CRANFIELD UNIVERSITY

MARIA REY-MARSTON

ALIGNMENT OF INTER-FIRM PERFORMANCE MEASURES IN CONTRACTUAL ALLIANCES AS A PREDICTOR OF RELATIONSHIP SUCCESS

SCHOOL OF MANAGEMENT
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This thesis is submitted in partial fulfilment of the requirements for the degree of PhD

ABSTRACT

This research explains the role of aligned inter-firm performance measures as a predictor of success in of contractual alliances. Contractual alliances, a popular type of inter-firm relations, are also known as non-equity alliances and often display conflicting objectives in their contractual agreements. This research proposes that the assessment of contractual alliances performance must go beyond the contract's ability to deliver to its internal performance targets or service level agreements (SLA). The success of contractual alliances lies in the alliance's capability to contribute to the specific performance objectives of the firms involved as well as to fulfil its internal SLAs. This capability is called alignment and the results of this research show that is critical to the success of inter-firm relationships.

The data for the research was gathered from outsourcing contracts between a logistics service provider and 149 users. Each contract includes its SLAs and two years of actual performance measures. The research design considers the firms' financial measures as a proxy for their performance objectives during the same period of time. The alignment construct was operationalised by creating an inter-firm alignment (IFA) coefficient calculated with mathematical techniques to assess multi-dimensional fit amongst constructs. The three dimensions included in the IFA coefficient are i) alignment of contract's SLAs and actual performance values, ii) alignment of contract's SLAs and provider's performance objectives, and iii) alignment of contract's SLAs and user's performance objectives.

Success of contractual alliances was operationalised using known measures from the inter-firm management literature, such as longevity, stability, formality and relative profitability of the relationship. Information for all determinants was available in the 149 contracts. The quantitative correlations were specified and calculated using structural equation models (SEM). The results show that aligned inter-firm performance measures are a strong predictor of contractual alliance success. The empirical model supports the positive correlation of

longevity and formality as measures of contractual alliance success, as stated in extant literature. The findings dispute the expected positive correlation between formality and stability with alliance success as described in the alliance literature. The results confirm the positive role of renegotiations as stated in the organization learning literature. Additional in-depth interviews were conducted with relationship managers, during the pilot study. The qualitative results support the quantitative findings.

This research contributes to theory by: a) conceptualising and measuring the concept alignment to inter-firm performance measures; b) estimating the contribution of relation-specific measures to contractual alliance success, and c) introducing alignment of inter-firm performance measures as a predictor of contractual alliance success.

The research and its results fill a substantive gap in managing contractual alliances. It provides the outsourcing industry with a tool that predicts the likelihood of relationship survival based on the degree of alignment of the inter-firm's performance measures. The quantitative methods employed in the research extend the use of current techniques for assessing 'fit' in the strategy literature, into the field of performance measurement systems.

Keywords: co-alignment; strategic fit of performance measures, inter-firm relationships; alliance success; longevity; renegotiations; successful logistics outsourcing, aligned metrics, performance measurement systems

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The PhD journey would have not been completed without the unconditional support of my family. I want to thank my sisters Adriana and Olga Lucia for travelling the doctoral path earlier, and thus motivating me to follow it. Thanks to my sister Paula for being so encouraging throughout the years. My parents, Emiliano and Olga, created an environment that demanded academic excellence along with unconditional love. What a wonderful environment to grow up in. Finally, I owe so much to Lee Marston, my husband, whose endless patience and faith in me carried me through this process.

Maria Rey-Marston

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I dedicate this thesis to my grandfathers, Emiliano and Fernando, the first academics I encountered in my youth. Their thirst for knowledge in history, law, chemistry and literature inspired me to be a researcher and a lifetime learner.

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LIST OF ABBREVIATIONS AND GLOSSARY

3PL	Third-Party Logistics	A type of outsourcing firm that provides logistics services on behalf of their customers. They sit between suppliers and customers as a third-party managing logistics flows. It is a synonym of logistics service provider
ACTUAL-SLA	Alignment of SLAs and Actuals	Observed variable in the alignment analysis representing the degree of fit between the target and the actual values of the SLAs in a contractual alliance
AMOS	Analysis of Moment Structures	It is the software application embedded in the SPSS Software used to conduct SEM analysis.
AP	Accounts Payables	Line in the liability side of balance sheet representing payments to be made to creditors
AR	Accounts Receivables	Line in the asset side of balance sheet representing payments to be collected from debtors
CA	Contractual Alliance	Type of inter-firm relationships characterised for lack of joint investment or equity building by the members of the relationship
CAS	Contractual Alliance Success Index	Unobserved dependent variable to be predicted based on the values of the IFA coefficient. CAS is measured as a function of the longevity, stability, formality and relative profitability of the relationship.
CFA	Confirmatory Factor Analysis	Confirmatory factor analysis is a statistical technique that studies how specific unmeasured factors influence responses on the values of measured variables.
CFO	Chief Financial Officer	C-level executive responsible for the financial strategy of the firm and typically in charge of investments and treasury management
C.R. (c.r.)	Critical Ratio	A ratio associated with the probability of a sample. It is calculated as the ratio of the deviation from the mean to the standard deviation.
DC	Distribution Centre	Dedicated or shared warehousing space for storage of commercial goods or service parts
Df (d.f.)	Degrees of Freedom	Degrees of freedom are the number of values in the final calculation of a statistic that are free to vary. They are commonly discussed in relation to forms of hypothesis testing statistics.

EBITDA	Earnings Before Interest, Taxes, Depreciation and Amortisations	Line in the Profit & Losses financial statement representing the net income with interest, taxes, depreciation, and amortization added back to it. It can be used to analyse and compare profitability between companies and industries because it eliminates the effects of financing and accounting decisions.
EFA	Exploratory Factor Analysis	Exploratory factor analysis is a statistical technique that uncovers the underlying structure of a relatively large set of variables to understand the relationships between measurable variables.
IFA	Inter-Firm Alignment Coefficient	Unobserved independent variable to be estimated based on the values of ACTUAL-SLA, USER-SLA, and PROVIDER-SLA. IFA will be used to predict the success of a contractual alliance (or CAS values).
IFR	Inter-Firm Relationships	Type of governance structure formed by two or more firms that create a new structure to pursue strategic goals
IOR	Inter-Organisational Relations	Synonym of inter-firm relationships and of strategic alliances
LSP	Logistics Service Provider	A firm engaged in the provision of outsourced logistics, transportation and services on behalf of their customers and users as a third-party
PM	Programme Manager	A team member of the Programme Management Group at the Provider firm
PMG	Programme Management Group	Dedicated group of Programme Managers in charge of representing the voice of the Users within the Provider's organisation
PMS	Performance Measurement System	The arrangement of performance measures design to assess, communicate and improve performance of a firm or a business function.
PROVIDER-SLA	Alignment of SLAs and Provider Targets	Observed variable in the alignment analysis representing the degree of fit between the provider's financial objectives and the target values of the SLAs in a contractual alliance.
RQ	Research Question	A research question poses a relationship between two or more variables but phrases the relationship in an interrogative way. It is developed after the review of relevant literature.
RMSEA	Root Mean Square Error of Approximation	It is one of the fit measures reported in AMOS. The RMSEA evaluates how well the model, with unknown but optimally chosen parameter estimates would fit the population covariance matrix. In recent years it has become regarded as 'one of the most informative fit indices due to its sensitivity to the number of estimated parameters in the model.

SA	Strategic Alliance	It represents a firm's strategic decision to engage in a relationship with another firm. It is synonym of inter-firm or inter-organisational relationships.
SCR	Supply Chain Relationships	A type of inter-firm relationships with a scope of products or services related to supply chain processes: order management, inventory, procurement, distribution, transportation and/or warehousing.
SEM	Structural Equation Modelling	Structural equation modelling is a statistical technique for building and testing causal statistical models. It is a hybrid technique that encompasses aspects of confirmatory factor analysis, path analysis and regression.
SGA	Selling, General and Administrative Expenses	Line in the Profit & Losses financial statement representing the non-direct expenses of a firm known as selling, administrative and general expenses.
SIC	Standard Industry Code	SIC Code is a number used to specify what industry a particular company belongs to.
SLA	Service Level Agreement	The collection of key performance indicators and performance targets that will be monitored according to the scope of a contract
SPL	Service Parts Logistics	A type of service in the portfolio of the 3PL. The service comprises all logistics activities to manage service parts including transportation, warehousing and inventory control.
TCE	Transaction Cost Economics	Economic theory that explains firms' behaviours to minimise transaction costs under the assumptions of bounded rationality, opportunism risk and uncertainty. Transaction costs are those incurred in searching for the best partner, the cost of establishing a supposedly "tamper-proof" contract, and the costs of monitoring and enforcing the implementation of the contract.
USER-SLA	Alignment of SLAs and User's Targets	Observed variable in the alignment analysis representing the degree of fit between the user's financial objectives and the target values of the SLAs in a contractual alliance

LIST OF EQUATIONS

1 INTRODUCTION

1.1. Context and Purpose

The research presented in this thesis explores the role of aligned inter-firm performance measures as a predictor to the success of contractual alliances (CA). The research is positioned at the intersection of three streams of the academic literature: inter-firm relationships[1] (IFR), performance measurement systems (PMS) and strategic alignment. These three streams, though widely and deeply researched, are rarely considered jointly. This research has a focus on contractual alliances, a popular type of IFR. Contractual alliances, also known as non-equity relationships, generate a complex system of performance measurements with the interplay of the contract's internal performance measures and the members' performance objectives. This complex inter-firm PMS is prone to conflicting and misaligned objectives.

This research aims to explore the alignment between the contract's internal performance goals or service level agreements (SLA), and the performance objectives of the participating firms. It evaluates whether these factors contribute to the overall success of the inter-firm relationship. To do so, a coefficient of inter-firm alignment (IFA) was conceptualised and calculated, and will be considered the independent variable of the analysis. The dependent variable is the contractual alliance success (CAS) defined by a relationship that is stable, longevous, formal, and relatively profitable for both parties involved. The research designed a theoretical model, tested quantitatively, that correlates the IFA coefficient with the CAS index; the principal hypothesis under study.

This research builds upon extant academic contributions on determinants of contractual alliance success (Ariño and Reuer, 2004) but proposes a new predictor and determinant: the alignment of the inter-firm performance

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[1] The concept of inter-firm relationships (IFR) has many synonyms such as inter-organisational relationships (IOR), alliances (A) or strategic alliances (SA). These terms may be used interchangeably throughout the document and refer to a strategic decision of the firm to engage in a relationship with another firm to achieve a strategic objective.

measurement system. Alignment is a central concept in the research. It has been extensively studied and measured in strategic management research (Venkatraman and Camillus, 1984; Venkatraman and Prescott, 1990; Venkatraman, 1990). It is defined as the process of making conflicting local objectives fit within a greater objective. Alignment seeks congruence amongst different objectives (McAdam and Bailie, 2002; Venkatraman and Prescott, 1990). When extrapolated to performance management systems (PMS), alignment has been prescribed as a desirable feature (Kaplan and Norton, 2006). It has not been assessed quantitatively, although it is identified as an area of research in collaborative enterprises (Busi and Bititci, 2006). The aim of this research is to explore the benefits of aligned inter-firm performance measurement systems and contribute to greater theoretical coherence and empirical testing, as needed in the fields of inter-firm relationships and performance measures (Kathuria et al., 2007; Nielsen, 2010; Nielsen and Gudergan, 2012).

The empirical analysis was conducted based on the contractual alliances' complexities of non-equity relationships. Contractual alliances are the opposite of equity-based relationships where partners actually share and build individual equity in the new governance mechanism (Gulati and Singh, 1998; Anand and Khanna, 2000). Contractual alliances are complex governance structures because their design does not consider a central coordination instance in order to aid in aligning opposite objectives.

The data used in this research comes from the logistics outsourcing industry. It was provided by one of the largest global service providers in the industry. Outsourcing offers an ideal context in which to study contractual alliances because both parties involved in the relationship may have conflicting objectives (Knemeyer and Murphy, 2004; Tsai et al., 2012). The conflict arises when providers seek to maximise revenue and profits and users look to minimise costs and capital expenses via outsourcing contracts.

Logistics outsourcing relationships are governed by service level agreements (SLAs[2]) (Sharafali and Bhakoo, 2007). The terms of SLAs are agreed upon by key performance indicators that users have negotiated with the service provider. SLAs include a desirable state of performance – what is called a *target* level – and the *actual* value of each indicator that is compared on an on-going basis with the target. SLAs are typically associated with a performance-based rate structure to determine the provider's compensation. These variable rate structures bring additional conflicts in contractual alliances. Service users seek lower fixed rates from service providers and flexible contractual arrangements. However, service providers aim for long-term relationships with cost plus rates (Tsai et al., 2012; Krauth et al., 2005). The industry's standard response has been to negotiate the conflict by using multiple performance metrics that represent the views of both parties. This, however, generates cumbersome SLAs and contracts with too many indicators to be tracked. It also causes constant tension regarding the priority of specific metrics.

If the alignment of objectives is a desirable feature within intra-firm PMS that have central governance instances, it should even be a more important feature within inter-firm PMS lacking a centralised coordination instance. This research calculates the inter-firm alignment (IFA) coefficient by quantifying the fit between: i) contract's SLAs and actual performance, ii) contract's SLAs and provider's performance objectives, and iii) contract's SLAs and user's performance objectives. If the SLAs fit the participating firms' performance objectives perfectly the IFA coefficient will be equal to zero[3]. Good alignment, representing a very small distance (or misalignment) between two constructs, yields calculations of very small values, ideally as close as possible to zero. The IFA coefficient becomes the independent variable of the analysis that may determine the success of the contractual alliance success (CAS); CAS is the dependent variable of the equation.

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[2] Throughout the rest of the document a contract's Service Level Agreements will be referred to as SLAs

[3] It is the result of zero misalignment or zero Euclidean distance between two constructs. The methodological details will be clarified in Chapter 4.

The alignment calculations are generated from contracts between one leading logistics service provider and 149 users. All contracts provided data on agreed upon SLAs, their target levels and actual performance values during a two-year period. The performance objectives of the provider and the users were generated from available financial metrics of the 150 firms in the analysis. These were used as approximations of the firms' performance objectives participating in a contractual alliance (Kaplan and Norton, 2001; Kaplan and Norton, 1996; Kennerley and Neely, 2000; Neely et al., 2005).

The resulting alignment coefficient becomes the independent variable to be correlated with relational success as the dependent variable. The key argument of this research is that greater alignment of inter-firm performance metrics is positively related and significant to predict overall success of contractual alliances (Bititci et al., 2005; Bititci et al., 2006).

1.2. Gaps and Research Questions

1.2.1 Knowledge Gaps

Gaps became apparent after reviewing the relevant academic literature on inter-firm relationships (IFR), performance measurement systems (PMS) and strategic alignment. The use and design of performance measurements in inter-firm contexts could benefit from additional testing of some recommended features such as alignment. These gaps have been previously identified in published literature reviews (Bititci et al., 2005; Busi and Bititci, 2006; Parung and Bititci, 2008). Some will be addressed by the contributions of this research.

The literature review, presented in Chapter 2, identifies four types of gaps that will be addressed in this dissertation: (1) gaps in theory, (2) gaps in empirical studies, (3) contextual gaps to study the topics, and (4) substantive gaps related to the application of these concepts in managing inter-firm relationships.

Gaps in theory are related to the inability to predict or explain a phenomenon based on tested hypotheses. Available frameworks for performance measurement systems only reach the <u>single firm</u> hierarchy and are insufficient to assess the alignment of their performance objectives in inter-firm relationships (Neely et al., 2005). No studies were found that explain or predict the success or failure of a contractual alliance based upon the level of alignment between the contracts' SLAs and the financial objectives of the firms in the relationship. That fact supports the purpose of this research. The current assumption from the literature is that success of a contractual alliance is based on the ability of the provider to deliver results against the contracted SLAs (Knemeyer and Murphy, 2004; Ariño and Reuer, 2004). This research will add to the discussion the fact that success in contractual alliances is due in part to greater alignment with the partners' performance objectives. When alignment is not present it may explain *why* some apparently successful contractual alliances fail, even when they deliver results against contractual SLAs.

Empirical gaps reflect the lack of studies that connect the phenomena explaining *when* and *where* greater alignment of performance measures contribute to contractual alliance success. The studies that deal with concepts of collaborative or cross-enterprise performance measures do not empirically measure the alignment feature (Parung and Bititci, 2006). Moreover, such studies do not correlate *'alignment'* with the *'success'* of the relationship either conceptually or empirically (Coletti et al., 2005; Vitasek and Manrodt, 2012).

Contextual gaps refer to the ability to generalise the findings of existing research in specific industries or geographies. Although logistics outsourcing serves as the context for many articles on contractual alliances, none of these studies explore the role of aligned performance measures in the success of a logistics outsourcing relationship. Nor do they measure alignment between contract's SLAs and partners' objectives (Tsai et al., 2012; Vitasek and Manrodt, 2012).

Finally, and in the spirit of developing applied research relevant to practice, there were no studies that could explain to practitioners *how to* measure inter-firm performance measurement alignment or how to predict the success or failure of a contractual outsourcing relationship based upon inter-firm alignment results. The available literature related to methods for measuring alignment, focuses on measuring alignment of one business function with the corporate strategy or between corporate strategy and the market environment (Venkatraman and Camillus, 1984; Venkatraman and Prescott, 1990; Venkatraman, 1990; Venkatraman, 1989). This research proposes the application of such methods to a new context which has far reaching management implications.

The evidence of theoretical, empirical, contextual and substantive gaps in the academic literature is translated into the questions that will be addressed in this doctoral research and translated into hypotheses to be tested.

