncertainty and moderate asset specificity (relatively low in the hierarchical organisational context). This is tested through Equation 1 below.

$COMBINATION\_INDEX\_ARMS_i = \alpha_0 + \alpha_1 AT\_PROFILE\_ARMS\_DUM_i + \alpha_2 UNCERTAINTY\_DUM_i + \alpha_3 ASSET\_SPEC\_DUM_i + \varepsilon_i$ **(1)**

where:

$COMBINATION\_INDEX\_ARMS_i$: Degree headquarters use arm's length control relative to others

$AT\_PROFILE\_ARMS\_DUM_i$: Dummy variable of 1 where both uncertainty and asset specificity are low, and zero where they are not

$UNCERTAINTY\_DUM_i$: Dummy variable of 1 where uncertainty is low, and zero for moderate to high uncertainty

$ASSET\_SPEC\_DUM_i$: Dummy variable of 1 where asset specificity is low, and zero for moderate to high asset specificity (in an absolute sense).

Proposition 2a predicts results oriented machine control is used in situations of low uncertainty, high asset specificity and low ex-post information asymmetry. This is tested through Equation 2 below.

$COMBINATION\_INDEX\_RESULTS_i = \alpha_0 + \alpha_1 AT\_PROFILE\_RESULTS\_DUM_i + \alpha_2 UNCERTAINTY\_DUM_i + \alpha_3 ASSET\_SPEC\_DUM_i + \alpha_4 EX\text{-}POST\_INFO\_ASY\_DUM_i + \varepsilon_i$ **(2)**

where:

$COMBINATION\_INDEX\_RESULTS_i$: Degree headquarters use results oriented machine control relative to others

$AT\_PROFILE\_RESULTS\_DUM_i$: Dummy variable of 1 where uncertainty is low, asset specificity is high and ex-post asymmetry is low, and zero where they are not

$UNCERTAINTY\_DUM_i$: Dummy variable of 1 where uncertainty is low, and zero for moderate to high uncertainty

$ASSET\_SPEC\_DUM_i$: Dummy variable of 1 where asset specificity is high, and zero for low to moderate asset specificity (in an absolute sense)

$EX\text{-}POST\_INFO\_ASY\_DUM_i$: Dummy variable of 1 where ex-post information asymmetry is low, and zero for moderate to high ex-post information asymmetry.

Proposition 2b predicts action oriented machine control is used in situations of low uncertainty, high asset specificity and high ex-post information asymmetry. This is tested through Equation 3 below.

$$COMBINATION\_INDEX\_ACTION_i = \alpha_0 + \alpha_1 AT\_PROFILE\_ACTION\_DUM_i +$$
$$\alpha_2 UNCERTAINTY\_DUM_i + \alpha_3 ASSET\_SPEC\_DUM_i + \alpha_4 EX\text{-}POST\_INFO\_ASY\_DUM_i +$$
$$\varepsilon_i \qquad \qquad \textbf{(3)}$$

where:

$COMBINATION\_INDEX\_ACTION_i$: Degree headquarters use action oriented machine control relative to others

$AT\_PROFILE\_ACTION\_DUM_i$: Dummy variable of 1 where uncertainty is low, asset specificity is high and ex-post asymmetry is high, and zero where they are not

$UNCERTAINTY\_DUM_i$: Dummy variable of 1 where uncertainty is low, and zero for moderate to high uncertainty

$ASSET\_SPEC\_DUM_i$: Dummy variable of 1 where asset specificity is high, and zero for low to moderate asset specificity (in an absolute sense)

$EX\text{-}POST\_INFO\_ASY\_DUM_i$: Dummy variable of 1 where ex-post information asymmetry is high, and zero for low to moderate ex-post information asymmetry.

Proposition 3 predicts boundary control is used in situations of high uncertainty and high ex-post information asymmetry. This is tested through Equation 4 below.

$$COMBINATION\_INDEX\_BOUNDARY_i = \alpha_0 + \alpha_1 AT\_PROFILE\_BOUNDARY\_DUM_i +$$
$$\alpha_2 UNCERTAINTY\_DUM_i + \alpha_3 EX\text{-}POST\_INFO\_ASY\_DUM_i + \varepsilon_i \qquad \qquad \textbf{(4)}$$

where:

$COMBINATION\_INDEX\_BOUNDARY_i$: Degree headquarters use boundary control relative to others

$AT\_PROFILE\_BOUNDARY\_DUM_i$: Dummy variable of 1 where uncertainty is high and ex-post asymmetry is high, and zero where they are not

$UNCERTAINTY\_DUM_i$: Dummy variable of 1 where uncertainty is high, and zero for low to moderate uncertainty

$EX\text{-}POST\_INFO\_ASY\_DUM_i$: Dummy variable of 1 where ex-post information asymmetry is high, and zero for low to moderate ex-post information asymmetry.

Proposition 4 predicts exploratory control is used in situations of high uncertainty and low ex-post information asymmetry. This is tested through Equation 5 below.

$COMBINATION\_INDEX\_EXPLOR_i = \alpha_0 + \alpha_1 AT\_PROFILE\_EXPLOR\_DUM_i +$
$\alpha_2 UNCERTAINTY\_DUM_i + \alpha_3 EX\text{-}POST\_INFO\_ASY\_DUM_i + \varepsilon_i$ **(5)**

where:

COMBINATION_INDEX_EXPLOR$_i$: Degree headquarters use exploratory control relative to others

AT_PROFILE_EXPLOR_DUM$_i$: Dummy variable of 1 where uncertainty is high and ex-post asymmetry is low, and zero where they are not

UNCERTAINTY_DUM$_i$: Dummy variable of 1 where uncertainty is high, and zero for low to moderate uncertainty

EX-POST_INFO_ASY_DUM$_i$: Dummy variable of 1 where ex-post information asymmetry is low, and zero for moderate to high ex-post information asymmetry.

4.3   Data validity

4.3.1   Non-response bias

An independent sample *t*-test is conducted for each construct comparing early and late respondents to test whether there is any non-response bias in the data collected. This test is relevant as late respondents are likely to be representative of non-respondent characteristics (Moore & Tarnai 2002). A significant *t*-statistic indicates non-response bias. The *t*-test is appropriate because parametric data is used, rather than non-parametric techniques such as the Kruskal-Wallis test (Chen, Young & Van der Stede 2007). The sample is split into two, based on early and late respondents, to conduct the test. The results of the independent sample *t*-tests are reported in Table 4.8. The results show there are no significant differences between early and late respondents, with the exception of asset specificity. While there is a significant difference in the mean values of asset specificity, the size of this difference is small.

Table 4.8 – Early & late respondent constructs compared

Variable	N	Mean	Standard Deviation	Mean diffence	t-value	Degrees of freedom	p-value (2-tailed)
Subsidiary size							
Early respondents	84	3.150	1.512	-0.378	-1.370	165	0.173
Late respondents	83	3.528	2.022				
Uncertainty							
Early respondents	84	1.964	0.603	-0.102	-1.078	165	0.283
Late respondents	83	2.066	0.620				
Asset specificity							
Early respondents	84	3.267	0.873	0.365***	2.752	165	0.007
Late respondents	83	2.901	0.842				
Ex-post information asymmetry							
Early respondents	84	1.614	0.226	-0.032	-0.830	165	0.408
Late respondents	83	1.656	0.266				
Arm's length control							
Early respondents	84	2.921	0.990	-0.069	-0.445	165	0.657
Late respondents	83	2.990	1.022				
Results control							
Early respondents	84	1.763	0.310	-0.030	-0.633	165	0.528
Late respondents	83	1.793	0.297				
Action control							
Early respondents	84	1.650	0.332	-0.043	-0.827	165	0.409
Late respondents	83	1.694	0.344				
Boundary control							
Early respondents	84	1.686	0.332	0.061	1.172	165	0.243
Late respondents	83	1.625	0.342				
Exploratory control							
Early respondents	84	1.590	0.178	-0.034	1.167	165	0.245
Late respondents	83	1.556	0.194				

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

Data for the total number of employees of both respondent (participated in this study) and contacted (invited to participate in this study) corporations is also compared through a t-test. The statistics reported in Table 4.9 indicates the t-value is 0.309, which is insignificant at conventional levels. This indicates there is no significance difference between the respondent and contacted corporations, and therefore no bias in survey responses based on the number of employees.

Table 4.9 – Corporation size (employees) compared

Corporations	N	Mean	Standard Deviation	Mean difference	*t*-value	Degrees of freedom	p-value (2-tailed)
No. employees Respondent	167	1897.08	5718.654	237.867	0.309	691	0.757
Contacted	526	1659.22	9392.108				

As a last check of non-response bias, industry involvement of respondent and contacted respondents is compared. Table 4.10 reports the industry involvement for the contacted corporations, respondent corporations, and foreign subsidiaries of these respondent corporations. Most percentages of respondent involvement are similar to contacted percentages, with the exception of the construction and wholesale trade. These statistics provide further support that there is no bias in survey respondents.

Table 4.10 – Industry involvement compared[5]

Industry Involvement	Contacted corporations	Respondents corporations	Respondent subsidiaries
Agriculture, Forestry & Fishing	0.00%	2.65%	2.50%
Mining	14.48%	20.35%	18.50%
Manufacturing	16.16%	16.81%	13.50%
Electricity, Gas, Water & Waste Services	1.95%	3.54%	4.00%
Construction	14.76%	4.87%	5.00%
Wholesale Trade	14.76%	5.75%	8.00%
Retail Trade	4.74%	3.10%	2.50%
Accommodation & Food Services	0.56%	0.44%	0.00%
Transport, Postal & Warehousing	0.00%	2.65%	2.00%
Information Media & Telecommunications	2.92%	7.08%	7.50%
Finance & Insurance Services	6.13%	5.75%	6.00%
Rental, Hiring & Real Estate Services	1.39%	1.33%	2.00%
Professional, Scientific & Technical Services	6.55%	7.96%	9.50%
Administrative & Support Services	1.25%	2.21%	2.00%
Public Administration & Safety	0.14%	0.44%	0.00%
Education & Training	0.70%	0.44%	0.50%
Health Care & Social Assistance	1.25%	2.65%	3.00%
Arts & Recreation Services	1.11%	0.44%	0.50%
Other Services	11.14%	11.50%	13.00%

The analysis of the data in this section indicates that non-response bias is not an issue and the sample is representative of the general population.

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[5] Some respondent corporation percentages are higher than contacted percentages. The industry involvement of contacted firms is difficult to classify in some cases which is why some respondent percentages are higher.

4.3.2   Construct validity

All constructs applied in this study are based on reflective indicators. The indicators should be correlated with a change in the underlying construct which affects all indicators accordingly (Jarvis, Mackenzie & Podsakoff 2003). The validity of reflective indicators is assessed through three tests: (1) examining the cross-loading between indicators representing distinct constructs (factor analysis); (2) measuring the internal consistency of each construct with reflective indicators (Cronbach Alpha); and (3) examining the ability to differentiate the measurement of one construct from that of others (discriminant validity). Firms employing zero employees are deleted for the purpose of proposition testing in this chapter and the following additional testing chapter. Control choices are not relevant in cases where subsidiaries employ zero people. The final sample is therefore 161. Construct validity statistics for the full sample are also reported in Appendix 5 of this thesis.

4.3.2.1.   Indicator reliability

To assess the indicator reliability for each construct, the rotated factor loadings, item total correlations, and Principal Component Analysis (PCA) communalities are calculated (Jarvis, Mackenzie & Podsakoff 2003). Rotated factor loadings and PCA communalities are calculated using the PCA Extraction and Varimax with the Kaiser Normalisation Rotation Method. Item total correlations are based on Spearman rank correlation coefficients as data distribution normality cannot be assumed. Given there are a number of second order constructs in this study, it is necessary to first determine the indicator reliability of the first order constructs, then second order constructs. A rotated factor loading of 0.5 or above indicates acceptable indicator reliability. Any indicator with a rotated factor loading falling below 0.5 is excluded from the measurement of the construct (Cohen 1988). The revised constructs, with indicators falling below acceptable reliability removed, are then used to generate second order constructs. The factor analysis of the constructs is reported in Appendix 4 which contains the final indicators used to measure each construct.

The factor analysis of the control archetypes demonstrates the indicators closely describing the main characteristics of each control archetypes are the final indicators remaining after the factor analysis. Indicators providing general characteristics applicable to a number of archetypes are usually removed on the basis of the factor analysis. This has important implications for Speklé's (2001) theory due to the support for the relevance and validity of the indicators measuring the archetypes conceptualised.

The case analysis suggests headquarters often use a combination of control archetypes. In addition, correlations are expected between these control archetype constructs as demonstrated in Appendix 6 of this thesis. However, even if combinations of control archetypes are exercised, each archetype should still be representative of unique control choices. To examine whether each set of control archetype indicators represent unique control choices, indicators for control archetypes are factor analysed together. It is important to note the final indicators for each control archetype based on the factor analysis reported in Appendix 4 are used in this section. The factor analysis of the final indicators for both action and results oriented machine control is reported in Table 4.11. The factor analysis demonstrates it is not possible to factor analyse the indicators for both these archetypes into one rotation; two rotated factors emerge, clearly reflecting results oriented machine control (component 1) and action oriented machine control (component 2).

Table 4.11 – Factor analysis of machine control archetypes

Indicators	Rotated factor component 1	Rotated factor component 2
Codifications of targets (MCI 8)	**0.815**	0.142
Monitoring & evaluation based on codified targets (MCI 14)	**0.889**	0.189
Rewards based on codified evaluation (MCI 20)	**0.837**	0.162
Codification of actions (MCI 6)	0.062	**0.819**
Adherence to codified actions (MCI 13)	0.177	**0.867**
Punishment for not complying with codified actions (MCI 19)	0.249	**0.699**

The factor analysis of all the final indicators for arm's length, action oriented machine, and results oriented machine control is reported in Table 4.12. The factor analysis demonstrates it is not possible to factor analyse the indicators for these three archetypes into one rotation. Rather, three rotated factors emerge clearly reflecting results oriented machine (component 1), action oriented machine (component 2), and arm's length control (component 3). Therefore, Speklé's (2001) theory is in line with the separate arm's length, action oriented machine, and results oriented machine control archetypes observed in practice.

Table 4.12 – Factor analysis of arm's length & machine control archetypes

Indicators	Rotated factor component 1	Rotated factor component 2	Rotated factor component 3
Codifications of targets (MCI 8)	**0.769**	0.113	0.280
Monitoring & evaluation based on codified targets (MCI 14)	**0.898**	0.193	0.071
Rewards based on codified evaluation (MCI 20)	**0.833**	0.159	0.128
Codification of actions (MCI 6)	0.099	**0.840**	-0.060
Adherence to codified actions (MCI 13)	0.149	**0.845**	0.217
Punishment for not complying with codified actions (MCI 19)	0.200	**0.674**	0.224
Monitoring & evaluation according to market benchmarks (MCI15)	0.344	0.160	**0.842**
Rewards tied to market based performance evaluation (MCI21)	0.079	0.127	**0.927**

Finally, the factor analysis of all the final indicators measuring the control archetypes is reported in Table 4.13. Four components emerge which approximate the control archetypes described by Speklé (2001). The more indicators added to a factor analysis, the less meaningful the results usually become. This is the reason why the indicators for each archetype are progressively added to the factor analysis and reported in the tables above. However, despite the large number of indicators added to the factor analysis, the components generated still remain largely representative of each unique control archetype proposed by Speklé (2001). Table 4.13 indicates rotated factor component 1 is representative of results oriented machine control, component 2 representative of action oriented machine control, component 3 representative of boundary control, and component 4 representative of both arm's length control (negative factor loadings) and exploratory control (positive factor loadings).

Table 4.13 – Factor analysis of all control archetypes

Indicators	Rotated factor component 1	Rotated factor component 2	Rotated factor component 3	Rotated factor component 4
Monitoring & evaluation according to market benchmarks (MCI15)	0.135	0.417	0.096	**0.731**
Rewards tied to market based performance evaluation (MCI21)	0.101	0.169	0.012	**0.842**
Codifications of targets (MCI 8)	0.039	**0.765**	0.198	0.267
Monitoring & evaluation based on codified targets (MCI 14)	0.084	**0.829**	0.213	0.132
Rewards based on codified evaluation (MCI 20)	0.100	**0.783**	0.119	0.179
Codification of actions (MCI 6)	**0.831**	0.153	0.069	-0.010
Adherence to codified actions (MCI 13)	**0.774**	0.091	0.320	0.349
Punishment for not complying with codified actions (MCI 19)	**0.294**	0.086	0.706	0.336
Boundaries delineated (MCI 5)	0.493	0.146	**0.500**	-0.162
HQ periodically checking compliance with boundaries (MCI 18)	0.781	0.014	**0.306**	0.370
Severe sanctions for crossing boundaries (MCI 24)	0.140	0.149	**0.804**	0.244
Transparency of information flow (MCI 4)	0.048	0.127	0.683	**-0.171**
Flexibility of targets (MCI 9)	0.419	0.329	0.335	**-0.381**
Broad HQ performance expectations (MCI 10)	0.224	0.238	0.437	**-0.013**
Subjectivity in performance evaluation (MCI 17)	0.441	0.542	0.067	**-0.122**

The results of the factor analysis indicate the control archetypes conceptualised by Speklé (2001) are representative of those used by headquarters to control WOFS operations.

4.3.2.2. Composite reliability

The internal consistency of each construct with reflective indicators (composite reliability) is assessed using the Cronbach Alpha (Cronbach 1951). A survey with composite reliability survey is one where different responses from participants represent differences in opinions. In contrast, if there are multiple interpretations of survey questions associated with respondent confusion, construct composite reliability is low. The Cronbach Alpha is based on the assumption that all indicators are equally weighted, representing the lower bound for true survey reliability (Chin & Gopal 1995). The Cronbach Alpha of a construct should be higher than 0.70 for confirmatory research, or 0.50 for exploratory research, for acceptable composite reliability (Nunnally 1978).

The Cronbach Alpha's are reported in Table 4.14. All Cronbach Alpha values are higher or close to 0.70, except for MCI 22, indicating the constructs have acceptable composite

reliability. MCI 22 (reward through promotion) is removed from the measurement of exploratory control previously due to low factor loadings, and accordingly is not used to test the relevant proposition.

Table 4.14 – Construct composite reliability based on Cronbach Alpha

Construct	Cronbach Alpha
Uncertainty	0.840
Asset specificity	0.743
Ex-post information asymmetry	0.745
MCI 2 Autonomy extended to subsidiary management	0.729
MCI 3 HQ management by exception	0.830
MCI 6 Codification of actions	0.812
MCI 7 Standardised systems	0.821
Targets established (24a-g)	0.742
MCI 8 Codifications of targets	0.591
MCI 13 Adherence to codified actions	0.675
HQ monitoring (25a,b,d,e)	0.743
HQ evaluation (26a&b)	0.660
MCI 14 Monitoring & Evaluation based on codified targets	0.583
MCI15 Monitoring & evaluation according to market benchmarks	0.903
MCI 16 Long term performance assessment	0.631
MCI 18 HQ periodically checking compliance with boundaries	0.668
MCI 20 Rewards based on codified evaluation	0.671
MCI 22 Reward through promotion	0.262
Arm's length control	0.837
Results oriented machine control	0.821
Action oriented machine control	0.740
Boundary control	0.687
Exploratory control	0.594

4.3.2.3. Descriptive statistics

The descriptive statistics of the combination index control archetype measures are reported in Table 4.15. There are no excess floors or ceilings in the data; the statistics indicate sufficient variation in the measures for the purpose of statistical modelling.

Table 4.15 – Combination index descriptive statistics

	Minimum	Maximum	Mean	Median	Std. Deviation
Arm's Length Control	0.058	0.247	0.157	0.163	0.043
Results Oriented Machine Control	0.141	0.317	0.224	0.219	0.027
Action Oriented Machine Control	0.093	0.247	0.191	0.195	0.027
Boundary Control	0.138	0.269	0.205	0.207	0.023
Exploratory Control	0.151	0.331	0.224	0.218	0.027

The frequencies of dummy variable values used as independent variables in the regressions are reported in Table 4.16. These frequencies show only one firm has activity traits representative of situations where exploratory control is argued to be applicable. In addition,

only three firms have activity traits representative of situations where boundary control is argued to be applicable. The lack of firms with activity trait profiles representative of situations where boundary and exploratory control archetypes are argued to be applicable may affect the validity of the OLS regression models concerning these archetypes. It should be noted the frequencies of high and low levels of both asset specificity and ex-post information asymmetry are the same according to this table.

Table 4.16 – Frequency of dummy variables

Construct	Frequency	
Dummy value:	1	0
AT_PROFILE_ARMS_DUM	69	92
AT_PROFILE_RESULTS_DUM	27	134
AT_PROFILE_ACTION_DUM	18	143
AT_PROFILE_BOUNDARY_DUM	3	158
AT_PROFILE_EXPLOR_DUM	1	160
UNCERTAINTY_DUM *(High)*	6	155
UNCERTAINTY_DUM *(Low)*	152	9
ASSET_SPEC_DUM *(High)*	72	89
ASSET_SPEC_DUM *(Low)*	72	89
EX-POST_INFO_ASY_DUM *(High)*	57	104
EX-POST_INFO_ASY_DUM *(Low)*	57	104

The descriptive statistics for the indicators of the constructs are reported in Appendix 3 of this thesis. These descriptive statistics indicate no excessive floors or ceilings and an adequate variation in the data.

4.3.2.4.   Construct linearity

Ordinary least squares (OLS) regression is based on the assumption data analysed is normally distributed (Kutner, Nachtsheim & Neter 2004). However, data gathered through survey questionnaires is rarely normally distributed. Using data that does not approximate a normal distribution in OLS regressions produces unreliable results. Accordingly it is necessary to test whether the data, the continuous combination index control measures, are normally distributed. Data transformations are required if data is not normally distributed (VassarStats 2011).

The following tests are undertaken to determine whether the data is normally distributed:

- Skewness statistic indicates the degree the data is asymmetrically distributed. Skewness values within two standard errors indicate the data is asymmetrically distributed and not significantly skewed.

- Kurtosis statistic indicates whether there are excessive peaks in the data distribution above what is expected in a normal distribution. Kurtosis values within two standard errors indicate there are no excessive peaks in the data.

Skewness or Kurtosis values outside an acceptable range (two standard errors) indicate the data is not normally distributed (Elliott & Woodward 2006). Another test available to examine normality is the Kolmogorov-Smirnov test. However, this test is based only on the largest discrepancy between the sample and normal distribution; therefore it is not comprehensive when comparing the two distributions. D'Agostino and Stephens (1986) suggests the Kolmogorov-Smirnov test is very crude and should never be used to assess normal distributions. The Shapiro-Wilk test is also not appropriate because all values in a sample need to be unique to run this test, which is not the case in this study.

The values of Skewness and Kurtosis are reported in Table 4.17. All combination index measures appear to deviate significantly from what is expected in a normal distribution.

Table 4.17 – Skewness & Kurtosis of combination index variables

	Skewness		Kurtosis	
	Statistic	Std. error	Statistic	Std. error
Arm's Length Control	-0.432	0.191	-0.377	0.380
Results Oriented Machine Control	0.520	0.191	1.030	0.380
Action Oriented Machine Control	-0.802	0.191	0.832	0.380
Boundary Control	-0.355	0.191	0.793	0.380
Exploratory Control	0.638	0.191	1.553	0.380

To address the lack of normality associated with arm's length and results oriented machine control combination indices, the inverse reflected and inverse respectively of the constructs are required. In addition, Winsorisation of the highest two values for results oriented machine control, lowest nine values for action oriented machine control, lowest three values for boundary control, and both the lowest and highest value for exploratory control are required for normalisation (VassarStats 2011).

The descriptive, Skewness and Kurtosis, statistics are recalculated to examine whether the data transformation addresses the issues noted. These are reported in Table 4.18. The

statistics indicate the data now approximates normal distributions (all Skewness and Kurtosis statistics are within two standard errors) and can be analysed using OLS regressions.

Table 4.18 – Skewness & Kurtosis of combination index variables after normalisation

	Skewness		Kurtosis	
	Statistic	**Std. error**	**Statistic**	**Std. error**
Arm's Length Control - normalised	-0.266	0.191	-0.487	0.380
Results Oriented Machine Control - normalised	0.332	0.191	-0.013	0.380
Action Oriented Machine Control - normalised	-0.344	0.191	-0.286	0.380
Boundary Control - normalised	0.291	0.191	0.643	0.380
Exploratory Control - normalised	0.252	0.191	0.668	0.380

4.3.2.5. Discriminant validity

The discriminant validity relates to the ability to discriminate a set of indicators measuring one construct from those of other constructs in the model. It is assessed by comparing the square root of the average variance extracted (AVE) to the correlations between each construct (Fornell & Larcker 1981). To determine if a construct has acceptable discriminant validity, the value of the square root of the AVE for a construct should be higher than the correlations with other constructs. This indicates more variance is shared between the indicators of a construct than any other indicators representing a different construct.

AVE is calculated as follows:

$$AVE = \frac{\sum \lambda_i^2}{\sum \lambda_i^2 + \sum \Theta_{ii}}$$

where:

λ_i is the factor loading and Θ_{ii} is the unique/error variance

λ_i values are given in Appendix 4

Θ_{ii} is 1 minus $(\lambda_i)^2$

The value of the square root of AVE for each construct is higher than the Pearson correlations between all constructs. Therefore the discriminant validity of the constructs is confirmed, in addition to the indicator and composite reliability. The relevant AVE and correlation values are reported in the Appendix 5.

4.4 Results

The OLS regression results regarding the proposition testing are reported in this section.

4.4.1. Arm's length control

Table 4.19 reports the results concerning the association between arm's length control and activity traits, testing Proposition 1.

Table 4.19 – Arm's length control & activity traits OLS regression

$COMBINATION\_INDEX\_ARMS_i = \alpha_0 + \alpha_1 AT\_PROFILE\_ARMS\_DUM_i + \alpha_2 UNCERTAINTY\_DUM_i + \alpha_3 ASSET\_SPEC\_DUM_i + \varepsilon_i$

Variables	Predicted sign	Regression coefficient	t-stat
Constant	+/-	1.105***	77.202
$AT\_PROFILE\_ARMS\_DUM_i$	+	0.595*	1.672
$UNCERTAINTY\_DUM_i$	+	-0.211**	-2.188
$ASSET\_SPEC\_DUM_i$	+	-0.462	-1.325
F-Stat (p-value)	2.213* (0.089)		
Adjusted R^2	0.022		

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

Consistent with Proposition 1, the arm's length control activity trait profile variable is positively (coefficient: 0.595) and significantly (t-stat: 1.672) associated with the arm's length control combination index. This provides support for Proposition 1. However, the effects of the individual activity traits on arm's length control use are inconsistent with predictions. The uncertainty dummy variable is negatively (coefficient: -0.211) and significantly (t-stat: -2.188) associated with the arm's length control combination index. The asset specificity dummy variable is also negatively (coefficient: -0.462), but insignificantly (t-stat: -1.325) associated with the arm's length control combination index. The regression has significant explanatory power according to the F-statistic of 2.213 and p-value of 0.089. While the model has significant explanatory power, the R square indicates only 2.2 per cent of variation in the arm's length control combination index is explained by the regression model.

4.4.2. Results oriented machine control

Table 4.20 reports the results concerning the association between results oriented machine control and activity traits, testing Proposition 2a.

Table 4.20 – Results oriented machine control & activity traits OLS regression

$COMBINATION\_INDEX\_RESULTS_i = \alpha_0 + \alpha_1 AT\_PROFILE\_RESULTS\_DUM_i + \alpha_2 UNCERTAINTY\_DUM_i + \alpha_3 ASSET\_SPEC\_DUM_i + \alpha_4 EX\text{-}POST\_INFO\_ASY\_DUM_i + \varepsilon_i$

Variables	Predicted sign	Regression coefficient	t-stat
Constant	+/-	1.067***	133.198
AT_PROFILE_RESULTS_DUM$_i$	+	0.055	0.466
UNCERTAINTY_DUM$_i$	+	-0.157**	-1.993
ASSET_SPEC_DUM$_i$	+	0.085	0.901
EX-POST_INFO_ASY_DUM$_i$	+	-0.188*	-1.837
F-Stat (p-value)	2.622** (0.037)		
Adjusted R^2	0.039		

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

Consistent with Proposition 2a expectations, the results oriented machine control activity trait profile variable is positively (coefficient: 0.055), however, insignificantly (t-stat: 0.466) associated with the results oriented machine control combination index. There is no support for Proposition 2a due to the insignificant association. Opposite to predictions, the uncertainty dummy variable is negatively (coefficient: -0.157) and significantly (t-stat: -1.993) associated with the results oriented machine control combination index. In addition, the ex-post information asymmetry dummy variable is negatively (coefficient: -0.188) and significantly (t-stat: -1.837) associated with the results oriented machine control combination index, again inconsistent with predictions. The asset specificity dummy variable is positively (coefficient: 0.085) but insignificantly (t-stat: 0.901) associated with the results oriented machine control combination index. The regression has significant explanatory power according to the F-statistic of 2.622 and p-value of 0.037. The R square indicates 3.9 per cent of variation in the results oriented machine control combination index is explained by the regression model.

4.4.3. Action oriented machine control

Table 4.21 reports the results concerning the association between action oriented machine control and activity traits, testing Proposition 2b.

Table 4.21 – Action oriented machine control & activity traits OLS regression

$COMBINATION\_INDEX\_ACTION_i = \alpha_0 + \alpha_1 AT\_PROFILE\_ACTION\_DUM_i + \alpha_2 UNCERTAINTY\_DUM_i + \alpha_3 ASSET\_SPEC\_DUM_i + \alpha_4 EX\text{-}POST\_INFO\_ASY\_DUM_i + \varepsilon_i$

Variables	Predicted sign	Regression coefficient	t-stat
Constant	+/-	1.026***	124.453
AT_PROFILE_ACTION_DUM$_i$	+	-0.075	-0.712
UNCERTAINTY_DUM$_i$	+	0.253***	3.212
ASSET_SPEC_DUM$_i$	+	-0.099	-1.073
EX-POST_INFO_ASY_DUM$_i$	+	-0.084	-0.865
F-Stat (p-value)	4.312*** (0.002)		
Adjusted R^2	0.076		

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

Proposition 2b is not supported as the action oriented machine control activity trait profile variable is negatively (coefficient: -0.075) and insignificantly (*t*-stat: -0.712) associated with the action oriented machine control combination index. Consistent with predictions, the uncertainty dummy variable is positively (coefficient: 0.253) and significantly (*t*-stat: 3.212) associated with the action oriented machine control combination index. However, asset specificity is negatively (coefficient: -0.099) and insignificantly (*t*-stat: -1.073) associated with the action oriented machine control combination index, inconsistent with predictions. In addition, ex-post information asymmetry is negatively (coefficient: -0.084), and insignificantly (*t*-stat: -0.865) associated with the action oriented machine control combination index. The regression has significant explanatory power according to the F-statistic of 4.312 and p-value of 0.002. The *R* square indicates 7.6 per cent of variation in the action oriented machine control combination index is explained by the regression model.

4.4.4. Boundary control

Table 4.22 reports the results concerning the association between boundary control and activity traits, testing Proposition 3.

Table 4.22 – Boundary control & activity traits OLS regression

$COMBINATION\_INDEX\_BOUNDARY_i = \alpha_0 + \alpha_1 AT\_PROFILE\_BOUNDARY\_DUM_i + \alpha_2 UNCERTAINTY\_DUM_i + \alpha_3 EX\text{-}POST\_INFO\_ASY\_DUM_i + \varepsilon_i$

Variables	Predicted sign	Regression coefficient	t-stat
Constant	+/-	0.208***	91.711
AT_PROFILE_BOUNDARY_DUM$_i$	+	0.278***	2.519
UNCERTAINTY_DUM$_i$	+	-0.325***	-2.998
EX-POST_INFO_ASY_DUM$_i$	+	-0.142*	-1.807
F-Stat (p-value)	3.790** (0.012)		
Adjusted R^2	0.050		

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

Consistent with Proposition 3, the boundary control activity trait profile variable is positively (coefficient: 0.278) and insignificantly (t-stat: 2.519) associated with the boundary control combination index. Accordingly there is support for Proposition 3. Inconsistent with predictions, uncertainty (dummy variable) is negatively (coefficient: -0.325) and significantly (t-stat: -2.998) associated with the boundary control combination index. In addition, ex-post information asymmetry is negatively (coefficient: -0.142) and significantly (t-stat: -1.807) associated with the boundary control combination index, again inconsistent with predictions. The regression has significant explanatory power according to the F-statistic of 3.790 and p-value of 0.012. The R square indicates 5.0 per cent of variation in the boundary control combination index is explained.

4.4.5. Exploratory control

Table 4.23 reports the results concerning the association between exploratory control and activity traits, testing Proposition 4.

Table 4.23 – Exploratory control & activity traits OLS regression

$COMBINATION\_INDEX\_EXPLOR_i = \alpha_0 + \alpha_1 AT\_PROFILE\_EXPLOR\_DUM_i +$
$\alpha_2 UNCERTAINTY\_DUM_i + \alpha_3 EX\text{-}POST\_INFO\_ASY\_DUM_i + \varepsilon_i$

Variables	Predicted sign	Regression coefficient	t-stat
Constant	+/-	1.066***	472.526
AT_PROFILE_EXPLOR_DUM$_i$	+	-0.166*	-1.914
UNCERTAINTY_DUM$_i$	+	-0.011	-0.123
EX-POST_INFO_ASY_DUM$_i$	+	-0.027	-0.340
F-Stat (p-value)		1.662 (0.177)	
Adjusted R^2		0.012	

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

Only one headquarters in the sample has an exploratory control activity trait profile sample representative of exploratory control, hence the association proposed in the regression model does not produce meaningful results. The F-statistic indicates only 1.662 and insignificant with a p-value of 0.177. Nonetheless, the exploratory control activity trait profile variable is negatively (coefficient: -0.166) and significantly (t-stat: -1.914) associated with the exploratory control combination index, the opposite of predictions.

The results presented in this chapter are summarised Table 4.24.

Table 4.24 – OLS regression results summarised

Control archetype	AT Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Adjusted	F-stat
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	R square	(significance)
Arms Length	0.595*	1.672	-0.211**	-2.188	-0.462	-1.325	n/a		0.022	2.213* (0.089)
Results	0.055	0.466	-0.157**	-1.993	0.085	0.901	-0.188*	-1.837	0.039	2.622** (0.037)
Action	-0.075	-0.712	0.253***	3.212	-0.099	-1.073	-0.084	-0.865	0.076	4.312*** (0.002)
Boundary	0.278***	2.519	-0.325***	-2.998	n/a		-0.142*	-1.807	0.050	3.790** (0.012)
Exploratory	-0.166*	-1.914	-0.011	-0.123	n/a		-0.027	-0.340	0.012	1.662 (0.177)

4.4.6. Sensitivity testing

Firms involved in the mining sector accounted for a relatively large proportion (20 per cent) of sample used in this study. It is therefore of interest to examine whether the results of the regression models change when these firms are removed from the sample. To examine the sensitivity of the results to mining involvement, firms involved in mining are deleted from the sample and the OLS regressions are re-run using this reduced sample. The results of the OLS regression models run, consistent with the method described in this chapter, are reported in Appendix 7. Consistent with the results in this chapter, the activity trait profile coefficient in the boundary control model is significant. However, the activity trait profile coefficient and F-statistic in the arm's length control model are not significant. This reduction in significance could be explained by the reduction in sample size, rather than mining industry effects. It should also be noted that the exploratory control model cannot be run as there are no activity trait profiles representative of situations where exploratory control is applicable which remain in the reduced sample.

Asset specificity is operationalised through formatively determined constructs in some studies. The factor analysis and validity testing performed in this chapter indicates the use of reflective indicators is a reliable means of measuring asset specificity. To further examine the effects of asset specificity, each individual indicator is used as the basis of determining the asset specificity and activity trait profile dummy variables in the OLS regression models. The results of these regressions, reported in Appendix 8, are largely consistent with those reported in this chapter. While there are differences, it appears the results reported in this chapter are the most consistent with the case study suggestions and prior literature. This indicates the reflectively determined construct is the most informative and relevant means of measuring asset specificity in the context of this study.

Firms with WOFS operations employing zero employees are deleted for the purpose of the analysis and results reported in this chapter as control choices in these cases are not relevant. The OLS regressions are re-run using the full sample and reported in Appendix 9 of this thesis. All results concerning the full sample OLS regressions are weaker than those reported in this section of the thesis, confirming control in the context of subsidiary employing zero people is not relevant.

4.5   Results discussion

The factor analysis of the control archetype indicators demonstrates the representation of control archetypes conceptualised by Speklé (2001) concerning headquarters' control choices. While multiple control archetypes are used by headquarters, the choice of each distinct control archetype can be clearly identified. This provides support for the validity of Speklé's (2001) control archetype conceptualisations which is fundamental to the theory. This is in line with the suggestions of the case studies reported in Chapter 3.

The results reported in this chapter provide limited support for Speklé's (2001) theory in the WOFS operations context. The use of arm's length and boundary control are consistent with Speklé's (2001) predictions. However, despite these two control archetypes being used more dominantly in the presence of the relevant activity trait profiles, the descriptive statistics of the combination index measures demonstrate headquarters use multiple and variable levels of control archetypes as a means of control. The use of multiple control archetypes, rather than single distinct choices, is consistent with the suggestions of the case study analyses, which indicate the control archetypes would be better named 'dimensions' of control. The more problematic nature of controlling WOFS from a distance suggests the use of multiple control dimensions is necessary to effectively control operations in this challenging context (Hassel & Cunningham 2004).

The association between activity trait profile variables and machine control archetype combination index measures is insignificant. The case study analyses suggest headquarters widely use results and action oriented machine control in the WOFS operations context. It is therefore unsurprising and consistent with these suggestions that no significant associations between activity traits and machine control archetypes are found.   However, while performance implications of control choices are not examined in this thesis, it is debatable as to whether exercising these two machine control archetypes so widely is appropriate. This is particularly the case if headquarters faces high uncertainty and ex-post information asymmetry and accordingly does not have sufficient ex-ante and ex-post information respectively to use such control archetypes (Argyres 1995; Nilsson 2002; Park 2002; Zenger & Hesterly 1997).

Significant associations between individual activity trait variables and control archetype combination index measures are found in a number of cases. It is important to note activity

trait profile dummy variables are interactions of the individual activity traits, and accordingly it is necessary to include these individual dummy variables in the OLS regressions for the purpose of statistical validity. Speklé's (2001) theory is based on activity trait profile variables, and caution should be exercised when interpreting results relating to individual activity trait variables. For instance, the results indicate arm's length control is exercised in situations of high uncertainty; however, asset specificity is insignificantly related to arm's length control. As the individual and isolated effects of uncertainty and asset specificity on arm's length control are inconsistent with predictions, the combined effect of the these activity traits (activity trait profile variable) appears to be the important factor in determining the control choice consistent with Speklé's (2001) theory. Higher uncertainty in isolation appears to result in greater use of arm's length control; this could be explained by the applicability of using market benchmarks to control operations at a distance. The distance separating headquarters from subsidiary operations means establishment of relevant market benchmarks may be a practical method of control, compared with the difficulties of using more direct action controls at a distance (Merchant & Van der Stede 2007; Zaheer & Mosakowski 1997). However, it is clear that uncertainty, combined with the effects of asset specificity, has unique effects on the control archetype choice, reinforcing arm's length control as the appropriate choice (Speklé 2001).

A number of inconsistent and significant associations are observed regarding results oriented machine control use. In particular, the regression analysis indicates results oriented machine control is exercised in situations of higher uncertainty and higher ex-post information asymmetry, inconsistent with the suggestions of a large of body of literature (Chenhall 2003; Merchant & Van der Stede 2007). However, results oriented machine control provides one of the few means of clear objective communication of subsidiary performance when controlling from a distance, explaining its widespread use in the context of both higher uncertainty and ex-post information asymmetry (Argyres 1995; Park 2002). The use of result oriented machine control may also be important where there is high turbulence in a foreign context related to factors including exchange rates, inflation, interest, and growth rates, which directly affect the operation of WOFS operations. Headquarters may want to closely monitor the performance of subsidiaries in such cases to ensure investments are not exposed to significant risks. Accordingly it is conceivable both higher uncertainty and ex-post information lead to greater use of results oriented machine control, despite literature suggesting this choice is not optimal in such situations (Chenhall 2003). It is important to

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note, as discussed previously, that the activity trait profile dummy variable is insignificant, reflecting the wide of use of results oriented machine control in the context of controlling WOFS operations from a distance, observed in the case study analyses.

The results of the boundary control model provide support for Proposition 3, indicating the combination of high uncertainty and high ex-post information asymmetry is associated with boundary control. However, the isolated effects of activity traits on boundary control differ comparatively to the combined effects of the activity trait profile variable. In particular, lower uncertainty and ex-post information asymmetry appear to result in the use of boundary control, opposite to predictions. These effects could be explained by the issues associated with setting inappropriate boundaries, where headquarters lacks sufficient understanding of subsidiary activities and performance, significantly impeding the autonomy of subsidiary management to maximise returns from operations (Merchant & Van der Stede 2007). This is particularly the case regarding subsidiary operations at distance from headquarters (Miller & Eden 2006; Zaheer & Mosakowski 1997). Similar to the results of the arm's length control model, these results highlight the importance of considering both combined and isolated effects of activity traits which can be quite different.

The results relating to the exploratory control model indicate a lack of significant explanatory power based on the F-statistic. Accordingly it is not relevant to interpret the results generated in the model. The fact that the exploratory control is only deemed as relevant for one firm according to the activity trait profile dummy variable indicates this archetype may not be relevant in the context of WOFS operations. This is not surprising as it unclear whether it is possible for headquarters to have both high uncertainty and low ex-post information asymmetry concerning WOFS operations. The ability to assess the performance of subsidiary operations implies headquarters need, at least, some basic ex-ante information, lowering uncertainty, regarding subsidiary operations (Ouchi 1979). Therefore the lack of regression model significance could be a function of the lack of exploratory control applicability and the presence of situations where uncertainty is high and ex-post information asymmetry are observed, rather than related statistical issues.

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4.6   Conclusion

The results provide limited support for the TCE theory of management control. Both the predictions of arm's length and boundary control use are supported, in addition to the validity of the control archetypes conceptualised by Speklé (2001). However, there are a number of deviations from the theory noted in the case study analyses, in particular the use of multiple control archetypes and the wide use of machine control archetypes, which appear consistent with the results reported in this chapter. In addition, situations where exploratory control is proposed to appropriate may rarely exist in reality, questioning the applicability of this particular archetype.

The testing of Speklé's (2001) theory presented in this chapter is designed to be as direct as possible. However, this is the first study to test this theory and it is open to debate consistent with the multiple interpretations of Speklé (2001). For example, using activity trait dummy variables, despite the consistency with Speklé's (2001) theory, may be regarded as a crude measure. Dummy variables may not adequately explain the affects of variation in activity traits on control archetypes, comparative to continuous variables. In addition, direct measures of control archetypes, rather than the degree each is used relative to others, may be important to capture the implications of activity trait effects. Additional testing is required to ensure this study thoroughly investigates and tests the propositions associated with the TCE theory of management control. This allows this study to investigate whether possible alternative interpretations and testing of the theory produce different results than those reported in this chapter. This is addressed in the next chapter of this thesis.

Chapter 5: Theory testing extended – alternative specification

5.1   Introduction

The objective of this chapter is to further investigate Speklé's (2001) TCE theory of management control. The testing reported in Chapter 4 is based on the interpretations of Speklé's (2001) theory. However, testing of the theory in prior studies is very limited beyond the work of Kruis (2008) and these interpretations are open to debate. Further testing is required to examine the implications of alternative specifications to test the propositions investigated in this study.

The motivation of this chapter is the importance of the TCE theory of management control which is relatively comprehensive concerning the determinants of control and the actual control choices. This is particularly notable in the WOFS operations context where reported research is fragmented providing limited guidance on a more comprehensive control framework that headquarters can exercise in practice (Busco, Giovannoni & Scapens 2008; Dossi & Patelli 2008; Henri 2006; Jaussaud & Schaaper 2006; Malmi & Brown 2008). If the TCE theory of management control is relevant regarding the application in this and other contexts, further examination and testing is necessary due to the multiple and possibly more accurate specifications of the proposition testing.

A number of alternative specifications of testing the propositions associated with Speklé's (2001) theory are presented in this chapter. This relates to changes to both the dependent and independent variables in the regression models. The results reported in Chapter 4 remain the strongest and most informative concerning the testing of the propositions when compared with the results based on alternative specifications reported in this chapter. While only two of the five propositions are supported by the results in the prior chapter, these are consistent with the suggestions of the case studies reported in this thesis.

5.2 Alternative specification of proposition testing

This section details the alternative specifications applied in this chapter to investigate the TCE theory of management control.

First, the independent variables are specified as follows:

- High and low activity trait dummy variables determined through median activity trait levels, rather than moderate levels. Determining dummy variables on the basis of relative levels may more accurately reflect high or low levels in reality. Consequently, dummy variables based on median values may capture the effects of variation in control archetype choices more accurately.

- Continuous activity trait variables based on the summation of the relevant indicators. The use of continuous variables may be important to capture variation in control archetype choices. Analysis of both case study and survey data indicates headquarters choose multiple and variable levels of control archetypes, rather than single distinct archetypes. Continuous variables may be more appropriate to capture the effects of variation in multiple control archetype choices.

- Firms with moderate levels of any activity trait deleted from the sample and OLS regression models described in Chapter 4 re-run. Firms with moderate levels of any activity trait could be regarded as inconsistent with the definition of the constructs in TCE theory of management control (Speklé 2001). Deleting firms with moderate activity traits may allow a clearer distinction and contrast between different situations where control archetypes are selected, leading to results of greater significance. It should be noted that asset specificity is measured on the basis of high to low in the context of hierarchical organisations in this study.

Second, the dependent regression variables are specified as follows:

- Dummy variables are used for the purpose of measuring the control archetypes. These dummy variables are determined on the basis of identifying which control archetype each headquarters primarily exercises. Speklé (2001) argues distinct and single archetypes are used in the presence of particular activity traits. Accordingly these dummy variables may more accurately reflect this argument.

- Direct measures of the extent headquarters use each control archetype are based on the summation of the relevant indicators. These direct measures of the extent control

archetypes are used may allow the implications of the activity traits to be more accurately captured.

5.3 Alternative specification testing

Three sets of regressions are presented in this chapter, each based on the independent variables detailed above.

5.3.1 Median activity trait determination

Activity trait dummy variables are determined in Chapter 4 on the basis of absolute high or low levels according to the Likert scales in the survey instrument. However, based on the descriptive statistics presented in Chapter 4, headquarters experience on average lower than moderate levels of uncertainty. A total of 152 headquarters indicated their perception of uncertainty is low and only six firms indicated uncertainty is high, with the remaining three indicating uncertainty is at moderate levels. The larger proportion of headquarters experiencing low uncertainty suggests that determining the dummy variable for uncertainty based on a sample median value is more appropriate to capture headquarters' relative, rather than absolute high or low uncertainty. It is interesting to note asset specificity and ex-post information median values exactly match the moderate Likert scale values used in the survey instrument. Accordingly, no changes are made to the asset specificity and ex-post information asymmetry dummy variables on the basis of median value determination.

The statistical models run in this section are the same as those in Chapter 4, applying the following equation:

$$COMBINATION\_INDEX_i = \alpha_0 + \alpha_1 AT\_PROFILE\_DUM_i + \alpha_2 UNCERTAINTY\_DUM_i +$$
$$\alpha_3 ASSET\_SPEC\_DUM_i + \alpha_4 EX\text{-}POST\_INFO\_ASY\_DUM_i + \varepsilon_i \qquad \textbf{(1)}$$

The relevant combination index and activity trait variables are substituted into the above equation where appropriate for each model.

The dummy variables in this model are now determined on the basis of median values, to establish relatively high or low activity trait levels. If a control archetype is argued to be appropriate under situations of high levels of an activity trait, the dummy variable is assigned a value of 1 for values above median, and zero for values at or below the median. If a control archetype is argued to be appropriate under situations of low levels of an activity trait, the

dummy variable is assigned a value of 1 for values below the median, and zero for values at or above the median.

The descriptive statistics for the revised dummy variables are reported in Table 5.1. As expected, there is a significant change in the frequency of the dummy variables relating to uncertainty. In addition there are a larger number of control archetype activity trait profiles relating to boundary and exploratory control. The frequency of the asset specificity and ex-post information asymmetry dummy variables remains the same as those applied in Chapter 4 as the median and moderate Likert scale values match.

Table 5.1 – Dummy variable frequencies (based on median determination)

Construct	Frequency	
Dummy value:	1	0
AT_PROFILE_ARMS_DUM	19	142
AT_PROFILE_RESULTS_DUM	9	152
AT_PROFILE_ACTION_DUM	6	155
AT_PROFILE_BOUNDARY_DUM	26	135
AT_PROFILE_EXPLOR_DUM	23	138
UNCERTAINTY_DUM *(High)*	62	99
UNCERTAINTY_DUM *(Low)*	52	109
ASSET_SPEC_DUM *(High)*	72	89
ASSET_SPEC_DUM *(Low)*	72	89
EX-POST_INFO_ASY_DUM *(High)*	57	104
EX-POST_INFO_ASY_DUM *(Low)*	57	104

The results of the OLS regressions applying the modified activity trait dummy variables are reported in Table 5.2.

Table 5.2 – OLS regression results based on median dummy variable determination

Control archetype	AT Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Adjusted R square	F-stat (significance)
	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat		
Arms Length	0.046	0.413	-0.047	-0.454	0.075	0.782	n/a		-0.008	0.599 (0.616)
Results	0.134	1.476	-0.102	-1.221	0.094	1.163	-0.206**	-2.488	0.031	2.292* (0.062)
Action	-0.020	-0.221	-0.042	-0.494	-0.144*	-1.756	-0.154*	-1.789	0.018	1.732 (0.146)
Boundary	-0.039	-0.315	0.008	0.081	n/a		-0.088	-0.843	-0.006	0.685 (0.563)
Exploratory	-0.005	-0.041	0.073	0.735	n/a		-0.043	-0.424	-0.012	0.365 (0.778)

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

The activity trait profile variable (AT Profile) coefficients in each of the models are not statistically significant. This contrasts to the statistically significant activity trait profile variables for arm's length and boundary control in the results presented in Chapter 4. It should also be noted while some of the individual independent activity trait variables in the models are statistically significant, the F-statistic in all cases, with the exception of the results oriented machine control model, indicates the OLS regression models do not have significant explanatory power. The adjusted R square values are also very low in all cases. Applying relative activity trait dependent dummy variables, based on median values, yields results of far lower significance than the models using dummy variables based on absolute high or low levels. In this case, determining dummy variables on the basis of absolute high or low levels, consistent with the levels indicated by headquarters in the survey instrument, appears more appropriate.

5.3.2 Continuous activity trait variables

Applying dummy variables as the basis of capturing activity trait may be an over simplified and crude measure. Extant literature frequently measures variables, including uncertainty, on a continuous basis which could be important in capturing the effects of these variables on control choice variation (Chenhall 2003; Gerdin 2005; Gerdin & Greve 2004). In particular, the suggestions of the case study analyses reported in Chapter 3 and the control archetype combination index descriptive statistics reported in Chapter 4 indicate headquarters' choice of control archetypes is more complex than simply choosing one control archetype for a given situation. Accordingly, capturing the effects of variation in activity traits through continuous variables may be important to explain the effects on control archetype choices.

To examine the effect of continuous activity trait variables on control choices ($COMBINATION\_INDEX_i$) the OLS regressions are run, applying the following equation according to the relevant combination index and activity traits in each case:

$$COMBINATION\_INDEX_i = \alpha_0 + \alpha_1 AT\_PROFILE_i + \alpha_2 UNCERTAINTY_i + \alpha_3 ASSET\_SPEC_i$$
$$+ \alpha_4 EX\text{-}POST\_INFO\_ASY_i + \varepsilon_i \qquad \textbf{(2)}$$

The continuous variables for each activity trait are based on the summation of the relevant indicators, as explained in Chapter 4. These summations previously formed the basis of the activity trait dummy variable determination. The activity trait profile variables

(AT_PROFILE) are calculated by multiplying the relevant activity trait together, thereby creating interaction variables. Individual activity trait constructs are reversed where appropriate to determine the activity trait profile variable to reflect situations where each control archetype is applicable. That is, higher interaction variables indicate situations where the relevant control archetype is proposed to be appropriate. A positive coefficient for an activity trait profile variable is consistent with predictions.

The descriptive statistics for each of the continuous activity trait variables are reported in Table 5.3. These statistics indicate there is sufficient variation in the continuous variable data to run the OLS regressions given there are no excessive ceilings or floors in the data. The distribution of each construct is normalised where appropriate due to the assumptions of OLS regressions.

Table 5.3 – Descriptive statistics of continuous activity trait (AT) variables

	Minimum	Maximum	Mean	Median	Std. Deviation
Uncertainty	1.000	4.000	1.994	2.000	0.605
Asset specificity	1.000	5.000	3.053	3.000	0.867
Ex-post information asymmetry	1.000	4.250	2.913	3.000	0.567
Arm's length AT profile	1.400	15.200	6.079	5.600	2.616
Results AT profile	1.750	45.600	17.252	16.088	8.276
Action AT profile	3.000	59.375	18.049	17.213	8.564
Boundary AT profile	1.000	12.250	5.842	6.000	2.194
Exploratory AT profile	2.250	12.500	6.121	6.000	2.120

Table 5.4 reports the results for the OLS regression including the continuous dependent variables.

Table 5.4 – OLS regression results based on continuous variables

Control archetype	AT Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Adjusted	F-stat
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	R square	(significance)
Arms Length	-0.275	-0.791	0.202	0.753	0.154	0.642	n/a		-0.014	0.241 (0.867)
Results	-0.320	-0.855	0.445*	1.901	-0.104	-0.449	0.377**	2.123	0.121	6.531*** (0.000)
Action	-0.442	-1.015	0.137	0.469	-0.443	-1.437	-0.387**	-2.214	0.080	4.487*** (0.002)
Boundary	0.085	0.196	-0.246	-0.697	n/a		-0.251	-1.053	0.065	4.689*** (0.004)
Exploratory	0.035	0.067	0.010	0.021	n/a		0.070	0.253	-0.014	0.256 (0.857)

***Significant at the 0.01 level (2-tailed); **Significanty at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

The coefficients of the activity trait interaction variables are insignificant in all cases. Further still, the majority of the individual continuous activity trait variable coefficients are insignificant. The results indicate, consistent with Speklé's (2001) theory, that dummy variables based on high or low levels capture to a greater extent the control archetype choices made by headquarters.

5.3.3 Moderate activity trait firms deleted from sample

The dummy variables in the model presented in Chapter 4 included firms which classified activity traits at moderate levels, which means certain activity traits for these firms are at neither high or low levels. For the purpose of statistical analysis these values at moderate levels are assigned a zero for the dummy variables. Deleting firms where headquarters indicate any activity trait is at moderate levels may increase the explanatory power of the statistical models as only firms with high or low activity trait levels would remain in the sample. These high or low activity trait levels may be more consistent with Speklé's (2001) explanation of factors determining appropriate control archetypes.

The models presented in Chapter 4 are re-run with the reduced sample by applying the following equation, substituting the relevant combination index and activity traits in each case:

$$COMBINATION\_INDEX_i = \alpha_0 + \alpha_1 AT\_PROFILE\_DUM_i + \alpha_2 UNCERTAINTY\_DUM_i +$$
$$\alpha_3 ASSET\_SPEC\_DUM_i + \alpha_4 EX\text{-}POST\_INFO\_ASY\_DUM_i + \varepsilon_i \qquad \textbf{(3)}$$

After deleting firms where headquarters indicate one or more activity traits are at moderate levels, a total of 100 firms are left in the sample. The descriptive statistics of the continuous combination index control archetype variables in the reduced sample are reported in Table 5.5. The descriptive statistics indicate that there is sufficient variation in the combination index variables for the purpose of statistical analysis. Where appropriate, the final combination index variables are normalised for the purpose of running the OLS regressions.

Table 5.5 – Descriptive statistics of combination index variables in sample with moderate activity trait firms deleted

	Minimum	Maximum	Mean	Median	Std. Deviation
Arms Length Combination Index	0.060	0.247	0.156	0.163	0.042
Results Combination Index	0.141	0.307	0.223	0.220	0.026
Action Combination Index	0.127	0.247	0.194	0.196	0.024
Boundary Combination Index	0.138	0.269	0.205	0.207	0.023
Exploratory Combination Index	0.151	0.286	0.222	0.221	0.025

The dummy variable frequencies are reported in Table 5.6 for the reduced sample. These dummy variables are based on absolute high and low dummy variable determination, consistent the main analysis presented in Chapter 4. Again, similar to observations in Chapter 4, the perceived uncertainty from headquarters' perspective in the majority of cases appears to be relatively low.

Table 5.6 – Dummy variable frequencies in sample with moderate activity trait firms deleted

Construct	Frequency	
Dummy value:	1	0
AT_PROFILE_ARMS_DUM	52	48
AT_PROFILE_RESULTS_DUM	27	73
AT_PROFILE_ACTION_DUM	18	82
AT_PROFILE_BOUNDARY_DUM	2	98
AT_PROFILE_EXPLOR_DUM	1	99
UNCERTAINTY_DUM *(High)*	3	97
UNCERTAINTY_DUM *(Low)*	97	3
ASSET_SPEC_DUM *(High)*	48	52
ASSET_SPEC_DUM *(Low)*	52	48
EX-POST_INFO_ASY_DUM *(High)*	47	53
EX-POST_INFO_ASY_DUM *(Low)*	53	47

The results when applying the reduced sample, deleting firms with moderate activity traits, are reported in Table 5.7.

Table 5.7 – Moderate activity trait firms deleted sample OLS regression results

Control archetype	AT Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Adjusted R square	F-stat (significance)
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat		
Arms Length	0.098	0.970	-0.211**	-2.192	Excluded		n/a		0.031	2.570* (0.082)
Results	0.081	0.454	0.045	0.419	0.220	1.470	-0.172	-1.284	0.028	1.700 (0.156)
Action	-0.123	-0.803	0.110	1.039	-0.075	-0.558	-0.174	-1.318	0.056	2.463** (0.050)
Boundary	0.218	1.256	-0.253	-1.468	n/a		-0.155	-1.527	0.011	1.371 (0.256)
Exploratory	-0.204*	-1.661	-0.042	-0.346	n/a		0.026	0.257	0.023	1.792 (0.154)

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

No significant coefficients are observed for the activity trait profile variables regarding both arm's length control and boundary control, in contrast to the results reported in Chapter 4 where Propositions 1 and 3 are supported. In addition the only remaining statistically significant coefficients are uncertainty in the arm's length control model and the activity trait profile in the exploratory control model. The F-statistic in the exploratory control model, however, remains at insignificant levels. It should also be noted that the asset specificity variable is excluded from the arm's length control model due to a perfect correlation with the arm's length control activity trait profile variable. Removing firms with activity traits at moderate levels appears to decrease the explanatory power of the models compared with those presented in Chapter 4.

As discussed earlier in this chapter, relative rather than absolute determination of dummy variables based on median values may be more appropriate to capture the effects of activity trait levels on control archetype choices. Accordingly firms with any activity trait at median levels are deleted from the sample. The median value of uncertainty is 2, while asset specificity and ex-post information both have a median value of 3. Once firms with any activity trait variable at a median level are deleted, the final sample total is 75. The descriptive statistics of the continuous combination index control archetype variables are reported in Table 5.8. These descriptive statistics indicate sufficient variation and are normalised where appropriate.