1.2.2 Research Questions

The research aim of the study is to correlate alignment of inter-firm performance measures with the success of contractual alliances. If alignment of inter-firm performance measures matters to contractual alliance success it will help to explain why some contractual alliances are terminated abruptly when internal goals are achieved.

Keeping in mind the gaps documented in the literature review and introduced above, the research will answer the following questions:

> RQ1: How can inter-firm performance alignment be measured, considering contractual SLAs and the alliance members' performance objectives?
>
> RQ2: How can contractual alliance success be operationalised, using known measures of that success such as longevity, formality, relative profitability, and stability?
>
> RQ3: How much does inter-firm alignment (IFA) contribute to predict contractual alliance success (CAS)?

The above questions will form the research hypotheses, which are grounded in the literature and will be tested through the proposed structural equation model

(SEM) model (to be described in detail in Chapter 4, under quantitative methods).

1.3. Research Model

The study follows the research model presented below in Figure 1. This model describes the overall relationship between inter-firm performance alignment and the success of the contractual alliance. A new construct was designed to measure alignment of inter-firm performance: the inter-firm alignment coefficient (IFA). The IFA is the result of estimating the distance (fit) amongst three sets of performance measures: i) the contract's SLAs vs. actual performance, ii) the contract's SLAs and the provider's financial objectives, and iii) the contract's SLAs and user's financial objectives. The firms' financial objectives are used as a proxy of their performance objectives.

Once the IFA coefficient has been calculated, the model proposes to estimate an index for contractual alliance success (CAS). The CAS index includes four variables that indicate the degree of success of contractual alliances. Three of these variables were derived from previous research documented in the management literature. They are longevity (duration of the relationship), stability (minimising the need to renegotiate), formality (existence of a signed formal contract), and relative profitability (Ariño, 2003; Reuer and Ariño, 2002; Zollo et al., 2002; Reuer and Zollo, 2005; Parkhe, 1993). The fourth variable, relative profitability, measures the impact of the contractual alliance to the provider's revenue and the user's cost structure. It was conceptualised from a game theory perspective and the associated switching costs.

The research model will be explained in more detail at the end of Chapter 2 with the literature review, and will be translated in the research hypotheses.

The research model is grounded in Transaction Cost Economics (TCE) theory. TCE supports the idea that firms seek to economise the costs involved in transacting either internally or externally, and that economisation takes place as firms select the appropriate governance structure for different types of transactions. Optimal governance structures minimise transaction costs and protect the firm against unavoidable opportunism in business. Chapter 3 will justify this choice in more detail.

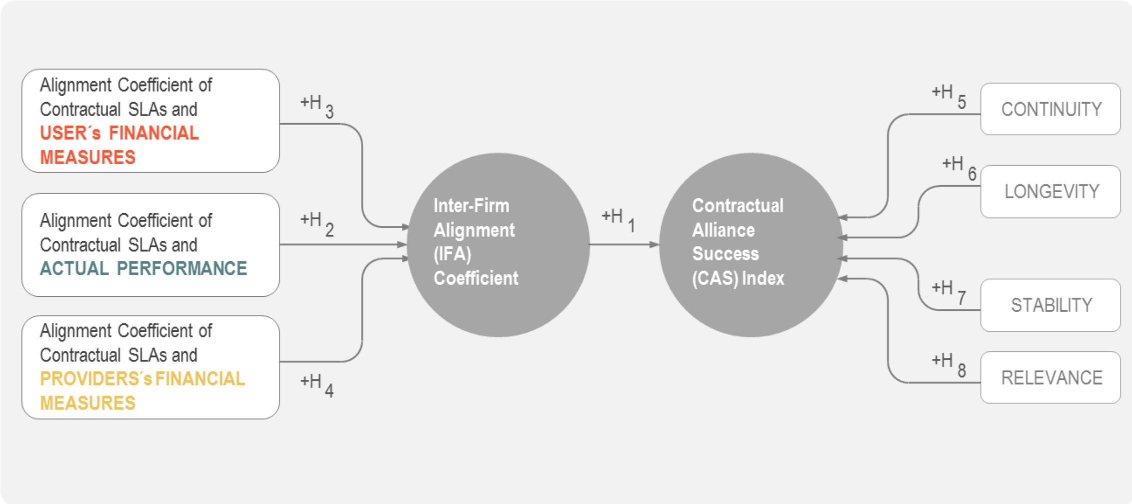


Figure 1 Proposed Research Model

In the proposed research model, the inter-firm alignment coefficient (IAF) acts as the independent variable or predictor of the value of the contract alliance success (CAS) index. It is evident that alignment of performance measurement systems is not the only determinant of IFR success. With that in mind, the research will isolate the IFA coefficient to measure its single explanatory power of the CAS index.

Chapter 2 describes in detail the literature review that supports the research model, the knowledge gaps to be addressed, and the hypotheses to be tested.

1.4. Contributions and Findings

This research contributes to management theory, business practice and quantitative methods in the fields of inter-firm relationship management, performance management systems and strategic alignment. The research project is placed at the intersection of these three literature domains, which are depicted in Figure 2.

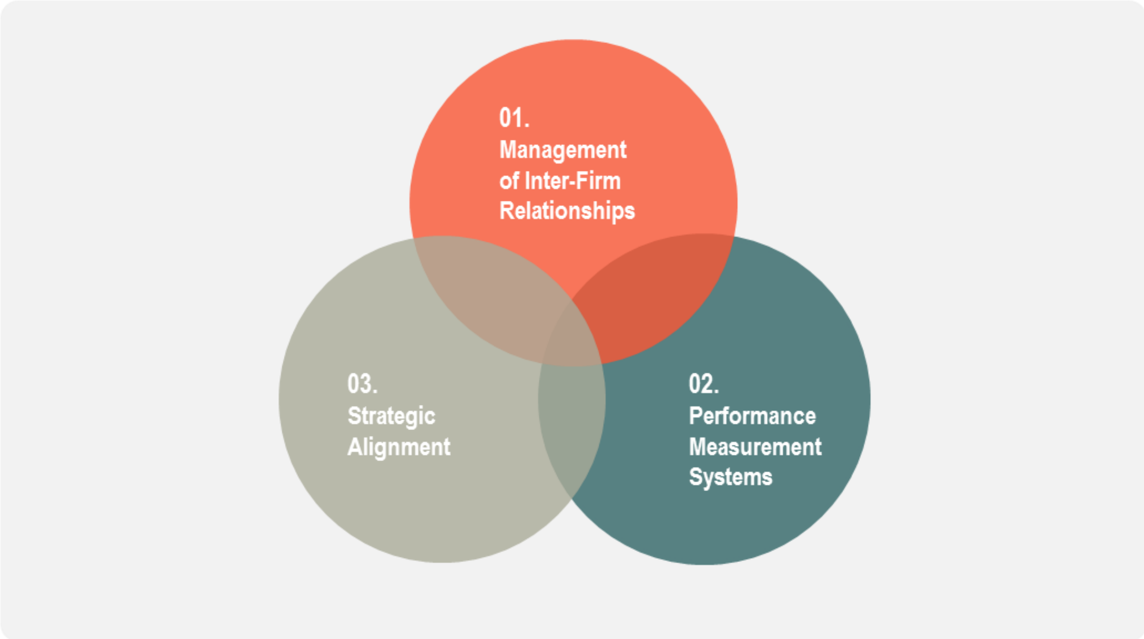


Figure 2 Locus of Expected Contributions

The study conceptualised and measured the inter-firm alignment (IFA) coefficient by adapting an existing method from the strategy literature. The method is based on measuring Euclidean distances between the numerical values of two or more constructs. The method has been used extensively to test alignment between functional strategy and corporate strategy (IT strategy is a premier example of this). It also tests the alignment between corporate strategy and the firm's environment (Venkatraman and Camillus, 1984; Venkatraman and Prescott, 1990; Venkatraman, 1990; Venkatraman, 1989).

The calculations of the inter-firm alignment (IFA) coefficient measured the fit between three different dimensions of performance: i) contract's SLAs and actual performance, ii) contract's SLAs and provider's performance objectives, and iii) contract's SLAs and user's performance objectives. These three components created a general IFA coefficient by contract. A key finding in this phase of the research was the fact that there is one critical dimension of performance that drives alignment of the whole contract: .the alignment between the contracts' SLAs and the users' financial objectives. When alignment is high in this dimension, the overall alignment of the relationship is high as well. Chapter 6 shows the quantitative details of the model.

The calculation of the contractual alliance success index is another contribution of this research. The CAS index was calculated using existing measures of success that have been proposed and tested individually in the management literature. The CAS index includes contractual alliance characteristics such as longevity (Parkhe, 1993), stability (Ariño and Reuer, 2004; Reuer and Ariño, 2002; Ariño et al., 2001), formality and the relative profitability of the relationship for the partners. Using data from 149 contracts this study shows the relevance of each variable to the overall CAS index. The quantitative analysis confirmed the contribution of longevity to CAS as predicted in the literature. However the results of the SEM contradict the proposed hypotheses that consider stability and formality measures of CAS. The research shows that low stability (high numbers of renegotiations) is closely correlated with the values of the CAS index. The same is true for low formality. These findings challenge traditional IFR management views. The fourth measure of CAS, relative profitably, was proposed during the full quantitative study when more data became available. It was positively correlated with CAS though with low contribution to success.

The main contribution of this research was the causal correlation established between the levels of the IFA coefficient to predict the values of the CAS index. Higher levels of alignment of inter-firm performance contribute to greater contractual alliance success. The results concluded that inter-firm performance alignment is one of the determinants of success in inter-firm relationships. The analysis was conducted using a model of structural equations (SEM) that simultaneously established bivariate correlations and the overall fit of the estimated model versus the existing data. The SEM's output estimated the goodness of fit of the model to validate all research hypotheses simultaneously.

In summary, successful inter-firm relations have negotiated conflicting objectives that seek alignment towards common goals by leveraging their performance measurement systems as a management tool (Kaplan and Norton, 2006; Kathuria et al., 2007; Decoene and Bruggeman, 2006; Neely and Najjar, 2006). By adapting and testing a method to measure degrees of alignment of inter-firm objectives, as well as the effect on successful contractual alliances, this research expands on current theories of performance measurement and inter-firm relationship management. The research confirms the value of strategic alignment in a new context.

Applied research must also inform and shape management practice. Considering the high level of activity in the formation (and dissolution) of contractual alliances, it is important that management research addresses the expanding use of service providers to manage non-core business functions (Gulati and Singh, 1998; Gulati and Kletter, 2005; Gulati, 2007). The conclusions and methods of this research will inform managers on how to set-up better SLAs and the importance of aligning them to the financial objectives of signing firms. In the case of existing contractual alliances, service providers will be able to identify and modify relationships that have a high risk of dissolution and low probability of success. Getting access to this predictive capability motivated the sponsoring logistics service provider to support this research and grant access to their internal contracts and managers. It is expected that the contextual contribution of this research in the logistics outsourcing industry will be extrapolated to other sectors facing similar challenges of aligning objectives across inter-firm relations.

1.5. Research Approach and Thesis Structure

The structure of this document follows closely the approach taken during the research. Chapter 1 introduces the context of the research topic and discusses the main motivations for pursuing the project, including the main knowledge gaps and research questions. Chapter 2 presents a thorough literature review of the three literature domains that frame the discussion on alignment of inter-firm performance measures. The review confirms the knowledge gaps and proposes researchable hypotheses that will be answered using a multi-method research approach of quantitative statistical analysis combined with in-depth interviews. Chapter 3 introduces the theoretical model that will be used in light of the premises of Transaction Cost Economics and the philosophical position to approach the hypotheses. Chapter 4 presents the research methodology including the operationalisation of variables using the service provider's contracts. These contracts are of two types, one set of active (successful) contracts and a set of decommissioned (failed) contracts.

As part of the research design, a triangulation of quantitative and qualitative research methods is proposed. The quantitative methods have been applied to the calculations of alignment and the computation of a structural equation model to explain the relationship between alignment and CA success. Quantitative results were generated from the Pilot Study with 11 contracts summarised in Chapter 5 and from the full study with all 149 contracts, analysed in Chapter 6. The qualitative method via interviews was applied to confirm the rationale of the proposed hypotheses, and to improve sense-making of the quantitative results of the pilot study. The interviews are summarised in Chapter 5 as well. The validation of the research hypotheses as a result of the full quantitative analysis from the SEM is offered in Chapter 6. Chapter 7 summarises the findings of the research and states the contributions of the research and its limitations.

Table 1, below, presents the overall structure of the document and key contents from each section.

Table 1 Thesis Structure

CHAPTER	DESCRIPTION	KEY CONTENT
Chapter 1. Introduction	Sets the context for the research by emphasizing the importance of managing inter-firm relationships and the use of performance measurement systems to seek alignment of conflicting objectives present in contractual alliances.	Research Context Knowledge Gaps Research Questions Expected Contributions Research Approach and Thesis Structure
Chapter 2. Literature Review	Reviews key references of the academic literature covering three specific management fields relevant to the research. These fields are: management of inter-firm relationships and determinants of their success; performance measurement systems, features and applications to the IFR field; and concepts of strategic alignment with a review of methods to evaluate it.	Types of IFRs Contractual Alliances Determinants of Success of Contractual Alliances Impact on Firm Performance Operationalisation of the Alignment Concept Knowledge Gaps and Hypotheses

Chapter 3. Theoretical Model & Hypotheses	Explains the operationalisation of the research constructs and the choice of performance measures from contracts, users and providers to be aligned. Presents the choice of theoretical lens (Transaction Cost Economics – TCE) that informs the research and the philosophical position supporting research methods and contribution. The Chapter ends with arguments for advancing the research hypotheses.	Operationalisation of Research Constructs TCE as a Theoretical Lens that Connects IFRs and Performance Management Philosophical Position Informing Research Research Model and Hypotheses
Chapter 4. Research Methodology	Describes the multi-method research design including the interview protocol, and the experimental design from a single data source. It presents in depth descriptions of the operationalisation of all variables used in the quantitative analysis. The Chapter ends with a description of the research strategy that was developed as a result of the selected research method and that will be applied for the pilot and full studies.	Unit of Analysis and Context Operationalisation of Performance Variables Operationalisation of the (CAS) Index Operationalisation of the IFA Coefficient Interviewing as Qualitative Method SEM Quantitative Research Design Strategies for Pilot and Full Studies
Chapter 5. Data Collection and Pilot Studies	Presents data collection methods for both quantitative and qualitative sources. The Chapter describes the results of two pilot projects: one to operationalise the two key constructs of the research: the inter-firm alignment (IFA) coefficient, the contractual alliance success (CAS) index; and the second to validate these constructs and the research hypotheses with in-depth expert interviews. The conclusions summarise the implications of the pilots for the full quantitative study.	Quantitative Data Collection Pilot Study 1 for Construct Operationalisation Results of Pilot Study 1 Pilot Study 2 for Construct Conceptual Validation Results of Pilot Study 2 Implications for Full Quantitative Study
Chapter 6. Model Results and Analysis	In the context of the research hypotheses, this Chapter begins by justifying the suitability of structural equation modelling (SEM) as the technique selected for the full quantitative analysis. It also presents a step-by-step description of all actions recommended for using SEM—from data preparation to the analysis of significance tests.	Data Preparation Model Specification Model Identification Model Estimation, Testing and Modification Final Model Estimation Analysis of Global Model Fit Analysis of Estimated Parameters Significance Tests by Theorised Relation (Hypotheses)

Chapter 7. Discussion of Results and Contributions	This Chapter describes key findings of the research, connecting the results with the research hypotheses and the contributions of the research for theory and for practice. The Chapter also acknowledges the limitations of the research and future avenues of research	Results for Each Research Hypotheses Contributions to Theory Contributions to Practice Contributions to Methods Limitations
Chapter 8. Conclusions	This Chapter summarises the aim of the research, restates the rigour and importance of the topic and the method, and proposes new ideas for research projects in the field.	Research Summary Rigour and Importance Further Research
References	Bibliography cited in the dissertation	Cited references
Appendices	Detailed raw data received from the logistics service provider and 24 months of indicators.	Raw data from logistics service provider

2 LITERATURE REVIEW

2.1 Introduction

This Chapter presents the results of the literature review that demonstrates the existing knowledge gaps referred to in Chapter 1. The existence of researchable gaps in the extant management literature is fundamental in order to justify this doctoral research. The literature review indicates the need of additional research on the alignment of inter-firm performance measures and their role in predicting success of contractual alliances in particular and inter-firm relations in general.

The literature review was conducted using the Systematic Review. The review systematically identified, assessed and summarised pertinent contributions providing the theoretical foundation that informs this doctoral research (Tranfield et al, 2003). The systematic review confirmed in a more definitive way, the opportunity to contribute to the body of knowledge in the fields of inter-firm relationships, performance measurement systems and strategic alignment.

The systematic review refined the existing references in terms of quality of the contribution and applicability to my research problem. The inclusion and exclusion criteria are presented in Table 2. Considering the amount of available sources of information, the process of fully documenting the state of the knowledge in the selected domains required a structured and methodical review approach (Denyer and Tranfield, 2009).

Table 2 Inclusion and Exclusion Criteria for the Systematic Review

Ranking of Journals (Based on Cranfield University Guidelines)	Grasp of existing knowledge	Proposed problem or research question	Research method: data collection, data processing, data analysis	Quality of conclusions: Argumentation, Contribution, Identification of future areas of research.
☆☆☆☆	Excellent review of relevant literature and widely cited reference (+100	Creative academic research question with clear application to	Clear justification of selected research method, clarity in data	Reaching the conclusions was a natural process from the literature review,

	citations)	management research	collection, analysis and processing.	the proposed question, and method for data analysis.
☆☆☆	Good review of the literature but missing some key concepts. Locally cited (50-100 citations)	Interesting problem to research from an academic perspective with little application to business	More focus on the research method but limited clarity in data collection methods and analysis.	The conclusions are interesting but the links between method and results are not clear.
☆☆	The literature cited missed key authors. Niche contribution with 25-50 citations	Good documentation of a management problem with little academic rigor in the discussion.	More focus on data collection and analysis but little discussion on the pertinence of the research method.	Conclusions are interesting but there is no correlation with gaps in the literature.
☆	The literature reviewed for the research does not reflect a current knowledge of concepts and authors in the field. Few citations (less -25)	The paper does not propose a research problem relevant to academia or practitioners.	The method utilized for data collection, analysis and processing did not fit the problem or the conclusions	Conclusions do not add to the body of knowledge. Seem irrelevant or disconnected from method and data.

Source: Table by Author based on Denyer and Tranfield (2009)

Three knowledge domains are central to inform research within the scope mentioned above. Two of them are traditional management research fields: inter-firm relationships (IFR) and performance measurement systems (PMS). The third domain is centred on the concept of alignment, which connects, in an inter-firm context, the literature on IFRs and on performance management. Alignment is a more recent management concept, originated in the strategy literature. It was transposed to the PM literature after the advent of Balanced Scorecard (Kaplan and Norton, 2006; Kaplan and Norton, 1996; Kaplan and Norton, 2004; Kaplan and Norton, 1992) as a performance measurement framework. Balance Scorecard strongly advocates alignment as a desirable feature of a measurement system. As a construct, alignment is used primarily in intra-firm contexts (Kaplan and Norton, 2006). However, in this research alignment will be conceptualised and measured in an inter-firm context.

Within the IFR domain the literature review covered the common taxonomy of strategic alliances with a specific focus on contractual alliances (CA), also known as non-equity alliances. From an alignment-seeking perspective, contractual alliances pose an interesting management challenge because of the presence of often conflicting objectives between partners and the existence of a third set of performance measures (SLAs) to be aligned. These SLAs are embedded in the contract that governs the CA. The review of the IFR literature includes a summary of the motivations for alliance formation, the determinants of IFR success (Gulati, 2007; Gulati et al., 2011; Gulati et al., 2009), and a connection to performance evaluation of the new governance structure.

The second domain in the review is the vast field of performance management literature. To uncover the knowledge gaps that support this research, the review connects the fundamentals of performance measurement systems in an intra-firm context with the assessment of IFR success. This includes specific characteristics of CA's performance measurement systems, definitions and measurements of CA's success and characteristics of performance measurements applied in to the inter-firm space rather than solely intra-firm performance (Neely et al., 2005; Martinez and Bititci, 2006).

Considering the scope of the proposed research, alignment is explored in the literature review as a third domain. Alignment has been a popular construct in management research for a diversity of purposes (McAdam and Bailie, 2002; Kathuria et al., 2007). It is believed to be a desirable and measurable quality in strategy formulation, and is often used when testing the fit between a firm's strategy and its environment (Venkatraman and Prescott, 1990; Venkatraman, 1990; Nielsen, 2010). The construct has also been applied as a characteristic that ensures coherence between corporate strategy and local or functional strategy. And it assesses the fit of a specific project and corporate strategy. In the field of performance measurement systems, alignment has been mentioned as a desirable feature of the system where all performance measures must align with an overall goal of the firm (McAdam and Bailie, 2002; Kaplan and Norton, 2006; Zajac et al., 2000). For this research it is crucial to explore the role of performance measures in IFR management and reviewing different methods to measure alignment in the context of contractual alliances.

Alignment of performance measures in contractual alliances occurs among three different systems (Nielsen and Gudergan, 2012; Gulati et al., 2011):

i) The performance measures of the governance mechanism or service level agreements (SLAs);
ii) The performance measures of the firm providing products or services in the alliance; and,
iii) The performance measures of the firm procuring those products or services.

Overall, the goal of the review is to demonstrate gaps in the academic research connecting degrees of alignment of contractual alliance performance measurement systems as determinants of the inter-firm relation success.

2.2 Inter-Firm Relationships

2.2.1 Importance

The years of the interconnected firm are upon us (Gulati and Kletter, 2005; Gulati et al., 2009; Lavie, 2006). This is confirmed by the business world announcing, on a daily basis, the formation of a new kind of inter-firm relationship[4] and vast amounts of strategic management literature devoted to the study of inter-firm relationships. Journal papers on alliances, constellations, networks, joint ventures, licensing agreements, franchises, outsourcing relationships, horizontal integrations, vertical integrations, supplier-buyer partnerships, and many more forms of inter-firm relationships, add to the body

[4] The Association for Strategic Alliances (ASAP) estimates that in 2011 the number of new inter-firm relationships created was in excess of 2,760 across all industries and geographies.

of IFR knowledge. If the words 'alliance' 'inter-firm relations' are used in Google Scholar, the search results bring more than 15,100 articles since 2000 and over 3.1m hits from trade and business sources accessible in the world wide web[5].

Management authors have long theorised over the perils of being alone in business. *'Unitary organisations often suffer, amongst other things, from operational inefficiencies, resource scarcity, lack of facilities to take advantage of economies of scale, or risks that are more appropriately spread across multiple business units'* (Borys and Jemison, 1989). Management scientists, always keen observers of business realities, note the ever shrinking core of the firm and its expanding boundaries (Gulati and Kletter, 2005). So it is not surprising that management research on inter-firm forms has mushroomed.

2.2.2 Taxonomy of Inter-Firm Relationships

However, despite this interest, the study of alliance performance is complex. There are many frameworks describing the typology of IFRs, the strategic intent of firms pursuing alliances and different subjective ideas describing the performance of a strategic alliance without much data (Zollo et al., 2002; Zollo et al., 2002). Given this lack of consistency, it is appropriate to introduce some terms and definitions, and explain the way they are used for the reminder of the document.

Inter-firm relationships have been classified using different frameworks and typologies. Often they are riddled with redundancies and gaps, making it difficult to represent real business structures. There is also little convergence around key concepts (Das and Teng, 2001; Oliver, 1990). For the purpose of this thesis, all of these terms will be referred to as inter-firm relationships or IFRs. This is a term widely used in the literature and a synonym of inter-organisational relations summarised by The Oxford Handbook of Inter-Organizational Relations (Cropper et al., 2008) and by other key authors in the field (Barringer

[5] www.scholar.google.com search of the concepts of 'alliance' and 'inter-firm relations' conducted on March 31st, 2013

and Harrison, 2000; Dyer and Singh, 1998; Dyer et al., 2001). Inter-firms relationships are business structures that involve the close relation of more than one firm engaged in joint activities to pursue strategic or operational objectives. IFRs 'can occur as the result of a wide range of motives and goals, take a variety of forms, and occur across vertical and horizontal boundaries' (Gulati and Singh, 1998; Gulati, 1998; Mitsuhashi and Greve, 2009).

Table 3, below, offers a summarised typology of inter-firm relationships (IFR), generalised in some reviews as Strategic Alliances (SA). The typology is organised along the axes of hierarchies and market from Williamson's fundamentals of the structure of organisations (1979 and 1984). IFRs can be classified based on:

- The position of the focal firm in the network,
- The number of firms in the relationship,
- The degree of governance of the member firms in the IFR, and
- The balance between level of internal control and commitment of resources (i.e. how close they are to an internal function in a corporate hierarchy, such as joint ventures, or how far is the level of control making it akin to a market relationship).

This research will focus on non-equity contractual alliances which are located at the middle of the Williamson's continuum between hierarchies and market. Some authors equate the concept of IFRs to strategic alliances or alliances in general (Bleeke and Ernst, 1995; Hamel et al., 1989; Kanter, 1994). When this is the case, alliances include both equity and non-equity inter-firm arrangements. Gulati and Singh (1998) provide probably the most popular definition of *strategic alliance*, as a *'voluntary arrangements between firms involving exchange, sharing, and co-development of products, technologies or services'*.

Table 3 Typology of Inter-Firm Relationships

HIERARCHIES					
HYBRIDS	NETWORK POSITION	SIZE	DEGREE OF GOVERNANCE	BILATERAL CONTRACTS	UNILATERAL CONTRACTS
	Vertical	Dyads	Joint Ventures (JV)	Co-Developments	Supply Agreements
	Horizontal	Triads	Equity Arrangements (EA)	Co-Licensing	Marketing Agreements
	Diagonal	Consortia	**Contractual Alliances (Non-Equity)**	Co-Marketing	Licensing
	Prominent	Networks	Unilateral Contracts	**Outsourcing**	Franchising
	Entrepreneurial	Constellations	Inter-Locked Boards	**NON-EQUITY CONTRACTUAL ALLIANCES**	
MARKETS					

Source: Developed by Author from Fundamental TCE Concepts Combined with Other Typologies in the Strategic Alliance Literature

'Popular forms of strategic alliances include such arrangements as joint ventures, research and development agreements, co-marketing contracts, and significant buyer-supplier relationships' (Das and Teng, 2000; Sengun and Wasti, 2007). In this case, alliances (Barringer and Harrison, 2000) are a type of inter-firm relationships that are characterised by not having equity participation of the partners when forming a new organisation. Rather, the partners simply share resources to pursue a joint goal.

The table's first column, *network position*, refers to the relative position of the partner in the value chain of the focal firm. If the partner is next upstream (supplier) or downstream (distribution channel), then the IFR is *vertical* in nature. This concept applies mostly for dyads or triads. If the partner shares the same industry and product line, (for example, firms with the same SIC code), the IFR is *horizontal* and could even become an inter-rival strategic alliance, anti-trust laws permitting. *Diagonal* IFRs are possible when members of disparate industries come together to tackle new opportunities in product or market development (Gulati and Kletter, 2005).

This classification is non-exclusive as we find examples of vertical dyads forming a joint venture to do new product development, for example. However some combinations are more prevalent than others; most joint-ventures are horizontal, and most bilateral contractual agreements are vertical. Recent literature on the network of alliances (Koka and Prescott, 2008) describes two new types of IFRs based on relative position of the focal firm, where the firm could be the *prominent* centre of a network or an *entrepreneurial* member seeking some network advantages.

The column *size* refers to the number of firms in the IFR. It will be a dyad if two firms are participating of the arrangement, a triad if there are three, and a consortium with more than three. A larger number of firms in an inter-firm relationship, without finding specific quantities in the literature, are called a network (Gulati, 1998) or constellation. It is prevalent in the management literature today to find the concept of alliance portfolios, which refers to the amount of alliances and IFR that a single firm manages.

Most of the research on IFRs has been conducted at the dyadic level, although authors occasionally extrapolate their analytical frameworks to a web of relationships in which the firm operates (Wu et al., 2010). This web of relationships is again called a *network*, which reveals a pattern of ties amongst members. The concept of networks also refers to the environment or the 'social network' in which dyadic relations develop. These concepts of networks speak generally of a new way in which firms can generate additional rents and competitive advantage by specialising inter-firm (rather than intra-firm) assets. In that way, they obtain differentiating firm performance (Gulati, 1998), hence the term 'value networks'.

The column *degree of governance* stems from classifications based on the transaction cost economics paradigm. It is a popular typology of IFRs (Zollo et al., 2002; Barringer and Harrison, 2000; Oxley, 1997; Kogut, 1988) and was the typology used for early research on joint ventures and other forms of equity-based alliances. Following the transaction cost economics' logic, equity based arrangements and joint ventures are closest to *hierarchies.* Contractual non-equity alliances, meanwhile, are closer to the logic of *markets.* All forms in between are considered *hybrid* governance structures.

Das & Teng's (2001) typology defines alliances based on degree of governance as well. Their framework considers four forms of alliances: two of *equity*, and two of *non-equity.* Examples of equity-based relationships include equity joint ventures and minority equity alliances, and non-equity alliances are *bilateral* and *unilateral contract-based alliances*. *Bilateral contract-based alliances* require that both members invest resources in the relationship and work constantly together so they are integrated tightly to the IFR. In unilateral alliances, one member contributes an asset that is desirable and procured by the other member but the activities of the providing party are carried independently of the interaction with the buyer.

Regarding the nature of the resources to be shared bilateral alliances, could be define as a scale or link alliance (Dussauge et al., 2000 and 2004). In *scale alliances* the partners contribute similar resources thereby creating economies of scale and scope. In *link alliances*, members combine different resources and skills to generate new value for both members. Alliance portfolios tend to combine both types within the firm.

As described above, each type of inter-firm relationship has unique characteristics regarding ownership structure, degree of inter-firm interaction, control mechanisms, duration, and adjustments required in the event of an unplanned alliance termination. Using the taxonomy depicted in Table 3 above, this research focuses on bilateral non-equity alliances or contractual alliances (CA). They are characterised by lack of shared ownership, moderate degree of inter-firm interaction, mostly focused on the scope of the relation, and reciprocity as the key control mechanism (Nielsen, 2010).

2.2.3 Theoretical Lenses to Explain Alliance Formation

Before uncovering gaps that explain the connection between alignment of performance measurement systems and contractual alliance success is critical to understand the rationale behind alliance formation. Without understanding the theoretical lenses that explain IFR formation it will be difficult to articulate alliance success and impossible to connect success with degrees of goal alignment between members.

A review of the IFR management literature shows that determinants of alliance success vary depending on the theoretical paradigm applied to the formation of alliances. Any given theory will present a rationale for alliance formation, and will define the main purpose of the alliance, its expected outcomes and determinants for success.

This section briefly summarises the six prevailing theoretical lenses used to explain alliance formation. This will serve as an introduction to the discussion on determinants of alliance performance. Table 4, next, presents the key theoretical paradigms to be reviewed.

Table 4 Theoretical Paradigms to Explain Alliance Formation

RATIONALE FOR ALLIANCE FORMATION	Transaction Cost Economics
	Resource Dependence
	Strategic Choice
	Stakeholder Theory
	Organisational Learning
	Institutional Theory

Source: Barringer & Harrison, 2000; p. 382

The six lenses are organised from the most economical rationale embodied in transaction cost economics (TCE) to the most behavioural one represented by the institutional theory.

Taken mainly from (Barringer and Harrison, 2000), Table 5 below presents a brief summary of the lenses, the rationale for alliance formation from each one, the strongest academic criticism and an example of a determinant of alliance success under that particular lens. More than an exhaustive review of theories this is a selection of significant theoretical contributions and how each one explains IFR formation. Thus the determinants of alliance success change as well. It is worth mentioning that these theoretical lenses do not apply exclusively to the formation of CAs in particular but to strategic alliances and inter-firm relationships in general.

2.2.3.1 Economic Lenses

When transaction cost economics (TCE) is used as a theoretical lens (Das and Teng, 2001), alliances are defined as hybrid governance mechanisms that optimise transaction and production costs by minimising opportunism, bounded rationality and uncertainty (Barringer and Harrison, 2000; Williamson, 1993). Therefore, under TCE, determinants of alliance success are the pre-existing conditions of the alliance. Examples include relation-specific assets, - as a way to reduce opportunism -, (Dyer, 1997) and the appropriate governance structure and management competence to drive lowest transaction and production costs (Dyer and Chu, 2003). Optimal governance structures minimise transaction costs and protect the firm against unavoidable factors in business such as opportunism, uncertainty and bounded rationality (Williamson, 1981).

In Williamson's seminal contribution on markets and hierarchies (1985), inter-firm firms had not been yet conceptualised. Most of the prescriptive application to managers was for deciding when to use what type of governance mechanism: markets and their efficiencies (and risks), or hierarchies to maintain control but perhaps at a higher cost. A classic example that depicts this dichotomy is the make-or-buy decision (Walker and Weber, 1984). In 1991, Williamson adds the concept of hybrid structures as governance mechanisms that sit in between markets and hierarchies, and that were used mostly to explain vertical integration (Das and Teng, 2001). Oxley (1997) contributes with an additional taxonomy of hybrid structures by aligning joint ventures and equity alliances to hierarchies, and unilateral contracts (such as licensing, marketing, procurement and distribution agreements) to markets. Bilateral contracts (co-development agreements, outsourcing, cross-licensing and other reciprocal agreements) are in the middle of the hierarchy-market continuum.

The TCE explanation of alliance formation fails to articulate the concept of joint benefits or joint value creation. It assumes that one firm is willing to minimise transaction and production costs but it does not address what happens if both firms in an alliance are trying to apply the same logic. Zajac (Zajac et al., 2000; Zajac and Olsen, 1993) and Dyer (1997) depart from transaction cost minimisation as a motivation for alliance formation, and complement the TCE approach with the concept of joint value creation. There is additional criticism regarding the unit of analysis: TCE is focused on the transaction and its characteristics whereas other lenses are concerned with the characteristics of the firm and the factors, - strategic and social -, that explain IFR formation (Eisenhardt and Schoonhoven, 1996; Eisenhardt, 1989).

Looking at alliance formation through the lens of the resource dependency and resource-based theories, alliances are vehicles to acquire critical resources that are available in the market, or to avoid dependencies from resource controlling entities (Das and Teng, 2000). The resource view on alliance formation is deeply rooted in the concept of using resources as means to gain competitive advantage and power over critical resources that can differentiate the firm from its nearest competitors (Peteraf, 1993; Prahalad and Hamel, 1990). The assumption exists that resources capable of creating competitive advantage are unique (Hamel et al., 1989) but reachable within the industry and at a lower price, if acquired in a collaborative context. This context extends to the strategic and social motivations for formation of alliances as means to acquire and share resources (Eisenhardt and Schoonhoven, 1996). Some IFRs are knowledge seeking vehicles that provide strong motivation to alliance formation (Mitsuhashi and Greve, 2009; Kotabe et al., 2003; McNamara, 1998).