Table 5.8 – Descriptive statistics of combination index variables in reduced sample with median activity trait firms deleted

	Minimum	Maximum	Mean	Median	Std. Deviation
Arms Length Combination Index	0.060	0.247	0.152	0.155	0.043
Results Combination Index	0.141	0.307	0.225	0.221	0.027
Action Combination Index	0.119	0.247	0.193	0.194	0.025
Boundary Combination Index	0.138	0.269	0.206	0.208	0.026
Exploratory Combination Index	0.151	0.298	0.224	0.221	0.028

The frequencies of the dummy variables in this sample are reported in Table 5.9. Given the determination of high and low uncertainty is at a lower level in relative terms, a higher proportion of firms fall in the boundary and exploratory control activity trait profiles.

Table 5.9 – Dummy variable frequencies in sample with median activity trait firms deleted

Construct	Frequency	
Dummy value:	1	0
AT_PROFILE_ARMS_DUM	14	61
AT_PROFILE_RESULTS_DUM	9	66
AT_PROFILE_ACTION_DUM	6	69
AT_PROFILE_BOUNDARY_DUM	23	52
AT_PROFILE_EXPLOR_DUM	23	52
UNCERTAINTY_DUM *(High)*	46	29
UNCERTAINTY_DUM *(Low)*	29	46
ASSET_SPEC_DUM *(High)*	38	37
ASSET_SPEC_DUM *(Low)*	37	38
EX-POST_INFO_ASY_DUM *(High)*	34	41
EX-POST_INFO_ASY_DUM *(Low)*	41	34

The results of the regressions using the sample of firms, excluding those with activity traits at median levels, are reported in Table 5.10.

Table 5.10 – Median activity trait firms deleted sample OLS regression results

Control archetype	AT Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Adjusted R square	F-stat (significance)
	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat		
Arms Length	0.291	1.564	-0.111	-0.680	-0.162	-1.093	n/a		-0.03	0.936 (0.428)
Results	0.256*	1.735	-0.293**	-2.248	0.017	0.138	-0.193	-1.603	0.051	1.989 (0.106)
Action	-0.084	-0.581	-0.001	-0.009	-0.111	-0.900	-0.225*	-1.752	0.032	1.612 (0.181)
Boundary	0.183	0.819	-0.173	-1.126	n/a		-0.288	-1.510	0.008	1.190 (0.320)
Exploratory	-0.091	-0.399	0.068	0.370	n/a		0.086	0.440	-0.039	0.069 (0.976)

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

The coefficient concerning the activity trait profile in the results oriented machine control model is significant and positive, consistent with Proposition 2a. However, the F-statistic in all cases is insignificant indicating all regressions do not have significant explanatory power. Therefore, it cannot be concluded there is support for Proposition 2a based on the results oriented machine control regression model results. The reduced sample size may be the reason for the reduced explanatory power of the models.

5.3.4 Control archetype dummy variables

The control archetype combination index variables measure the degree headquarters exercised particular control archetypes in proportion to others. If Speklé's (2001) theory is correct, the majority of combination index variables should be either at minimum or maximum levels, reflecting headquarters' choice of a distinct control archetype in each case. In contrast, there is far more variation in the combination index variables. This is consistent with the case study analyses suggestion and extant literature (Abernethy, Bouwens & Lent 2004), reflecting situations where headquarters choose multiple control archetypes to varying degrees. However, some may argue that based on strict interpretations of Speklé (2001), headquarters should only choose one control archetype and for the purposes of statistical testing, this one control archetype needs to be identified for each firm.

A dummy variable for each control archetype is created and used as the dependent variable in each of the models. The following equation is applied with the relevant control dummy variables and activity traits substituted in the model where appropriate:

$$CONTROL\_DUM_i = \alpha_0 + \alpha_1 AT\_PROFILE\_DUM_i + \alpha_2 UNCERTAINTY\_DUM_i + \alpha_3 ASSET\_SPEC\_DUM_i + \alpha_4 EX\text{-}POST\_INFO\_ASY\_DUM_i + \varepsilon_i \quad \textbf{(4)}$$

The control archetype dummy variable ($CONTROL\_DUM_i$) is assigned a 1 if the focal control archetype is the control archetype primarily used by headquarters, and zero if it is not. The combination index values, and in particular the highest of the five control archetypes, is used to determine the primary control archetype exercised by each headquarters. If two or more combination index values for a firm are equally high, the control archetype dummy variables are all assigned a value of zero for the firm. Consistent with the modelling in Chapter 4, the activity trait dummy variables are determine by the absolute high or low level

based on the survey instrument Likert scales. A binary logistic regression approach is applied for this testing given the dependent variables for each model are dummy rather than continuous variables (Kutner, Nachtsheim & Neter 2004).

The frequency of the control archetype dummy variables is reported in Table 5.11. These frequencies indicate there is a large variation in the primary control archetype choice. In particular, results oriented and exploratory control appear to be the primary choice of control for many firms, which is consistent with the importance of accounting-centric control reported in literature (Merchant & Van der Stede 2007) and the suggestions of the case studies reported in this thesis. It should be noted the dummy values of 1 sum to a total of 134, compared with the sample size of 161. This indicates 27 headquarters in the sample exercise two or more control archetypes as the highest choice. This again indicates headquarters use multiple and combined control archetype choices as suggested in the case study analyses and extant literature (Malmi & Brown 2008; Merchant & Van der Stede 2007; Simons 2005). Accordingly, while this measure is consistent with Speklé's (2001) theory, which argues headquarters choose single and distinct control archetypes, it may not be consistent with reality.

Table 5.11 – Frequency of control archetype dummy variables

Construct	Frequency	
Dummy value:	1	0
ARMS_DUM	5	156
RESULTS_DUM	55	106
ACTION_DUM	6	155
BOUNDARY_DUM	19	142
EXPLOR_DUM	49	112

The results of the models applying the dependent control archetype dummy variables are reported in Table 5.12.

Table 5.12 – Dependent dummy variable and independent absolute activity trait (AT) dummy variable determination binary logistic regression results

Control archetype	AT Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Pseudo *R* square (Nagelkerke)
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	
Arms Length	20.909	0.999	-2.797*	0.060	-19.593	0.999	n/a		0.093
Results	0.968	0.211	0.083	0.912	0.220	0.581	-1.405**	0.017	0.074
Action	-0.539	0.772	18.394	0.999	0.041	0.977	1.577	0.180	0.082
Boundary	21.597	0.999	-19.457	0.999	n/a		-1.087*	0.098	0.059
Exploratory	-20.159	1.000	-0.456	0.689	n/a		0.343	0.337	0.017

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

The binary logistic regression results indicate the activity trait profile dummy variable coefficients are insignificant in all cases, providing no support for the propositions based on Speklé's (2001) theory. While three individual activity trait dummy variables have significant coefficients, consistent with the results of the main analysis reported in Chapter 4, there are other coefficients including the activity trait variables for arm's and boundary control which fall to insignificance. The lack of significance of these regression results, compared with the main analysis reported in Chapter 4, indicate using a dependent dummy variable based on the primary control choice of headquarters is a crude measure, inconsistent with headquarter control choices in reality.

The activity trait dummy variables can also be established based on relative (median value) activity traits levels. The models above are re-run using independent activity traits variables based on relative high and low levels. The results are reported in Table 5.13 below.

Table 5.13 – Dependent dummy variable and independent relative activity trait (AT) dummy variable determination binary logistic regression results

Control archetype	AT Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Pseudo *R* square (Nagelkerke)
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	
Arms Length	19.718	0.998	-17.907	0.998	-0.655	0.597	n/a		0.116
Results	0.687	0.432	-0.355	0.376	0.442	0.212	-0.998**	0.016	0.068
Action	-19.319	0.999	0.694	0.471	0.010	-0.991	1.665*	0.089	0.089
Boundary	-0.082	0.945	0.271	0.636	n/a		-0.797	0.329	0.028
Exploratory	-0.167	0.820	-0.181	0.693	n/a		0.405	0.364	0.012

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

These results indicate, again, all activity trait profile variable coefficients are insignificant, providing no support for the propositions based on Speklé (2001).

Finally, the dependent control archetype dummy variables are applied in binary logistic regressions with continuous activity trait dependent variables. The results of these regressions are reported in Table 5.14.

Table 5.14 – Dependent dummy variable and independent continuous activity trait (AT) variable binary logistic regression results

Control archetype	AT Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Pseudo R square
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	(Nagelkerke)
Arms Length	1.713**	0.031	-4.391*	0.060	-4.814**	0.013	n/a		0.183
Results	-0.047	0.635	1.184	0.196	0.092	0.886	1.778**	0.020	0.210
Action	-0.159	0.540	1.001	0.695	-1.711	0.274	-0.054	0.974	0.090
Boundary	-0.120	0.843	0.034	0.984	n/a		-0.517	0.668	0.049
Exploratory	0.334	0.483	-1.457	0.344	n/a		-0.784	0.777	0.036

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

Consistent with the main analysis reported in Chapter 4, the coefficient concerning the arm's length control activity trait profile is significant and positive, providing support for Proposition 1. However, the activity trait profile coefficients for boundary control falls to insignificant levels when using independent activity trait continuous variables.

Whether the independent regression variables are based on absolute determined dummies, relative determined dummies, or continuous variables, there is very limited support for Speklé's (2001) theory when using dependent control archetype dummy variables. While this dependent control archetype dummy variable appears consistent with the TCE theory of management control, it is not consistent with the suggestions of literature (Chenhall 2003) and case study analyses. Accordingly, the control archetype combination index appears a far more appropriate measure both theoretically and comparatively.

5.3.5 Control archetype continuous measures

It is proposed by Speklé (2001) that headquarters choose a distinct control choice for each situation based on the activity traits. However, in a vast number of studies reported in literature, control choices are measured on a continuous rather than the relative basis used in this study (Abdel-Kader & Luther 2008; Gerdin & Greve 2004). Consistent with this literature, it may be informative to examine the effect of activity traits on the absolute extent, rather than relative degree, control archetypes are exercised by headquarters.

The individual continuous activity trait variables, based on the summation of the relevant control archetype indicators previously substituted into the combination index equation, are used as the dependent variables in the regression models in this section. The independent variables used in the equation are the same as the main analysis models presented in Chapter 4. OLS regression is applied in this section given the dependent control archetype variables are continuous in terms of measurement. The equation applied for each of the control archetype models is as follows, substituting the control archetype and activity trait variables where relevant:

$$CONTROL\_ARCHETYPE_i = \alpha_0 + \alpha_1 AT\_PROFILE\_DUM_i + \alpha_2 UNCERTAINTY\_DUM_i + \alpha_3 ASSET\_SPEC\_DUM_i + \alpha_4 EX\text{-}POST\_INFO\_ASY\_DUM_i + \varepsilon_i \quad \textbf{(5)}$$

Positive and significant activity trait profile coefficients, beyond those reported in the main analysis in Chapter 4, would indicate measures based on the extent each control archetype is used are more accurate regarding headquarters' control choices.

The descriptive statistics of the individual control archetype measures are reported in Table 5.15. These statistics indicate each control archetype is used to a moderate to high extent, reflecting headquarters' use of multiple control archetype combinations. There appears to be sufficient variation in the data for the purposes of statistical modelling, with no excessive floors or ceilings in the data. Where appropriate, these control archetype variables are normalised due to the assumptions of OLS regressions.

Table 5.15 – Descriptive statistics of individual control archetype variables

	Minimum	Maximum	Mean	Median	Std. Deviation
Arms Length Control	1.000	5.000	2.967	3.000	0.982
Results Oriented Machine Control	2.097	5.000	4.146	4.153	0.559
Action Oriented Machine Control	1.500	5.000	3.594	3.667	0.783
Boundary Control	2.000	5.000	3.823	3.833	0.706
Exploratory Control	2.250	5.000	4.134	4.000	0.487

The results of the regression models using continuous dependent control archetype measures and independent individual and profile activity trait dummy variables based on absolute high or low levels is reported in Table 5.16.

Table 5.16 – Dependent activity trait variable and independent absolute activity trait (AT) dummy variable determination OLS regression results

Control archetype	AT Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Adjusted R square	F-stat (significance)
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat		
Arms Length	0.812	1.142	-0.242	-0.584	-0.528	-0.762	n/a		0.005	1.261 (0.290)
Results	-0.070	-0.730	0.095	0.917	0.006*	0.063	0.101	0.959	-0.014	0.467 (0.760)
Action	0.031	0.281	0.327***	2.881	-0.179*	-1.960	-0.206**	-2.135	0.097	5.303*** (0.000)
Boundary	0.136	1.250	-0.295***	-2.766	n/a		-0.244***	-2.887	0.079	5.584*** (0.001)
Exploratory	-0.215***	-2.619	-0.157*	-1.922	n/a		0.197***	2.617	0.116	8.017*** (0.000)

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

The results indicate all activity trait profile variable coefficients are at insignificant levels, with the exception of exploratory control. In addition, the F-statistic for both the arm's length and results oriented machine control regression models are insignificant, indicating these models do not have significant explanatory power.

The negative, but significant in this case, coefficient concerning the activity trait profile in the exploratory control model is consistent with the results presented in Chapter 4. In addition, uncertainty is also negatively and significantly associated with exploratory control, opposite to predictions. This suggests exploratory control may be more applicable in instances of lower uncertainty. The ability to establish targets during a financial period, applicable in the case of exploratory control, may only be possible where headquarters face lower uncertainty regarding WOFS operations (Merchant & Van der Stede 2007; Ouchi 1979). This may explain the opposite than expected association concerning exploratory control.

As described previously, activity trait dummy variable measures based on relative high and low activity trait levels are also used, with the results reported in Table 5.17.

Table 5.17 – Dependent activity trait variable and independent relative activity trait (AT) dummy variable determination OLS regression results

Control archetype	AT Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Adjusted R square	F-stat (significance)
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat		
Arms Length	0.026	0.228	0.051	0.491	0.119	1.249	n/a		0.001	1.063 (0.366)
Results	0.057	0.618	0.128	1.511	-0.061	-0.743	0.034	0.400	0.003	1.117 (0.351)
Action	0.032	0.365	0.072	0.868	-0.193**	-2.383	-0.215**	2.542	0.051	3.164** (0.016)
Boundary	0.020	0.168	-0.164*	-1680	n/a		-0.211**	-2.084	0.053	3.976*** (0.009)
Exploratory	-0.110	-0.958	-0.149	-1.556	n/a		-0.251**	2.558	0.064	4.655*** (0.004)

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

The results indicate the activity trait profile variables are not significantly associated with any of the control archetypes, therefore providing no support for any of the propositions based on Speklé (2001).

Finally, continuous activity trait variables are applied in the OLS regressions, reported in Table 5.18.

Table 5.18 – Dependent dummy variable and independent continuous activity trait (AT) variable OLS regression results

Control archetype	AT Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Adjusted R square	F-stat (significance)
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat		
Arms Length	-0.134	-0.388	-0.027	-0.101	-0.002	-0.007	n/a		0.005	1.290 (0.280)
Results	0.179	0.444	-0.160	-0.635	0.015	0.059	-0.103	-0.540	-0.012	0.509 (0.729)
Action	0.011	0.025	-0.247	-0.884	-0.180	-0.610	-0.278*	-1.664	0.159	8.587*** (0.000)
Boundary	-0.067	-0.164	-0.237	-0.718	n/a		-0.273	-1.224	0.181	12.801*** (0.000)
Exploratory	0.443	0.915	-0.686	-1.548	n/a		0.008	0.032	0.129	8.893*** (0.000)

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

The results again indicate none of the activity trait profile variables are significantly associated with the extent to which control is exercised by headquarters. In addition, the association of individual activity traits with control archetypes is insignificant in all cases, with the exception of ex-post information asymmetry in the action oriented machine control model.

The lack of significance concerning the associations in the regression results reported in this section suggest continuous variables capturing the extent control archetypes are used are not appropriate. Rather, the combination index variables which reflect the degree headquarters exercise control archetypes in relative terms appear to yield more significant results, particularly in the arm's length and boundary control models.

5.4   Conclusion

The results based on alternative specifications of the regression variables indicate the main analysis reported in Chapter 4 yields the most significant results. Determining activity trait dummy variables on the basis of relative rather than absolute levels, using continuous activity trait measures, and removing firms where activity traits are at moderate levels, does not appear to definitively explain variation in the combination index control variable in any case. Further, classifying headquarters into particular activity trait profiles on a relative basis may

not be appropriate as it appears there are a much larger proportion of corporations in low uncertainty related profiles. This is expected as headquarters would generally engage in operations where they have less uncertainty. The absolute activity trait dummy variable determination is the most consistent with the theory and yields significant results consistent with predictions regarding both arm's length and boundary control.

Using dummy control archetype variables based on the primary control choice does not appear to yield significant results beyond those observed when using the control archetype combination index variables. Identifying a primary control archetype used by headquarters appears a very crude measure of control, which is inconsistent with the control combination exercised by headquarters in reality as suggested by the case study analyses. The combination index importantly captures the degree headquarters exercise each control archetype relative to others, and yields more significant results compared with a measure of the extent to which headquarters use each individual archetype. This supports the assertions of Speklé's (2001) theory concerning the choice of certain control archetypes over others in association with activity trait profiles.

The results reported in Chapter 4 not only provide the greatest, although limited, support for propositions based on Speklé (2001), but are also the most consistent with both the suggestions from the case study analyses and extant literature. The alternative specifications of the theory testing presented in this chapter, however, may be useful to consider for studies concerning other contexts beyond that of WOFS operations. It has been noted, for example, there are few firms with activity traits consisting of high uncertainty and low ex-post information asymmetry, which may be a characteristic particular to the WOFS operations context. Accordingly, the WOFS operations context may affect the applicability of different testing specifications.

Chapter 6: Conclusion and Implications

6.1   Conclusion

This thesis investigates the TCE theory of management control in the context of multinational corporation headquarters controlling WOFS operations. A mixed method approach is adopted in this study due to the limited prior investigation of Speklé's (2001) theory and the WOFS operations context. First, a series of five case studies enable the exploratory examination of the propositions, providing insights on support and deviations from the theory and also considerations for further testing. Second, the propositions are tested through OLS regression analyses based on cross sectional survey questionnaire data collected as part of this study. This statistical analysis allows more definitive findings concerning support and deviations from the TCE theory of management control.

Chapter 2 describes the TCE theory of management control conceptualised by Speklé (2001) and justifies its relevance in the context of headquarters controlling WOFS operations. TCE theory is used as the basis of identifying the problems headquarters face when controlling WOFS operations. These problems are based on the activity traits in TCE theory; uncertainty, asset specificity, and ex-post information asymmetry. A series of control archetypes are conceptualised as part Speklé's (2001) theory and proposed as solutions to the problems associated with the three activity traits. Based on Speklé's (2001) theory, a series of testable propositions are detailed and explained in Chapter 2 forming the basis of investigation in this study. The theory is critically reviewed through reference to extant literature, which provides indications of support and possible deviations from the theory predictions. While many of Speklé's (2001) theory predictions are consistent with extant literature, possible deviations include whether combined rather than distinct and separate action and results oriented machine control archetypes are exercised by headquarters (Argyres 1995; Nilsson 2002; Park 2002; Zenger & Hesterly 1997). In addition, it is questionable whether situations of high uncertainty and low ex-post information asymmetry are observed in practice and accordingly leaving the relevance of exploratory control in doubt (Merchant & Van der Stede 2007; Ouchi 1979). The theory appears comprehensive concerning both factors affecting and the actual control archetype choices considered, compared with extant literature (Busco, Giovannoni & Scapens 2008; Dossi & Patelli 2008; Henri 2006; Jaussaud & Schaaper 2006; Malmi & Brown 2008; Sandelin 2008); however, it remained untested and therefore required further investigation.

The examination of the TCE theory of management control through a series of five case studies is presented in Chapter 3. Background research is conducted to ensure firms with contrasting activity traits are selected, enabling the examination of each proposition. All interview data from the case studies was transcribed and coded for the purpose of analysis. The control archetypes conceptualisations and some associations predicted by the propositions were supported by evidence from the case studies. This suggests the TCE theory of management control is may be relevant in the context of investigating headquarters' control of WOFS operations. However, a number of deviations from the theory are noted. Headquarters, in a number of cases, use multiple control archetypes rather than single distinct control archetype choices. Combined control archetypes are observed, including the combined use of results and action oriented machine consistent with the suggestions of extant literature (Argyres 1995; Nilsson 2002; Park 2002; Zenger & Hesterly 1997). This has important implications for an appropriate means of measuring control archetypes use in the statistical analysis. In addition, both results and action oriented machine control appear widely exercised rather than associated with variation in activity traits. A further possible deviation observed is the use of exploratory control being enabled where uncertainty is lower, consistent with the accounting-centric focus of this control archetype (Merchant & Van der Stede 2007; Ouchi 1979). This contrasts with the applicability of exploratory control under situations of higher uncertainty predicted by Proposition 4. It should be noted the case studies provide suggestions rather than definitive indications of theory deviations or support (Eisenhardt 1989; Yin 1988), providing important considerations for the purpose of further investigation.

The confirmatory OLS regression analyses and testing of the TCE theory of management control based on data from a cross sectional survey questionnaire is reported in Chapter 4. Examination of the responses received indicates non-response bias is not an issue and the constructs used in the regression analyses are valid and reliable. The factor analysis of control archetype construct indicators demonstrates the conceptualisation of each control archetype by Speklé (2001) is valid and reliable. There is partial support for the TCE theory of management control; in particular arm's length and boundary control are exercised consistent with the predictions of the propositions. Significant coefficients for both the arm's length and boundary control activity trait profile variables indicate support for Propositions 1 and 3. The predictions, however, concerning results oriented machine, action oriented machine, and exploratory control, are not supported in the context of controlling WOFS

operations with all coefficients concerning these activity trait profile variables insignificant. The insignificant results regarding results and action oriented machine control are consistent with the case study suggestions. In addition, exploratory control does not appear a relevant control choice, with activity trait profiles consisting of high uncertainty and low ex-post information asymmetry generally not observed in practice. Speklé (2001) provides some indications of control archetype choices in association with activity traits; however, the extent of control archetype determination explained by activity traits does not appear to be as substantial as suggested. Accordingly the answer to the research question as to whether the TCE theory of management control explains the choice of management control systems in the context multinational corporation headquarters controlling WOFS operations is yes, but only to a limited degree.

This is the first study to test the associations between activity traits and control archetypes proposed in the TCE theory of management control. The research method and in particular the variable specification used to test the propositions is therefore open to debate. A series of additional tests based on alternative variable specifications are performed and reported in Chapter 5. This additional testing indicates the tests reported in Chapter 4, while only providing limited support for the theory, still yield the strongest and most consistent results with Speklé (2001). The combination index and the dummy variable activity trait measures therefore appear the most appropriate means of testing the theory. The combination index measures are particularly useful in providing an indication of the degree headquarters use one control archetype relative to others. The large variation in the combination index values for the sample firms indicate headquarters use multiple and variable choices of control archetypes, consistent with the suggestions of case studies and literature (Malmi & Brown 2008; Simons 2009). Measures of control choices using dummy variables or control archetype extent measures do not yield stronger results or align as closely with the conceptualisation of Speklé's (2001) theory compared with the combination index.

The findings of this thesis have several implications for researchers. This study indicates the TCE theory of management control partially explains the control choices of headquarters regarding WOFS operations. While the TCE theory of management control appears relatively comprehensive, the associations between activity traits and management control system choices are more complex in many cases concerning the WOFS context than those conceptualised by Speklé (2001). In particular, using multiple control archetypes where

possible appears an important means of exercising sufficient control in the context of WOFS operations. The findings of this study suggest the TCE theory management control may be useful to a certain extent in investigating and understanding control choices, relating to WOFS operations in this case; however, revisions to the theory in different contexts are necessary.

6.2   Limitations

The TCE theory of management control facilitates a comprehensive investigation of control choices regarding WOFS operations. However, as with any control conceptualisation, there are limitations. First, Speklé's (2001) theory is only partially supported in the WOFS operations context. Revisions and further examination are required before the theory can be of value in a range of contexts. Second, it is probable there are other factors affecting control choices, outside the activity traits proposed in TCE theory. While the case studies suggested activity traits are relatively comprehensive in capturing the WOFS context, there are many other factors that may affect control choice which are alluded to in management accounting literature (Chenhall 2003). Third, Speklé (2001) does not consider personnel and cultural control as part of control archetypes to a great extent. These controls are included in Merchant and Van der Stede's (2003) control framework. Greater inclusion of personnel and cultural controls would have added to the relatively comprehensive nature of the theory.

This study focuses on Australian corporations; while results can be generalised to headquarters based in western economies, they may not be as applicable to headquarters in other regions including developing and transition economies. The cultural characteristics of the country where headquarters are located may affect control choices (Hofstede 1984). In addition the control exercised by headquarters may be influenced by the region in which WOFS operations are located. However, separating the sample based on the country WOFS operations are located, whilst informative, would provide samples too small to be of use (Kutner, Nachtsheim & Neter 2004).

The case study firms were selected to enable to the theory to be comprehensively examined in the WOFS operations context. While these case studies are very informative in allowing the examination of the theory, not all activity traits observed are in line with the expectations based on the background research. In particular, moderate levels of activity traits are observed in a number of cases, rather than either high or low levels expected. Selecting and

examining further case study firms may have allowed the effects of a larger range of activity trait levels with the associated effects on control archetype choices to be examined. However, all the control archetypes proposed are observed in the case study data and therefore the theory appears to be comprehensively examined in this study.

The focus on WOFS operations controlled by multinational corporation headquarters may limit the ability to comprehensively examine the TCE theory of management. There are few firms in the sample which can be classified with activity traits representative of boundary or exploratory control archetypes. The reason for this stems from few headquarters indicating high levels of uncertainty regarding WOFS operations. It is probable that headquarters in many cases avoid operations where they experience high levels of uncertainty due to the more problematic nature of controlling such operations (Merchant & Van der Stede 2007). As a result, the relevance of boundary and exploratory control archetypes may be relatively limited. From a limitations perspective concerning this study, this can create validity issues when testing the theory which are observed in the exploratory control archetype regression model.

The survey was designed to mitigate bias in response to questions through careful wording of questions, design of scales, and anonymity provided to respondents. The analysis of descriptive statistics indicates there is no excessive bias in responses. However, there is always a risk some respondents may answer questions on the strongly agree end of a scale, particularly concerning control choices to indicate they are 'doing the right thing'. This may result in some response bias.

The indicators and measurement of the constructs is always open to debate. The definition of each variable is carefully noted in this study and considered when determining the relevant indicators. The definitions adopted for the activity traits and control archetypes are aligned with Speklé (2001). The questions used to capture the relevant indicators are adapted from extant literature where possible. However, other studies may use different means of measuring each construct affecting the degree results in this study can be reconciled with prior studies. This is one of the few studies to test the TCE theory of management control and therefore is open to critique concerning the measurement of each variable and construct.

6.3   Future Research

There are a number potential research opportunities related to this study. Further case studies exploring the applicability of the TCE theory of management control to other contexts would be useful. Additional case studies would provide data on whether the consistencies and deviations noted in this thesis apply to other contexts beyond that of WOFS operations. This would provide more substantial indication as to whether the theory should be revised to reflect the deviations noted in this thesis. The control archetypes appear valid conceptualisations of control choices used by headquarters; however, the assertions made by Speklé (2001) that there are single and distinct control archetype choices does not appear to be supported. Rather, combinations of control archetypes are used by headquarters. This suggests it is appropriate to rename these archetypes 'dimensions' of control. An informed revision of theory would enable the development of a more comprehensive control framework, addressing the fragmented nature of management control system research literature (Chenhall 2003; Malmi & Brown 2008).

The testing in this study, including that related to alternative variable specifications, provides a starting point for future studies to investigate the TCE theory of management control in contexts including and beyond WOFS operations. As discussed in the limitations section, the variable measurement adopted in this study is open to debate. It is only through further testing that a clearer view of whether the method applied in this study or that of other studies is the most appropriate means of testing Speklé's (2001) theory. However, the development of the combination index variable definitely appears to be an innovative measure of control archetype choices, informed by the suggestions of case studies, that can be adopted in future studies.

Extending the investigation to performance may provide further indication of the appropriateness of control choice guidance provided by the theory. Investigating whether the models developed in this study, in particular those concerning arm's length and boundary control, are able to generate predictions of optimal control choices would be a useful avenue for future research. In addition, results and action oriented machine control are widely used by headquarters; however, it is questionable as to whether such wide use of these control archetypes is optimal. Accordingly, extending the analysis to performance implications may reinforce the appropriateness and value of the models developed in this study.

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Appendices

Appendix 1: Case study analyses

This appendix discusses the findings and suggestions arising from the case study analyses. The discussion is structured around the sets of activity traits observed in the cases. The link between each set of activity traits and the control archetype choices of headquarters is reported here. The quotes supporting the case study analysis suggestions and findings described in the proposition section in Chapter 2 are provided in this appendix.

1. Low uncertainty, moderate asset specificity & low ex-post information asymmetry

WOFS operations in both Corporations A and B are similar worldwide, enhancing the ability of headquarters to acquire and use globally relevant ex-ante information relating to these operations. The similarity of WOFS operations means headquarters have broadly applicable ex-ante information and therefore low uncertainty concerning WOFS processes and activities. Accordingly uncertainty relating to WOFS operations in both corporations is low from the perspective of headquarters'. In addition, it is in headquarters' interest to acquire ex-ante information of WOFS operations, minimising uncertainty, given the interdependence of WOFS operations and the notable effect on overall corporate performance. The CFO of Corporation A stated:

> We have to brief headquarters when we want pricing adjustments. You can image how much information that goes between us and the US on the reasons why we are asking for a price to be approved at a particular price point. But headquarters has to understand the particular environment here, what is going on here with the government, the market, the economics and the rest of it.