Table 5 Six Theories to Explain Alliance Formation

THEORETICAL LENS	DESCRIPTION	RATIONALE OF ALLIANCE FORMATION	LIMITATIONS	DETERMINANT OF ALLIANCE SUCCESS
Transaction Cost Economics (TCE)	Focuses on how an organisation should structure its boundary-spanning activities so as to minimise the sum of its production and transaction costs.	Alliances will be formed if they provide a mechanism that reduces the uncertainty of market failure but can operate at lower costs than establishing a hierarchy.	TCE is insufficient to explain other management motives, beyond cost minimisation, that drive alliance formation, such as learning or legitimacy.	Relation-Specific Assets Governance Mechanisms
Resource Dependence & Resource-Based View	Theorises that firms must engage in exchanges with their environment in order to obtain resources. Resources can lead to competitive advantage if they are: rare, imperfectly imitable, valuable, and non-substitutable.	Firms enter alliances to minimise the dependency of a given resource by exerting control over organisations that possess that resource.	Limited lens to explain how the transfer of competencies and resources take place in an alliance or other form of IFR.	Network Resources (Complementarily)
Strategic Choice	Study of factors that provide opportunities for firms to increase in competitiveness or market power. Profit and growth are typically the major firm objectives that drive strategic behaviour.	Entering alliances is a sensible strategy if the benefits of doing so (financial or strategic) exceed the associated costs (financial or perceived). Alliances may increase speed-to-market or neutralise a competitor.	Very broad approach that encompasses all other motivations for alliance formation under the concept of "strategies". Limited empirical testing.	Alliance Management Competencies

Stakeholder Theory	Organisations are at the centre of an interdependent web of stakeholders and have a responsibility to consider the legitimate claims of their stakeholders when making decisions or conducting business transactions.	Organisations form alliances to align their own interests with the interest of the stakeholders and also to reduce environmental uncertainty.	Lack of empirical testing. Theory mostly accepted on bases of 'moral correctness'. Stakeholder models conclude that IFRs facilitate goal congruence amongst stakeholders but do not suggest how.	Relational Capabilities
Organisational Learning	Is concerned over processes that lead to organisational learning. A key factor is absorptive capacity, which is defined as a firm's ability to recognise the value of new knowledge, assimilate it and apply it in a business setting.	Alliances will provide a source of knowledge that must be absorbed as much as possible in order to increase organisational competencies and add value to the organisation.	Focuses on skills development and transfers, without assessing costs of alternative knowledge acquisition vehicles. Does not adequately account for the risks of information sharing.	Knowledge-Sharing Routines
Institutional Theory	Suggests that institutional environments impose pressures on organisations to appear legitimate and conform to prevailing social norms.	Organisations form alliances to obtain legitimacy or to mimic, out of social pressure, other firms that have established IFRs.	It is difficult to explain why a different variety of IFRs exist even when the prevalent environment do not use them.	Partner Reputation

Source: Theories from Table 3 in Barringer and Harrison (2000; p. 370). Correspondence to determinants by Author.

The RD/RBV lens rejects the perspective of cost minimisation and greater efficiencies embedded in TCE as the motivation to form alliances. Major criticisms arise from the fact that TCE focuses on static efficiency and routine operations (Ghoshal and Moran, 1996). It does not consider other determinant factors for alliance formation such as needs and opportunities to get or share resources with other firms. Williamson critiques the ‘power’ aspect of the resource dependency view of the firm by saying that the advocates of the RBV lens reach a tautology when asserting that power allows the possession of critical resources, but possessing critical resources brings power (Williamson, 1981).

Using the strategic choice as a theoretical lens for alliance formation proposes that the motivation comes from opportunities for firms to increase their competitiveness and market power. Profit and growth are considered the major firm objectives that drive strategic behaviour (Barringer and Harrison, 2000) as they apply to formation of alliances and IFRs. To explain the formation of alliances, the strategic choice lens is used when firms use a wide variety of strategic reasons to pursue them such as increase speed-to-market or neutralise a competitor. These strategic reasons may include cost minimisation and resource acquisition objectives, both seen as separate motivations under TCE and RD/RBV, but seen as one “strategic choice” under this powerful lens.

The strategic choice lens has been applied more frequently in the analysis of joint ventures (Kogut, 1988; Harrigan, 1988), but the rationale applies to contractual alliances. However encompassing the “strategic choice” lens may be, critics argue that this very power, which seems to include almost all motivations for alliance formation under the concept of "strategic choice", has a limited empirical testing. Furthermore, it fails to recognise when to use alliances versus another governance structure for the firm (Barringer and Harrison, 2000). In short, under the strategic choice lens *‘the uniqueness of alliances, as strategic decisions, is not properly recognised’* (Das and Teng, 2001).

2.2.3.2 Behavioural Lenses

The institutional theory suggests that firms enter alliances and other forms of inter-firm relationships to draw legitimacy from that of the partner (Dacin et al., 2007). Even though legitimisation is a valid outcome for some alliance members, the institutional lens has difficulties explaining why joining an IFR is the best available choice to gain such legitimacy and why firms form different types of IFRs (Barringer and Harrison, 2000). Additionally, operationalised metrics of these outcomes, as they relate to alliance, are not yet found in studies considering this theoretical lens.

Some firms are at the centre of a network of stakeholders and use IFRs as the vehicle for coordinating multiple stakeholders' interests. The stakeholder theory is used to explain alliance formation. It considers the firm as a nexus of treaties (Aoki et al., 1990) and places the centre of a network with explicit and implicit contracts that need to be satisfied and measured (Atkinson et al., 1997). Agency theory can be considered a subset of the stakeholder theory to the extent that it focuses on one specific stakeholder and its relationship to the firm. In agency theory the main stakeholder is the principal shareholder and management is its agent. Agency theory argues that in order to avoid conflicts between agent and principal, generated by the maximising behaviour of both, strict controls must be in place (Eisenhardt, 1989; Lajili and Mahoney, 2006).

Organisational learning approaches, on the other hand, seem to be gaining traction as explanatory of inter-organisation relationships in general and alliances in particular. Hamel, Doz and Prahalad emphasise the value of international alliances in creating knowledge for competitive advantage (Hamel et al., 1989; Hamel, 1991). Knowledge acquisition could be considered a case of resource acquisition (Ireland et al., 2002). However, these authors emphasise the importance of absorbing such knowledge within the firm relying heavily on theoretical issues like absorptive capacity and knowledge management (Dussauge et al., 2000).

A seminal study on value creation for firms forming joint ventures and licensing agreements (Anand and Khanna, 2000) demonstrated that firms do learn to create value by taking their cumulative experience in managing alliances and presenting better than average financial results for both members of the alliance. Cumulative learning and improving absorptive capacity have also great impact in firm-level results when firms invest in alliance structures to coordinate alliance activity and code alliance-related know-how. This is demonstrated in a study with more than 200 organisations with different degrees of absorption of their alliance know-how (Dyer et al., 2001; Kale et al., 2000, 2001, and 2002; Kale and Singh, 2007).

Criticism to the organisational learning lens stems from the realisation that authors focus on management skills and knowledge transfer without assessing the costs of alternative vehicles of knowledge acquisition (besides IFRs). Additionally very few studies address the issue of risks in information sharing that are present in every alliance. One exception to this is found in Kale (2000), who proposes the use of relational governance mechanisms to protect proprietary assets in strategic alliances.

2.2.4 Determinants of IFR Success

Following Venkatraman and Ramanujam (1986) and Neely et al. (2005), IFR success is defined as the ability of the organisational form to deliver effective results to its partners and to be efficient in managing all internal shared resources available to fulfil the IFR-specific goals. This section reviews the different perspectives on determinants of IFR success, as a pre-requisite to exploring success measurement and alignment of IFR metrics.

Determinants are defined as the conditions, antecedents or mediators to success. Alternatively, determinants are those conditions available to an alliance (from its partners, the environment or strategic mandate) to perform better than any alternative organisational structure (Wittmann et al., 2009). Determinants of alliance success are classified in two categories: a)

Determinants originated from the participating firms, and ii) Determinants generated within the scope of the IFR.

There are characteristics present in the partners before the alliance was formed and made available to the new structure. This includes the nature of the resources to be shared; the relation-specific assets to be contributed to the alliance; and in general all competencies and experience that partners have in alliance management. These determinants are grouped under the *member-provided determinants.* They exist whether the specific alliance materialises or not.

The second group of determinants are those characteristics not available before the alliance is formed, but generated over time as the dynamics of post-formation begin to take effect. This group is known as *dynamic determinants,* and they include relational capabilities, governance frameworks, and information and knowledge sharing routines amongst others.

Determinants of alliance success are closely aligned with the particular theoretical lens used to explain alliance formation. These lenses were summarised in Table 5 above. Figure 3 depicts the two categories of determinants of alliance success with their correspondent theory to explain alliance formation.

2.2.4.1 Member-Provided Determinants

This section reviews the most frequent member-provided determinants of IFR success. The determinants range from the existing reputation of member firms, to a complex array of management capabilities related to alliance management. The review offers theoretical contributions and empirical demonstrations of the impact of these factors on alliance performance.

It is worth mentioning that most of these determinants have been conceptualised as contributors to the success of inter-firm relationships in general and not necessarily contractual alliances in particular. Alliance management research has been active in theorising the role of a particular determinant, creating and testing new constructs and measuring alliance success.

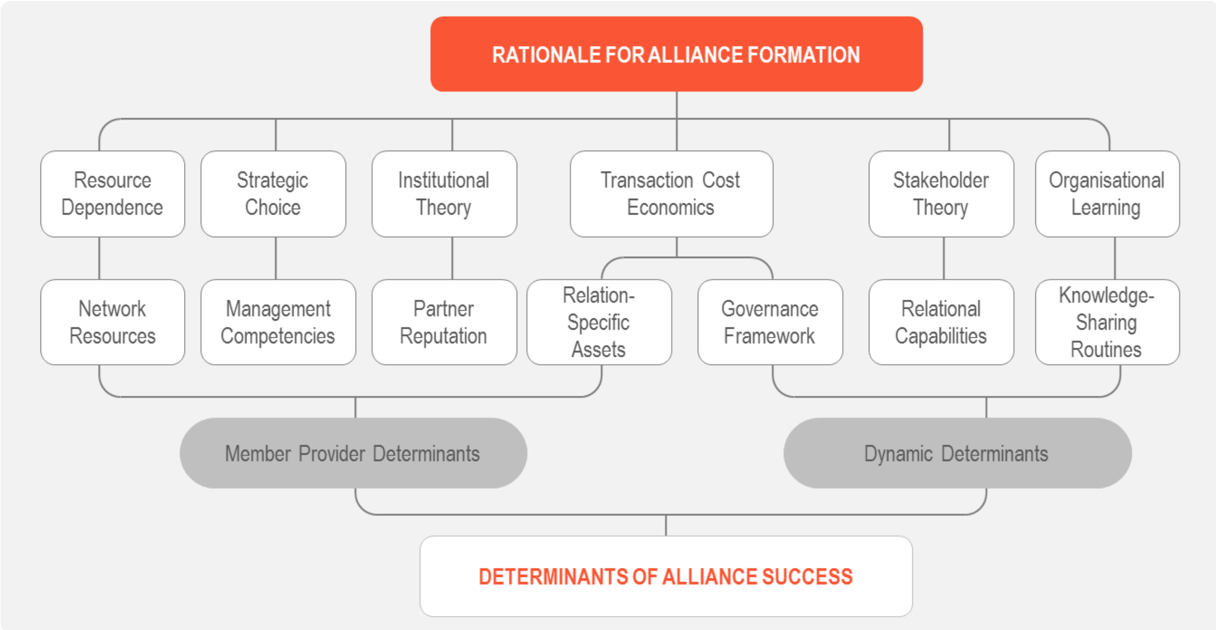


Figure 3 Formation Rationales and Determinants of Success

2.2.4.1.1 Network Resources

For an alliance to be successful it must pool the right kind of resources from member firms. These are called network resources (Gulati and Kletter, 2005; Gulati, 2007) and to follow the definition of the RBV, they are rare, valuable, imperfectly imitable and non-substitutable (Barney, 1996; Barney, 2001).

Value is created by combining or obtaining resources, under the assumption of resource deficiency (Lavie, 2006). Therefore resources ought to be complimentary (Anand and Khanna, 2000), compatible (Sarkar et al., 2001), reduce dependency from external sources (Barringer and Harrison, 2000) and contribute to a sustained competitive advantage (Dyer and Singh, 1998; Hamel et al., 1989; Spanos and Lioukas, 2001). If all those characteristics are accomplished there will then be empirical proof that resource owners achieve greater productivity through collaboration and specialisation (Dyer, 1997) with other firms.

2.2.4.1.2 Relation-specific Assets

Relation-specific asset investments lock partners in a relationship. In the case of strategic buyer-supplier relationships, the supplier has an interest to leverage his initial investment, and the buyer would like to maintain the favourable conditions for accessing the assets. Predicting continuity of the relationship is desirable for managers so they can adjust their actions accordingly.

Theoretical and empirical studies positively correlate a firm's performance in inter-firm relationships if there is a previous investment in relational-specific investments or assets. Those assets include stock ownership on the partnering firm, without configuring an acquisition or an equity-based IFR (Parkhe, 1993; Dyer, 1997 and 2002). In Oliver Williamson's words (2005) 'asset specificity is the most important dimension for describing transactions'. As we study alliance success, this determinant is critical. In his view, relational-specific asset investments include human, physical and site assets. However, one derived conclusion of increased asset specificity is the increased complexity of governance costs (i.e. more complex contracts), which in turn may translate into higher transaction costs.

Dyer (1997) demonstrated, with an empirical example from the automotive sector in the U.S. and Japan, that effective inter-firm collaboration (i.e. Japanese relationships) in the supply chain can prevent this undesirable effect. In doing so, firms may enjoy the benefits of both high asset specificity and low transaction costs. Japanese automakers, for example, have lower transaction costs than their American counterparts. This is primarily due to repeated transactions with a small set of suppliers, economies of scale and scope of high volume of transactions within a small group, extensive inter-firm information sharing which avoids "guessing games" amongst partners, use of non-contractual governance mechanisms with an indefinite time horizon, and investment in co-specialised assets.

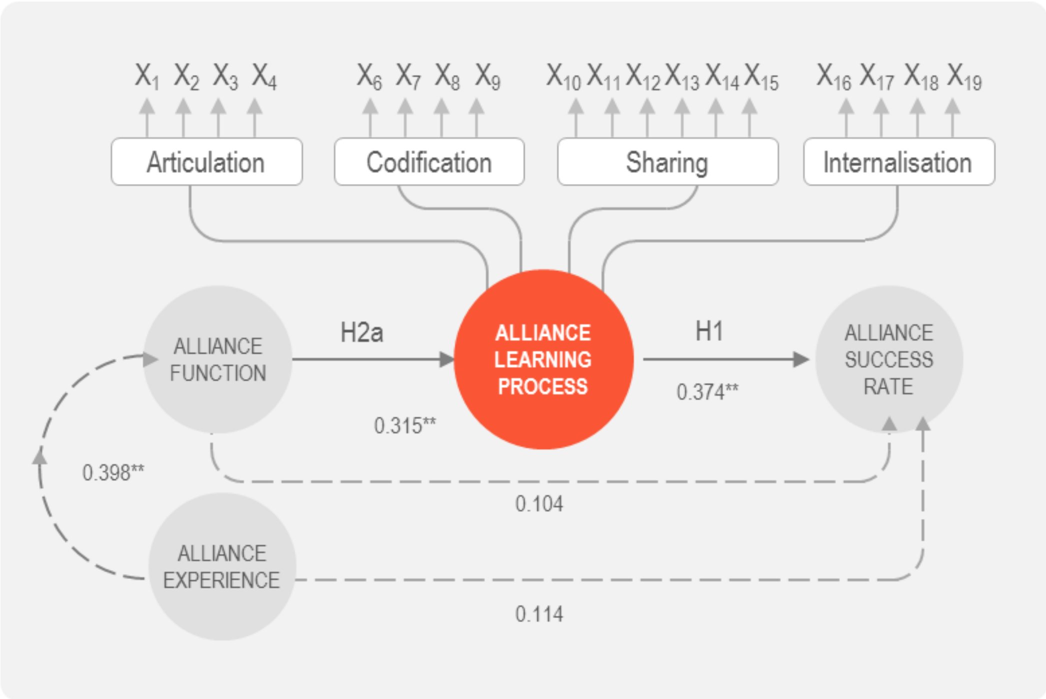
In two reviewed articles, authors emphasise the fact that experience in alliance management has become an asset to be brought into the relationship to create alliance success (Anand and Khanna, 2000; Madhok, 2000). In this scenario, more relation-specific investments generate more relational capital. In turn they increase the probability of alliance success. However, a recent empirical study conducted in the U.S. health care industry (Judge and Dooley, 2006) disputed the relation between relation-specific assets and protection against opportunistic behaviour, but other results of alliance outcomes and other determinants of the transaction cost met theoretical assumptions. These other determinants of success will be reviewed in more detail below.

2.2.4.1.3 Management Competencies

Under the lens of organisational learning we approach some of the discussions about the role of alliances in providing knowledge for the firm. Management competencies, as determinants of alliance success, propose the opposite relation: the more internal knowledge available on alliance management, the higher the probability of success.

It is a fairly straightforward proposition but one with interesting empirical validations in the literature. The more alliance experience a firm has, the greater value it derives from IFRs, especially equity and knowledge-based (Anand and Khanna, 2000). In other terms, alliance management competency could be also interpreted (Lambe et al., 2002) as the organisational ability to find, develop and manage inter-firm relationships.

Recent results from empirical studies support the importance of alliance management competencies as a determinant of success but mediated by a stronger role of 'learning processes'. For learning to take place it needs a strong degree of formalisation of different routines to articulate, code, share and internalise learning from previous alliances (experience) and to develop new capabilities applied to new ones (Kale and Singh, 2007). Figure 4 depicts the cycle of alliance learning, its determinants and correlation with alliance success rate.



Adapted from: Kale & Singh (2007)

Figure 4 Structural Model of Alliance Learning

Table 6 below summarises alliance management competencies provided by members of the inter-firm relationship and their contributions to alliance success.

Table 6 Alliance Management Competencies Provided by Alliance Members and Critical to Alliance Success

MANAGEMENT COMPETENCY	AUTHORS	DEFINITION	EMPIRICAL STUDIES ON SPECIFIC COMPETENCIES
Alliance Management Experience	Day (1995) Anand and Khanna (2000) Spekman, et al (1999) Simonin (1997) Kale, Dyer, Singh (2002) Kale & Singh (2007)	Experience in managing alliances and alliance management as tacit knowledge that can be leveraged across organisations.	Selecting and negotiating with potential partners Planning clear roles and responsibilities Attempting more complex and ambitious alliances. Correlates with the concept of the shadow of the future and pay-off patterns in Parkhe (1993)
Alliance Manager Development Capability	Lambe, et al (2002)	Firms with alliance management competence have the ability to develop capable alliance managers	To review continuously the fit of the alliance to the changing environment and make modifications as necessary. To plan and navigate the mechanics of the alliance so roles and responsibilities are clearly defined To minimise chances of alliance mismanagement and poor conflict resolutions
Alliance Partner Identification	Lambe, et al (2002)	Ability to scan the environment and find optimal alliance partners	To secure attractive partners To work with partners to successfully combine complementary resources into new alliances
Top Management Support for Alliance	Sivadas & Dwyer 2000 Lambe, et al (2002)	Top management support drives the implementation of a dedicated alliance management function.	Allocation of corporate resources to alliance monitoring and development
Dedicated Alliance Management Function	Kale, et al (2002) Kale & Singh (2007)	Institutionalisation of tacit alliance management knowledge into an explicit knowledge in a formal function. (Kale & Singh, 2007)	Kale, et al 2002 verified that having a dedicated alliance management function is even more important as a determinant of success than overall alliance experience. An alliance learning process that involves articulation, codification, sharing and internalisation of alliance management know-how is positively correlated to firm-level alliance success.

2.2.4.1.4 Reputation

Under the institutional theory lens, in order to provide legitimacy to one firm through an alliance, the key determinant of success is the reputation of the other partner, and the legitimate motives to enter the alliance (Dacin et al., 2007). The scant number of references exploring this determinant of success easily suggests that it is either not very interesting for management researchers or plainly not highly explanatory of alliance success.

Parkhe (1993) links the reputation of the partners as a replacement to the analysis of past pay-offs and also as a determinant of successful alliance cooperation. This factor is built on TCE paradigms where “reputation effects have information content that can attenuate or intensify fear of opportunism modifying firm behaviour” (Parkhe, 1993).

2.2.4.2 Dynamic Determinants of Success

The second category of determinants of alliance success encompasses the *dynamic determinants*. As mentioned before dynamic determinants are not provided by the members but generated as the IFR develops overtime. The most recent discussions in the alliance management literature are related to dynamic determinants of success and include contributions on formal vs. relational governance, control vs. trust, contracting theory, relational capital formation, and knowledge management.

2.2.4.2.1 Governance Frameworks

Governance frameworks were typically assumed to be formal structures that contained all the details related to a specific transaction. Today, when the issue of governance arise in the context of inter-firm relationships, most of the theoretical contributions are centred in the concept of ‘relational governance’. This section will cover the traditional interpretation of governance frameworks as formal structures like contracts, letters of agreement, service-level agreements, etc. Relational governance will be covered under relational capabilities.

TCE as a theoretical lens and governance frameworks as determinants of alliance success have a natural connection. Formal governance structures (such as contracts and letters of agreement) need to be in place to compensate for two facts present in the *organisation man*: bounded rationality, uncertainty and opportunistic behaviour (Williamson, 1981) which left uncontrolled, will translate in greater transaction costs (Oxley, 1997).

In his experiment with automakers and part suppliers, Dyer (1997) tested that relation-specific assets create success only if the alliance chooses an appropriate level of governance framework (safeguard). Appropriate governance frameworks do not increase transaction cost but increase the level of trust and perceived commitment by the partners in the alliance. In Dyer's experience effective governance frameworks include self-enforcing contracts and stock ownership investments (of the automaker in the supplier firm). Other views propose that governance frameworks should go beyond a pure cost minimisation effort and efficiency-seeking management tools (Das and Teng, 2001).

Governance structures should be chosen based on their ability to minimise relational risk (Nooteboom et al., 1997) and should be used in conjunction with other tactics to increase alliance success such as relation-specific assets or measuring cooperation costs (White, 2005).

2.2.4.2.2 Knowledge Sharing Routines

Theorists and researchers in the alliance field agree that management processes within the alliance are insufficiently explored (Barringer and Harrison, 2000). However in the analysis of dynamic determinants of alliance success there is an element that is the precursor to what we know today as relational capabilities or relational capital. That element is known as knowledge or information sharing routines.

Initially described by Dyer (1997) and Anand & Khanna (2000) as key elements for building trust and opening communication channels amongst alliance partners, these inter-firm routines are regarded today as the baseline for effective social interactions that create relational capital (Zollo et al., 2002). In Parkhe (1993) it was also demonstrated that frequent interactions can reduce fear of opportunism and drive alliance performance.

Under knowledge-sharing routines this research adds the concept of the ‘shadow of the future’ as described by Parkhe (1993). This is the link between the future benefits a partner anticipates from the alliance and its present actions. This concept has been linked to the past partner of alliance pay-offs as a determinant of alliance success. Under a game-theory lens, “iteration in the transactions improves the prospect for cooperation by encouraging strategies of reciprocity” (Parkhe, 1993).

Using additional lenses such as the behavioural theory of the firm and organisational learning, these routines become much more significant in the discussion. Bititci et al (2007) have designed a theoretical model to create synergies in collaborative relationships; this is based on the ability of partner firms to assess their readiness for collaboration. One of the components of this assessment is referred to as ‘strategic synergy’. Strategic synergy speaks of the ability to understand each partner’s objectives and expectations.

2.2.4.2.3 Relational Capabilities

The field of alliance management has reached a new level of discussion since the Classic Contemporary authors in the 90s. This could be a sign of the new millennium, or a reflexion of the new “green and organic” themes that permeate our daily lives. The truth is that in the last few years, the discussion around alliance success is dominated by what are called ‘soft’ topics. These determinants are summarised collectively as the relational capabilities of the firm that ultimately build the relational capital and the relational architecture of high-performing organisations (Gulati and Kletter, 2005).

In the late 90s, the concepts of trust and commitment became central to the discussion of alliance success (Ariño et al., 2001; Das and Teng, 2001; Zaheer and Venkatraman, 1995; Nooteboom, 1996). Former advocates of formal governance mechanisms like Williamson proposed a combination of formal and informal mechanisms to mitigate ‘calculativeness in the economic organisation’ (Williamson, 1993). Well known researchers in contracting design and contract renegotiations combined their traditional research with discussions about ‘relational quality’ and how to manage trust in business alliances (Ariño et al., 2001). Jeffrey Dyer (2003) repositioned his previous work in the automotive sector under the concept of ‘trustworthiness’ as a mechanism to reduce transaction costs and improve alliance performance (Dyer and Chu, 2003).

Lambe and others (2002) evolved the concept of commitment from Dyer (1997) to go beyond ‘self-enforced contractual commitments’ like business volumes and repeat contracting, and move into the realm of firm’ commitment to the relationship. Relational commitment, trust and communication, drive cooperation and as a dynamic determinant, generates alliance success.

It is understood today, and from very different management disciplines such as accounting (Coletti et al., 2005), contracting (Ariño and Reuer, 2004; Reuer and Ariño, 2002 and 2007; Reuer et al., 2002), and supply chain management (Joshi and Campbell, 2003), that alliance management principles need to introduce relational concepts. These include precepts such as trust, communication, cooperation and commitment, in order to understand alliance performance. Those relational dimensions of alliance management challenged traditional formal control mechanisms of inter-firm organisations (Carson et al., 2006; Poppo and Zenger, 2002) with relational governance mechanisms.

In very recent theoretical and empirical contributions, researchers from marketing disciplines attempted to create a meta-theoretical model, by testing with the same data from 346 dyads, the assumptions of antecedents, determinants (mediators in their language), and alliance outcomes (Palmatier et al., 2007). Even though the selection of theoretical paradigms is more appropriate for looking into IFRs from a marketing perspective, they accomplish an interesting level of integration. They do so by quantifying antecedents, relating them to quantifiable mediators and then correlating the results to firm-level desirable outcomes in financial terms: sales growth, overall financial performance, increased cooperation, and reduced level of conflict. Figure 5 depicts this contribution.

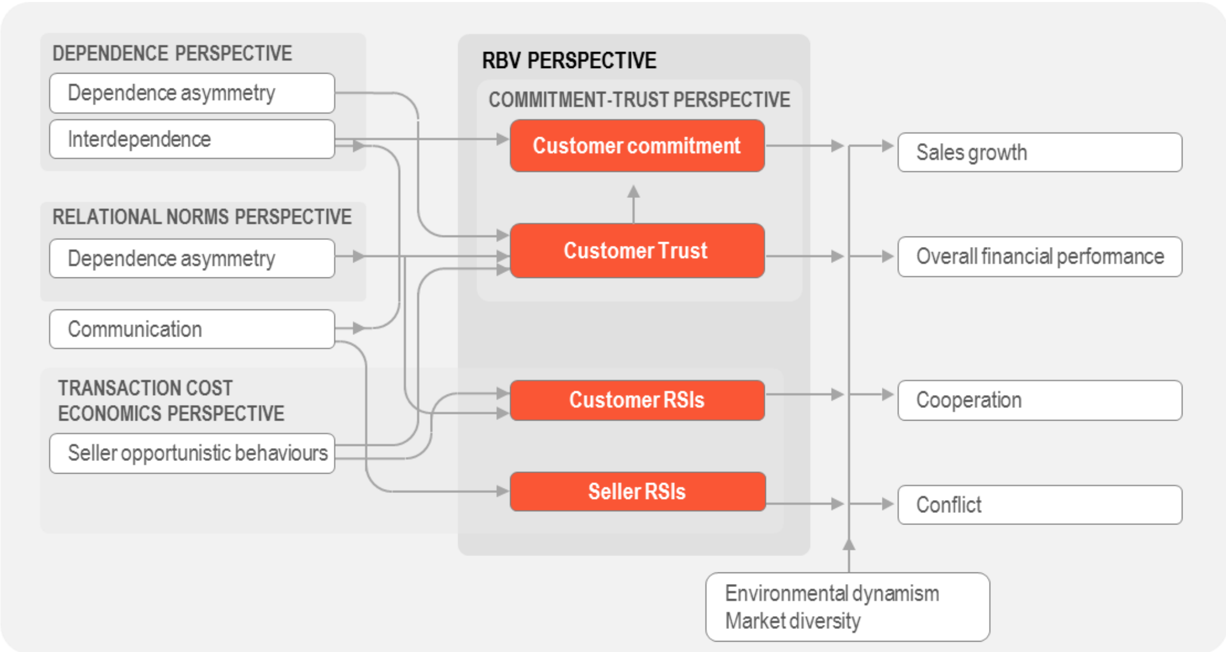


Figure 5 Integrated Theoretical Perspective of IFR Performance

It is evident that the main theoretical gap exposed by this review is that performance management is not considered a dynamic determinant of alliance success, although it is generally considered a success factor in intra-firm management success. Additionally there is no discussion about structuring performance tracking mechanisms that assure the alignment of IFR performance to performance objectives of the alliance members.

2.3 Performance Measurement Systems

2.3.1 Fundamentals of Performance Measurement Systems

To introduce concepts of performance measurement in the context of inter-firm relationships it is important to understand the fundamental tenets of performance measurement systems and how 'success' is currently measured in contractual alliances.

Performance measurement systems are managerial tools that enable firms to translate their global strategy into local action (Najmi et al., 2005), control performance, drive alignment, provide feed-back to the organisation and serve as learning mechanisms (Neely and Najjar, 2006). Faced with the new reality of inter-firm relations and alliances, managers explore the possibility that performance measurement systems (PMS) could be deployed to the inter-firm environment as a way to reduce uncertainty on the alliance meeting partner's strategic goals and contribute to performance (Bititci et al., 2005; Busi and Bititci, 2006; Straub et al., 2004; Adams and Neely, 2000). By exploring characteristics of intra-firm performance systems some extrapolations can be generated to improve alliance management.

To drive consistency of action, theorists propose that metrics must align with strategy, objectives (Kaplan and Norton, 1992 and 1996). These constructs are typically limited to the scope of the firm, as the top echelon of alignment. It is up to this level that current measurement systems are designed.

There is a fundamental assertion that firms achieve success when they meet stakeholders' expectations (effectiveness), and they maximise the utilisation of their available resources (efficiency) (Neely et al., 2005). Based on this affirmation measuring performance is really a task of measuring the current path to success and the likelihood of continuing such performance. Early academic references summarise the importance of performance definition and measurement by saying *"theoretically, the concept of business performance is at the centre of strategic management. Most strategic management theories either implicitly or explicitly underscore performance implications, since performance is the time test of any strategy"* (Venkatraman and Ramanujam, 1986). Venkatraman and Ramanujan point out that the discussion around measuring performance is not about the importance of measuring or prescriptions on how to improve performance. Rather it is about levels of analysis and definitions of desirable outcomes (Atkinson et al., 1997).

From that perspective, designing a performance measurement system is the process of selecting and arranging metrics to measure the efficiency and effectiveness of past and present actions (Neely et al., 2005). To design a firm-specific performance measurement system, managers use different frameworks that suggest specific performance indicators, aligned in certain ways, and linked to particular units of analysis within the firm (Kennerley and Neely, 2000). This approach has been powerful in driving local competitive advantages but it is limited as most corporations are shrinking their core operations, thus limiting the application of sophisticated performance measurement systems to a smaller scope over time.

Additionally most measurement systems tend to drive local optimisation first when applied to a single function or process and later consider lateral coherence of goals across functions, or vertical alignment to superior objectives (Decoene and Bruggeman, 2006). No performance measurement system in the market allows for sub-optimising the parts in search of system-wide optimisation (Altiparmak et al., 2006; Venugopal and Narendran, 1990).

Performance measurement systems (PMS) tend to agree on the way organisations should work and the ideologies they represent when dealing with multiple stakeholders of the firm (Bourguignon et al., 2004). Superior designs of performance measurement systems have the ability to integrate horizontally across functions and vertically through the echelons of the organisation. These key features have made the *Tableau de Bord* a popular framework for tightly structured firms (Epstein and Manzoni, 1998).

Balanced Scorecard shares this philosophy with its objective to reflect the firm's strategy and vision into metrics, goals and action plans in functional levels (Kaplan and Norton, 1992 and 1996; Bourguignon et al., 2004). Considered in this regard, Balanced Scorecard is more applicable to translating strategy into performance from the top echelon in the organisation rather than at the operational levels. The academic community regards the value of Balanced Scorecard as a strategy deployment and communication tool, but acknowledge its inability to evaluate or measure performance across and through all functions of the firm (Malina and Selto, 2001). In other terms, Balanced Scorecard has the scope of well-designed systems but it is not a multi-hierarchical framework.

It cannot easily cascade metrics down the hierarchy or prioritise levels of local execution to achieve general objectives.

Alignment is considered a desirable characteristic of intra-firm PMS. It promotes convergence of the organisation towards a single goal (Kaplan and Norton, 1992, 1996, 2004 and 2006; Kennerley and Neely, 2000). Yet, it may become the major limitation of inter-firm performance measurement systems, considering that by definition inter-firm relationships have independent goals and objectives (Busi and Bititci, 2006; Bititci et al., 2006; Hitt, 1988; Yeung et al., 2006).

If performance measurements are the tools companies use to monitor internal relationships (Atkinson et al., 1997) these tools need to be expanded to contractual inter-firm relationships both from the perspective of assessing the relationship’s contribution to the member firms, as well as evaluating the performance of the relation itself. Applied to CAs, alliance-wide performance measurement system could optimise the resources of the alliance and maximise its rent (Neely et al., 2005).

2.3.2 Introduction to Measurement of IFR Success

The assessment and measurement of alliance success is the connector between the management fields reviewed above. Section 2.2 summarised the fundamentals of inter-firm relations, the motivations to IFR formation, and its determinants of success. Section 2.3.1 presented the fundamentals of performance management as the driver of strategic execution. This section connects the role of performance measures in evaluating alliance success to highlight the knowledge gaps to be address in this doctoral research.

Evaluating and measuring IFR success has been challenging (Provan and Sydow, 2006; Gulati and Nickerson, 2008). Employing different methodologies have yielded completely different results depending on their focus (Parkhe, 1993a; Yeung et al., 2006) The management literature considers two different dimensions for measuring alliance success: Success at the alliance level per se, also known as relational-level, and success in terms of the impact of the alliance on the results of the member firms, known as firm-level success.

At the relational level, alliance success is measured in a more operational way, especially when assessing the performance of non-equity (contract-based) alliances (Ariño, 2003; Geringer and Hebert, 1991). Generally, relational-level metrics of success include variables like contract stability (measured by the number of contract renegotiations in the life of the alliance), longevity, assuming the relationship is designed to be renewed (Anand and Khanna, 2000), and in general alliance continuity or survival, as a binary concept opposite to abrupt termination (Kale et al., 2002). There is an on-going discussion about longevity as a measure of success. It is typically regarded as a positive sign but new contributions point to deliberate short-term nature of some alliances, as well as the fact that greater longevity may relate to inability by the alliance to deliver timely results (Rahman and Korn, 2012).