The subsidiaries of both Corporations A & B are distribution arms of the corporation and accordingly asset specificity is limited. These subsidiaries do not design, develop or manufacture products sold. Subsidiaries are heavily dependent on intellectual property held by headquarters relating to the development, manufacture and distribution of products. This intellectual property is not held at the subsidiary level and accordingly there is limited risk of loss at this level. The Associate Director of Finance (Corporation A) explained:

> The company owns intellectual property, products and normally they would not buy a company locally, they would buy a company around the world to get those products. So because they have those products they want to make sure they distribute to all the markets, so they can have a presence in all the big markets around the world. We are what's called a research based organisational, not a wholesaler that buys and sells

things. It takes years to develop products, there is a lot of investment going in, so then you need outlets to distribute them and a presence in all markets.

Training programs represent one of the few areas where resources tailored to the products sold at the subsidiary level. The CFO of Corporation B commented:

People are trained within that particular area in terms of how they sell the product, how it complies with the Australian market, so it is not like they can just go and get another product. There is global marketing and pricing as well. The global departments provide support to the local marketing for a particular therapeutic area. It is heavily integrated.

Employees trained to sell products at the subsidiary level, however, can be easily transferred to other subsidiaries due to the commonality in product offering across the corporation. In addition, the skills and knowledge required to sell products in Corporations A & B are similar to those required at competitor firms. Accordingly, asset specificity of WOFS operations in both Corporations A and B appears moderate (relatively low in hierarchal organisational context). Note, this indicates asset specificity is low in the context of hierarchal organisations, not low in an absolute sense.

Ex-post information asymmetry is low concerning WOFS operations as headquarters are able to assess performance in the local business environment and market context subsidiaries operate. This links to the limited uncertainty headquarters have regarding WOFS operations, previously identified, and the ability to assess performance of these operations in the local context. Ex-post information asymmetry is further reduced by headquarters' clear expectations relating to information subsidiary management is required to communicate. The director of finance (Corporation B) commented:

Well from our side financial reporting is very extensive, every single line, all the accounts, sales, expenses. There must be other reporting from various business units, they have to report their performance as well, not only sales numbers, but new listings, price approvals. We are required to report monthly.

Subsidiary level finance departments have a clear role in conveying performance information to headquarters and in addition there is a strict policy of no surprises at the time of reporting as explained by the CFO (Corporation A):

The thing that you don't want to do is send off the results which are dramatically different to what your business plan or forecast was without any heads up to anyone. That would be political suicide. So what you do is monitor how the month is going and about a week before you do a proper check. If there are some quite large

variances and there can be for quite good reasons, then you let headquarters know. That way when they get the results they understand them and there is no issue. You don't want anyone in the US to have surprise ever. Basically what you are doing is managing them and you are treating them the way you would want to be treated if you were in their role. Headquarters don't want you to forget that your finance role within the organisation, you're through and through finance and your number one responsibility is finance and that's fair.

The transparency of subsidiary activities is further promoted by headquarters through frequent visits to foreign operations and a flat management structure. The CFO (Corporation A) observed:

Many people from overseas come to visit and so when someone is coming you might need to do a presentation that might go on for a couple of days. You're meeting people from around the business and that's for them to get a sense of how it is going. So there is the formal reporting and this informal style to give them a comfort level that everything else is fine, or opportunity to raise something well in advance, to discuss possible treatments for whatever the risk is or opportunity.

The controls choice of headquarters and the links with the activity traits are now described. These choices are described based on the control archetypes conceptualised by Speklé (2001).

The structural dimension of control exercised is characterised by centralised decision making and direction provided by headquarters which is consistent with the similarity of WOFS operations globally. The CFO (Corporation A) explained:

If you are a limited risk distributor it means that you don't have a lot of decision making here (at subsidiary). So how it works is, the control is very much centralised from the headquarters , so for example if we want to do anything here we have to prepare a very detailed business case and that business case has to go to headquarters for approval.

In addition there is clear division of responsibility of subsidiary activities, allowing headquarters to provide a high degree of direction to subsidiary operation. The associate director of finance (Corporation A) made the following points:

Not all decisions are made offshore. Once things are agreed in your budget you can just about do anything that is in your budget. Anything above certain thresholds and any abnormal type of transactions you need to go back to headquarters.

Bounded rationality or opportunistic by subsidiary management could have potentially damaging consequences for operations elsewhere, particularly due to the high interdependence noted regarding WOFS operations. It is in headquarters' interest to take advantage of low uncertainty through centralising decision making as noted by the CFO (Corporation A):

> *Sometimes headquarters decides not to do something in one country, because if they did that it would harm the business elsewhere. And that is a very important point and that is why the decisions need to be made centrally. The associate director of finance elaborated: pricing is a very good example. You have to be careful of the price because of the government as well and you can mess up the markets for the other subsidiaries.*

Consistent with the need to prevent suboptimal subsidiary behaviour affecting corporate operations elsewhere, headquarters implemented extensive and inflexible standardisation of subsidiary processes. These include extensive operational guidelines concerning stock ordering and staff recruitment. The director of finance (Corporation B) explained headquarters is able to implement these guidelines due to the low uncertainty faced:

> *Finance has a particular function, they have a manual, they need to implement their control accordingly and you will find within the company you can only go a particular way. There is no flexibility, so it is frustrating. Just putting people on and issuing a letter of appointment, it is not simple. The person needs to be on the system, the system needs to be gives the person a number. If the system is not ready to give that person a number, you can't issue a letter of appointment.*

It is expected that extensive standardisation of policies and procedures reduce the risk suboptimal behaviour associated with subsidiary activities at a distance by specifying good business practices. Internal audits are conducted by headquarters to ensure policies and procedures are followed by subsidiary management as intended. The associate director of finance commented on these internal audits:

> *The internal auditors visit us from time to time. There are many guidelines, so you have your policies, procedures, big manuals. So headquarters implement these and trains people and they do what they need to do. Then the internal audit department makes sure people are following good business practice and the policies and procedures. They come every second year or so and usually their reports are taken very seriously, because the target audience is top management of the corporation.*

In addition, behaviour constraints regarding areas of responsibility are clearly defined to ensure key areas receive sufficient focus and only those that are meant to be involved in particular processes, are involved as noted by the director of finance (Corporation B):

> *The company is a huge organisation and headquarters just tell you that you can't do something. It has to be done their way, no one seems to have the power to change it.*

Low ex-post information asymmetry means headquarters can and do objectively monitor and evaluate the performance of each subsidiary. This enables close monitoring, important to motivate subsidiary management to maximise performance due to the investment in highly specific assets which have limited alternative uses and headquarters have limited ability to redeploy at a distance. The director of finance explained:

> *The most important thing is there is no company profit. If they give you a budget, let's say it is 100 million that you need to produce this year and some of your products don't go very well, but for some reason the others did and you manage to make the 100 million anyway, so you are smiling, everyone is happy with you. In the Corporation B model, they are probably happy with some (product lines), they are not happy with others. The products that they expected to do well didn't, so there will be a lot of attention at those people looking after those products, so they get a lot more focus.*

In the case of both Corporations A & B, headquarters require results to be reported in extensive detail and frequently which is instigated through a common performance measurement and reporting system. The combination of both low uncertainty and low ex-post information asymmetry regarding WOFS operations means headquarters understand in depth the implications of performance achieved. Consistent with objective performance evaluations, bonuses awarded are objectively determined by formulas clearly communicated to subsidiary personnel as explained by the CFO (Corporation A):

> *Bonuses are based our objectives and how you perform versus your personnel objectives or the business plan. The whole bonus system is completely based on the business plan (budget). That's why it is very important to negotiate the business plan, right, so then obviously the more you achieve, the higher the bonus will be and there is a grid. If you're a particular level, and the performance is X and the company is performed so much you'll get Y. So that's how the whole thing works, unfortunately there was one division in the company that didn't get their bonus last year, because they didn't achieve their business plan. We on the other hand have exceeded it for the last 4 years. What we got out of that was a bad name for sand bagging our business plan. But we could prove that circumstances have changed, here is X Y Z which*

happened after we had negotiated the business plan and this is why we have done so well for so long.

The case study analysis of Corporations A and B suggest low uncertainty, relatively low asset specificity and low ex-post information asymmetry are related to machine control archetypes. The association with low uncertainty and ex-post information asymmetry is consistent with Speklé's (2001) theory. However, the association with asset specificity is inconsistent with the theory.

A further inconsistency with Speklé's (2001) theory is headquarters' joint use of both action and results oriented machine control archetypes. The theory proposes under low ex-post information asymmetry headquarters choose results oriented machine control because it is the most efficient control choice, while under high ex-post information asymmetry headquarters choose action oriented machine control. The cases suggest ex-post information asymmetry is positively related to action oriented machine control, similarly to results oriented machine control, but for different reasons. Low ex-post information asymmetry enables headquarters to gain clear insights into performance and then take direct action through action oriented machine control to guide WOFS operations.

The link between activity traits and the control choices examined in Corporations A & B are summarised in Figure A1.1.

Figure A1.1 – Corporations A & B case summary
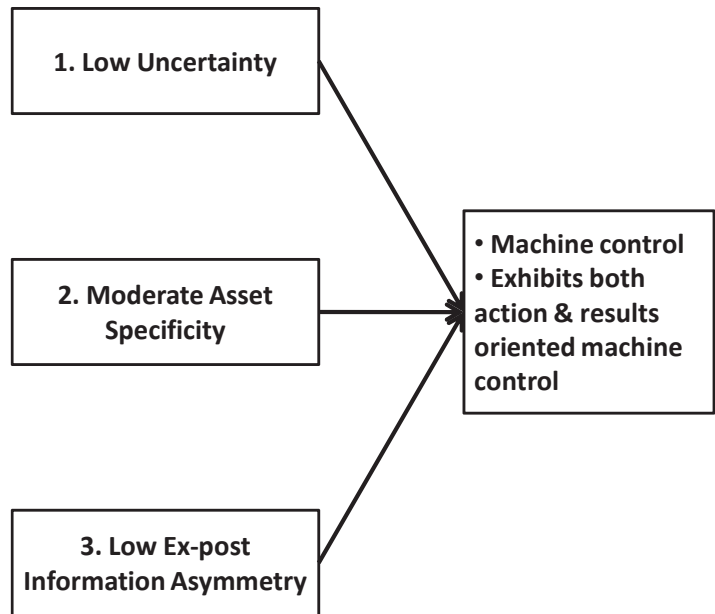
2. Moderate uncertainty, moderate asset specificity & moderate ex-post information asymmetry

Corporation C1 subsidiaries operate as local companies and are highly embedded with organisations in the regions they are located. These subsidiaries are located all over the world and accordingly it is difficult for headquarters to be aware of the ex-ante processes and activities applicable in each region, increasing uncertainty faced. The head of global finance (HGF) commented:

> *From the finance side of things it is much easier to have that overarching consistency between the regions. It gets harder, probably from a safety point of view and some of the other functions to have the same consistency. With HR you have different employee laws within states in Australia and those laws will differ to how they work in Asia. All different countries in Asia have different laws, so it gets harder from a HR point of view to get things consistent.*

Unique strategic initiatives are adopted by subsidiaries to achieve a competitive advantage in different regions. The personnel at the subsidiary level rather than headquarters have expertise of the local market and drive these strategic initiatives. The HGF explained:

> *Subsidiaries get the opportunity to develop their own strategic initiatives, to put up in front of the global team or the corporate team to help drive the business forward. It is very hard for a corporate M&A team sitting at the headquarters level to come up with these strategic initiatives. They can do as much market research as they like at headquarters, but they are still using things like the internet or other sources of data they have access to. That's not the same as being on the ground in that country, knowing the local conditions, customers, how those markets operate, you still you still need your local people to drive all that. They just utilise the M&A strategy team where they can to get the expertise they perhaps they don't have locally to really drive it forward.*

Further increases to headquarters' uncertainty are the range of business lines subsidiaries operate in and the uniquely tailored products to the requirements of individual customers. The HGF noted:

> *It would be fair to say the construction business is totally different to the investment management business, a retirement village business. Therefore it makes sense that the business has been aligned on line of business sort of structure because other than projects we work together on, all other facets are generally pretty different businesses, independent businesses and it has really been a bit of silo mentally.*

The high external embeddedness (integration with local companies) and unique strategic initiatives of different subsidiaries operating globally, suggest headquarters face a high level of uncertainty concerning foreign subsidiaries. However, all WOFS operations are involved

in property related businesses, ensuring headquarters has basic knowledge of subsidiary operations and processes. Therefore the uncertainty headquarters faces in this case is moderate.

Much of the work performed by Corporation C1 subsidiaries is subcontracted, and accordingly subsidiaries do not invest significantly in assets to facilitate product delivery. Given the high degree of subcontracting, WOFS operation asset specificity is moderate (relatively low in the hierarchical organisational context). The HGF explained:

> *We are the managing contractor, responsible for a particular project. We have the head contract with the client, and we then have sub contracts with the builders effectively. So we don't tend to have large numbers of construction workers, we actually subcontract 99 per cent of that construction work down the supply chain.*

In addition headquarters has a limited role in the training and development of subsidiary personnel. These personnel are often recruited externally and are experts of their local market as noted by the HGF:

> *You need a strong local management presence who are experts in their particular market and just supplementing those with high quality Australian talent who you are trying to bring through the organisation.*

Subsidiaries operate largely independently; the assets are not tailored to activities of other entities. Consistent with relatively low asset specificity noted in this case, the risk associated with bounded rationality or opportunistic decisions at the subsidiary management level is minimal.

All subsidiaries operate in the property sector, allowing headquarters to broadly monitor and evaluate performance. The diversity of subsidiaries, however, increases headquarters difficulty when using detailed performance metrics to monitor and evaluate performance. Subsidiaries are highly externally embedded in a range of different markets and lines of business around the world which means it is difficult for headquarters to have clear expectations of performance. There are a range of different strategic initiatives subsidiaries adopt at various stages of implementation which further complicates headquarter's ability to assess performance, meaning headquarters is reliant on broad budget numbers. The HGF explained:

Once the budget is set, that becomes the base for monitoring performance for the next financial year. Each month in our financial reporting, headquarters are always going "how has this subsidiary performed compared with the plan" and then as we move through the year it is not only a comparison to the business plan, but it is also with rest of your prior month forecasts.

As headquarters can only broadly monitor performance, ex-post information asymmetry is moderate in this case.

The structural dimension of control is characterised by high autonomy extended to subsidiary personnel. This is consistent with the external embeddedness of subsidiaries in a range of foreign markets. Headquarters have basic ex-ante information of the processes and activities of these externally embedded operations. The HGF explained:

Subsidiaries definitely operate in their own market as though they weren't attached to corporate headquarters. We don't have global procurement models or anything like that. So the guys running the construction division in the US, they are buying steel for maybe multiple projects or might just be one project that is purely based on that one project in the US. So there is sort of complete autonomy from that point of view, they're operating as though they are not part of the corporation, other than for the bureaucracy headquarters puts over them.

Rather than centralising decisions and providing explicit direction to subsidiaries, headquarters focuses on providing overall strategic direction to subsidiaries. This direction influences the strategic initiatives personnel at subsidiaries formulate as explained by the HGF:

The CEO of the construction division global is constantly working with the CEO of the corporation and the head of strategy, M&A, the CFO and head office management on the future direction of the group and some of the key things in the business plan. They're giving an overview of business, key sectors they operate in, what service they provide, they're giving an organisational structure, key markets, key market trends and uncertainties, commentary on the key sectors that they operate in, commentary on geography, analysis of their competitors and then how does what they want to do fit into a strategic backdrop, what do they want to fix and invest in their business, what existing platforms do they want to scale up, what are the new growth initiatives and what parts of the business are we going to rationalise and/or exit. So that is the key focus that it driven by the strategy and M&A guys, CEO, right down consistently through all of the business units, so each of the business units is coming up with their plan, have had to come up with from that strategic backdrop and go through in detail for each part of it what their plan is.

Headquarters does, however, delineate clear boundaries concerning minimum safety requirements and investment criteria. Clear boundaries ensure the corporation is not exposed to risk, particularly to the reputation of the corporation as a whole. This is important as products are tailored to specific regional expectations and demands given the high level of autonomy extended to subsidiaries. It is challenging for headquarters to maintain a balance between consistent policies and procedures and the autonomy needed by subsidiary managers associated with external embeddedness in foreign markets. Unique strategic initiatives in markets around the world further limit the ability of headquarters to implement consistent policies and procedures. Accordingly, headquarters only sets minimum policies and procedures throughout the corporation relating to safety, finance reporting and human resources practices as described by the HGF:

> *Corporate functions are all trying to drive consistent policies and procedures of various functions throughout the business units and regions. I'd say we're better at some than others, like HR always seem to. I don't know what it is with HR, but they never seem to be able to get their head around consistent policies and procedures in the regions, the sort of rigor and control around that sort of stuff. You compare that with the finance community which is very well structured. Lend Lease it is very big on limits of authority, each business unit has a limit of authority document that outlines who has the power to make certain decisions, that can be as much as who approves the sign off of an overhead invoice. If I sign something, it goes down to accounts payable, they would know that I can't sign off on an invoice greater than 40 grand, reject it and send it back upstairs for re-approval. So we have limits of authority like that, whether it be overheads, operating expenses, through to who has the authority to commit to a billion dollar project bid. It is documented in a detailed fashion so that at each stage of what it is you are doing, you know how far up the chain of command you've got to get approval. There are your very clear limits of authority all along the chain of command through to the board level about what you can and can't sign off on and obviously if you go outside those limits of authority then you are breaching code of conduct and then you know putting yourself at risk of losing your job.*

Very prescriptive policies and procedures are inappropriate due to the uncertainty headquarters faces concerning subsidiary operations. However, one exception is safety standards which are inflexible and emphasised heavily through the corporation. The HGF explained:

> *The company is committed to operating incident free wherever we have a presence. There are some things where the client will be trying to write terms and conditions into an employment contract where, a bid, a project contract*

which we will find totally unacceptable from safety point of view. They are trying to cut costs and we go "no" that does not meet the minimum of what we want to do on each project to make sure that every worker goes home safely and we minimise the risk of injury. So there are some things that are just a complete no go.

These safety standards ensure bounded rationality or opportunistic decisions at the subsidiary level do not have far reaching implications on the whole corporation, particularly reputational effects.

Subsidiary performance is monitored and evaluated based on progress towards targets set as part of the five year plan. These long term targets and plans are consistent with the significant length of time it takes to complete projects. The HGF explained:

It is quite a slow 3 or 4 month progress to pull together a 5 year business plan from underlying business unit, right up to the headquarters. But once it is set, it becomes the base for monitoring performance for the next financial year. So each month in our financial reporting, we are always going how has the subsidiary performed compared with the plan and then as we move through the year it is not only a comparison with the business plan, but also with the prior month forecasts. How is the forecast moving throughout the year relative to what was previously set? Through all that we are trying to eliminate surprises, to make sure there is transparency between whether subsidiaries and headquarters.

Projects undertaken by subsidiaries frequently involve lengthy negotiations and consultation to tailor products to the customers' requirements. Lengthy lead times associated with projects increases the ex-post information asymmetry faced and limits the ability of headquarters to closely monitor and evaluate the performance of subsidiaries outside broad financial indicators. However, headquarters does closely monitor compliance with safety standards to ensure each subsidiary is following the appropriate guidelines within their market place.

Rewards and incentives are based on the achievement of targets set out as part of the five year plan and are based on long term performance. In addition, there are rewards for achieving stretch targets, important to the long term performance of the corporation. The HGF explained the bonus system:

I'd almost say that first few years that I was here bonuses really were if you turned up and did your job and the company achieved the profit targets, you got

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your bonus and a fairly healthy one at that. Whereas now they are moving towards targets that are not just what is put into the budget, we are looking beyond the budget targets, to put stretch targets which could be 4 or 5 different metrics, could be profit after tax, it could be new work secured, it could be backlog. This is all about what projects you have won, how much work in hand have you got to deliver in future periods, all of that type of stuff. It's very important because that's what drives future profitability. So they are very much looking at stretch targets for financial metrics for whatever part of the business a subsidiary is in. In order to get 100 per cent hit of budget potential subsidiaries have to get the stretch targets and if they don't hit them, then there is a degree of discretion. Senior management business units CEO, CFO level to go look, they missed their stretch target by 10 per cent, does that mean that they get nothing, probably not, it means they get slightly less than their full achievement.

It is important from the headquarters' perspective to motivate managers who have greater knowledge of unique foreign markets to drive long term performance. Headquarters does not appear to be in a position to effectively drive long term performance of each subsidiary due to the range of different markets they operate in and the different strategic initiatives undertaken.

The case analysis of Corporation C1 suggests moderate uncertainty, moderate asset specificity and moderate ex-post information asymmetry are clearly related to a boundary control archetype, with elements of results oriented machine control. The TCE theory of management control defines distinct control archetypes applicable in contexts exhibiting low or high uncertainty and ex-post information asymmetry. In this case, moderate ex-post information asymmetry is observed and it appears related primarily to boundary control and also elements of results oriented machine control. This suggests headquarters select a combination of archetypes when an activity trait, such as uncertainty and ex-post information asymmetry, are between low and high extremes.

The link between activity traits and the control choices examined in Corporation C1 are summarised in Figure A1.2.

Figure A1.2 – Corporation C1 case summary
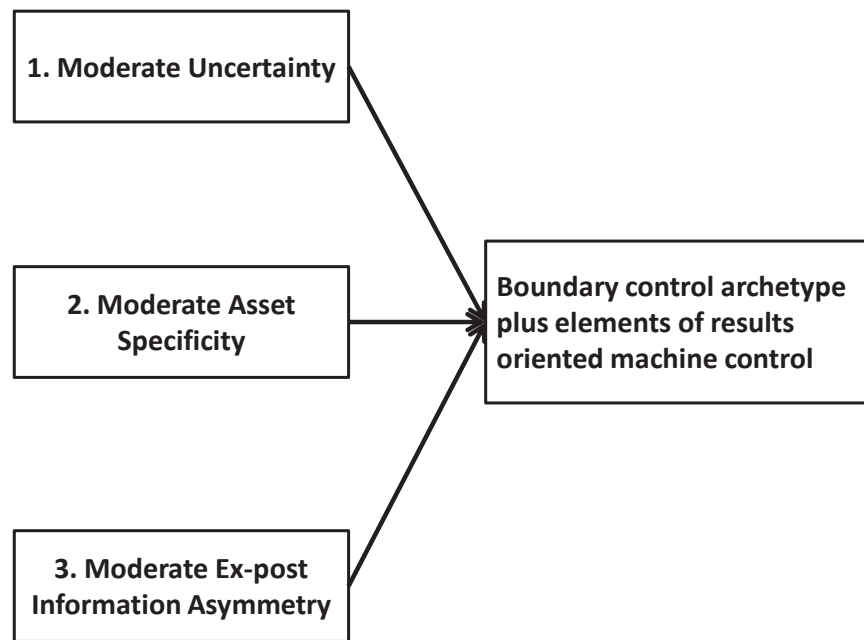
3. Low uncertainty, moderate asset specificity & moderate ex-post information asymmetry

Corporation C2 subsidiaries primarily focus on price competitiveness as a means of maintaining competitive advantage. Projects completed by subsidiaries show limited innovation and processes are kept consistent to ensure costs are minimised. Accordingly a defender based competitive strategy is adopted by subsidiaries. The HGF explained:

> *A lot of companies are prepared to take those 1 per cent margins in market X at the moment.*

Despite the subsidiaries operating in a number of different foreign markets, consistent processes mean headquarters face lower uncertainty concerning subsidiary activities. Greater risks associated with tight margins on projects means it is in headquarters' interest to acquire more information regarding subsidiary activities ensuring the corporation is not exposed to excessive risks. The HGF explained:

> *I think it is important to recognise that there are many layers of review that happen from corporate through to the underlying business unit, because it is all about understanding what is going on at the underlying business unit and what are the good things that are going on and what are the things that need to be fixed. It is not just headquarters sitting in their Ivory tower with no real involvement or knowledge of what is going on underneath, they have, they don't have absolute 100 per cent detailed understanding, but they have sufficient understanding that is enabling them to deliver to the market the results that they're forecasting and implementing the strategy that the CEO wants to roll out.*

The majority of projects are subcontracted and therefore subsidiaries do not invest significantly in assets to deliver projects. Therefore the limited investment in unique assets by headquarters means asset specificity is moderate (relatively low in the hierarchal organisational context) in the case of Corporation C2, similarly to Corporation C1. The HGF noted:

> *We are the managing contractor, responsible for a particular project. We have the head contract with the client, and we then have sub contracts with the builders effectively. So we don't tend to have large numbers of construction workers, we actually sub contract 99 per cent of that construction work down the supply chain.*

In particular, subsidiaries in Corporation C2 adopt a defender approach to competitive strategy and are not involved in highly innovative or leading edge projects. The investment in specific practices or knowledge to deliver particular products is therefore low.

Headquarters is able to broadly monitor and evaluate performance of foreign subsidiaries due to the sole involvement in the property sector and similar strategic focus on price competitiveness. However, subsidiaries operate in different markets around the world, with conditions varying in each market. This makes it difficult for headquarters to monitor a range of detailed performance metrics. Therefore ex-post information asymmetry is moderate from the perspective of headquarters'.

The structural dimension of control is characterised by high autonomy extended to subsidiary personnel, similarly to Corporation C1, as noted by the HGF:

> *The CEO of the construction division, he is basically left to run his business within the limits of authority that he has and that's full hiring and firing power over key direct reports. So at all levels of the organisation you are, certainly from a line managers point of view, given certain levels of autonomy in terms how you run your particular area of responsibility.*

However, headquarters has a far greater role in monitoring and approving the projects undertaken by Corporation C2 subsidiaries. The autonomy extended to subsidiary management is in a framework where headquarters monitors and approves the projects proposed by subsidiaries as explained by the HGF:

> *Corporate headquarters has in place a minimum margin limit of authority. So once a margin on a project bid gets below a percentage that has been set for a particular region, then that deal automatically needs to be pushed up to the global team for approval. If it is a certain level beyond that, like it could be a $400 million dollar project at 1 per cent, then it comes up to global just because it is such a low margin.*

The low uncertainty headquarters face allows it to take a more active role in monitoring and approving projects. It is in the interests of the headquarters to do so due to the greater risks associated with tight profitability margins on projects undertaken.

Varying expectations of customers around the world mean headquarters heavily emphasise the importance of subsidiary compliance with the minimum safety standards. In many cases customers initiating low cost projects in certain regions have less regard for safety standards and it is important headquarters guard against possible negative effects on the corporation's reputation by stopping unacceptable safety compromises. The consistent processes of

subsidiaries adopting a defender based competitive strategy, lowering uncertainty, enables headquarters to set out clear standards concerning minimum safety expectations and requirements. The HGF explained:

> *The company is committed to operating incident free wherever we have a presence. There are some things where the client will be trying to write terms and conditions into an employment contract where, a bid, a project contract which we will find totally unacceptable from safety point of view. They are trying to cut costs and we go "no" that does not meet the minimum of what we want to do on each project to make sure that every worker goes home safely and we minimise the risk of injury. So there are some things that are just a complete no go.*

The focus on price competitive projects undertaken by Corporation C2, despite subsidiary operations in a range of different markets, means headquarters only experience a moderate level of ex-post information asymmetry. Accordingly headquarters monitor and evaluate the performance of subsidiaries in line with market benchmarks. Tight profitability margins on projects undertaken by subsidiaries is in line with the competitive environment in which they operate, enabling headquarters to use market benchmarks to assess performance. The HGF explained:

> *In the market X it is such a race to the bottom, that there are very few projects that are being put out for tender. What projects that are going out for tender relative to the size of the country, clients are really trying to screw down contractors prices, so that is screwing down their margin, so whereas you might normally get 5 to 7 per cent margin on projects, in market X you might be getting 1 per cent and you look at it and you go that is just 1 per cent gross profit margin on project revenues less project costs. After all that you have still got to fund your head office costs and our overhead costs tend to range between 2 and 3 per cent of revenue, so if you have only got 1 per cent gross profit margin and then you have 2 – 3 per cent overhead costs to run your head office you are going to make a loss.*

Rewards and incentives are based on the achievement of targets as part of the five year plan and stretch targets, consistent with Corporation C1.

The analysis of Corporation C2 suggests low uncertainty, moderate asset specificity and moderate ex-post information asymmetry lead to the use of an arm's length control archetype. This is consistent with the TCE theory of management control. In addition, action oriented

machine and boundary control archetype elements are also used by headquarters to control subsidiaries. It appears important for headquarters to use these control as a means of minimising risk associated with low profit margin projects and varying safety standard expectations given the distance separating headquarters and WOFS operations. This suggests the competitive strategy and level of external embeddedness are key drivers of control choices, which appear to drive the activity traits observed.

The link between activity traits and the control choices examined in Corporation C2 are summarised in Figure A1.3.