When measured at the firm-level, success is typically assessed by the level of improvement of the financial performance of the participating firm (Palmatier et al., 2007), and the overall managers' perception of the alliance effectiveness. Improved financial performance considers impacts on firm's profitability, growth, cost-positioning and economic value derived from the alliance. Also at the firm-level, perceptions of operational effectiveness reflect management satisfaction with alliance performance, fulfilment of strategic objectives and assessment of direct net contributions of alliance performance to the participating firm.

These dimensions of alliance success (firm-level and relational-level), introduce three different performance measurement systems that will interact amongst them. One system measures the intra-relational performance (operational performance or SLAs); the other two measure member-level performance derived from participating in an alliance (one for each member firm but at least two) (Poppo and Zenger, 2002).

So far in the literature review, the role of these three performance measurement systems as a determinant of alliance success is absent. Rather, they are introduced merely as a formal governance mechanism mostly in contracting theory. In the corporate accounting literature it is recognised that performance of alliances has implications on firm-performance and that it needs to be addressed in a more formal way, but the discussion stops there (Dekker, 2003 and 2004).

The literature on inter-firm relationships recognises the need to measure all levels of performance. However, it does not suggest specifically any guidance on how to include inter-firm PMS in the management of the alliance, nor does it prescribe the need to seek alignment or congruence amongst inter-firm measures (Zajac and Olsen, 1993; Kale et al., 2002; Madhok and Tallman, 1998). After reviewing the alliance management literature, and specific references on motivations to form alliances, it is evident that determinants of alliance success and measurements of alliance success are related. When a firm enters an alliance to fulfil a strategic objective, then the measurement of internal alliance success and firm's success must align at some point. If popular management belief is correct and 'what gets measured gets done', then the link between determinants and measurements of success (or performance) should be clearer in the IFR literature, but it is not.

An empirical extension of the intra-firm performance measurement paradigm outside of the boundaries of the firm will become a contribution to practice. Expanding the use of available alignment measurement methods to sets of inter-firm performance indicators will be a contribution to methods in management research.

The strategic goals of contractual alliances are very specific in the literature and need to be assessed with a unique performance measurement system; the key objectives of CAs as a governance mechanisms are to gain access to critical resources (Gulati, 1998), acquire competitive advantage (Dyer and Singh, 1998), create economic value (Chan et al., 1997) and minimise transaction costs (Williamson, 1985) amongst others. However, this alliance formation activity has yielded mixed business results with almost equal probability of success or failure (Das and Teng, 2000). The management literature presents compelling cases for participating in alliances and report great numbers of alliance formation in past years (Anand and Khanna, 2000). The purpose of this research is to understand the role that aligned performance measurements play in predicting the continuation of the contractual alliance. This correlation should also predict the firm's return on relational capital and alliance investments.

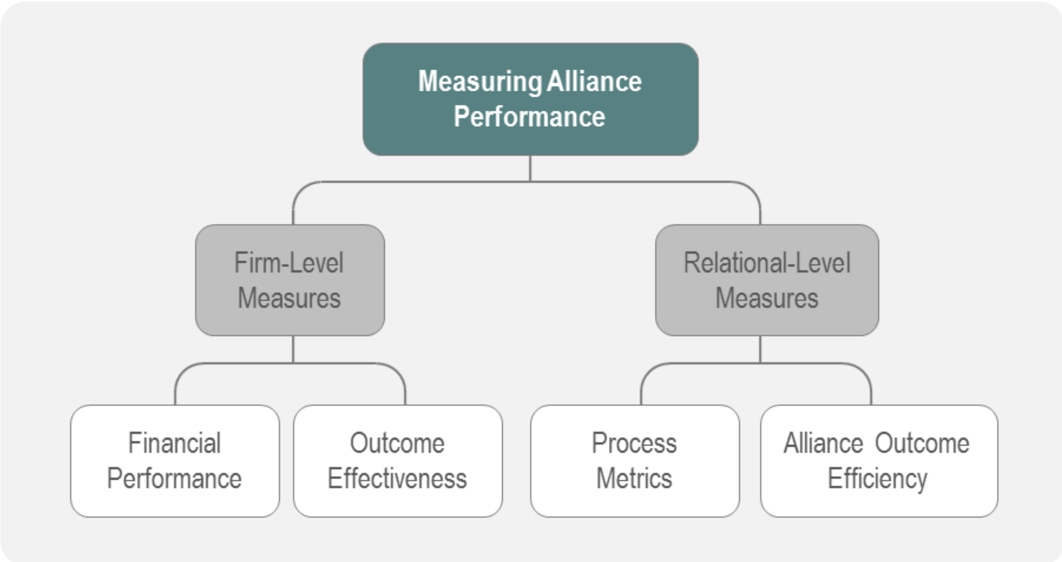


Figure 6 Summary Review of Measuring Alliance Performance

The initial scoping of the literature explored the link between contractual alliances and performance, and identified enough links between these topics to justify a more detailed look into their synergies. A more systematic review of the literature summarised the key determinants of alliance success based on different theoretical explanations of alliance formation but failed to find an explicit explanation of the use of performance measurement systems to drive alliance success. The current IFR management literature presents performance metrics as potential governance mechanisms in certain types of relations. However, it does not say anything about the role of metrics on creating relational capital and how aligned performance measures could contribute to alliance success.

Measuring IFR success becomes a priority for alliance managers as the mechanism to track progress towards achieving the strategic goals that motivated the alliance in the first place. Figure 6 above summarises the two dimensions of current contributions. However the performance measurement systems employed to monitor intra-firm performance may not suffice for the monitoring of contractual alliances and IFRs.

2.3.3 Firm-Level Measures of Alliance Performance

Key authors and contributors agree that measurement is an important capability in managing alliances. When firms decide to participate in an alliance it is a conscious managerial decision that has different motivations and seeks specific results. Given that, measuring the outcome of that decision is a clear need for decision-makers and managers.

Measuring alliance success adds a new level of analysis, or a new domain of measurement, for a given performance measuring system[6]. If the modern definition of the firm is a nexus of contracts and relationships with different stakeholders (Aoki et al., 1990; Atkinson et al., 1997), then the PMS of the firm must include the primary objectives of external stakeholders. In consequence the measurement system of the alliance needs to measure in a coherent manner its internal efficiencies and the effectiveness of its impact on the member firms.

(Hammer, 2001) initiated an interesting discussion urging managers to apply the same principles of intra-firm efficiency and effectiveness to the processes they share with other companies. As these inter-firm processes move from mere coordination to co-operation and collaboration efforts they should use proven intra-firm management tools to enhance their performance. One of these tools is definitely a performance measurement framework that helps alliances

[6] Performance measurement is defined as the business effort to “develop indicators and collect data to describe, report on and analyse performance” (Neely, 2005); and a performance measurement system “enables informed decisions to be made and actions to be taken because it quantifies the efficiency and effectiveness of past actions through acquisition, collation, sorting, analysis, interpretation and dissemination of appropriate data” (Neely, 1999).

“define a set of measures that reflects their objectives and assesses their performance appropriately” (Franco-Santos et al., 2012; Suwignjo et al., 2000). In the case of alliances, their objectives and their impact go beyond the boundaries of the relationship. Thus, the inter-firm performance measurement system needs to include metrics the relational-level and the firm-level.

This section goes back to the fundamental assertion that firms’ desirable outcome is success. Success is achievable when firms meet stakeholders’ expectations (effectiveness) and maximise the utilisation of their available resources (efficiency) (Neely et al., 2005). When managers form or join an alliance, they need to meet the expectations of their stakeholders (including the alliance partner) and acquire or maximise available resources[7], including those from the network. Then measuring alliance performance is really a task of measuring and predicting success. In consequence, it is important to define, from the literature, what alliance success is, and what measures and metrics have been proposed and operationalised to measure it.

Alliance success can be defined as the ability of the relationship to deliver effective results to its partners, and to be efficient in the management of its internal shared resources. This will fulfil the ultimate goal that drove the alliance creation in the first place (Neely et al., 2005; Venkatraman and Ramanujam, 1986). This definition implies two levels in the performance measurement system of an alliance: one that addresses the alliance impact on its partners, labelled “firm-level performance” and another level to address the alliance internal performance, labelled “relational-level performance”. In the reviewed literature, there is theoretical and conceptual support for these two levels of analysis in alliance performance but no empirical studies addressing both levels or stressing the importance of alignment amongst them.

[7] This assertion follows the rationale for alliance formation based on the resource dependency theory. See the discussions about this theoretical lens and others that explain alliance formation in Section 3.

2.3.4 Measurement of Alliance Success and Firm Performance

The literature on inter-firm relationship performance devotes extensive considerations to measuring alliance impact at the firm-level. The subject has been researched since the early 90s, with considerable cohesion. Cohesion meaning that most authors build on previous arguments and existing theories of the firm to derive or complement new constructs in their analyses. The firm-level performance measures that are described below match the particular theoretical lens that was used to explain alliance formation.

The main contributions on firm-level performance can be mapped along three moments in time: classic contemporaries (from 1990 to 1999); established contemporaries (from 2000 to 2005); and contemporary innovators (from 2006 to 2008). This classification includes contributions for measuring alliance performances as a financial impact on the partner and the overall effectiveness of the structure. Some authors have been active contributors in all three periods. Dyer, Gulati, Singh, Kale and Khanna are examples, whom also contribute to discussions about relational-level performance measurement, coming next.

Table 7 lists key authors, prevalent definitions of alliance impact on the firm-level performance and examples of metrics used to quantify such impact. It also summarises the main contributions and limitations of the academic views in all three periods with a time span of 18 years. A more detailed narrative follows the table.

Table 7 Summary of Academic Contributions to Firm-Level Alliance Performance Models

PERIOD	KEY AUTHORS	FIRM-LEVEL IMPACT FROM ALLIANCES	OPERATIONALISATION OF METRICS	MAIN CONTRIBUTIONS AND LIMITATIONS
Classic Contemporary (1990-1999)	Geringer Parkhe Zajac & Olsen Dyer & Singh Khanna Madhok & Tallman Das & Teng Chan, et al Gulati	Firm-level impact was measured at the stockholder level Stock price appreciation after alliance announcement (Chan, et al, 1997) Value from alliance vs. value from alternative governance mechanisms (Madhok & Tallman, 1998) Madhok and Tallman (1998) make a distinction between firm-specific quasi-rents, transaction-specific quasi-rents and inter-firm quasi-rents. Joint Value Maximisation Zajac & Olsen (1993)	Total Transaction Value = Production Cost + Alliance Set-up Cost + Alliance Transaction Cost (Dyer, 1997) Alliance Quasi Rents = $V'_{ifc} > V'_{alt}$ where V'=R'-C; V' is potential economic value, and R' is potential rents and C' is relational costs (Madhok & Tallman, 1998) Common Benefits = equivalent to inter-firm quasi-rents (Khanna, 1997)	Early discussions on issues of joint value creation and rent distribution amongst alliance partners (Zajac & Olsen, 1993). Extrapolation of discussion from performance measurements in joint ventures to other types of IFRs. Gulati (1998) differentiates two levels of performance measurement and Madhok & Tallman (1998) identify three levels. No metrics beyond financial impact at member firms. Little operationalisation of quasi-rent metrics Dyer (1997) demonstrated that relation-specific asset investments do not always increase transaction costs.

Established Contemporary (2000-2005)	Anand & Khanna Tomkins Zollo, Reuer, Singh Kale, Dyer & Singh Lambe, Spekman & Hunt Ariño Dussauge, et al Coletti White	Same as Chan, et al, 1997, but determined by cumulative experience in alliance management (Anand & Khanna, 2000) Performance at one firm-level (self-assessment measurement) (Zollo, et al 2002; Lambe, et al 2002) Combination of abnormal stock-market gains following alliance announcement plus managerial self-assessments on long-term alliance performance (Kale, Dyer & Singh, 2002) Measurement of "buyer's satisfaction" in the case of IT outsourcing alliances, to approximate for alliance performance (Poppo, Zenger 2002)	Alliance Performance = f(Goal Fulfilment; Growth; Meeting Initial Objectives) Zollo, et al 2002 Joint Profits = (three-item reflective measure) high-level of joint profits generated between the partners; a lot of profits together and increase of profits shared (Lambe, et al, 2002) Long-Term Alliance Success = f(harmony between alliance partners; firm meets alliance objectives; alliance enhancing competitive position; acquisition of critical skills from partner) (Kale, et al 2002) Drop in Relative Market Share Position = f(Inter-rival link alliances) (Dussauge et al, 2004)	Accounting analyses related to alliances involves at least two firms (i.e. inter-firm budgets; joint cost of capital analyses) Positive correlation between stock market-based measures of alliance success and managerial assessments (Kale, et al 2002) Evolution of alliance research from set-up measurements to post-formation dynamic measurement. Validity of measurements for equity and non-equity alliances Measurements of alliance success from one partner responses. Little focus on service contracts, except Poppo and Zenger, 2002), mostly on co-developments

Contemporary Innovators (2006-2012)	Rothaermel et al Kale & Singh Cousins, et al Palmatier, et al Lavie (2006, 2007) Lunnan & Haugland Koka & Prescott	Increase competitiveness by balancing external outsourcing (contractual alliance) with internal vertical integration (Rothaermel, et al 2006) Lavie, 2006 builds on the concept of relational rents (value created) from network resources. The analysis is similar to Madhok and Tallman Improved Supplier Performance Outcomes (improved product design; process design; increased sales) (Originally used by Kotabe, et al 2003) Inclusion of non-accounting metrics to account for alliance impact on firm performance: Market Performance Measure (Lavie, 2007) Firm-level financial impact of alliance performance is over measured and typically from short-term financial stock market differentials. (Lunnan Haugland 2008) Evolution to measure firm performance relative to the firm's position in an alliance network with independent variables such as size of network and degree of centrality of the firm in the network. (Koka & Prescott, 2008)	Size of New Product Portfolio (Rothaermel, et al 2006) New Product Success = expert ratings; incremental participation in sales portfolio. Value Created from Network Resources = Internal Rents + Appropriation Rents + Net Spill-Over Rents (Inbound – Outbound) (Lavie, 2006) Annual Change in Market Performance Measure = Adjusted (by S&P 500) market performance measures based on investors' expectation about the future performance of the firm (Lavie, 2007) Sales Performance per Employee = Used as a dependent variable in the analysis of impact of firm's position in a network in the global steel industry. It focuses strongly on productivity. (Tonnage per person was considered an ideal metric but global data was not available) (Koka, Prescott, 2008)	Analyses focusing on alliance success performance on the partner firm, not the focal firm. Operationalisation of difficult constructs like relational rents and quasi-rents. Testable measurements of conceptualised determinants of alliance success impact on partner like "reputation" in institutional theory. Lavie (2007) shows that firm performance improves by the amount of marketing resources in the network. Also from Lavie (2007), impact on firm performance from relative financial performance of partners in an alliance portfolio. Links between alliance-level performance and firm-level performance, not only financials but productivity metrics. Different perspectives on which level is over or under researched. (Lavie vs. Lunnan Haugland) Most of the constructs for perceived alliance performance and contribution to firm have been developed 10-15 years ago. (See Appendix in Lunnan & Haugland 2008)

2.3.4.1 Classic Contemporary Contributions on Firm-level Impact from Alliance Performance

The authors of the 90s, from the Classic Contemporary period, evolved the research on inter-firm relationships from the discussions of the 80s about typology. The new conversation was about more 'managerial' concerns regarding these organisational forms. Authors also conducted empirical research about different types of IFRs. And they moved from joint ventures and equity IFRs, to contractual non-equity IFRs, such as alliances. A good example of this transition is Jeffrey Dyer's studies, on buyer-supplier relationships in the U.S. and Japan's automotive sector (Dyer, 1996, 1997; Dyer and Singh, 1998).

The Classic Contemporary contributions also displayed a new set of theoretical lenses[8]. In the 80's and early 90's most of the academic work on alliance had a strong 'transaction cost economics' view. In the second part of the decade authors explored other theoretical paradigms, such as the resource-based view of the firm, which influenced perspectives on measurements of success.

The classic contemporary discussions on alliance performance are centred in the financial impact of the alliance on the member firm (Gulati and Singh, 1998; Dyer and Singh, 1998; Gulati, 1998; Dyer, 1997; Madhok and Tallman, 1998; Chan et al., 1997; Dyer, 1996). There was a strong drive to 'convince' firms that joining inter-firm structures was good for them, both from a shareholder value creation (Chan et al., 1997) and from a financial performance impact on different indicators of the firm, such as sourcing administration costs (Dyer, 1997). One exception is presented in Parkhe (1993), where, as part of his definition of alliance performance, he included questions in his survey to alliance managers regarding their level of "perceived satisfaction with the alliance" as a vehicle to meet their strategic objectives.

Some authors warned about the difficulty in isolating the impact of the alliance from other influencers of firm's financial performance (Zajac and Olsen, 1993;

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[8] Section 2.2.4 has a more detailed review on theoretical lenses informing alliance formation and determinants of success

Gulati, 1998; Zajac et al., 2000). However, through the use of specialised questionnaires targeting qualified informants, researchers were able to complement their quantitative analyses (Gulati and Singh, 1998; Dyer, 1997; Parkhe, 1993).

Theoretical contributions from the Classic Contemporary period propose interesting constructs for measuring alliance impact on member firms (Dyer and Singh, 1998; Madhok and Tallman, 1998). This includes evolving the concept of quasi-rents from the RBV literature, and identifying three types of quasi-rents associated to alliance formation. These quasi-rents are classified as: firm-specific; transaction-specific and inter-firm-specific, and all three are generated at different points in the relationship and with different potential for accrual. The concept of quasi-rents is equivalent to the concept of 'common benefits' from alliances in Khanna (1998).

Progress, in the field of alliance performance measurement came in the way of considering 'joint benefits' for alliance partners. Zajac and Olsen (1993) urged academics to stop focusing on transaction cost reduction and to move onto 'joint transaction value' creation. In that way, they would begin a conversation later tested empirically by Anand and Khanna (2000) and Dyer (1996, 2001). Dyer demonstrated how automakers could create value for their suppliers and for themselves, through high relation-specific asset investments, but without increasing transaction costs, as predicated in the transaction-cost economics literature (Williamson, 1985). Some of the conditions for this benefit involved the development of trust, long-term commitments, complementary assets, and open knowledge-sharing routines between buyer and supplier. These determinants were explored in section 2.2.4.

2.3.4.2 Established Contemporary Contributions on Firm-level Impact of Alliance Performance

In the first years of the new century, management researchers became 'balanced' on measuring the firm-level performance of alliance activity. Balanced meant complementing financial implications of alliance formation with additional metrics. Typically new metrics fell into the category of alliance effectiveness, which was defined as the alliance's ability to meet expected goals (Ariño, 2003).

Key contributors to the alliance formation literature continued using financial impact from alliance announcements (Anand and Khanna, 2000) to demonstrate value creation from alliance formation. Others included measures of the firm's perceived overall alliance effectiveness (Kale et al., 2002; Kale et al., 2001). As an example of these measures, Kale (2002) proved that positive correlations existed between two metrics of alliance formation success: stock-market gains and perceived alliance performance. It was said that some of the measurements, based on self-assessments from respondents, tend to have a response skew towards score inflation. However, most empirical studies reviewed tend to correct this trend, disregard it, or justify the validity of the collected survey data. Unfortunately objective metrics or data on alliance performance are rarely available considering the private nature of these arrangements (Zollo et al., 2002).

When looking at alliance success as the impact on alliance partners, measures are created as multi-constructs of different factors related to the fulfilment of strategic goals (Ariño, 2003). Zollo et al (2002) tested alliance success (the dependent variable) as determined by the routinisation of relational patterns (independent variable). Here, the researchers created a multi-construct composite of self-ratings, including goal fulfilment, opportunities for growth derived from alliance activity, and the degree by which initial objectives had been met. With this construct they were able to carry on the needed empirical tests.

Other measurements of alliance success at the firm-level include:

- Measurement of "*buyer's satisfaction"* in the case of IT outsourcing alliances, as an approximate of alliance performance (Poppo and Zenger, 2002). Here, satisfaction was defined as quality of the services, responsiveness and cost.

- *Joint Profits*, measured as a three-item reflective measure, asking one partner about: the level of joint profits generated between the partners; the amount of profits generated together, and the overall trend of profits to be shared. This measurement of alliance success was used by (Lambe et al., 2002) as the dependent variable of alliance management competencies in the firm.

- *Relative Market Share Position* as a negative outcome of participating in inter-rival link alliances. Metrics used in an empirical study on the global automotive sector (Dussauge et al., 2004)

- *Long-term Alliance Success,* defined as: harmony between alliance partners; firm meeting alliance objectives; alliance enhancing competitive position; and acquisition of critical skills from partner (Kale et al., 2002)

Notwithstanding the major contributions of the established contemporary authors during 2000-2005, firm-level performance measures of alliance success still face challenges. All empirical studies reviewed use data from one of the members of the alliances, rather than linking both partners. The justification for this tends to be limitations of time and cost. However it is difficult to argue joint benefits when only one side of the equation gets a say.

The second challenge is that most metrics refer to the initial stages of alliance formation or to alliance outcomes. Few introduce alliance process-oriented metrics or the issues alliances face during the post-formation dynamics.

In terms of types of IFRs being measured, most of the empirical results are obtained from or for equity-based IFRs. Some studies analyse non-equity alliances with strategic mandates of product co-developments, distribution agreements, licensing and other forms of IFRs. Additionally, there is one empirical study from Poppo and Zenger (2002) that deals with IT outsourcing service contracts.

2.3.4.3 Contemporary Innovators on Firm-level Impact of Alliance Performance

The set of contributions portrayed in this section speaks of the high interest in alliance performance measurement issues and the resourcefulness of researchers in building new indices and metrics to test their theories on determinants of alliance success.

The reviewed studies from 2006-2008 include a recent one demonstrating the impact of synergistic integration of external outsourcing alliances and internal vertical integration strategies. The study demonstrates that ‘synergistic taper integration’, as the name of this strategic choice has been coined, could yield positive results in the rate and success of new product introductions (Rothaermel et al., 2006). In order to test their hypotheses, the researchers contributed a new performance measurement construct to calculate at the individual product-level the degree of innovation success. This measure becomes thus a connection of alliance performance measurement with a specific strategic goal.

In the view of some researchers, the issue of firm-level performance has been thoroughly researched from strategic and financial perspectives. For some, now is the time to focus on alliance performance per se (Lunnan and Haugland, 2008), although Lavie (2006 and 2007) argues that there is too much emphasis on alliance success per se. He ascribes to the view that determinants of alliance success have been researched extensively whereas the impact of alliance success on partners still has areas of concern and subject to scientific inquiry.

Lavie (2007) makes a significant contribution to the measurement of alliance activity on firm performance. His research has conceptualised a new construct to measure firm benefits from alliance activity. The construct is called *adjusted market value performance*, and is based on measurements from stock price impact starting at alliance announcement with continuous measurements during the life of the alliance. The second major contribution from this research (Lavie, 2007), is about measuring contribution to firm performance, not just at a dyadic level but for the alliance portfolio as a whole. This approach allows him to measure the impact of the differentiated nature of alliances within a firm's portfolio, to consider the bargaining power of alliance partners when appropriating rents, and to test the specific contributions of different network resources to firm performance.

This research (Lavie, 2006) continued a previous discussion on the quantification of relational rents, their composition and mechanisms for generation and appropriation (Dyer, 1997; Madhok, 2000; Madhok and Tallman, 1998). Figure 7 presents a graphical perspective on the three components of relational rent that a firm may have available as a result of its alliance activity: internal rents from non-shared resources, appropriated rent from shared resources and a net spill-over rent, measured as the net result of inbound and outbound spill-over rents from the alliance.

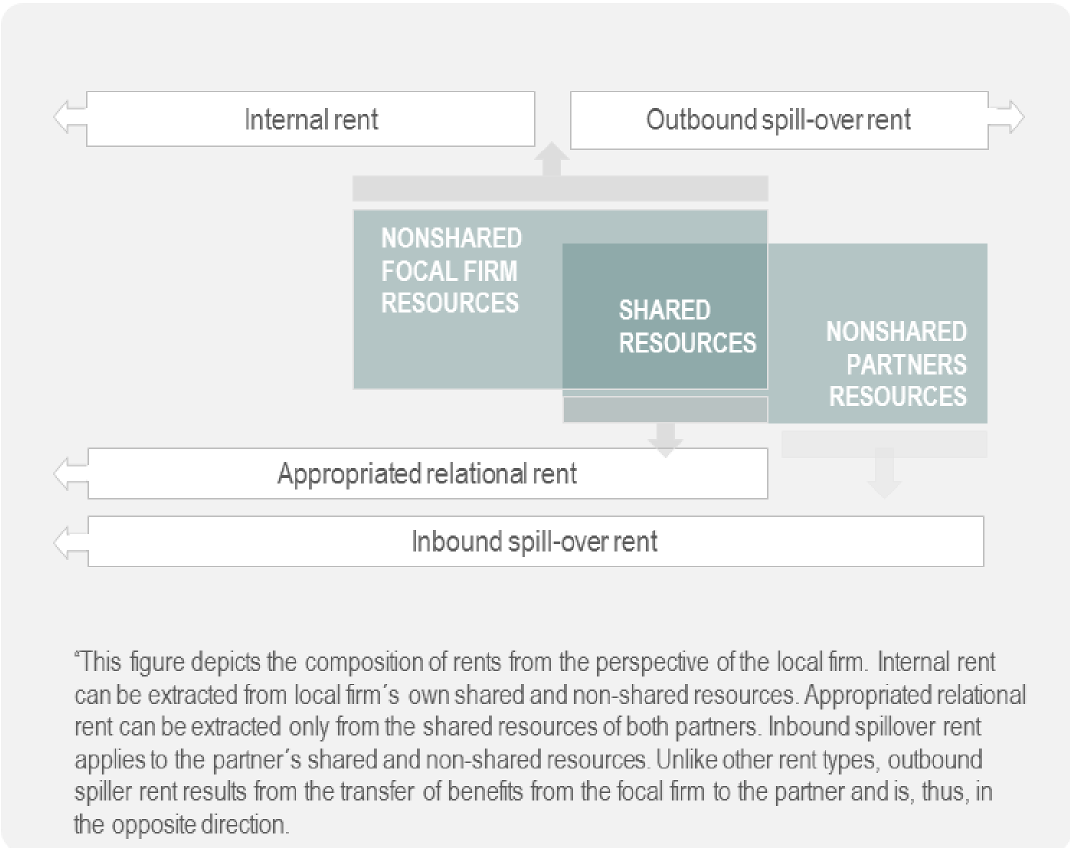

Figure 7 Firm-Level Performance from Alliance Success

2.3.5 Relational-Level Measures of Alliance Performance

2.3.5.1 Introduction

The alliance management literature explains at length the determinants of alliance success, but there is little discussion on how to operationalise that success in quantitative terms. In that sense, what is called *relational-level alliance performance* is relatively free of prescriptions on how to measure the internal performance of an inter-firm relationship. As seen the previous section on firm-level measurements, most of the academic contribution has been devoted to measuring firm-impact of alliance performance.

Nevertheless in order to assure conditions in which alliances and member firms will thrive, there is a need to understand internal (alliance process-based) performance metrics and their interrelation with firm-level metrics. More importantly, in bilateral contractual alliances, relational-level measures may determine formal performance expectations and will be part of contract clauses, service level agreements and other formal governance mechanisms.

Practitioners also agree with these ideas, and with the importance to set the right metrics to manage alliances. One of these simple rules for making alliances work, stresses the idea of replacing "ultimate goal metrics by soft relationship progress metrics" (Hughes and Weiss, 2007). Well-known business consultants in the field suggest that metrics should change as the lifecycle of the alliance evolves. Thus, metrics for the start-up stage must be different from metrics in the maturing stage. This difference creates two types of metrics: development and implementation metrics (Segil, 1998 and 2005)

2.3.6 Types of relational-level alliance performance

Relational-level alliance performance metrics can be classified into process metrics and alliance outcome efficiency. Process metrics include all key performance indicators that are relevant to the specific scope of activities encompassed by the alliance (Ariño, 2003). These could be the idea-to-market cycle time in the case of alliances for new product development; user order cycle-time reduction in a contractual relationship of a shipper and a logistics service provider; or user satisfaction index in a co-distribution agreement. Figure 8 presents this typology of relational-level alliance performance metrics and the key authors contributing to this body of literature.

Some authors consider contract renegotiations as a sign of performance problems in the alliance (Ariño and Reuer, 2004). Misalignment between the governance structure and the environment generates some warning signs: slow decision making, excessive bureaucracy costs, hold-ups or moral hazards (Oxley, 1997). So the number of contract renegotiations could be an indication of a governance misfit with the environment. Such a scenario would require changes in strategies or the nature of the transaction. (Reuer and Ariño, 2002; Reuer et al., 2002)

In hindsight, contract renegotiations can be seen as the ability of the alliance to adapt and transform after the initial formation stage. Additionally, a high degree of contract renegotiation signals that alliance management is not dealing with static issues but actively engaged in post-formation dynamics (Reuer et al., 2002).

Survival is a deceiving construct to associate to alliance success. Williamson (1993) suggested that alliances, as hybrid structures, are transitional organisational forms, evolving to become markets or hierarchies. Others consider that alliance survival is not a good measure. Some alliances have long life-spans thanks to some sort of inertia, whilst other alliances may be terminated as part of a planned decision when the alliance has fulfilled the expected goals. However, abrupt termination as opposite to survival is definitely a measure of poor performance. Abrupt termination suggests the relationship came to an end before its expected life span, and the natural question is why (Ariño, 2003).

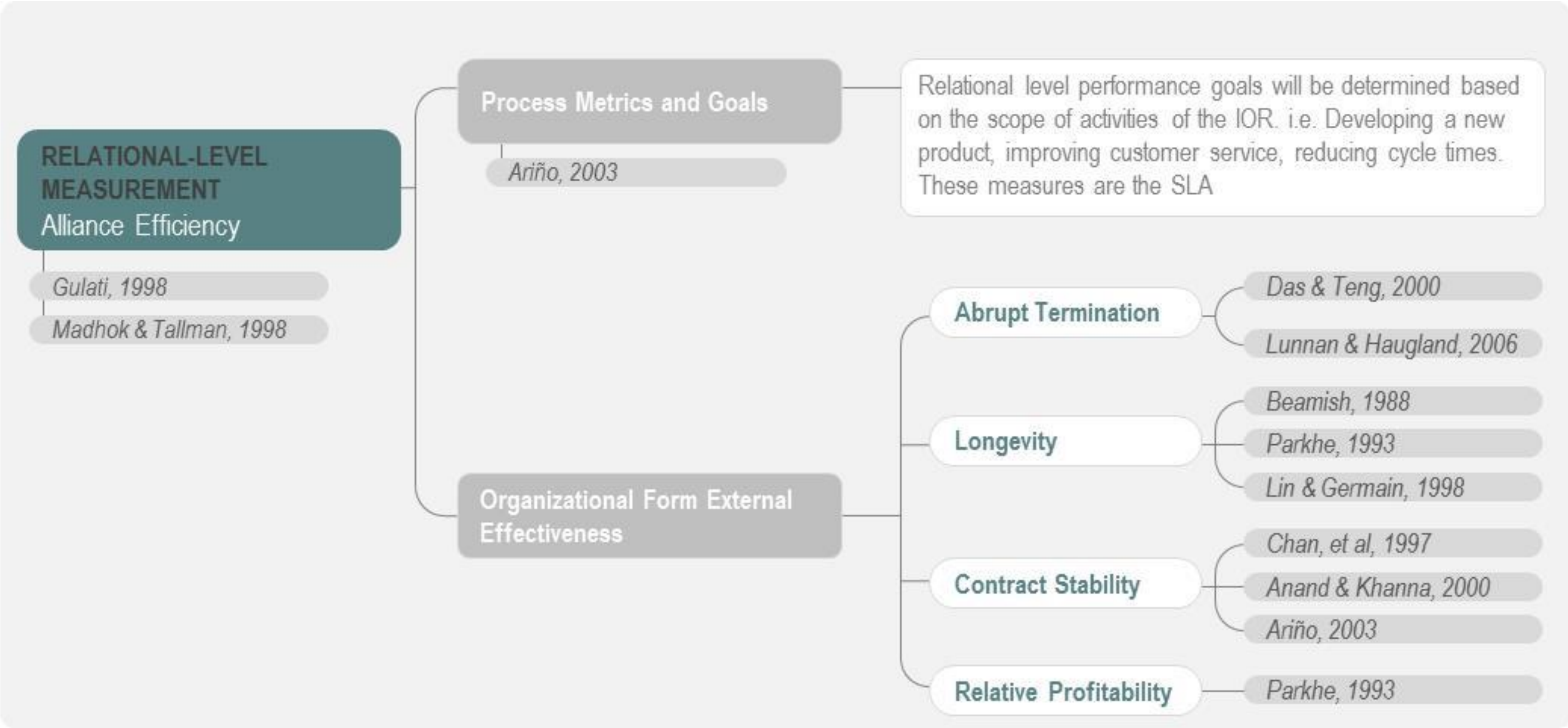

Figure 8 Internal-level Metrics of Alliance Performance

One recent contribution, (Lunnan and Haugland, 2008) presented a longitudinal analysis of over 100 alliances in order to test key determinants of alliance success. In the study, alliance performance was assessed as a multidimensional construct where different factors are related to short-term and long-term performance interplay. Those factors include: abrupt termination, long-term performance and short-term performance. As with previous studies, the metrics for alliance short and long term performance come from self-assessed surveys using Likert scales.

Very few times in the literature even in papers using the transaction cost economics lens, researchers ventured to measure transaction costs. In Dyer (1997) there is a specific account of Transaction Costs in the context of a Procurement Department. In that study, procurement costs were proxy to transaction costs, and included the costs of finding, selecting, monitoring and communicating with suppliers.

Transaction costs were measured as the total procured value divided by the number of people in the procurement departments of the five automakers in his study (Dyer, 1997). Considering the proposed classification of firm-level performance and alliance-level performance, this study calculates both. Even more, it includes a financial measure for the second partner's performance and an estimation of a relational level (appropriation rents in Lavie's view) value created through a successful alliance.

Table 8 Performance Measurement in Inter-Firm Relationships

Total Transaction Value =	Production Cost +	Alliance Set-up Cost +	Alliance Transaction Cost
Relational-Level	*Partner 1 Level*	*Relational-Level*	*Partner 2 Level*

2.3.7 Relational Rents

In early definitions of alliance-level performance it was acknowledge that the alliances were designed to generate supernormal profits in an exchange relationship. These supernormal profits are called relational rents, cannot be generated by either firm in isolation and can only be created through the joint idiosyncratic contributions of the partners (Dyer and Singh, 1998).

Relational rents may sound like an abstract academic construct with little importance to every day management of business relationships. However intuitively and proven by empirical research, it is known that the success and continuity of relationships depend on the ability of the members to build, sustain and share above normal returns (Das and Teng, 2001). In several references we have seen empirical efforts to quantify these rents from the perspective of firm performance (Madhok and Tallman, 1998; Madhok, 2000; Lavie, 2006 and 2007).