Figure A1.3 – Corporation C2 case summary
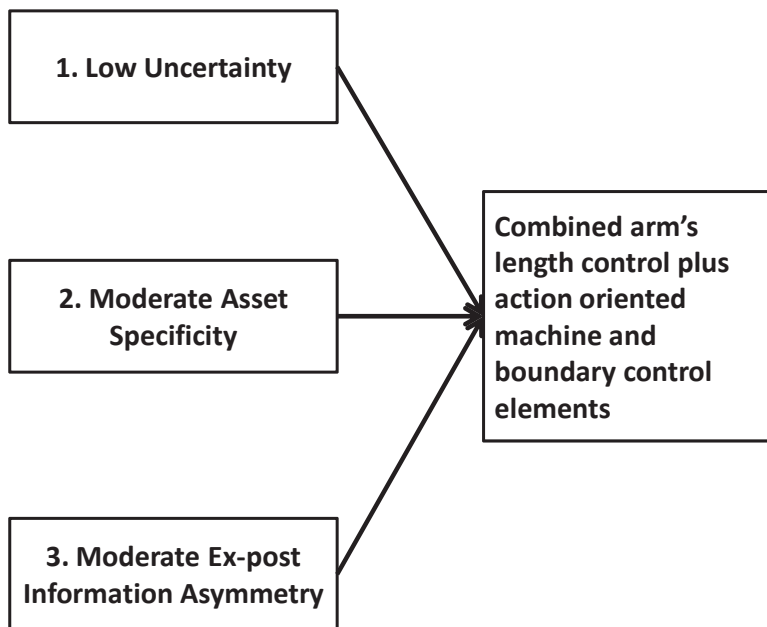
4. Moderate uncertainty, moderate asset specificity & moderate ex-post information asymmetry

Corporation D invests in a range of different subsidiaries consistent with its portfolio approach to corporate strategy. Subsidiaries operate in different industries, increasing the uncertainty headquarters faces concerning processes and activities performed by these entities. Despite the wide range of different subsidiaries controlled, headquarters only invests in those which are already established and in which it has at least a basic understanding as explained by the head of risk and compliance (HRC):

> *The previous CEO was a great believer in logical incrementalism. It is not big bang theory where it's like you step out and buy something that you don't know anything about, you slowly grow logically, incrementally. People might say that the retail chain acquisition was a big bang, but we have owned retail business before. Industrial and safety businesses in other instances, in the manufacturing and mining industry, but it sort of retail businesses as well.*

The investment in established subsidiaries which headquarters has at least a basic understanding reduces the uncertainty faced. Accordingly, uncertainty is moderate from the perspective of headquarters. Information reaching headquarters is primarily associated with governance and regulatory issues, rather than significant information concerning processes and activities carried out by subsidiaries, meaning uncertainty remains moderate. The HRC noted:

> *The corporate office is purely support. Company secretariat, providing secretarial support for each of the company's boards and that provides a link. There is information flowing back to corporate office as to what is going on, from a governance point of view in the divisions.*

Subsidiaries operate independently and accordingly each uses unique systems, training programs, policies and procedures consistent with the unique characteristics of each entity. The HRC explained:

> *In insurance we use outlook soft for financial reporting in each of the businesses, so we bring all the information up to Outlook soft and then we input it into the Oracle system, so then headquarters has consolidated reporting. For a number of years the chemical and fertiliser business used Lotus notes as their email system, where everyone else was on outlook, but it does not mean that everyone will be on Microsoft version 7, they might be 2003. It is up to them and whether they can justify the financial investment in their business. You*

need to develop sales programs for insurance people, brokers, marketing and retail businesses. It is totally different. The programs have got to be bespoke for each particular business.

While the assets of each subsidiary are unique, the independence of WOFS operations makes it easy for headquarters to divest individual subsidiaries. The HRC commented:

If the business can't perform adequately then there's an option that headquarters will think that it is not worth keeping this business, the return is not good enough, so the business would be better held in someone else's hands to attract synergies or whatever.

The ease of divesting subsidiaries indicates asset specificity is relatively low (moderate in the hierarchal organisational context) from the perspective of headquarters.

The range of different businesses headquarters control limits its ability to form clear expectations of performance and assess results achieved. However, the level of ex-post information asymmetry is moderated by the high importance headquarters place on facilitating clear and open communication with subsidiary management concerning performance achieved. The HRC explained:

The CEO made a speech recently and said we don't want a command and control structure, we want the information to flow and also one of the things is openness, no politics. The CEO wants to hear the bad news, you want the bad news to flow up, you don't want people hiding it, things like that. He wants clear open communication, he'll pick up the phone to the MDs all the time, they ring, constant phone calls, conferences calls, things like that and because he sits on most of the boards as well, he'll be around groups, he will be meeting the senior managers quite often so.

The structural dimension of control is characterised by high autonomy extended to subsidiary management concerning operational decisions. This is consistent with the expertise subsidiary management has relative to headquarters due to the large number and variety of businesses owned by Corporation D. The HRC explained:

Our code of ethics and conduct, these are minimum standards that corporate office expects from all divisions. Business units can amend those as long as they don't derogate, so they can make them more difficult, so there is a policy in relation travel, let's say certain people can take business class flights going overseas or whatever at a certain level. A division can say no everyone goes economy, they can't give them a greater benefit. Code of ethics and conduct,

there is a gifts policy, the corporate sets the minimum, but you know a division can go tighter if they want or elaborate and put more procedures.

The HRC continued:

Corporate office has a very limited role in the selection of staff, except at a very senior level. Obviously the MDs of each of the divisions that decision is made by CEO, at the corporate office level. Finance director and lower down senior general managers are pretty much made at the divisional level, but each of the MDs would talk to head office and let them know. So certain appointments over, we use the hay points system, it is a way of grading seniority, so people over a certain hay level, you have got to notify head office. They don't necessarily have a say about whether you employ them or not, but that have to be notified.

This autonomy is extended on a management by exception basis, so provided performance meets expectations headquarters does not intervene in WOFS operations. The HRC commented:

If you are not meeting your targets, if there is a compliance issues, there is a strong internal audit program. So all internal audits get reported back up to the corporation audit committee.

To minimise the ex-post information asymmetry associated with the range of different entities controlled, the management structure from the subsidiary to headquarters' level is relatively flat. This ensures relevant and important information from the large number of subsidiaries flows up to headquarters.

The headquarters has standardised the return on capital expected from each subsidiary. A 20 per cent return on capital is expected and if a subsidiary is unable to achieve this target in the short term, subsidiary management is required to demonstrate how it will be achieved in the medium to long term. Relevant targets are established as subsidiaries process towards meeting the 20 per cent return on capital target. The HRC explained:

We have a rolling 5 year planning process. So every year you submit a new corporate plan, but it is a rolling plan, so every year you are adding an extra year on the end and you are reviewing it. The corporate office sets the required return for the company, it is about 20 per cent return on capital. There is an acknowledgement that not all the businesses will be there, some businesses are way over that. So it doesn't mean that because you are over 20 per cent you can just sit down, you got to show growth strategies, what are you going to put in place it to take it to the next level, so for people, the company, for the businesses, for the divisions that are below that, you have to set out where you

are going to take it, maybe if you are down to 10 per cent, and then up to 15 per
cent, and then up to 20 per cent.

This broad return on capital target, rather than detailed performance metrics is consistent with the moderate ex-post information asymmetry noted from the perspective of headquarters. In addition, headquarters sets the minimum standards and boundaries expected of subsidiary personnel. Minimum expectations are appropriate given the uncertainty headquarters faces concerning WOFS operations and therefore the difficulty in proving explicit direction to subsidiary personnel.

For the purpose of monitoring and evaluating performance, subsidiaries are required to follow strict financial reporting guidelines. This enables headquarters to assess whether subsidiaries are achieving or moving towards the 20 per cent return on capital target. The HRC explained:

> *All the divisions have approximately 6 board meetings a year. So they are formal, they are board meetings as if they were headquarters board meetings, they are not just like a management meeting where you all sit around and mince papers. The disciplines are very strict, the papers are prepared as if they were being prepared for the headquarters, so it's exactly the same, everything will look exactly the same. At the divisional boards you will have basically all the financial reporting, detail financial reporting, people metrics, legal reports, compliance reports, proper minutes are prepared by the company secretaries, those minutes are provided to the headquarters board, so when they meet 6-8 times per year, part of their board pack will be divisional board minutes so they have oversight of what it happening. The corporation also has divisional activity reports, so each of the CEOs will provide reports and financial summaries for their divisions, so they're in the headquarters board pack and there will be CEO and finance director reports, so the CEO has his overall group report, so that is what happens one of the other departments at the corporate office is the finance and treasury, and they consolidate the groups finances, so there is consolidated reporting, so the board at headquarters will have the complete overview of the complete financial reporting a divisional level.*

Internal audits are also conducted to ensure subsidiaries comply with the minimum standards and boundaries. It appears headquarters is reliant in many cases on internal audits to ensure good business practice is followed due to the moderate uncertainty faced by headquarters.

Rewards are objectively determined by comparing results with key targets such as the 20 per cent return on capital. The HRC explained:

How employees are rewarded will be structured in accordance with the requirements of the division and their metrics. If you are in the resources division it might be strong on safety measures. Safety is a big thing across the corporation, but obviously in some divisions there is greater risks relating to safety and than others. It might be the amount of coal that they have actually dug up. You have got retail, they have got their own metrics based on sales, and it depends on whether you are somebody on the floor in a store or you are a marketing person at head office.

If performance does not meet headquarters' expectations the autonomy of subsidiary management is reduced.

Uncertainty and ex-post information asymmetry noted in this case do not appear to be at high or low levels, but rather at moderate levels. Accordingly the exploratory control archetype with elements of action oriented and boundary control is used by headquarters to control subsidiaries. This provides further evidence of the combined use of control archetypes, rather than the single distinct archetypes argued by Speklé (2001).

The link between activity traits and the control choices examined in Corporation D are summarised in Figure A1.4.

Figure A1.4 – Corporation D case summary
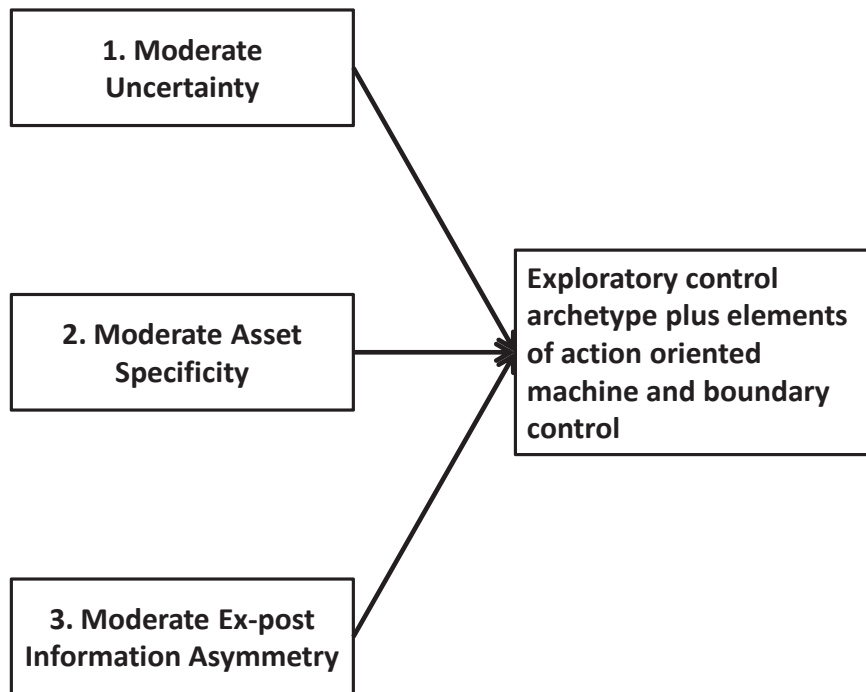
5. Low uncertainty, high asset specificity & low ex-post information asymmetry

Corporation E focuses on the bionic device produced by the corporation, accordingly headquarters faces low uncertainty concerning WOFS operations. The CEO explained:

> *I as CEO am not frightened to have technical or clinical conversion with these people so I sort of try and lead the organisation, there is an engagement in the technical clinical complexity of what we are doing from the top down, so I am not an accountant or a lawyer or an economist sitting behind a desk sort of getting feed numbers. When you go out into the regions, you can be embraced by them and you can help them with their problems. They can help you with an organisational issue and problems and priorities and you can help them on what is going on in the region and you develop and really good working relationship and if it can work, get good cross functional working at the senior level.*

There are consistent processes and operations worldwide relating to the service and repair of the bionic devices produced by the corporation. The CEO commented:

> *There has been a trend in the company to try and get a little more standardisation in key processes, like service and repair for example where we think we can get scale from getting standardisation.*

The consistency of operations worldwide means minimises the uncertainty headquarters face concerning WOFS operations. Further, headquarters and in particular the CEO of the corporation is highly engaged with the activities of subsidiaries around the world.

> *I spend a fair bit of time on a plane as most of the core people do here, going around and attending key conferences and speaking to key customers and sort of being a part of those businesses, going on in those key regions. So one is not just sitting around a desk being tuberous on the telephone, but actually or sort of reading reports that are sort of third or fourth hand, but actually going out and interacting with key customers and key opinion leaders and sort of leading the business from the front.*

This engagement allows headquarters to maintain high ex-ante information concerning WOFS operations, minimising the level of uncertainty.

Asset specificity of WOFS operations is high in two respects. First, subsidiaries have invested substantially in the development, design, manufacture and distribution of the bionic device which the corporation is dependent on for its ongoing business. Second, service and repair activities are corporation specific in terms of staff training and equipment used. These

two factors indicate the alternative use of assets outside the corporation is very limited and accordingly asset specificity of WOFS operations around the world is high.

The direction and goals of each subsidiary are clear from the perspective of headquarters. Headquarters is able to assess the performance and contribution of each subsidiary to overall performance of the corporation given its high engagement and understanding of WOFS operations. Accordingly the ex-post information asymmetry from headquarters' perspective is low. The CEO explained:

> *We do a lot of travel in this company and the revolution in our lifetime is that communication is so much easier and less expensive, from email, to telephone, to travel and all that sort of stuff. I mean I'm old enough that I started off before the fax machine, it was a bloody telex machine and the ability to operate a complex global business today is a hell of a lot easier then it was back 30 years ago. I travel between the different regions to get a feel about how each is performing. That's my style, different people would have different styles, but that is definitely my style. The business is surprising complex for it size, it is only a small business, but it is far more complex than many businesses many times bigger than it, just because of the global nature of the business and the technical complexity of what we are doing. So it is about how do we deal with that complexity and how do you make sure you are across everything and sort of know what is going on and I think making sure people have lots of face to face contact internally with customers is the key to that.*

The low ex-post information asymmetry is consistent with the alignment of subsidiary business operations around the bionic device developed, designed, manufactured, distributed and serviced by the corporation.

The structural dimension of control is characterised by high autonomy extended foreign subsidiary management. Consistent with the low uncertainty of WOFS operations headquarters faces around the world, headquarters keeps a close watch on the activities and decisions at the subsidiary level; however, it rarely intervenes in WOFS operations. The CEO explained:

> *From my point of view I have always had a bit of a philosophy of being a bit careful of what you try and control in head office and making sure that you give enough decision making capability within the regions and from my experience the single business problem with an international business like this is communication. I'm sure some of this come down to personal style, so I'm very*

low on power, but high on achievement and I guess that if I was high on power I would probably go to the army or something, a policeman and I'm not trying to be discouraging but there is different personally types, because I am not really power driven but much more achievement oriented, than that in itself encourages certain behaviours and so the organisation. What we really are about is how we are going to get stuff done, very goal oriented and I think that you will find that the people that report to me are very similar from that point of view. It is a culture where if you wake up every day sort of worried about how many people are reporting to you, then you better have a lot more people reporting to you next year, so I think this is the wrong culture for you, but some organisation are like that, but if this is an organisation where you want to get things done, whether you are goal oriented or achievement oriented it is a much better culture, so it is also about finding people that fit in that culture.

In some cases headquarters requires justification for decisions at the subsidiary level, but it is rare they use pre-action reviews to modify proposals.

The corporation aims to provide sales and support of the bionic medical devices over the long term. Long term goals are translated into a three year plan which is then broken into a rolling budget on a quarterly basis. Headquarters take an active role in this budgeting process to ensure subsidiaries focus on key objectives and strategy associated with the central focus on the bionic device. The CEO explained:

What is different about this product to any other medical product I know is the only way someone will really benefit from the bionic device over long term is if it doesn't fail and it works and that people have an opportunity to upgrade their external device, when their external device wears out. So that means the only way they are going to benefit is if we are in existence for the rest of their lives which might be 70 or 80 years and developing technology that is backwards compatible to their device. The people that got devices back in the 1980s use our state of the art external today. So it is not just about who has the best product today, but it is whether I am going to get support in the year 2020 or 2040 or 2060 and that is very important. I don't know of another medical device like that, if you get a hip or knee, the surgeon will put anybody's hip or knee in and so there is a whole sort of awareness of marketing and the importance of the brand that doesn't exist in a lot of other products, you need a heart pace maker, you don't discuss the brand with the cardiologist.

The focus on key objectives and strategy is important due to the high asset specificity of WOFS operations and need to guard against bounded rationality at the subsidiary level, because decisions at a distance which may not be in the interests of the whole corporation. Headquarters has standardised operations involved in service and repair activities to a great

extent and provided greater direction on activities undertaken. This is consistent with the marginally lower uncertainty associated with operations involved in service and repair. Service and repair operations are critical to the provision of support to existing customers and the ongoing viability of the business. Accordingly headquarters provides greater direction to these operations around the world to ensure high efficiencies and effectiveness on a global basis.

The performance of subsidiaries around the world is monitored and evaluated in line with the budget targets and quarterly forecasts. Headquarters is in a position to closely monitor the performance of WOFS operations due to the low ex-post information asymmetry noted. The financial reporting from subsidiaries up to headquarters in the corporation is very transparent. The CEO commented:

> *The regions in whichever area, we can see their contribution to what is happening, so we do monthly accounts, we generate the monthly result and compare that we the monthly forecast for a particular quarter. So in fact we get weekly sales for example, we don't get a weekly profit figure, we get weekly sales, with a lot of granularity so I can tell you right round the world how last week was. Performance data is also distributed within, so the Europeans would see how the Americas are doing etc, so it is very transparent.*

The central focus of performance monitoring and evaluation by headquarters is the long term viability and sustainability of operations. This is important to ensure highly specific assets are effectively used around the world.

The reward and incentive structure is based on the both individual subsidiary and corporation wide performance metrics. The CEO explained:

> *I know their teams fairly well; we get together quarterly and sort of seep through the business and make sure where everything is aligned. The other thing, regional presidents have a seat at the global table, so they are not just running a region, but they are also add some shared responsibility about how they operate this global operation and some of their incentive is based on regional performance and some of their incentive is based on global performance.*

This reward structure links to the central focus of all operations on the bionic device and encourages collaboration and synergies between subsidiaries around the world. This is

important to maximise the returns of highly specific subsidiary assets dispersed all around the world, in the interests of the whole corporation.

The analysis of Corporation E suggests low uncertainty, high asset specificity, and low ex-post information asymmetry is related to results oriented machine control. In addition, headquarters appear to also use action oriented machine control over subsidiaries involved in service and repair activities. High asset specificity and the dispersed nature of subsidiary WOFS around the world suggests it is important headquarters provide clear direction WOFS operations in the interests of overall corporate performance. Low uncertainty concerning WOFS operations enables headquarters to effectively operationalise machine control. Similarly to Corporation A, a combination of action and results oriented machine control is observed in the case of subsidiaries involved in service and repairs. However, the use of both action and results oriented machine control appear to be applied in a more flexible manner than observed in the case of Corporations A & B. This may be associated with the high levels of asset specificity and the suboptimal nature of directing WOFS operation in this case, despite the suggestions of Speklé (2001). It appears, in the context of international operations, headquarters use greater control through combined archetypes (action and results oriented machine control in this case) to ensure the appropriate direction of global operations.

The link between activity traits and the control choices examined in Corporation E are summarised in Figure A1.5.

Figure A1.5 – Corporation E case summary
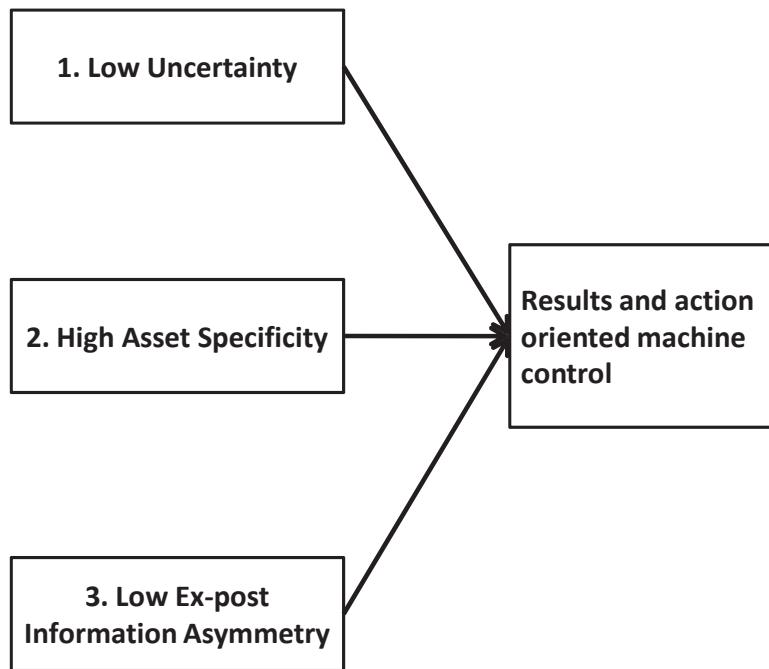
Appendix 2: Survey instrument

Survey questionnaire

QUESTIONNAIRE ON FOREIGN SUBSIDIARIES

September 2011

Purpose of this survey

The purpose of this survey is to investigate how the head office of Australian companies manages wholly (100%) owned foreign subsidiaries. This information will assist in understanding the effective management and performance of wholly owned foreign subsidiaries.

Who is conducting this survey?

This survey is being conducted by James Wakefield, PhD student in accounting at the UTS Business School. James' supervisors are Professor Zoltan Matolcsy and Dr Francesco Giacobbe at the University of Technology, Sydney.

Instructions

If your company wholly (100%) owns more than one foreign subsidiary, please <u>choose one</u> and answer this questionnaire with respect to this subsidiary. If your company is involved in multiple wholly owned foreign subsidiaries and you would like to complete more than one questionnaire, please let me know and I will send you additional copies. If you wish to refer this questionnaire to someone else in your company, please do so or contact me and I will forward the questionnaire to them. If your company does not own foreign subsidiaries, please indicate this by ticking the relevant box in the enclosed postcard and return it to us.

Confidentiality

Your answers to this questionnaire are completely anonymous. To let us know you have returned this questionnaire, please return the enclosed postcard separately in the mail so no reminder questionnaire is sent to you.

Thank you

By returning the enclosed postcard with your details we will send you an executive report detailing the research findings and other outcomes of this study.

Returning this questionnaire

Please return this questionnaire in the reply paid envelope within 14 days.

Help available

If you have any questions or want any help completing this questionnaire please contact James Wakefield by phone on (02) 9514 3583 or by email James.Wakefield@uts.edu.au

→ PLEASE START HERE

Answer questions 1 to 4 with respect to your company

1.   How many years have you worked for your company? _____years

2.   What is your current position?_____

3.   How many people does your company employ:

        a.   In Australia:_____

        b.   Overseas:_____

4.   Indicate whether your company is involved in:

		Yes	No
a.	International joint ventures	☐	☐
b.	Exporting to foreign countries	☐	☐

The remainder of this survey is about your company's involvement with a wholly (100%) owned foreign subsidiary. <u>Please note in the remainder of this survey "head office" refers to the Australian based head office of your company.</u>

5.   Please provide the following information about the foreign subsidiary *(If your company wholly owns more than one foreign subsidiary, answer the questions in this survey with respect to one of your choice):*

        a.   Location (country): _____

        b.   Year of formation: _____

        c.   Number of people employed at subsidiary: _____

        d.   Number of expatriates (personnel from head office) employed at subsidiary: _____

6.   Please tick the category or categories for the industry in which **your company** and your **foreign subsidiary** are principally involved *(Please tick as many boxes as applicable):*

		Your Company	Foreign subsidiary
a.	Agriculture, Forestry and Fishing	☐	☐
b.	Mining	☐	☐
c.	Manufacturing	☐	☐
d.	Electricity, Gas, Water and Waste Services	☐	☐
e.	Construction	☐	☐
f.	Wholesale Trade	☐	☐
g.	Retail Trade	☐	☐
h.	Accommodation and Food Services	☐	☐
i.	Transport, Postal and Warehousing	☐	☐
j.	Information Media and Telecommunications	☐	☐
k.	Finance and Insurance Services	☐	☐
l.	Rental, Hiring and Real Estate Services	☐	☐
m.	Professional, Scientific and Technical Services	☐	☐
n.	Administrative and Support Services	☐	☐
o.	Public Administration and Safety	☐	☐
p.	Education and Training	☐	☐
q.	Health Care and Social Assistance	☐	☐
r.	Arts and Recreation Services	☐	☐
s.	Other Services	☐	☐

→ **Answer question 7 using the scale below:** (tick one box for each row)

Significantly more	More	Same	Less	Significantly less
□ 1	□ 2	□ 3	□ 4	□ 5

7. How much information does **head office** have compared to subsidiary personnel concerning the following factors?

		Significantly more				Significantly less
a.	Type of activities undertaken by subsidiary	□ 1	□ 2	□ 3	□ 4	□ 5
b.	Operational processes performed by subsidiary	□ 1	□ 2	□ 3	□ 4	□ 5
c.	Realisation of subsidiary performance potential	□ 1	□ 2	□ 3	□ 4	□ 5
d.	Impact of external factors on subsidiary performance	□ 1	□ 2	□ 3	□ 4	□ 5
e.	Understanding of what subsidiary has achieved	□ 1	□ 2	□ 3	□ 4	□ 5

→ **Answer questions 8 to 21 using the scale below:** (tick one box for each row)

Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
□ 1	□ 2	□ 3	□ 4	□ 5

8. Indicate the extent you agree or disagree with the following statements from the perspective of **head office**:

		Strongly agree				Strongly disagree
a.	Subsidiary goals are clearly defined	□ 1	□ 2	□ 3	□ 4	□ 5
b.	Subsidiary goals provide clear direction to subsidiary personnel	□ 1	□ 2	□ 3	□ 4	□ 5
c.	Subsidiary goals are easily explained to outsiders (e.g. customers)	□ 1	□ 2	□ 3	□ 4	□ 5
d.	Subsidiary goals are clear to everyone working in subsidiary	□ 1	□ 2	□ 3	□ 4	□ 5

9. **Head office can predict developments** which **affect subsidiary operations** in the region the subsidiary is located according to the following factors:

		Strongly agree				Strongly disagree
a.	Supplier actions	□ 1	□ 2	□ 3	□ 4	□ 5
b.	Customer demands, tastes and preferences	□ 1	□ 2	□ 3	□ 4	□ 5
c.	Deregulation and globalisation	□ 1	□ 2	□ 3	□ 4	□ 5
d.	Market activities of competitors	□ 1	□ 2	□ 3	□ 4	□ 5
e.	Production and information technologies	□ 1	□ 2	□ 3	□ 4	□ 5
f.	Government regulation and policies	□ 1	□ 2	□ 3	□ 4	□ 5
g.	Economic environment	□ 1	□ 2	□ 3	□ 4	□ 5
h.	Industrial relations	□ 1	□ 2	□ 3	□ 4	□ 5

10. The following **foreign subsidiary resources** can be reallocated to alternative activities (for example other subsidiaries or transferred back to head office) if subsidiary operations ceased:

		Strongly agree				Strongly disagree
a.	Skilled employees	□ 1	□ 2	□ 3	□ 4	□ 5
b.	Training programs	□ 1	□ 2	□ 3	□ 4	□ 5
c.	Physical assets (e.g. manufacturing and processing equipment)	□ 1	□ 2	□ 3	□ 4	□ 5
d.	Technological systems	□ 1	□ 2	□ 3	□ 4	□ 5
e.	Product customisation expertise	□ 1	□ 2	□ 3	□ 4	□ 5
f.	Branding rights	□ 1	□ 2	□ 3	□ 4	□ 5
g.	Reputational capital	□ 1	□ 2	□ 3	□ 4	□ 5

11. Indicate the extent you agree or disagree with the following statements:

		Strongly agree				Strongly disagree
a.	The core area of business of both your subsidiary and your company's global operations are related	□ 1	□ 2	□ 3	□ 4	□ 5
b.	All the activities of **your company's** global operations are related	□ 1	□ 2	□ 3	□ 4	□ 5
c.	**Your company's** operations are involved in one line of business	□ 1	□ 2	□ 3	□ 4	□ 5
d.	Personnel from **head office** visit the subsidiary frequently	□ 1	□ 2	□ 3	□ 4	□ 5
e.	**Subsidiary operations** focus on a distinct activity	□ 1	□ 2	□ 3	□ 4	□ 5
f.	Focus of **subsidiary operations** is difficult to change	□ 1	□ 2	□ 3	□ 4	□ 5
g.	There is frequent communication between head office and subsidiary personnel concerning subsidiary operations	□ 1	□ 2	□ 3	□ 4	□ 5

12. The following factors are important to the competitiveness of the subsidiary relative to other companies in the region it operates:

		Strongly agree				Strongly disagree
a.	Operational efficiency	□ 1	□ 2	□ 3	□ 4	□ 5
b.	Competitive pricing	□ 1	□ 2	□ 3	□ 4	□ 5
c.	Procurement of product inputs	□ 1	□ 2	□ 3	□ 4	□ 5
d.	Reducing production costs	□ 1	□ 2	□ 3	□ 4	□ 5
e.	Minimisation of outside financing	□ 1	□ 2	□ 3	□ 4	□ 5
f.	New product development	□ 1	□ 2	□ 3	□ 4	□ 5
g.	Brand identification	□ 1	□ 2	□ 3	□ 4	□ 5
h.	Innovative marketing techniques	□ 1	□ 2	□ 3	□ 4	□ 5
i.	Control of distribution channels	□ 1	□ 2	□ 3	□ 4	□ 5
j.	Advertising	□ 1	□ 2	□ 3	□ 4	□ 5

13. The **practices of subsidiary operations** have changed or adapted over time due to relations with the following stakeholders:

		Strongly agree				Strongly disagree
a.	Customers	□ 1	□ 2	□ 3	□ 4	□ 5
b.	Suppliers	□ 1	□ 2	□ 3	□ 4	□ 5
c.	Government organisations	□ 1	□ 2	□ 3	□ 4	□ 5
d.	Professional trade associations	□ 1	□ 2	□ 3	□ 4	□ 5
e.	Entities within your company (e.g. other subsidiaries)	□ 1	□ 2	□ 3	□ 4	□ 5

14. **Head office** does the following concerning subsidiary operations:

		Strongly agree				Strongly disagree
a.	Specifies subsidiary personnel's area of responsibility	□ 1	□ 2	□ 3	□ 4	□ 5
b.	Sets guidelines specifying activities that are not to be engaged in	□ 1	□ 2	□ 3	□ 4	□ 5
c.	Modifies targets in line with conditions subsidiary faces	□ 1	□ 2	□ 3	□ 4	□ 5
d.	Uses documentation and manuals to direct subsidiary operations	□ 1	□ 2	□ 3	□ 4	□ 5
e.	Conducts extensive training concerning compliances with policies	□ 1	□ 2	□ 3	□ 4	□ 5
f.	Subjectively evaluates subsidiary performance	□ 1	□ 2	□ 3	□ 4	□ 5

15. **Head office** relies on internal audits to check subsidiary compliance with:

		Strongly agree				Strongly disagree
a.	Policies and procedures	□ 1	□ 2	□ 3	□ 4	□ 5
b.	Guidelines specifying activities not to be engaged in	□ 1	□ 2	□ 3	□ 4	□ 5

16. The following budget roles for the foreign subsidiary are important:

		Strongly agree				Strongly disagree
a.	Specifies performance targets subsidiary required to achieve	□ 1	□ 2	□ 3	□ 4	□ 5
b.	Provide guidance	□ 1	□ 2	□ 3	□ 4	□ 5
c.	Set limits on what can be done	□ 1	□ 2	□ 3	□ 4	□ 5

17. Performance targets concerning foreign subsidiary operations are established in the following ways:

		Strongly agree				Strongly disagree
a.	Set at the beginning of the period	□ 1	□ 2	□ 3	□ 4	□ 5
b.	Set during the period	□ 1	□ 2	□ 3	□ 4	□ 5

18. When performance does not meet expectations **head office intervenes** in the activities of subsidiary management in the following ways:

		Strongly agree				Strongly disagree
a.	Area of responsibility of subsidiary management changed	□ 1	□ 2	□ 3	□ 4	□ 5
b.	Decision making delegated to subsidiary management changed	□ 1	□ 2	□ 3	□ 4	□ 5
c.	Greater discussions between head office and subsidiary management concerning subsidiary operations	□ 1	□ 2	□ 3	□ 4	□ 5
d.	Senior subsidiary management replaced	□ 1	□ 2	□ 3	□ 4	□ 5

19. Indicate the extent you agree or disagree with the following statements at the **subsidiary level**:

		Strongly agree				Strongly disagree
a.	Promotion of subsidiary personnel is linked to subsidiary performance	□ 1	□ 2	□ 3	□ 4	□ 5
b.	Violating policies set by head office has serious consequences for subsidiary personnel	□ 1	□ 2	□ 3	□ 4	□ 5
c.	Violating guidelines set by head office specifying activities not be engaged in has serious consequences for subsidiary personnel	□ 1	□ 2	□ 3	□ 4	□ 5

20. **Head office is involved** in the recruitment and training of subsidiary personnel in the following ways:

		Strongly agree				Strongly disagree
a.	Selection of personnel determined by head office	□ 1	□ 2	□ 3	□ 4	□ 5
b.	Subsidiary management are trained by head office **before** they commence in their roles at the subsidiary	□ 1	□ 2	□ 3	□ 4	□ 5
c.	**Ongoing** training of personnel is provided by head office	□ 1	□ 2	□ 3	□ 4	□ 5
d.	Head office is strongly committed to development of personnel	□ 1	□ 2	□ 3	□ 4	□ 5

21. The following are used by **head office** to influence subsidiary personnel behaviour:

		Strongly agree				Strongly disagree
a.	Communication of corporate values	□ 1	□ 2	□ 3	□ 4	□ 5
b.	Communication of codes of conduct	□ 1	□ 2	□ 3	□ 4	□ 5
c.	Frequent transfer of head office managers to the subsidiary	□ 1	□ 2	□ 3	□ 4	□ 5

100% head office's responsibility	Mostly head office's responsibility	Shared responsibility	Mostly subsidiary management's responsibility	100% subsidiary management's responsibility
□ 1	□ 2	□ 3	□ 4	□ 5

22. Indicate whether head office and/or subsidiary management is responsible for the decision making process in the following areas:

		100% head office				100% subsidiary management
a.	Long term planning concerning subsidiary operations	□ 1	□ 2	□ 3	□ 4	□ 5
b.	Special business cases undertaken by subsidiary	□ 1	□ 2	□ 3	□ 4	□ 5
c.	Tasks performed by subsidiary	□ 1	□ 2	□ 3	□ 4	□ 5
d.	Standard operating procedures/work instructions for subsidiary	□ 1	□ 2	□ 3	□ 4	□ 5
e.	Guidelines and policies guiding subsidiary operations	□ 1	□ 2	□ 3	□ 4	□ 5
f.	Target setting for subsidiary	□ 1	□ 2	□ 3	□ 4	□ 5
g.	Evaluation of subsidiary performance	□ 1	□ 2	□ 3	□ 4	□ 5
h.	Reward allocation to subsidiary personnel	□ 1	□ 2	□ 3	□ 4	□ 5

Very high	High	Moderate	Low	Not at all
□ 1	□ 2	□ 3	□ 4	□ 5

23. Indicate the degree of similarity between the subsidiary and all other entities owned by your company concerning practices in the following areas:

		Very high				Not at all
a.	Human resources	□ 1	□ 2	□ 3	□ 4	□ 5
b.	Training programs	□ 1	□ 2	□ 3	□ 4	□ 5
c.	Information system	□ 1	□ 2	□ 3	□ 4	□ 5
d.	Purchase and ordering system	□ 1	□ 2	□ 3	□ 4	□ 5
e.	Reporting system	□ 1	□ 2	□ 3	□ 4	□ 5

24. What importance does **head office** place on the following **targets** concerning subsidiary operations?

		Very high				Not at all
a.	Return targets (e.g. return on investment/assets)	□ 1	□ 2	□ 3	□ 4	□ 5
b.	Profit targets (e.g. net profit, gross profit)	□ 1	□ 2	□ 3	□ 4	□ 5
c.	Sales targets	□ 1	□ 2	□ 3	□ 4	□ 5
d.	Cash flow targets	□ 1	□ 2	□ 3	□ 4	□ 5
e.	Customer targets (e.g. market share, customer satisfaction)	□ 1	□ 2	□ 3	□ 4	□ 5
f.	Internal process targets (e.g. processing time, efficiency ratings)	□ 1	□ 2	□ 3	□ 4	□ 5
g.	Learning targets (e.g. employee development, R&D outcomes)	□ 1	□ 2	□ 3	□ 4	□ 5
h.	Market benchmarks	□ 1	□ 2	□ 3	□ 4	□ 5
i.	Internal benchmarks	□ 1	□ 2	□ 3	□ 4	□ 5

25. What importance does **head office** place on the following when **monitoring** subsidiary performance?

		Very high				Not at all
a.	Achievement of performance target(s)	□ 1	□ 2	□ 3	□ 4	□ 5
b.	Variance between budget and actual performance	□ 1	□ 2	□ 3	□ 4	□ 5
c.	Market benchmarks versus actual performance	□ 1	□ 2	□ 3	□ 4	□ 5
d.	Line items in financial accounts (e.g. revenues, expenses, profit)	□ 1	□ 2	□ 3	□ 4	□ 5
e.	Unexpected news concerning subsidiary performance	□ 1	□ 2	□ 3	□ 4	□ 5

26. What importance does **head office** place on the following when **evaluating** subsidiary performance?

		Very high				Not at all
a.	Achievement of performance target(s)	□ 1	□ 2	□ 3	□ 4	□ 5
b.	Variance between budget versus actual performance	□ 1	□ 2	□ 3	□ 4	□ 5
c.	Market benchmarks versus actual performance	□ 1	□ 2	□ 3	□ 4	□ 5
d.	Compliance with policies and procedures	□ 1	□ 2	□ 3	□ 4	□ 5
e.	Professional development of managers	□ 1	□ 2	□ 3	□ 4	□ 5
f.	Long term sustained performance	□ 1	□ 2	□ 3	□ 4	□ 5
g	Contribution to overall performance of your company	□ 1	□ 2	□ 3	□ 4	□ 5

27. What importance does **head office** place on the following when **rewarding** subsidiary management?

		Very high				Not at all
a.	Achievement of performance target(s)	□ 1	□ 2	□ 3	□ 4	□ 5
b.	Variance between budget and actual performance	□ 1	□ 2	□ 3	□ 4	□ 5
c.	Market benchmarks versus actual performance	□ 1	□ 2	□ 3	□ 4	□ 5
d.	Long term performance	□ 1	□ 2	□ 3	□ 4	□ 5
e.	Subsidiary specific performance	□ 1	□ 2	□ 3	□ 4	□ 5
f.	Corporation wide performance	□ 1	□ 2	□ 3	□ 4	□ 5
g.	Subjective performance judgement by head office	□ 1	□ 2	□ 3	□ 4	□ 5

→ **Answer questions 28 and 29 using the scales provided:** (tick one box for each row)

28. Indicate the satisfaction of **head office** with the performance of the wholly owned foreign subsidiary according to the following factors (*Please tick one box for each row*):

		Extremely satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Extremely dissatisfied	Not relevant
a.	Profitability	□	□	□	□	□	□
b.	Sales volume	□	□	□	□	□	□
c.	Market share	□	□	□	□	□	□
d.	Productivity	□	□	□	□	□	□
e.	Adapting to a foreign market	□	□	□	□	□	□
f.	Ability to adopt innovation	□	□	□	□	□	□
g.	Learning about unfamiliar market	□	□	□	□	□	□
h.	Learning about new technology	□	□	□	□	□	□
i.	Product quality	□	□	□	□	□	□
j.	Customer satisfaction	□	□	□	□	□	□
k.	Corporate citizenship	□	□	□	□	□	□

29. In general, how satisfied is **head office** with the overall performance of the wholly owned foreign subsidiary?

Extremely satisfied	Satisfied	Neither satisfied nor dissatisfied	Dissatisfied	Extremely dissatisfied
□	□	□	□	□

Thank you for taking the time to complete this questionnaire. Your assistance is very much appreciated.

Please return the questionnaire in the reply paid envelope provided

Please return your completed questionnaire in the enclosed **reply paid envelope** to:

James Wakefield
UTS
Reply Paid 123
BROADWAY NSW 2007

Cover letter

September 2011

Effective Management of Wholly Owned Foreign Subsidiaries

Dear *<Survey participant>*,

I am writing to ask for your help in an important study of foreign subsidiaries that are wholly (100%) owned by Australian companies. This study is being undertaken as part of my PhD under the supervision of Professor Zoltan Matolcsy and Dr Francesco Giacobbe at the University of Technology, Sydney.

The purpose of this study is to investigate the effective management of foreign subsidiaries which are wholly (100%) owned by Australian companies. There is limited research concerning Australian companies with wholly owned foreign subsidiaries, despite the importance of these entities as a means of international expansion. This study aims to develop a better understanding of the critical factors determining the effective management of wholl1y owned foreign subsidiaries from a distance, which is of significant value to companies such as yours.

It is my understanding that you are a manager at an Australian corporation which owns a foreign subsidiary or subsidiaries. To assist in this study it would be greatly appreciated if you could complete the enclosed questionnaire with regard to your Australian company and one foreign subsidiary wholly owned by your company. If you wish to refer this questionnaire to someone else in your company, please do so or contact me and I will forward the questionnaire to them.

The questionnaire should take no more than 20 minutes to complete. Your answers to this questionnaire are completely anonymous and confidential.

I appreciate your time and willingness to complete this questionnaire. By returning the enclosed postcard with your details we will keep you informed of the on-going progress of this study and provide you with an executive report detailing the research findings and other outcomes.

Thank you very much for your help with this important study. Without your help this research for the Australian industry is not possible.

Yours Sincerely,

Production Note:
Signature removed prior to publication.

James Wakefield
University of Technology, Sydney

Post card (accompanying survey questionnaire)

Please return this postcard so we know you have completed the questionnaire.

☐ We have completed and returned the questionnaire

☐ We wish to receive the executive report from this study

☐ Our company does not wholly own foreign subsidiaries

Name:_____

Company:_____

Preferred address (so you receive the executive report):

☐ Mail:_____

_____

☐ Email:_____

Thank you very much for your help with this important study.

Follow up letter

October 2011

Effective Management of Wholly Owned Foreign Subsidiaries

Dear *<Survey participant>,*

Three weeks ago I sent you a questionnaire concerning your company's involvement in the operation of wholly (100%) owned foreign subsidiaries. If you have completed this questionnaire, thank you for your time.

If you have not completed the questionnaire I would like to strongly encourage you do so. This study will contribute significantly to our understanding of the effective management of wholly owned foreign subsidiaries by Australian companies. We realise you are busy at this time, however your response is very important to our study. The questionnaire should take no longer than 20 minutes to complete.

We will provide you with an executive report detailing the findings and outcomes of this project when you complete the questionnaire.

If you prefer to complete the questionnaire online, rather than the printed version I sent you previously, the questionnaire can be accessed by typing the following address into the address bar of your internet browser:

www.surveymonkey.com/s/WOFS

The questionnaire is completely anonymous. To ensure you receive the executive report you will be prompted to provide your name and email in a separate page that opens after you complete the online questionnaire. Alternatively you can email me at james.wakefield@uts.edu.au or return the postcard I previously sent you to indicate you have completed the questionnaire.

If your company is not involved in wholly owned foreign subsidiaries, please indicate this on the reply paid postcard I sent you previously or by emailing me.

Thank you for your support with this important study.

Yours Sincerely,

Production Note:
Signature removed prior to publication.

James Wakefield
University of Technology, Sydney

If you have any comments about this study please contact me on (02) 9514 3583 or by email James.Wakefield@uts.edu.au or my supervisors Professor Zoltan Matolcsy and Dr Francesco Giacobbe, P.O. Box 123 Broadway, NSW, 2007

Second survey follow up letter

November 2011

Effective Management of Wholly Owned Foreign Subsidiaries

Dear *<Survey participant>,*

I am writing to remind you about a questionnaire I sent you in September relating to the effective management of wholly (100%) owned foreign subsidiaries by Australian companies. My records indicate we have not received a response from you at this stage.

I would like to strongly encourage you to complete the questionnaire relating to this study for the follow reasons:

- There is limited research on the effective management of foreign subsidiaries which are wholly owned by Australian companies, despite the importance of these entities.
- You will receive an executive report which details the findings and outcomes of this study which may be of value to your company.
- Your response is very important to ensure the completion of this study as part of my PhD.

The questionnaire should take no longer than 20 minutes to complete. If you are unable to respond to the questionnaire, can you please refer it to another manager who is knowledgeable of your company's foreign subsidiaries? Answers to the questionnaire are anonymous and confidential.

I have enclosed the questionnaire in case you did not receive the original copy. Please return the enclosed postcard to indicate you have completed the questionnaire and so we can send you the executive report.

The questionnaire can also be completed online if you prefer by entering the following link into the address bar of your internet browser: www.surveymonkey.com/s/WOFS

If your company does not wholly own any foreign subsidiaries, please let me know by completing and ticking the relevant box in the enclosed postcard.

Thank you for your support with this important study.

Yours Sincerely,

Production Note:
Signature removed prior to publication.

James Wakefield
University of Technology, Sydney

If you have any comments or questions about this study please contact me on (02) 9514 3583 or by email James.Wakefield@uts.edu.au or my supervisors Professor Zoltan Matolcsy and Dr Francesco Giacobbe, P.O. Box 123, Broadway NSW 200

Appendix 3: Descriptive statistics of indicators

The descriptive statistics of indicators is reported in the Table A3.1 based on the sample with subsidiaries employing zero people deleted from the sample. This provides a final sample size of 161. Survey respondents were asked to indicate answers to questions on a scale of 1 to 5. These descriptive statistics indicate sufficient variation and no excessive floors or ceilings in the data.

Table A3.1 – Descriptive statistics of indicators (zero employee subsidiaries deleted from sample)

	Minimum	Maximum	Mean	Median	Std. Deviation
Activity traits:					
Uncertainty:					
Subsidiary goals are clearly defined (8a)	1	4	1.82	2	0.697
Subsidiary goals provide clear direction to subsidiary personnel (8b)	1	5	1.98	2	0.750
Subsidiary goals easily explained to outsiders (8c)	1	4	2.01	2	0.715
Subsidiary goals clear to everyone working in subsidiary (8d)	1	4	2.14	2	0.781
Asset specificity:					
Skilled employees (10a)	1	5	3.17	3	1.376
Training programs (10b)	1	5	3.07	3	1.202
Physical assets (10c)	1	5	3.30	3	1.240
Technological systems (10d)	1	5	2.65	2	1.179
Product customisation expertise (10e)	1	5	2.86	3	1.214
Branding rights (10f)	1	5	2.48	2	1.290
Reputational capital (10g)	1	5	2.86	3	1.123
Ex-post information asymmetry:					
Operating process performed by subsidiary (7b)	1	5	3.22	3	0.756
Reaching performance potential (7c)	1	5	2.80	3	0.699
Impact of external factors on performance (7d)	1	5	2.81	3	0.868
Understanding subsidiary achievements (7e)	1	4	2.83	3	0.676
MCS indicators:					
Accountability/responsibilities defined (14a)	1	5	2.31	2	1.108

Table A3.1 – Descriptive statistics of indicators (zero employee subsidiaries deleted from sample) (continued)

	Minimum	Maximum	Mean	Median	Std. Deviation
Autonomy extended to subsidiary management:					
Long term planning (22a)	1	4	2.23	2	0.839
Special business cases (22b)	1	5	2.83	3	0.957
Tasks performed by subsidiary (22c)	1	5	3.50	4	1.044
Standard setting for subsidiary (22d)	1	5	3.25	3	1.086
Standard operating procedures (22e)	1	5	2.60	3	0.944
HQ management by exception:					
Area of responsibility (18a)	1	5	2.71	3	1.069
Decision making delegation (18b)	1	5	2.71	3	1.047
HQ discussions (18c)	1	4	1.65	2	0.646
Management replacement (18d)	1	5	2.64	2	1.138
Transparency of information flow (11g)	1	5	1.59	2	0.666
Boundaries delineated (14b)	1	5	1.95	2	0.857
Codification of actions:					
Manuals specifying policies & procedures (14d)	1	5	2.52	2	1.085
Compliance training (14e)	1	5	2.81	3	1.141
Standardised systems:					
Human resources (23a)	1	5	2.35	2	1.051
Training programs (23b)	1	5	2.45	2	0.941
Information systems (23c)	1	5	2.16	2	1.030
Purchase & ordering systems (23d)	1	5	2.36	2	1.070
Reporting system (23e)	1	5	1.83	2	0.787
Codifications of targets:					
Budgets specify targets (16a)	1	5	1.78	2	0.756
Targets established at beginning of period (17a)	1	4	1.63	2	0.713
Return targets (24a)	1	5	2.16	2	1.046
Profit targets (24b)	1	5	1.78	2	0.929
Sales targets (24c)	1	5	2.16	2	1.181
Cash flow targets (24d)	1	5	2.01	2	0.962
Customer targets (24e)	1	5	2.61	3	1.168
Internal process targets (24f)	1	5	2.93	3	1.064
Learning targets (24g)	1	5	3.14	3	1.022
Internal benchmarks (24i)	1	5	2.78	3	1.049
Flexibility of targets:					
Modification of targets (14c)	1	5	1.97	2	0.770
Subsidiary influence on targets (22f)	1	4	2.28	2	0.816
Broad HQ performance expectations (16b)	1	5	1.97	2	0.737
Emergent HQ performance expectations (17b)	1	5	2.83	3	1.158

Table A3.1 – Descriptive statistics of indicators (zero employee subsidiaries deleted from sample) (continued)

	Minimum	Maximum	Mean	Median	Std. Deviation
Set limits on activities (16c)	1	5	2.18	2	0.843
Adherence to codified actions:					
Internal audits (15a)	1	5	2.60	2	1.195
Compliance evaluation (26d)	1	4	2.39	2	0.923
Monitoring & evaluation based on codified targets:					
Head office visits (11d)	1	5	1.89	2	0.841
Monitoring achievement of performance targets (25a)	1	5	1.67	2	0.731
Monitoring variance between budget & actual performance (25b)	1	5	1.87	2	0.830
Monitoring line items in financial accounts (25d)	1	5	2.16	2	0.887
Monitoring unexpected news (25e)	1	5	2.00	2	0.822
Evaluation of performance target achievement (26a)	1	4	1.62	2	0.661
Evaluation of variance between budget versus actual performance (26b)	1	5	1.85	2	0.823
Monitoring & evaluation according to market benchmarks:					
Market benchmarks (24h)	1	5	3.02	3	1.115
Monitoring market benchmarks versus actual performance (25c)	1	5	2.91	3	1.100
Evaluating market benchmarks versus actual performance (26c)	1	5	2.86	3	1.087
Long term performance assessment:					
Professional development of managers (26e)	1	5	2.82	3	0.935
Long term sustained performance (26f)	1	4	2.05	2	0.740
Contribution to overall company performance (26g)	1	4	1.93	2	0.729
Subjectivity in performance evaluation:					
Subjective evaluation (14f)	1	4	1.94	2	0.722
Subsidiary determined evaluation (22g)	1	4	2.13	2	0.759
HQ periodically checking compliance with boundaries:					
Internal audit to check boundaries compliance (15b)	1	5	2.73	3	1.166
Compliance evaluation (26d)	1	4	2.39	2	0.923
Punishment for not complying with codified actions (19b)	1	5	2.06	2	0.944

Table A3.1 – Descriptive statistics of indicators (zero employee subsidiaries deleted from sample) (continued)

	Minimum	Maximum	Mean	Median	Std. Deviation
Rewards based on codified evaluation:					
Achievement of targets (27a)	1	5	1.63	2	0.747
Variance between budget and actual performance (27b)	1	5	2.12	2	0.992
Rewards tied to market based performance evaluation (27c)	1	5	3.11	3	1.124
Reward through promotion:					
Promotion linked to performance (19a)	1	5	2.20	2	0.799
Long term performance (27d)	1	5	2.38	2	0.901
Subjectivity in reward determination:					
Subsidiary management determination of rewards (22h)	1	5	2.33	2	0.960
Subjective determination of rewards (27e)	1	5	1.98	2	0.818
Severe sanctions for crossing boundaries (19c)	1	4	2.02	2	0.932

The descriptive statistics of indicators is reported in the Table A3.2 based on the complete sample with 167 observations. Survey respondents were asked to indicate answers to questions on a scale of 1 to 5. These descriptive statistics indicate sufficient variation and no excessive floors or ceilings in the data.

Table A3.2 – Descriptive statistics of indicators (complete sample)

	Minimum	Maximum	Mean	Median	Std. Deviation
Activity traits:					
Uncertainty:					
Subsidiary goals are clearly defined (8a)	1	4	1.83	2	.685
Subsidiary goals provide clear direction to subsidiary personnel (8b)	1	5	2.01	2	.776
Subsidiary goals easily explained to outsiders (8c)	1	4	2.06	2	.742
Subsidiary goals clear to everyone working in subsidiary (8d)	1	4	2.16	2	.779
Asset specificity:					
Skilled employees (10a)	1	5	3.19	4	1.361
Training programs (10b)	1	5	3.11	3	1.214
Physical assets (10c)	1	5	3.35	4	1.247
Technological systems (10d)	1	5	2.72	2	1.212
Product customisation expertise (10e)	1	5	2.91	3	1.231
Branding rights (10f)	1	5	2.50	2	1.289
Reputational capital (10g)	1	5	2.86	3	1.132
Ex-post information asymmetry:					
Operating process performed by subsidiary (7b)	1	5	3.21	3	0.767
Reaching performance potential (7c)	1	5	2.80	3	0.713
Impact of external factors on performance (7d)	1	5	2.82	3	0.873
Understanding subsidiary achievements (7e)	1	4	2.83	3	0.691
MCS indicators:					
Accountability/responsibilities defined (14a)	1	5	2.31	2	1.091
Autonomy extended to subsidiary management:					
Long term planning (22a)	1	4	2.19	2	0.850
Special business cases (22b)	1	5	2.80	3	.973
Tasks performed by subsidiary (22c)	1	5	3.47	4	1.080
Standard setting for subsidiary (22d)	1	5	3.22	3	1.131
Standard operating procedures (22e)	1	5	2.56	2	0.973

Table A3.2 – Descriptive statistics of indicators (complete sample) (continued)

	Minimum	Maximum	Mean	Median	Std. Deviation
HQ management by exception:					
Area of responsibility (18a)	1	5	2.69	2	1.063
Decision making delegation (18b)	1	5	2.69	3	1.041
HQ discussions (18c)	1	4	1.66	2	0.655
Management replacement (18d)	1	5	2.63	2	1.127
Transparency of information flow (11g)	1	5	1.62	2	0.682
Boundaries delineated (14b)	1	5	1.98	2	0.878
Codification of actions:					
Manuals specifying policies & procedures (14d)	1	5	2.55	2	1.085
Compliance training (14e)	1	5	2.86	3	1.156
Standardised systems:					
Human resources (23a)	1	5	2.41	2	1.076
Training programs (23b)	1	5	2.50	3	0.969
Information systems (23c)	1	5	2.20	2	1.037
Purchase & ordering systems (23d)	1	5	2.38	2	1.062
Reporting system (23e)	1	5	1.83	2	0.781
Codifications of targets:					
Budgets specify targets (16a)	1	5	1.80		0.749
Targets established at beginning of period (17a)	1	4	1.63	2	0.714
Return targets (24a)	1	5	2.13	2	1.039
Profit targets (24b)	1	5	1.80	2	0.948
Sales targets (24c)	1	5	2.18	2	1.204
Cash flow targets (24d)	1	5	2.03	2	1.009
Customer targets (24e)	1	5	2.63	3	1.189
Internal process targets (24f)	1	5	2.92	3	1.067
Learning targets (24g)	1	5	3.13	3	1.025
Internal benchmarks (24i)	1	5	2.78	3	1.042
Flexibility of targets:					
Modification of targets (14c)	1	5	1.97	2	0.764
Subsidiary influence on targets (22f)	1	4	2.24	2	0.830
Broad HQ performance expectations (16b)	1	5	2.01	2	0.799
Emergent HQ performance expectations (17b)	1	5	2.78	3	1.167
Set limits on activities (16c)	1	5	2.19	2	0.835

Table A3.2 – Descriptive statistics of indicators (complete sample) (continued)

	Minimum	Maximum	Mean	Median	Std. Deviation
Adherence to codified actions:					
Internal audits (15a)	1	5	2.63	2	1.190
Compliance evaluation (26d)	1	5	2.40	2	0.938
Monitoring & evaluation based on codified targets:					
Head office visits (11d)	1	5	1.95	2	0.930
Monitoring achievement of performance targets (25a)	1	5	1.66	2	0.725
Monitoring variance between budget & actual performance (25b)	1	5	1.89	2	0.832
Monitoring line items in financial accounts (25d)	1	5	2.17	2	0.883
Monitoring unexpected news (25e)	1	5	2.02	2	0.838
Evaluation of performance target achievement (26a)		4	1.63	2	0.654
Evaluation of variance between budget versus actual performance (26b)	1	5	1.88	2	0.849
Monitoring & evaluation according to market benchmarks:					
Market benchmarks (24h)	1	5	3.02	3	1.108
Monitoring market benchmarks versus actual performance (25c)	1	5	2.92	3	1.114
Evaluating market benchmarks versus actual performance (26c)	1	5	2.87	3	1.110
Long term performance assessment:					
Professional development of managers (26e)	1	5	2.82	3	0.965
Long term sustained performance (26f)	1	4	2.05	2	0.735
Contribution to overall company performance (26g)	1	4	1.93	2	0.729
Subjectivity in performance evaluation:					
Subjective evaluation (14f)	1	4	1.97	2	0.748
Subsidiary determined evaluation (22g)	1	4	2.12	2	0.767
HQ periodically checking compliance with boundaries:					
Internal audit to check boundaries compliance (15b)	1	5	2.75	3	1.159
Compliance evaluation (26d)	1	5	2.40	2	0.938
Punishment for not complying with codified actions (19b)	1	5	2.06	2	0.942

Table A3.2 – Descriptive statistics of indicators (complete sample) (continued)

	Minimum	Maximum	Mean	Median	Std. Deviation
Rewards based on codified evaluation:					
Achievement of targets (27a)	1	5	1.66	2	0.789
Variance between budget and actual performance (27b)	1	5	2.17	2	1.053
Rewards tied to market based performance evaluation (27c)	1	5	3.13	3	1.147
Reward through promotion:					
Promotion linked to performance (19a)	1	5	2.20	2	0.793
Long term performance (27d)	1	5	2.38	2	0.917
Subjectivity in reward determination:					
Subsidiary management determination of rewards (22h)	1	5	2.31	2	0.963
Subjective determination of rewards (27e)	1	5	2.00	2	0.843
Severe sanctions for crossing boundaries (19c)	1	4	2.02	2	0.931

Appendix 4: Factor analysis

The factor analyses of the indicators forming the constructs used in Chapters 4 and 5 are reported in Table A4.1 based on the sample with subsidiaries employing zero people deleted from the sample. Indicators with asterisks shown in the table are removed from the final measurement of the construct due to low factor loadings.

Table A4.1 – Factor analysis (zero employee subsidiaries deleted from sample)

Constructs Indicators	Rotated Factor Loading	Item-Total Correlations	PCA Communality
Activity traits:			
Uncertainty			
Subsidiary goals are clearly defined (8a)	0.850	0.838	0.722
Subsidiary goals provide clear direction to subsidiary personnel (8b)	0.902	0.837	0.814
Subsidiary goals easily explained to outsiders (8c)	0.762	0.750	0.580
Subsidiary goals clear to everyone working in subsidiary (8d)	0.776	0.779	0.602
Asset specificity			
Skilled employees (10a)	0.722	0.730	0.521
Training programs (10b)	0.805	0.789	0.648
Physical assets (10c)	0.595	0.599	0.358
Technological systems (10d)	*	*	*
Product customisation expertise (10e)	0.759	0.675	0.576
Branding rights (10f)	*	*	*
Reputational capital (10g)	0.626	0.600	0.392
Ex-post information asymmetry			
Operating process performed by subsidiary (7b)	0.626	0.613	0.392
Reaching performance potential (7c)	0.805	0.746	0.648
Impact of external factors on performance (7d)	0.768	0.785	0.590
Understanding subsidiary achievements (7e)	0.825	0.725	0.681
Management control system:			
Autonomy extended to subsidiary management (MCI 2)			
Long term planning (22a)	*	*	*
Special business cases (22b)	*	*	*
Tasks performed by subsidiary (22c)	0.713	0.738	0.508
Standard setting for subsidiary (22d)	0.889	0.878	0.790
Standard operating procedures (22e)	0.812	0.790	0.659
HQ management by exception (MCI 3)			
Area of responsibility (18a)	0.902	0.893	0.813
Decision making delegation (18b)	0.871	0.858	0.759
HQ discussions (18c)	*	*	*
Management replacement (18d)	0.822	0.826	0.675

Table A4.1 – Factor analysis (zero employee subsidiaries deleted from sample) (continued)

Constructs Indicators	Rotated Factor Loading	Item-Total Correlations	PCA Communality
Codification of actions (MCI 6)			
Manuals specifying policies & procedures (14d)	0.918	0.901	0.842
Compliance training (14e)	0.918	0.908	0.842
Standardised systems (MCI 7)			
Human resources (23a)	0.689	0.717	0.474
Training programs (23b)	0.774	0.758	0.599
Information systems (23c)	0.812	0.813	0.659
Purchase & ordering systems (23d)	0.767	0.761	0.588
Reporting system (23e)	0.802	0.762	0.643
Targets established (24a-g)			
Returns (24a)	*	*	*
Profit (24b)	0.807	0.685	0.652
Sales (24c)	0.856	0.830	0.732
Cash flow (24d)	0.532	0.600	0.282
Customer (24e)	0.788	0.744	0.622
Internal process (24f)	*	*	*
Learning (24g)	*	*	*
Codifications of targets (MCI 8)			
Budgets specify targets (16a)	0.804	0.799	0.647
Targets established at beginning of period (17a)	0.822	0.780	0.676
Targets established (24a-g)	0.697	0.659	0.485
Internal benchmarks (24i)	*	*	*
Flexibility of targets (MCI 9)			
Modification of targets (14c reversed)	n/a	n/a	n/a
Subsidiary influence on targets (22f)	*	*	*
Adherence to codified actions (MCI 13)			
Internal audits (15a)	0.874	0.891	0.764
Compliance evaluation (26d)	0.874	0.849	0.764
HQ monitoring (25a,b,d,e)			
Achievement of performance targets (25a)	0.770	0.753	0.593
Variance between budget & actual performance (25b)	0.749	0.775	0.561
Line items in financial accounts (25d)	0.730	0.782	0.533
Unexpected news (25e)	0.764	0.745	0.583
HQ evaluation (26a&b)			
Performance target achievement (26a)	0.867	0.836	0.752
Variance between budget versus actual performance (26b)	0.867	0.903	0.752
Monitoring & Evaluation based on codified targets (MCI 14)			
Head office visits (11d)	*	*	*
HQ monitoring (25a,b,d,e)	0.940	0.946	0.885
HQ evaluation (26a&b)	0.940	0.924	0.885

Table A4.1 – Factor analysis (zero employee subsidiaries deleted from sample) (continued)

Constructs Indicators	Rotated Factor Loading	Item-Total Correlations	PCA Communality
Monitoring & evaluation according to market benchmarks (MCI 15)			
Market benchmarks (24h)	0.878	0.882	0.770
Monitoring market benchmarks versus actual performance (25c)	0.943	0.940	0.889
Evaluating market benchmarks versus actual performance (26c)	0.925	0.905	0.856
Long term performance assessment (MCI 16)			
Professional development of managers (26e)	0.858	0.891	0.737
Long term performance (26f)	0.858	0.797	0.737
Contribution to overall company performance (26g)	*	*	*
Subjectivity in performance evaluation (MCI 17)			
Subjective evaluation (14f reverse)	n/a	n/a	n/a
Subsidiary determined evaluation (22g)	*	*	*
HQ periodically checking compliance with boundaries (MCI 18)			
Internal audit to check boundaries compliance (15b)	0.871	0.898	0.758
Compliance evaluation (26d)	0.871	0.831	0.758
Rewards based on codified evaluation (MCI 20)			
Achievement of targets (27a)	0.873		0.763
Variance between budget and actual performance (27b)	0.873		0.763
Reward through promotion (MCI 22)			
Promotion linked to performance (19a)	0.759	0.725	0.576
Long term performance (27d)	0.759	0.773	0.576
Subjectivity in reward determination (MCI 23)			
Subsidiary management determination of rewards (22h)	*	*	*
Subjective determination of rewards (27e reversed)	n/a	n/a	n/a
<u>Control archetypes:</u>			
Arm's length control			
Autonomy extended to subsidiary management (MCI2)	*	*	*
HQ management by exception (MCI3)	*	*	*
Monitoring & evaluation according to market benchmarks (MCI15)	0.928	0.907	0.861
Rewards tied to market based performance evaluation (MCI21)	0.928	0.930	0.861

Table A4.1 – Factor analysis (zero employee subsidiaries deleted from sample) (continued)

Constructs Indicators	Rotated Factor Loading	Item-Total Correlations	PCA Communality
Results oriented machine control			
Accountability/responsibilities defined (MCI1)	*	*	*
Autonomy extended to subsidiary management (MCI2)	*	*	*
HQ management by exception (MCI3)	*	*	*
Codifications of targets (MCI8)	0.826	0.756	0.682
Flexibility of targets (MCI9 reversed)	*	*	*
Monitoring & evaluation based on codified targets (MCI14)	0.911	0.903	0.830
Rewards based on codified evaluation (MCI20)	0.855	0.865	0.732
Action oriented machine control			
Accountability/responsibilities defined (MCI1)	*	*	*
Autonomy extended to subsidiary management (MCI2 reversed)	*	*	*
Codification of actions (MCI6)	0.796	0.791	0.634
Standardised systems (MCI7)	*	*	*
Adherence to codified actions (MCI13)	0.885	0.862	0.782
Punishment for not complying with codified actions (MCI19)	0.756	0.730	0.572
Boundary control			
Autonomy extended to subsidiary management (MCI2)	*	*	*
Boundaries delineated (MCI 5)	0.790	0.735	0.624
Set limits on activities (MCI 12)	*	*	*
HQ periodically checking compliance with boundaries (MCI 18)	0.779	0.782	0.608
Severe sanctions for crossing boundaries (MCI 24)	0.784	0.808	0.615
Exploratory control			
Autonomy extended to subsidiary management (MCI2)	*	*	*
Transparency of information flow (MCI 4)	0.681	0.621	0.464
Flexibility of targets (MCI 9)	0.715	0.706	0.511
Broad HQ performance expectations (MCI 10)	0.682	0.686	0.466
Emergent HQ performance expectations (MCI 11)	*	*	*
Long term performance assessment (MCI 16)	*	*	*
Subjectivity in performance evaluation (MCI 17)	0.606	0.637	0.367
Reward through promotion (MCI 22)	*	*	*
Subjectivity in reward determination (MCI 23)	*	*	*

*Item deleted because of low rotated factor loading, high cross-loadings or low item-total correlation.

Table A4.2 includes the constructs reported in Table A4.1 above where indicators have been removed due to low indicator reliability. The statistics for indicators removed are shown in italics. Please note this table contains the factors analysis statistics for all indicators before any of the indicators with low factor loadings are removed.

Table A4.2 – Factor analysis (zero employee subsidiaries deleted from sample)

Constructs Indicators	Rotated Factor Loading	Item-Total Correlations	PCA Communality
Activity traits:			
Asset specificity			
Skilled employees (10a)	0.805	0.606	0.648
Training programs (10b)	0.857	0.734	0.766
Physical assets (10c)	0.567	0.599	0.416
Technological systems (10d)	*0.598*	*0.755*	*0.709*
Product customisation expertise (10e)	0.463	0.713	0.656
Branding rights (10f)	*0.410*	*0.563*	*0.807*
Reputational capital (10g)	0.143	0.626	0.632
Management control system:			
Autonomy extended to subsidiary management (MCI 2)			
Long term planning (22a)	*0.144*	*0.612*	*0.624*
Special business cases (22b)	*-0.011*	*0.607*	*0.783*
Tasks performed by subsidiary (22c)	0.486	0.749	0.600
Standard setting for subsidiary (22d)	0.886	0.745	0.812
Standard operating procedures (22e)	0.876	0.665	0.770
HQ management by exception (MCI 3)			
Area of responsibility (18a)	0.892	0.883	0.795
Decision making delegation (18b)	0.860	0.840	0.740
HQ discussions (18c)	*0.391*	*0.410*	*0.153*
Management replacement (18d)	0.808	0.804	0.653
Targets established (24a-g)			
Returns (24a)	*0.088*	*0.526*	*0.697*
Profit (24b)	0.606	0.559	0.791
Sales (24c)	0.913	0.659	0.853
Cash flow (24d)	0.074	0.551	0.597
Customer (24e)	0.817	0.730	0.806
Internal process (24f)	*0.130*	*0.624*	*0.789*
Learning (24g)	*0.120*	*0.580*	*0.811*
Codifications of targets (MCI 8)			
Budgets specify targets (16a)	0.797	0.747	0.636
Targets established at beginning of period (17a)	0.775	0.645	0.601
Targets established (24a-g)	0.690	0.625	0.476
Internal benchmarks (24i)	*0.453*	*0.678*	*0.205*

Table A4.2 – Factor analysis (zero employee subsidiaries deleted from sample) (continued)

Constructs Indicators	Rotated Factor Loading	Item-Total Correlations	PCA Communality
Flexibility of targets (MCI 9)			
Modification of targets (14c reversed)	0.798	0.512	0.636
Subsidiary influence on targets (22f)	-0.798	0.669	0.636
Monitoring & Evaluation based on codified targets (MCI 14)			
Head office visits (11d)	*0.359*	*0.609*	*0.129*
HQ monitoring (25a,b,d,e)	0.918	0.786	0.842
HQ evaluation (26a&b)	0.928	0.811	0.861
Long term performance assessment (MCI 16)			
Professional development of managers (26e)	0.741	0.768	0.549
Long term performance (26f)	0.874	0.799	0.763
Contribution to overall company performance (26g)	*0.534*	*0.536*	*0.285*
Subjectivity in performance evaluation (MCI 17)			
Subjective evaluation (14f reverse)	-0.759	0.586	0.576
Subsidiary determined evaluation (22g)	*0.759*	*0.312*	*0.576*
Subjectivity in reward determination (MCI 23)			
Subsidiary management determination of rewards (22h)	*0.718*	*0.786*	*0.516*
Subjective determination of rewards (27e reversed)	-0.718	0.503	0.516
<u>**Control archetypes:**</u>			
Arm's length control			
Autonomy extended to subsidiary management (MCI2)	*0.205*	*-0.138*	*0.694*
HQ management by exception (MCI3)	*0.263*	*0.438*	*0.649*
Monitoring & evaluation according to market benchmarks (MCI15)	0.929	0.314	0.863
Rewards tied to market based performance evaluation (MCI21)	0.903	0.209	0.816
Results oriented machine control			
Accountability/responsibilities defined (MCI1)	*-0.007*	*0.074*	*0.656*
Autonomy extended to subsidiary management (MCI2)	*0.182*	*0.025*	*0.604*
HQ management by exception (MCI3)	*0.458*	*0.220*	*0.391*
Codifications of targets (MCI8)	0.816	0.395	0.666
Flexibility of targets (MCI9 reversed)	*-0.279*	*0.220*	*0.519*
Monitoring & evaluation based on codified targets (MCI14)	0.894	0.139	0.801
Rewards based on codified evaluation (MCI20)	0.841	0.077	0.708

Table A4.2 – Factor analysis (zero employee subsidiaries deleted from sample) (continued)

Constructs Indicators	Rotated Factor Loading	Item-Total Correlations	PCA Communality
Action oriented machine control			
Accountability/responsibilities defined (MCI1)	*0.150*	*0.055*	*0.663*
Autonomy extended to subsidiary management (MCI2 reversed)	*0.139*	*0.035*	*0.703*
Codification of actions (MCI6)	0.698	0.297	0.632
Standardised systems (MCI7)	*0.515*	*0.236*	*0.298*
Adherence to codified actions (MCI13)	0.827	0.298	0.716
Punishment for not complying with codified actions (MCI19)	0.797	0.224	0.638
Boundary control			
Autonomy extended to subsidiary management (MCI2)	*-0.003*	*-0.303*	*0.864*
Boundaries delineated (MCI 5)	0.653	0.399	0.597
Set limits on activities (MCI 12)	*0.670*	*0.220*	*0.496*
HQ periodically checking compliance with boundaries (MCI 18)	0.709	0.411	0.626
Severe sanctions for crossing boundaries (MCI 24)	0.758	0.285	0.575
Exploratory control			
Autonomy extended to subsidiary management (MCI2)	*-0.306*	*0.149*	*0.478*
Transparency of information flow (MCI 4)	0.571	0.408	0.397
Flexibility of targets (MCI 9)	0.808	0.463	0.662
Broad HQ performance expectations (MCI 10)	0.421	0.622	0.442
Emergent HQ performance expectations (MCI 11)	*-0.026*	*0.429*	*0.639*
Long term performance assessment (MCI 16)	*0.332*	*0.590*	*0.606*
Subjectivity in performance evaluation (MCI 17)	0.630	0.547	0.593
Reward through promotion (MCI 22)	*0.056*	*0.474*	*0.582*
Subjectivity in reward determination (MCI 23)	*0.043*	*0.581*	*0.534*

The factor analyses of the indicators forming the constructs are reported in Table A4.3 based on the complete sample. Indicators with asterisks shown in the table are removed from the final measurement of the construct due to low factor loadings.

Table A4.3 – Factor analysis (complete sample)

Constructs Indicators	Rotated Factor Loading	Item-Total Correlations	PCA Communality
<u>Activity traits:</u>			
Uncertainty			
Subsidiary goals are clearly defined (8a)	0.835	0.828	0.698
Subsidiary goals provide clear direction to subsidiary personnel (8b)	0.900	0.837	0.810
Subsidiary goals easily explained to outsiders (8c)	0.763	0.746	0.583
Subsidiary goals clear to everyone working in subsidiary (8d)	0.780	0.783	0.609
Asset specificity			
Skilled employees (10a)	0.721	0.727	0.519
Training programs (10b)	0.814	0.799	0.663
Physical assets (10c)	0.609	0.612	0.370
Technological systems (10d)	*	*	*
Product customisation expertise (10e)	0.769	0.698	0.592
Branding rights (10f)	*	*	*
Reputational capital (10g)	0.613	0.587	0.376
Ex-post information asymmetry			
Operating process performed by subsidiary (7b)	0.656	0.627	0.430
Reaching performance potential (7c)	0.819	0.758	0.672
Impact of external factors on performance (7d)	0.780	0.794	0.608
Understanding subsidiary achievements (7e)	0.838	0.738	0.702
<u>Management control system:</u>			
Autonomy extended to subsidiary management (MCI 2)			
Long term planning (22a)	*	*	*
Special business cases (22b)	*	*	*
Tasks performed by subsidiary (22c)	0.747	0.755	0.558
Standard setting for subsidiary (22d)	0895	0.886	0.801
Standard operating procedures (22e)	0.809	0.790	0.655
HQ management by exception (MCI 3)			
Area of responsibility (18a)	0.904	0.895	0.817
Decision making delegation (18b)	0.874	0.861	0.764
HQ discussions (18c)	*	*	*
Management replacement (18d)	0.822	0.824	0.676

Table A4.3 – Factor analysis (complete sample) (continued)

Constructs Indicators	Rotated Factor Loading	Item-Total Correlations	PCA Communality
Codification of actions (MCI 6)			
Manuals specifying policies & procedures (14d)	0.921	0.906	0.848
Compliance training (14e)	0.921	0.914	0.848
Standardised systems (MCI 7)			
Human resources (23a)	0.707	0.731	0.500
Training programs (23b)	0.785	0.771	0.616
Information systems (23c)	0.815	0.820	0.664
Purchase & ordering systems (23d)	0.760	0.752	0.577
Reporting system (23e)	0.781	0.743	0.610
Targets established (24a-g)			
Returns (24a)	*	*	*
Profit (24b)	0.820	0.693	0.673
Sales (24c)	0.862	0.835	0.742
Cash flow (24d)	0.599	0.618	0.359
Customer (24e)	0.792	0.753	0.627
Internal process (24f)	*	*	*
Learning (24g)	*	*	*
Codifications of targets (MCI 8)			
Budgets specify targets (16a)	0.817	0.794	0.667
Targets established at beginning of period (17a)	0.813	0.757	0.661
Targets established (24a-g)	0.660	0.669	0.436
Internal benchmarks (24i)	*	*	*
Flexibility of targets (MCI 9)			
Modification of targets (14c reversed)	n/a	n/a	n/a
Subsidiary influence on targets (22f)	*	*	*
Adherence to codified actions (MCI 13)			
Internal audits (15a)	0.876	0.893	0.767
Compliance evaluation (26d)	0.876	0.852	0.767
HQ monitoring (25a,b,d,e)			
Achievement of performance targets (25a)	0.741	0.724	0.548
Variance between budget & actual performance (25b)	0.760	0.785	0.578
Line items in financial accounts (25d)	0.743	0.788	0.551
Unexpected news (25e)	0.764	0.752	0.584
HQ evaluation (26a&b)			
Performance target achievement (26a)	0.868	0.836	0.753
Variance between budget versus actual performance (26b)	0.868	0.908	0.753
Monitoring & Evaluation based on codified targets (MCI 14)			
Head office visits (11d)	*	*	*
HQ monitoring (25a,b,d,e)	0.943	0.948	0.889
HQ evaluation (26a&b)	0.943	0.927	0.889

Table A4.3 – Factor analysis (complete sample) (continued)

Constructs Indicators	Rotated Factor Loading	Item-Total Correlations	PCA Communality
Monitoring & evaluation according to market benchmarks (MCI 15)			
Market benchmarks (24h)	0.879	0.885	0.772
Monitoring market benchmarks versus actual performance (25c)	0.945	0.942	0.893
Evaluating market benchmarks versus actual performance (26c)	0.928	0.911	0.862
Long term performance assessment (MCI 16)			
Professional development of managers (26e)	0.863	0.985	0.745
Long term performance (26f)	0.863	0.801	0.745
Contribution to overall company performance (26g)	*	*	*
Subjectivity in performance evaluation (MCI 17)			
Subjective evaluation (14f reverse)	n/a	n/a	n/a
Subsidiary determined evaluation (22g)	*	*	*
HQ periodically checking compliance with boundaries (MCI 18)			
Internal audit to check boundaries compliance (15b)	0.873	0.899	0.762
Compliance evaluation (26d)	0.873	0.836	0.762
Rewards based on codified evaluation (MCI 20)			
Achievement of targets (27a)	0.880	0.802	0.775
Variance between budget and actual performance (27b)	0.880	0.947	0.775
Reward through promotion (MCI 22)			
Promotion linked to performance (19a)	0.767	0.731	0.588
Long term performance (27d)	0.767	0.782	0.588
Subjectivity in reward determination (MCI 23)			
Subsidiary management determination of rewards (22h)	*	*	*
Subjective determination of rewards (27e reversed)	n/a	n/a	n/a
<u>Control archetypes:</u>			
Arm's length control			
Autonomy extended to subsidiary management (MCI2)	*	*	*
HQ management by exception (MCI3)	*	*	*
Monitoring & evaluation according to market benchmarks (MCI15)	0.932	0.913	0.869
Rewards tied to market based performance evaluation (MCI21)	0.932	0.934	0.869

Table A4.3 – Factor analysis (complete sample) (continued)

Constructs Indicators	Rotated Factor Loading	Item-Total Correlations	PCA Communality
Results oriented machine control			
Accountability/responsibilities defined (MCI1)	*	*	*
Autonomy extended to subsidiary management (MCI2)	*	*	*
HQ management by exception (MCI3)	*	*	*
Codifications of targets (MCI8)	0.829	0.768	0.687
Flexibility of targets (MCI9 reversed)	*	*	*
Monitoring & evaluation based on codified targets (MCI14)	0.913	0.906	0.834
Rewards based on codified evaluation (MCI20)	0.856	0.874	0.733
Action oriented machine control			
Accountability/responsibilities defined (MCI1)	*	*	*
Autonomy extended to subsidiary management (MCI2 reversed)	*	*	*
Codification of actions (MCI6)	0.797	0.793	0.636
Standardised systems (MCI7)	*	*	*
Adherence to codified actions (MCI13)	0.888	0.867	0.788
Punishment for not complying with codified actions (MCI19)	0.761	0.737	0.579
Boundary control			
Autonomy extended to subsidiary management (MCI2)	*	*	*
Boundaries delineated (MCI 5)	0.779	0.723	0.608
Set limits on activities (MCI 12)	*	*	*
HQ periodically checking compliance with boundaries (MCI 18)	0.782	0.788	0.611
Severe sanctions for crossing boundaries (MCI 24)	0.793	0.815	0.628
Exploratory control			
Autonomy extended to subsidiary management (MCI2)	*	*	*
Transparency of information flow (MCI 4)	0.703	0.637	0.495
Flexibility of targets (MCI 9)	0.651	0.690	0.423
Broad HQ performance expectations (MCI 10)	0.727	0.700	0.528
Emergent HQ performance expectations (MCI 11)	*	*	*
Long term performance assessment (MCI 16)	*	*	*
Subjectivity in performance evaluation (MCI 17)	0.659	0.651	0.434
Reward through promotion (MCI 22)	*	*	*
Subjectivity in reward determination (MCI 23)	*	*	*

*Item deleted because of low rotated factor loading, high cross-loadings or low item-total correlation.

The final indicators measuring the constructs are factor analysis, together with results of the factor analyses reported in Tables A4.4, A4.5 and A4.6. These factors analyses results show that each set of indicators clearly represents the control archetypes conceptualised by Speklé (2001).

Table A4.4 – Factor analysis of machine control archetypes (complete sample)

Indicators	Rotated factor component 1	Rotated factor component 2
Codifications of targets (MCI 8)	**0.824**	0.136
Monitoring & evaluation based on codified targets (MCI 14)	**0.888**	0.205
Rewards based on codified evaluation (MCI 20)	**0.824**	0.211
Codification of actions (MCI 6)	0.089	**0.816**
Adherence to codified actions (MCI 13)	0.195	**0.866**
Punishment for not complying with codified actions (MCI 19)	0.252	**0.702**

Table A4.5 – Factor analysis of arm's length & machine and control archetypes (complete sample)

Indicators	Rotated factor component 1	Rotated factor component 2	Rotated factor component 3
Codifications of targets (MCI 8)	**0.781**	0.107	0.266
Monitoring & evaluation based on codified targets (MCI 14)	**0.895**	0.205	0.093
Rewards based on codified evaluation (MCI 20)	**0.814**	0.203	0.157
Codification of actions (MCI 6)	0.134	**0.840**	-0.058
Adherence to codified actions (MCI 13)	0.165	**0.841**	0.233
Punishment for not complying with codified actions (MCI 19)	0.193	**0.670**	0.259
Monitoring & evaluation according to market benchmarks (MCI15)	0.349	0.167	**0.841**
Rewards tied to market based performance evaluation (MCI21)	0.111	0145	**0.922**

Table A4.6 – Factor analysis of all control archetypes (complete sample)

Indicators	Rotated factor component 1	Rotated factor component 2	Rotated factor component 3	Rotated factor component 4
Monitoring & evaluation according to market benchmarks (MCI15)	0.661	0.370	0.223	**-0.324**
Rewards tied to market based performance evaluation (MCI21)	0.495	0.408	0.218	**-0.516**
Codifications of targets (MCI 8)	**0.814**	0.068	0.124	0.145
Monitoring & evaluation based on codified targets (MCI 14)	**0.807**	0.047	0.177	0.241
Rewards based on codified evaluation (MCI 20)	**0.770**	0.112	0.124	0.155
Codification of actions (MCI 6)	0.121	**0.734**	-0.018	0.411
Adherence to codified actions (MCI 13)	0.188	**0.838**	0.306	0.132
Punishment for not complying with codified actions (MCI 19)	0.179	**0.338**	0.796	0.075
Boundaries delineated (MCI 5)	0.074	0.318	**0.349**	0.557
HQ periodically checking compliance with boundaries (MCI 18)	0.127	0.858	**0.311**	0.091
Severe sanctions for crossing boundaries (MCI 24)	0.219	0.159	**0.856**	0.146
Transparency of information flow (MCI 4)	0.139	0.035	0.453	**0.450**
Flexibility of targets (MCI 9)	0.110	0.141	0.141	**0.689**
Broad HQ performance expectations (MCI 10)	0.315	0.246	0.189	**0.401**
Subjectivity in performance evaluation (MCI 17)	0.438	0.285	-0.035	**0.480**

Table A4.7 includes the constructs reported in Table A4.3 above where indicators are removed due to low indicator reliability. The statistics for indicators removed are shown in italics. Please note this table contains the factors analysis statistics for all indicators before any are removed.

Table A4.7 – Factor analysis (statistics for removed indicators, complete sample)

Constructs Indicators	Rotated Factor Loading	Item-Total Correlations	PCA Communality
Activity traits:			
Asset specificity			
Skilled employees (10a)	0.769	0.727	0.591
Training programs (10b)	0.858	0.799	0.761
Physical assets (10c)	0.616	0.612	0.447
Technological systems (10d)	*0.657*	*0.647*	*0.718*
Product customisation expertise (10e)	0.522	0.698	0.664
Branding rights (10f)	*0.076*	*0.378*	*0.816*
Reputational capital (10g)	0.144	0.587	0.650
Ex-post information asymmetry			
Activities undertaken (7a)	*0.711*	*0.463*	*0.505*
Operating process performed by subsidiary (7b)	0.704	0.627	0.495
Reaching performance potential (7c)	0.791	0.758	0.626
Impact of external factors on performance (7d)	0.739	0.794	0.546
Understanding subsidiary achievements (7e)	0.795	0.738	0.633
Management control system:			
Autonomy extended to subsidiary management (MCI 2)			
Long term planning (22a)	*0.192*	*0.338*	*0.649*
Special business cases (22b)	*0.007*	*0.287*	*0.799*
Tasks performed by subsidiary (22c)	0.545	0.755	0.612
Standard setting for subsidiary (22d)	0.895	0.886	0.823
Standard operating procedures (22e)	0.863	0.790	0.750
HQ management by exception (MCI 3)			
Area of responsibility (18a)	0.893	0.895	0.797
Decision making delegation (18b)	0.862	0.861	0.743
HQ discussions (18c)	*0.396*	*0.228*	*0.157*
Management replacement (18d)	0.810	0.824	0.656
Targets established (24a-g)			
Returns (24a)	*-0.035*	*0.495*	*0.739*
Profit (24b)	0.601	0.562	0.795
Sales (24c)	0.918	0.669	0.868
Cash flow (24d)	0.236	0.561	0.534
Customer (24e)	0.823	0.745	0.806
Internal process (24f)	*0.125*	*0.603*	*0.790*
Learning (24g)	*0.090*	*0.550*	*0.826*

Table A4.7 – Factor analysis (statistics for removed indicators, complete sample) (continued)

Constructs Indicators	Rotated Factor Loading	Item-Total Correlations	PCA Communality
Codifications of targets (MCI 8)			
Budgets specify targets (16a)	0.801	0.794	0.641
Targets established at beginning of period (17a)	0.752	0.757	0.566
Targets established (24a-g)	0.669	0.669	0.448
Internal benchmarks (24i)	*0.479*	*0.258*	*0.230*
Flexibility of targets (MCI 9)			
Modification of targets (14c reversed)	0.793	0.125	0.629
Subsidiary influence on targets (22f)	-0.793	0.353	0.629
Monitoring & Evaluation based on codified targets (MCI 14)			
Head office visits (11d)	*0.378*	*0.136*	*0.143*
HQ monitoring (25a,b,d,e)	0.915	0.948	0.838
HQ evaluation (26a&b)	0.932	0.927	0.868
Long term performance assessment (MCI 16)			
Professional development of managers (26e)	0.749	0.985	0.562
Long term performance (26f)	0.874	0.801	0.759
Contribution to overall company performance (26g)	*0.560*	*0.226*	*0.313*
Subjectivity in performance evaluation (MCI 17)			
Subjective evaluation (14f reverse)	0.763	0.595	0.582
Subsidiary determined evaluation (22g)	*-0.763*	*0.666*	*0.582*
Subjectivity in reward determination (MCI 23)			
Subsidiary management determination of rewards (22h)	*n/a*	*0.785*	*n/a*
Subjective determination of rewards (27e reversed)	n/a	0.534	n/a
<u>Control archetypes:</u>			
Arm's length control			
Autonomy extended to subsidiary management (MCI2)	*0.274*	*0.363*	*0.247*
HQ management by exception (MCI3)	*0.298*	*0.460*	*0.325*
Monitoring & evaluation according to market benchmarks (MCI15)	0.927	0.850	0.927
Rewards tied to market based performance evaluation (MCI21)	0.904	0.806	0.903
Results oriented machine control			
Accountability/responsibilities defined (MCI1)	*0.001*	*0.303*	*0.215*
Autonomy extended to subsidiary management (MCI2)	*0.281*	*0.245*	*0.076*
HQ management by exception (MCI3)	*0.422*	*0.551*	*0.546*
Codifications of targets (MCI8)	0.817	0.630	0.785
Flexibility of targets (MCI9 reversed)	*0.264*	*-0.104*	*0.434*
Monitoring & evaluation based on codified targets (MCI14)	0.892	0.764	0.875
Rewards based on codified evaluation (MCI20)	0.845	0.725	0.813

Table A4.7 – Factor analysis (statistics for removed indicators, complete sample) (continued)

Constructs Indicators	Rotated Factor Loading	Item-Total Correlations	PCA Communality
Action oriented machine control			
Accountability/responsibilities defined (MCI1)	*0.202*	*0.613*	*0.522*
Autonomy extended to subsidiary management (MCI2 reversed)	*0.036*	*0.504*	*0.441*
Codification of actions (MCI6)	0.739	0.746	0.795
Standardised systems (MCI7)	*0.582*	*0.520*	*0.550*
Adherence to codified actions (MCI13)	0.830	0.748	0.805
Punishment for not complying with codified actions (MCI19)	0.760	0.603	0.654
Boundary control			
Autonomy extended to subsidiary management (MCI2)	*-0.033*	*0.226*	*-0.203*
Boundaries delineated (MCI 5)	0.717	0.622	0.753
Set limits on activities (MCI 12)	*0.620*	*0.630*	*0.566*
HQ periodically checking compliance with boundaries (MCI 18)	0.755	0.676	0.784
Severe sanctions for crossing boundaries (MCI 24)	0.759	0.741	0.731
Exploratory control			
Autonomy extended to subsidiary management (MCI2)	*0.028*	*0.210*	*0.699*
Transparency of information flow (MCI 4)	0.704	0.430	0.501
Flexibility of targets (MCI 9)	0.639	0.441	0.565
Broad HQ performance expectations (MCI 10)	0.692	0.631	0.521
Emergent HQ performance expectations (MCI 11)	*-0.008*	*0.380*	*0.440*
Long term performance assessment (MCI 16)	*0.293*	*0.599*	*0.674*
Subjectivity in performance evaluation (MCI 17)	0.658	0.536	0.491
Reward through promotion (MCI 22)	*0.021*	*0.475*	*0.658*
Subjectivity in reward determination (MCI 23)	*0.135*	*0.591*	*0.566*

Appendix 5: Construct validity statistics

Table A5.1 to A5.5 reports the square root of the average variance extracted with the correlations between the constructs for the sample with subsidiaries employing zero people deleted. All average variance extracted (AVE) values are higher than all correlations between the constructs. This indicates the constructs used in this study are discriminately valid.

Table A5.1 – Arm's length control - correlation between constructs (square root of AVE on diagonal)

	Uncertainty	Asset specificity	Ex-post information asymmetry (LOG)	Arm's length control
Uncertainty	**0.894**			
Asset specificity	-0.017	**0.831**		
Ex-post information asymmetry (LOG)	0.099	-0.037	**0.844**	
Arm's length control	-0.123	-0.087	-0.047	**0.925**

Table A5.2 – Results oriented machine control - correlation between constructs (square root of AVE on diagonal)

	Uncertainty	Asset specificity	Ex-post information asymmetry (LOG)	Results control (LOG, ref.)
Uncertainty	**0.894**			
Asset specificity	-0.017	**0.831**		
Ex-post information asymmetry (LOG)	0.099	-0.037	**0.844**	
Results control (LOG, reflected)	-0.055	-0.088	-0.028	**0.899**

Table A5.3 – Action oriented machine control - correlation between constructs (square root of AVE on diagonal)

	Uncertainty	Asset specificity	Ex-post information asymmetry (LOG)	Action oriented machine control (LOG, ref)
Uncertainty	**0.894**			
Asset specificity	-0.017	**0.831**		
Ex-post information asymmetry (LOG)	0.099	-0.037	**0.844**	
Action oriented machine control (LOG, reflected)	-0.264	-0.172	0.299	**0.853**

Table A5.4 – Boundary control - correlation between constructs (square root of AVE on diagonal)

	Uncertainty	Asset specificity	Ex-post information asymmetry (LOG)	Boundary control (LOG, ref.)
Uncertainty	**0.894**			
Asset specificity	-0.017	**0.831**		
Ex-post information asymmetry (LOG)	0.099	-0.037	**0.844**	
Boundary control (LOG, reflected)	-0.321	-0.034	-0.336	**0.827**

Table A5.5 – Exploratory control - correlation between constructs (square root of AVE on diagonal)

	Uncertainty	Asset specificity	Ex-post information asymmetry (LOG)	Exploratory control (LOG, SR.)
Uncertainty	**0.894**			
Asset specificity	-0.017	**0.831**		
Ex-post information asymmetry (LOG)	0.099	-0.037	**0.844**	
Exploratory control (Square root, reflected)	-0.308	-0.197	-0.244	**0.767**

The validity statistics reported in the Tables A5.6 to A5.15 indicate the data in the complete sample is valid for the purposes of statistical analysis, consistent with the validity statistics for the sample with zero employee subsidiaries deleted reported in Chapter 4.

Table A5.6 – Construct composite reliability based on Cronbach Alpha (complete sample)

	Cronbach Alpha
Uncertainty	0.837
Asset specificity	0.748
Ex-post information asymmetry	0.770
MCI 2 Autonomy extended to subsidiary management	0.752
MCI 3 HQ management by exception	0.833
MCI 6 Codification of actions	0.819
MCI 7 Standardised systems	0.822
Targets established (24a-g)	0.771
MCI 8 Codifications of targets	0.636
MCI 13 Adherence to codified actions	0.683
HQ monitoring (25a,b,d,e)	0.742
HQ evaluation (26a&b)	0.657
MCI 14 Monitoring & Evaluation based on codified targets	0.874
MCI15 Monitoring & evaluation according to market benchmarks	0.906
MCI 16 Long term performance assessment	0.643
MCI 18 HQ periodically checking compliance with boundaries	0.677
MCI 20 Rewards based on codified evaluation	0.691
MCI 22 Reward through promotion	0.298
Arm's length control	0.847
Results oriented machine control	0.819
Action oriented machine control	0.746
Boundary control	0.688
Exploratory control	0.622

Table A5.7 – Combination index descriptive statistics (complete sample)

	Minimum	Maximum	Mean	Median	Std. Deviation
Arm's Length Control	0.058	0.247	0.157	0.163	0.043
Results Oriented Machine Control	0.141	0.317	0.224	0.219	0.027
Action Oriented Machine Control	0.093	0.247	0.191	0.195	0.027
Boundary Control	0.138	0.269	0.204	0.206	0.024
Exploratory Control	0.151	0.331	0.224	0.220	0.027

Table A5.8 – Dummy variable frequencies (complete sample)

Construct	Frequency	
Dummy value:	1	0
AT_PROFILE_ARMS_DUM	70	97
AT_PROFILE_RESULTS_DUM	27	140
AT_PROFILE_ACTION_DUM	18	149
AT_PROFILE_BOUNDARY_DUM	5	162
AT_PROFILE_EXPLOR_DUM	1	162
UNCERTAINTY_DUM *(High)*	8	159
UNCERTAINTY_DUM *(Low)*	156	11
ASSET_SPEC_DUM *(High)*	77	90
ASSET_SPEC_DUM *(Low)*	73	96
EX-POST_INFO_ASY_DUM *(High)*	59	108
EX-POST_INFO_ASY_DUM *(Low)*	58	109

Table A5.9 – Skewness & Kurtosis statistics (complete sample) before normalisation

	Skewness		Kurtosis	
	Statistic	Std. error	Statistic	Std. error
Arm's Length Control	-0.410	0.188	-0.475	0.374
Results Oriented Machine Control	0.519	0.188	0.941	0.374
Action Oriented Machine Control	-0.803	0.188	0.883	0.374
Boundary Control	-0.389	0.188	0.845	0.374
Exploratory Control	0.658	0.188	1.459	0.374

Table A5.10 – Skewness & Kurtosis statistics recalculated (complete sample) after normalisation

	Skewness		Kurtosis	
	Statistic	Std. error	Statistic	Std. error
Arm's Length Control - normalised	-0.251	0.188	-0.577	0.374
Results Oriented Machine Control - normalised	0.338	0.188	-0.071	0.374
Action Oriented Machine Control - normalised	-0.341	0.188	-0.249	0.374
Boundary Control - normalised	-0.325	0.188	0.718	0.374
Exploratory Control - normalised	0.291	0.188	0.649	0.374

Table A5.11 – Arm's length control - correlation between constructs (square root of AVE on diagonal, complete sample)

	Uncertainty	Asset specificity	Ex-post information asymmetry (LOG)	Arm's length control
Uncertainty	**0.892**			
Asset specificity	0.017	**0.834**		
Ex-post information asymmetry (LOG)	0.145	0.003	**0.858**	
Arm's length control	-0.157	-0.070	-0.066	**0.930**

Table A5.12 – Results oriented machine control - correlation between constructs (square root of AVE on diagonal, complete sample)

	Uncertainty	Asset specificity	Ex-post information asymmetry (LOG)	Results control (LOG, ref.)
Uncertainty	**0.892**			
Asset specificity	0.017	**0.834**		
Ex-post information asymmetry (LOG)	0.145	0.003	**0.858**	
Results control (LOG, reflected)	-0.102	-0.088	-0.046	**0.900**

Table A5.13 – Action oriented machine control - correlation between constructs (square root of AVE on diagonal, complete sample)

	Uncertainty	Asset specificity	Ex-post information asymmetry (LOG)	Action oriented machine control (LOG, ref)
Uncertainty	**0.892**			
Asset specificity	0.017	**0.834**		
Ex-post information asymmetry (LOG)	0.145	0.003	**0.858**	
Action oriented machine control (LOG, reflected)	-0.292	-0.173	-0.294	**0.857**

Table A5.14 – Boundary control - correlation between constructs (square root of AVE on diagonal, complete sample)

	Uncertainty	Asset specificity	Ex-post information asymmetry (LOG)	Boundary control (LOG, ref.)
Uncertainty	**0.892**			
Asset specificity	0.017	**0.834**		
Ex-post information asymmetry (LOG)	0.145	0.003	**0.858**	
Boundary control (LOG, reflected)	-0.345	-0.038	-0.341	**0.828**

Table A5.15 – Exploratory control - correlation between constructs (square root of AVE on diagonal, complete sample)

	Uncertainty	Asset specificity	Ex-post information asymmetry (LOG)	Exploratory control (LOG, SR.)
Uncertainty	**0.892**			
Asset specificity	0.017	**0.834**		
Ex-post information asymmetry (LOG)	0.145	0.003	**0.858**	
Exploratory control (Square root, reflected)	-0.355	-0.234	-0.294	**0.780**

Appendix 6: Archetype construct correlations

The correlation between control archetype constructs is high which is expected given the choice of one control archetype construct is related to others. This is consistent with the case study analyses, suggesting headquarters exercise multiple control archetypes. These Spearman rank correlations are based on the sample excluding firms with subsidiaries employing zero people.

Table A6.1 – Control archetype construct correlations

	Arm's length control	Results control	Action control	Boundary control	Exploratory control
Arm's length control	1.000				
Results control	0.367***	1.000			
Action control	0.305***	0.394***	1.000		
Boundary control	0.292***	0.410***	0.787***	1.000	
Exploratory control	0.131*	0.465***	0.516***	0.563***	1.000

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

Appendix 7: Mining firms deleted sample results

Any firm with headquarters or WOFS operations involved in mining is deleted from the sample, producing a final sample size of 122. In addition, any firms with subsidiaries employing zero people are deleted from the sample.

Table A7.1 – Mining firms deleted OLS regression results

Control archetype	Activity Trait Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Adjusted R square	F-stat (significance)
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat		
Arms Length	0.295	0.683	-0.143	-1.305	-0.244	-0.578	n/a		-0.010	0.599 (0.617)
Results	0.045	0.331	-0.068	-0.730	0.057	0.528	-0.116	-0.969	-0.014	0.593 (0.668)
Action	-0.071	-0.577	0.234**	2.579	-0.122	-1.147	-0.118	-1.062	0.079	3.580*** (0.009)
Boundary	0.361**	2.540	-0.366***	-2.624	n/a		-0.112	-1.221	0.041	2.742** (0.046)

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

Appendix 8: Asset specificity sensitivity testing

Table A8.1 – OLS Regressions results based on skilled employee asset specificity

Control archetype	Activity Trait Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Adjusted	F-stat
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	R square	(significance)
Arms Length	-0.231	-0.645	-0.075	-0.772	0.236	0.671	n/a		-0.004	0.807 (0.492)
Results	0.049	0.411	-0.157**	-1.977	0.056	0.592	-0.178*	-1.690	0.033	2.344* (0.057)
Action	-0.049	-0.434	0.246***	3.083	-0.116	-1.258	-0.087	-0.851	0.076	4.282*** (0.003)

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

Table A8.2 – OLS Regressions results based on training program asset specificity

Control archetype	Activity Trait Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Adjusted	F-stat
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	R square	(significance)
Arms Length	0.258	0.657	-0.146	-1626	-0.153	-0.396	n/a		0.005	1.292 (0.279)
Results	-0.005	-0.045	-0.148*	-1.883	0.110	1.167	-0.145	-1.526	0.037	2.537** (0.042)
Action	-0.198**	-1.973	0.265***	3.435	-0.098	-1.088	-0.026	-0.285	0.115	6.216*** (0.000)

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

Table A8.3 – OLS Regressions results based on physical asset specificity

Control archetype	Activity Trait Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Adjusted	F-stat
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	R square	(significance)
Arms Length	0.017	0.050	-0.114	-1.175	-0.061	-0.181	n/a		-0.005	0.760 (0.518)
Results	-0.076	-0.615	-0.156**	-1.984	0.043	0.447	-0.101	-0.934	0.028	2.139* (0.078)
Action	-0.199*	-1.771	0.277	3.548	0.062	0.674	0.012	0.121	0.075	4.222*** (0.003)

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

Table A8.4 – OLS Regressions results based on technological systems asset specificity

Control archetype	Activity Trait Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Adjusted	F-stat
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	R square	(significance)
Arms Length	-0.027	-0.074	-0.103	-0.757	0.015	0.044	n/a		-0.006	0.661 (0.577)
Results	-0.080	-0.738	-0.155**	-1.993	0.118	1.210	-0.120	-1.333	0.034	2.422* (0.051)
Action	-0.241**	-2.482	0.276***	3.640	-0.010	-0.117	-0.012	-0.135	0.108	5.850*** (0.000)

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

Table A8.5 – OLS Regressions results based on product customisation asset specificity

Control archetype	Activity Trait Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Adjusted R square	F-stat (significance)
	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat		
Arms Length	0.770**	2.279	-0.270**	-2.585	-0.674**	-0.674	n/a		0.029	2.589* (0.055)
Results	0.015	0.134	-0.144*	-1.804	0.104	1.037	-0.166*	-1.779	0.038	2.578** (0.040)
Action	0.165*	1.681	0.208***	2.670	-0.220**	-2.310	-0.073	-0.914	0.087	4.822*** (0.001)

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

Table A8.6 – OLS Regressions results based on branding rights asset specificity

Control archetype	Activity Trait Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Adjusted R square	F-stat (significance)
	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat		
Arms Length	0.911***	2.760	-0.317***	-3.072	-0.664**	-2.091	n/a		0.074	5.252*** (0.002)
Results	-0.066	-0.654	-0.147*	-1.882	0.128	1.367	-0.120	-1.396	0.037	2.532** (0.043)
Action	-0.248**	-2.424	0.282***	3.650	0.082	0.874	-0.009	-0.111	0.092	5.053*** (0.001)

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

Table A8.7 – OLS Regressions results based on reputational capital asset specificity

Control archetype	Activity Trait Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Adjusted R square	F-stat (significance)
	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat	Coeff.	*t*-stat		
Arms Length	0.382	1.149	-0.188*	-1.808	-0.194	-0.593	n/a		0.031	2.725** (0.046)
Results	-0.112	-1.004	-0.148*	-1.891	0.105	1.073	-0.103	-1.126	0.034	2.391* (0.053)
Action	-0.110	-1.106	0.264***	3.384	0.078	0.850	-0.056	-0.634	0.063	3.692*** (0.007)

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

Appendix 9: Complete sample regression results

The results reported in this section are based on the complete sample (sample size: 167), including subsidiaries employing zero people.

Control archetype (combination index) and activity traits (dummy variables)

Model: $COMBINATION\_INDEX_i = \alpha_0 + \alpha_1 AT\_PROFILE\_DUM_i + \alpha_2 UNCERTAINTY\_DUM_i + \alpha_3 ASSET\_SPEC\_DUM_i + \alpha_4 EX\text{-}POST\_INFO\_ASY\_DUM_i + \varepsilon_i$

Where:

- Combination index $= 1 - \dfrac{A2 + A3 + A4 + A5}{A1 + A2 + A3 + A4 + A5}$

- Activity trait profile dummy variable (*AT_PROFILE_DUM*): One if activity traits representative of situations where focal control archetype is relevant (based on Speklé's arguments) and zero if not representative.

- Activity trait dummy variables (*UNCERTAINTY_DUM, ASSET_SPEC_DUM & EX-POST_INFO_ASY_DUM*): Based on absolute high or low levels. If control archetype is argued to be appropriate under situations of high levels of an activity trait, dummy variable assigned a value of 1 for likert scale values above 3, and zero for likert scale values 1 – 3. If control archetype is argued to be appropriate under situations of low levels of an activity trait, dummy variable assigned a value of 1 for likert scale values below 3, and zero for variables above 3-5.

Results:

- Support for Speklé's (2001) theory concerning arms and boundary control in samples with zero employee size subsidiaries deleted, given significant activity trait profile variable coefficients. However full sample results reported in Table A9.1 are much weaker.

Table A9.1 – Control archetype (combination index) & activity traits (dummy variables) OLS regression results (complete sample)

Control archetype	AT Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Adjusted R square	F-stat (significance)
	Coefficient	*t*-stat	Coefficient	*t*-stat	Coefficient	*t*-stat	Coefficient	*t*-stat		
Arms Length	0.306	0.886	-0.088	-0.953	-0.203	-0.602	n/a		-0.004	0.759 (0.519)
Results	0.072	0.631	-0.205***	-2.657	0.069	0.748	-0.191*	-1.916	0.059	3.585*** (0.008)
Action	-0.109	-1.050	0.212***	2.626	-0.060	-0.659	-0.038	-0.389	0.048	3.075** (0.018)
Boundary	0.382***	3.063	-0.373***	-3.059	n/a		-0.148*	-1.899	0.048	4.153*** (0.007)
Exploratory	-0.162*	1.946	-0.016	-0.191	n/a		0.012	0.152	0.010	1.569 (0.199)

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

Control archetype (combination index) and activity traits determined based on median values (dummy variables)

Model: $COMBINATION\_INDEX_i = \alpha_0 + \alpha_1 AT\_PROFILE\_DUM_i + \alpha_2 UNCERTAINTY\_DUM_i + \alpha_3 ASSET\_SPEC\_DUM_i + \alpha_4 EX\text{-}POST\_INFO\_ASY\_DUM_i + \varepsilon_i$

Where:

- Combination index $= 1 - \dfrac{A2 \ + \ A3 \ + \ A4 \ + \ A5}{A1 + A2 + A3 + A4 + A5}$

- Activity trait profile dummy variable (*AT_PROFILE_DUM*): One if activity traits representative of situations where focal control archetype is relevant (based on Speklé arguments) and zero if not representative.

- Activity trait dummy variables (*UNCERTAINTY_DUM, ASSET_SPEC_DUM & EX-POST_INFO_ASY_DUM*): Based on relative high or low levels. If control archetype is argued to be appropriate under situations of high levels of an activity trait, dummy variable assigned a value of 1 for likert scale values above median value, and zero for likert scale values 1 – median value. If control archetype is argued to be appropriate under situations of low levels of an activity trait, dummy variable assigned a value of 1 for likert scale values below median value, and zero for variables at or above median values.

Results:

- No support for theory based on results reported in Table A9.2 given insignificant activity trait profile coefficients.

Table A9.2 – Control archetype (combination index) & activity traits determined based on median values (dummy variables) OLS regression results (complete sample)

Control archetype	AT Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Adjusted *R* square	F-stat (significance)
	Coefficient	*t*-stat	Coefficient	*t*-stat	Coefficient	*t*-stat	Coefficient	*t*-stat		
Arms Length	0.057	0.524	-0.053	-0.530	0.05	0.593	n/a		-0.009	0.500 (0.683)
Results	0.133	1.484	-0.099	-1.204	0.097	1.188	-0.206***	-2.545	0.034	2.442** (0.049)
Action	-0.034	-0.387	-0.033	-0.396	-0.123	-1.529	0.126	-1.503	0.009	1.393 (0.239)
Boundary	-0.032	-0.256	0.023	0.235	n/a		-0.088	-0.851	-0.007	0.633 (0.595)
Exploratory	-0.094	-0.809	0.039	0.410	n/a		0.199**	1.984	0.008	1.431 (0.236)

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

Control archetype (combination index) and activity traits (continuous variables)
Model: $COMBINATION\_INDEX_i = \alpha_0 + \alpha_1 AT\_PROFILE_i + \alpha_2 UNCERTAINTY_i +$
$\alpha_3 ASSET\_SPEC_i + \alpha_4 EX\text{-}POST\_INFO\_ASY_i + \varepsilon_i$

Where:

- Combination index $= 1 - \dfrac{A2 + A3 + A4 + A5}{A1 + A2 + A3 + A4 + A5}$
- Activity trait profile variable (*AT_PROFILE*): Relevant variables for activity traits multiplied together to interaction variable. Constructs reversed where appropriate to reflect situations where control archetype applicable.
- Activity trait variables (*UNCERTAINTY, ASSET_SPEC & EX-POST_INFO_ASY*): Continuous variables based on relevant indicator summations

Results:

- Activity trait (interaction) coefficients insignificant in all cases, some significant activity trait coefficients.

Table A9.3 – Control archetype (combination index) & activity traits (continuous variables) OLS regression results (complete sample)

Control archetype	AT Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Adjusted R square	F-stat (significance)
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat		
Arms Length	-0.213	-0.610	0.127	0.481	0.128	0.539	n/a		-0.015	0.168 (0.918)
Results	-0.314	-0.918	0.438**	2.063	-0.116	-0.534	0.395**	2.365	0.140	7.734*** (0.000)
Action	-0.696	-1.626	0.321	1.112	-0.600*	-1.958	-0.440**	-2.411	0.059	3.620 ***(0.007)
Boundary	-0.162	-0.385	-0.025	-0.075	n/a		-0.107	-0.460	0.050	3.928*** (0.010)
Exploratory	0.325	0.653	-0.256	-0.559	n/a		0.177	0.628	-0.014	0.224 (0.879)

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

Moderate Activity Trait Firms Deleted from Sample

Model: $COMBINATION\_INDEX_i = \alpha_0 + \alpha_1 AT\_PROFILE\_DUM_i + \alpha_2 UNCERTAINTY\_DUM_i + \alpha_3 ASSET\_SPEC\_DUM_i + \alpha_4 EX\text{-}POST\_INFO\_ASY\_DUM_i + \varepsilon_i$

Where:

- Combination index $= 1 - \dfrac{A2 + A3 + A4 + A5}{A1 + A2 + A3 + A4 + A5}$

- Firms deleted from sample where activity traits at moderate levels. Both absolute and relative dummy variable determination is used.

Results:
- Activity trait (interaction) coefficients insignificant in all cases, some significant activity trait coefficients.

Table A9.4 – Firms with activity traits at moderate levels deleted from the sample OLS regression results (complete sample)

Control archetype	AT Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Adjusted R square	F-stat (significance)
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat		
Arms Length	0.086	0.842	-0.068	-0.666	Excluded		n/a		-0.010	0.472 (0.625)
Results	-0.058	-0.335	-0.059	-0.557	0.209	1.416	-0.195	-1.494	0.054	2.452* (0.051)
Action	-0.160	-1.050	0.056	0.492	-0.032	-0.240	-0.124	-0.943	0.032	1.832 (0.129)
Boundary	0.364*	1.662	-0.324	-1.499	n/a		-0.165	-1.640	0.016	1.564 (0.203)
Exploratory	-0.205*	-1.855	-0.044	-0.397	n/a		0.050	0.499	0.025	1.854 (0.142)

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

Table A9.5 – Firms with activity traits at median levels deleted from the sample OLS regression results (complete sample)

Control archetype	AT Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Adjusted R square	F-stat (significance)
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat		
Arms Length	0.142	0.932	-0.070	-0.505	0.013	0.110	n/a		-0.016	0.471 (0.703)
Results	0.200*	1.658	-0.189*	-1.713	0.136	1.347	-0.267***	-2.693	0.083	3.319** (0.014)
Action	-0.090	-0.758	0.001	0.013	-0.103	-0.998	-1.191	-1.798	0.028	1.728 (0.150)
Boundary	0.125	0.748	-0.069	-0.502	n/a		-0.203	-1.520	-0.005	0.815 (0.489)
Exploratory	0.161	0.958	-0.076	-0.526	n/a		-0.048	-0.357	-0.019	0.371 (0.774)

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

Control Archetype Dummy Dependent Variable Models

The control archetype dummy dependent variable is assigned a 1 if the focal control archetype is the control archetype primarily used and zero if it is not.

Table A9.6 – Dependent dummy & independent absolute activity trait dummy variable determined binary logistic regression results (complete sample)

Control archetype	AT Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Pseudo R square
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	(Nagelkerke)
Arms Length	20.594	0.999	-2.497*	0.089	-19.257	0.999	n/a		0.081
Results	1.013	0.186	-0.391	0.552	0.255	0.509	-1.462**	0.013	0.085
Action	-0.498	0.789	18.474	0.999	0.000	1.000	1.596	0.175	0.087
Boundary	20.934	0.999	-19.487	0.999	n/a		-1.117*	0.087	0.052
Exploratory	-19.844	1.000	-0.820	0.457	n/a		0.433	0.220	0.027

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

Table A9.7 – Dependent dummy & independent relative activity trait dummy variable determined binary logistic regression results (complete sample)

Control archetype	AT Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Pseudo R square
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	(Nagelkerke)
Arms Length	19.649	0.998	-17.819	0.998	n/a		-3.387***	0.000	0.115
Results	0.704	0.421	-0.375	0.347	0.487	0.158	-1.046**	0.011	0.078
Action	-19.245	0.999	0.731	0.447	-0.079	0.932	1.647*	0.090	0.089
Boundary	-0.268	0.819	0.377	0.492	n/a		-0.777	0.340	0.034
Exploratory	0.075	0.917	-0.288	0.524	n/a		0.426	0.339	0.019

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

Table A9.8 – Dependent dummy & independent continuous activity trait variable binary logistic regression results (complete sample)

Control archetype	AT Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Pseudo R square
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	(Nagelkerke)
Arms Length	1.658**	0.037	-4.269*	0.068	-4.750**	0.015	n/a		0.181
Results	-0.043	0.663	1.135	0.205	0.136	0.831	1.797**	0.016	0.233
Action	-0.137	0.579	0.741	0.759	-1.626	0.282	0.054	0.973	0.094
Boundary	-0.050	0.931	-0.111	0.945	n/a		0.077	0.981	0.041
Exploratory	0.455	0.322	-1.866	0.210	n/a		-1.124	0.680	0.056

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

Control archetype continuous dependent variable models

The individual continuous activity trait variables which are previously substituted into the combination index equation are used as the dependent variables in the regression models in this section.

Table A9.9 – Dependent control archetype variable & independent absolute activity trait dummy variable determined OLS regression results (complete sample)

Control archetype	AT Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Adjusted R square	F-stat (significance)
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coefficient	t-stat		
Arms Length	0.133	0.386	0.069	0.749	-0.024	-0.072	n/a		0.003	1.143 (0.333)
Results	-0.057	-0.484	0.136*	17.10	-0.007	-0.076	0.071	0.693	-0.002	0.929 (0.488)
Action	0.019	0.187	0.244***	3.122	-0.162*	-1.835	-0.190**	-2.021	0.110	6.106*** (0.000)
Boundary	0.117	0.964	-0.330***	-2.772	n/a		-0.218***	-2.867	0.100	7.126*** (0.000)
Exploratory	-0.163**	-2.126	-0.282***	-3.685	n/a		0.194***	2.684	0.165	11.917*** (0.000)

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

Table A9.10 – Dependent control archetype variable & independent relative activity trait dummy variable determined OLS regression results (complete sample)

Control archetype	AT Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Adjusted R square	F-stat (significance)
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coefficient	t-stat		
Arms Length	0.035	0.320	0.047	0.469	0.100	1.078	n/a		-0.001	0.951 (0.417)
Results	0.059	0.653	0.141*	1.697	-0.067	-0.838	0.026	0.318	0.099	1.364 (0.249)
Action	0.034	0.393	0.082	1.010	-0.193**	-2.449	-0.221***	-2.688	0.058	2.573*** (0.008)
Boundary	0.004	0.029	-0.182*	-1.918	n/a		-0.215**	-2.146	0.070	5.133*** (0.002)
Exploratory	-0.066	-0.589	-0.205**	-2.227	n/a		0.247**	2.557	0.084	6.086*** (0.001)

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)

Table A9.11 – Dependent control archetype variable & independent continuous activity trait variable OLS regression results (complete sample)

Control archetype	AT Profile		Uncertainty		Asset specificity		Ex-post information asymmetry		Adjusted R square	F-stat (significance)
	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat	Coeff.	t-stat		
Arms Length	-0.079	-0.230	-0.098	-0.377	-0.017	-0.071	n/a		0.012	1.649 (0.180)
Results	0.464	1.261	-0.366	-1.606	0.193	0.822	-0.236	-1.313	0.004	1.185 (0.319)
Action	-0.227	-0.562	-0.104	-0.382	-0.326	-1.125	-0.345**	-1.998	0.159	8.867*** (0.000)
Boundary	0.225	0.583	-0.474	-1.566	n/a		-0.415*	-1.940	0.193	14.226*** (0.000)
Exploratory	0.535	1.194	-0.805*	-1.950	n/a		0.042	0.167	0.179	13.035*** (0.000)

***Significant at the 0.01 level (2-tailed); **Significant at the 0.05 level (2-tailed); *Significant at the 0.10 level (2-tailed)