In general, issues of measurement difficulty are acknowledged in the strategic alliance literature. The response has been to structure complex governance mechanisms, such as contracts, to account for such hazard (Poppo and Zenger, 2002). When quantitative measurement and formal management control systems become too difficult to implement, firms move to other types of mechanisms. There are two types of governance mechanisms: formal and relational mechanisms. Formal mechanisms rely on contracts, service level agreements, metrics, and formal performance reviews. Relational mechanisms are based on relational norms. Trust is an example of a relational mechanism that is developed by continuous personal interaction, joint communication, shared informal reviews and other mechanisms based on the social nature of inter-firm relationships (Uzzi, 1997). New streams of literature propose that both types of governance mechanisms are not exclusive but complementary (Poppo and Zenger, 2002). It is in that light, that this research will look at performance measurement systems as both formal and relational governance mechanism for hybrid governance structures.

2.4 Strategic Alignment

Strategic coalignment (also known as fit, or congruence, or internal coherence) is a widely conceptualised subject in strategic management (Venkatraman and Camillus, 1984). The academic literature has demonstrated, conceptually and empirically, the correlation between high degrees of coalignment and performance. There are references regarding improvements in firm performance due to participation in inter-firm relationships, but nothing about required degrees of alignment between alliance strategy and partners' strategy to determine alliance success (Venkatraman and Prescott, 1990; Venkatraman, 1990; Ittner et al., 2003).

In the context of performance measurement systems, alignment means that relational-level measures must cascade down from firm-level metrics to local metrics, and then reinforce the firm's strategy (Kaplan and Norton, 2006; Kaplan and Norton, 2006). This alignment integrates vertically functional level metrics with financial level metrics and goals (Neely et al., 2005). The alignment requirement, between the mission of the firm and its performance measurement architecture (Eccles, 1991), needs to be extrapolated from the measurements of internal alliance success to the measurements of alliance impact on the partners' performance. If at the firm-level a key proposition for designing performance measurement models is that metrics must align with strategy and objectives to drive consistency of action (Kaplan and Norton, 1992 and 1996), why not across alliance-level and firm-level metrics.

The 'strategic fit' literature demonstrated that internal coherence, or 'coalignment', of business strategies and the environment is positively related to firm performance (Venkatraman and Prescott, 1990). However, there is a gap in the management literature due to the lack of empirical or theoretical studies to test if strategic coalignment of firm-level performance measurement systems and alliance-level performance measurement systems is positively related to alliance success.

The need for aligned alliance performance measures (partner and internal) arises naturally from the concepts of assessing alignment at the intra-firm level (process level metrics with top management metrics). The concept of alignment (or strategic fit) has also been explored in the context of a firm's strategy and its environment. According to the strategic fit paradigm, a high degree of alignment amongst constructs deemed critical to achieve a strategic goal enhances performance. Typically, the strategic fit paradigm explores fit between local strategies and corporate strategy, or between a strategy and the environment. In both cases it has demonstrated a high degree of positive correlation with firm performance.

The most known case of strategic alignment is Venkatraman's IT-Strategy alignment model. The model proposes local IT strategies that "fit" the existing business strategy and the organisation's infrastructure and processes. The result of the alignment exercise is an information system infrastructure that is aligned with the business and its current capabilities (Venkatraman, 1990). Minimisation of Euclidean distances is was the methodology employed to assess, or design, such congruence (Venkatraman and Camillus, 1984). The same method will be applied in this research for assessing alignment between performance measurement systems.

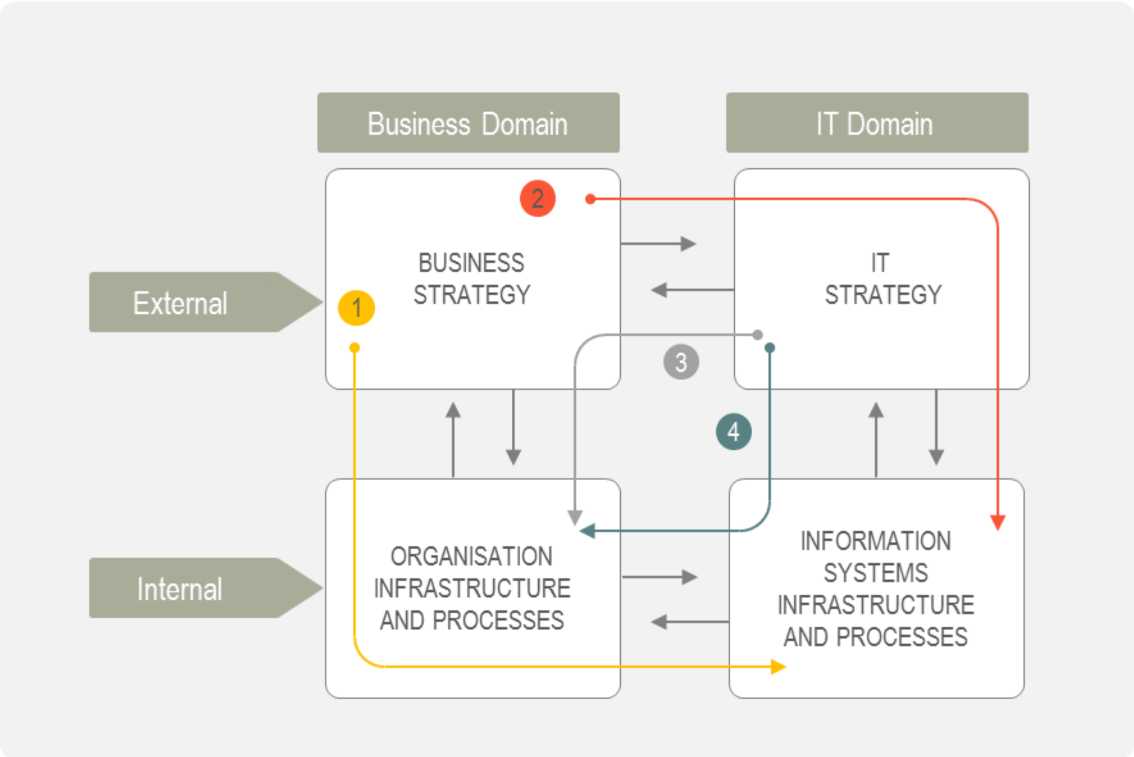

Figure 9 Venkatraman's IT Strategic Alignment Model

The literature establishes that alliance success may be measured internally in a more operational way, especially in the case of non-equity (contract-based) alliances. Thus, alliance-level measures of success include stability (measured by the number of contract renegotiations in the life of the alliance), longevity (assuming the relationship is designed to be renewed), formality (measured by the availability of a signed contract), relative profitability, and avoidance of abrupt termination.

The two dimensions of contractual alliance success (firm-level and alliance-level), generate in dyadic contractual alliances, three different performance measurement systems (PMS) that will interplay with each other. One system measures the intra-alliance performance (operational performance by comparing agreed upon SLAs with actual values). Two more measure member-level performance improvements derived from participating in an alliance (one for each member firm in the dyad).

The literature on inter-firm relationships recognises the need to measure all levels of performance but does not suggest specifically any guidance on how to include them in the management of the alliance. Nor does it prescribe the need to seek alignment or congruence amongst them. The ‘strategic fit’ literature has demonstrated that internal coherence or ‘coalignment’ of business strategies and the environment is positively related to firm performance (Venkatraman and Prescott, 1990). However there is a gap in the management literature due to the lack of empirical or theoretical studies to test if strategic coalignment of firm-level performance measurement systems and alliance-level performance measurement systems is positively related to alliance success.

2.5 Research Questions

The previous sections in this Chapter summarised three domains of the management literature that inform the main research question: How does alignment of inter-firm performance measures impact contractual alliance success. From the literature review on inter-firm relationship management, performance measurement systems and strategic alignment it is clear that the concepts should be interconnected but they are currently not. If a firm enters an alliance to fulfil a strategic objective, the measurement of internal alliance success and firm's success must align at some point. If popular management belief is correct and 'what gets measured gets done', then the link between determinants and measurements of success (or performance) should be explicit in the IFR literature.

The fundamental requirement of alignment between the mission of the firm and its performance measurement system (Eccles, 1991) needs to be extrapolated from the measurements of internal alliance performance to the measurements of alliance impact on partners' performance. At the firm-level a key proposition for designing performance measurement models is that metrics must align with strategy and objectives to drive consistency of action. If that is the case, why not across alliance-level and firm-level metrics?

The initial review of the literature explored the link between contractual alliances and performance, and identified enough links between these topics to justify a more detailed look into their relationships. A systematic review of the literature summarised the key determinants of alliance success based on different theoretical explanations of alliance formation. However, it failed to find an explicit explanation of the utilisation of performance measurement systems to drive alliance success. The current management literature merely presents performance metrics as potential governance mechanisms in certain types of IFRs but it does not say anything about the role of metrics and their contribution to alliance success.

More important, current contributions in the alliance management literature identify two levels of measures in an IFR: a) the firm-level measurement of IFR impact, and, b) the relational-level measurement of IFR efficiency. There is no discussion about the importance or the need to align those two levels of measurements in order to enhance the probability of IFR success. Considering the high levels of contractual alliance failure reported in the business and academic literature, it seems worthy to explore one more determinant of alliance success that is missing in the current state of thinking in the field.

The need of alignment of alliance performance measures (partner and internal levels) arises naturally from the concepts of measurement alignment at the intra-firm level (process level metrics with top management metrics). The concept of alignment (or strategic fit) has also been explored in the context of a firm's strategy and its environment. According to the strategic fit paradigm, a high degree of alignment amongst constructs is deemed critical in order to achieve a strategic goal enhances performance. Typically, the strategic fit paradigm explores congruence between functional, local strategies and corporate strategy, or between a strategy and the environment. In both cases it has demonstrated a high degree of positive correlation with firm performance.

Strategic coalignment (also known as fit, or congruence, or internal coherence) is a widely conceptualised subject in strategic management (Venkatraman and Camillus, 1984). There are references around improvements in firm performance, but no connections that suggest using degrees of alignment of partners' performance objectives as a determinant of alliance success.

Clearly today's measurements of alliance success are not enough to either explain or justify alliance formation or alliance dissolution (Lavie, 2007; Parise and Casher, 2003; Hoffmann, 2007). As a formal management research question, it would be interesting to know about the role of aligned inter-firm performance measurements as predictor of contractual alliance success. The challenge would be to apply the 'strategic fit paradigm' to the fields of alliance management and inter-firm performance (Joshi and Campbell, 2003; Murray and Kotabe, 2005; Koza and Lewin, 1998). This is under the assumption that alliance formation strategies should improve firm performance for both partners in order for the alliance to be sustainable.

Figure 9 presents graphically the key research questions that have arisen for the systematic literature review. Answers to these questions are the objective of this doctoral research.

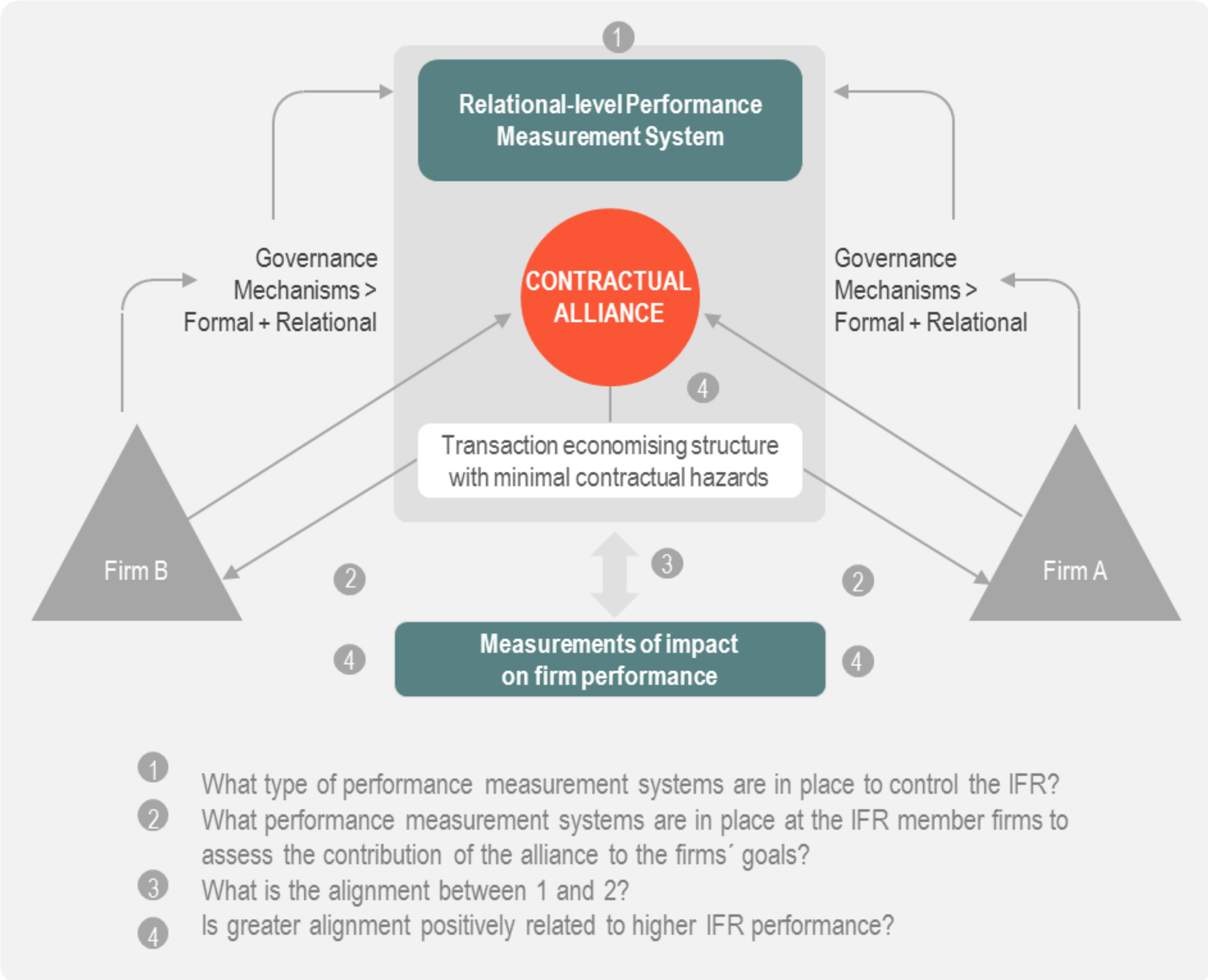

Figure 10 Research Questions from Literature Review

The main question is to understand the correlation between alignment of inter-firm performance measures and contractual alliance success. If greater alignment between the contract's internal measures (SLAs) and the partners' financial objectives contributes to alliance success then a new determinant has been found.

In order to answer the main question, the research needs to address several methodological and conceptual issues. The first one is the issue of measuring inter-firm performance alignment. It is known that alignment means greater congruence between local objectives, so the research will use methods from the strategic alignment literature and will apply them to performance measurement systems. The second issue is how to measure contractual alliance success using the current measures from the literature. Considering the available data at the contract level, this analysis will use information on longevity of the relationship, degree of formality, stability, and relative profitability, as elements of the contracts.

In conclusion from the literature review of the three management domains we know that:

a. The extant literature is non-explicit on how to extrapolate intra-firm metrics to an inter-firm context.
b. The extant academic literature does not offer a practical method to quantify the degree of alignment for inter-firm performance measurement systems.
c. Aligned performance measurement systems are not considered determinants of contractual alliance success.

Having documented these knowledge gaps, the aim of the study is to correlate alignment of inter-firm performance measures with the success of contractual alliances. If alignment of inter-firm performance measures matters to contractual alliance success it will help explaining why some contractual alliances may be terminated even though internal goals are being achieved. The coefficient of inter-firm performance alignment (IFA) will become a predictor of contractual alliance success (CAS).

The doctoral research will answer the following questions:

RQ1: How can inter-firm performance alignment be measured, considering contractual SLAs and the alliance members' performance objectives?

RQ2: How can contractual alliance success be measured, using known determinants of that success such as longevity, formality and stability?

RQ3: How much does inter-firm alignment (IFA) contribute to contractual alliance success (CAS)?

These research questions will be translated into research hypotheses grounded in the literature and informed by Transaction Cost Economics as the theoretical lens. Research methods will follow a post-positivist philosophical view of knowledge creation. Chapter 3 next will address these topics.

3 THEORETICAL MODEL AND HYPOTHESES

3.1 Introduction

The previous chapter reviewed relevant management literature and identified the research questions to be addressed in this thesis. From the gaps in the literature, this chapter presents a theoretical model for gap and develops the research hypotheses to be tested. The proposed research model uses Transaction Cost Economics (TCE) as the theoretical lens that will inform the location of the results within the management literature. The research methods proposed here triangulate quantitative and qualitative techniques, and are consistent with a post-positivist epistemology.

This chapter introduces the key variables and constructs that capture the phenomena of interest and that will be operationalised in the measurement model in the following chapter. Variables and constructs are a function of the proposed hypotheses derived from the literature review.

The proposed theoretical model and hypotheses determined the appropriate research methods consonant with the adopted theoretical and philosophical positions described in sections 3.2 and 3.3 respectively.

Additionally, the theoretical model guides

- The feasibility of the research design by taking into consideration the required data collection strategies, proposed research methods and analytical techniques
- The operationalisation and quantification of all research variables
- The selected research methods that will validate further conclusions from the primary research method.
- The ability to replicate the study in a different context or with a new data set

The focus of the research is to predict contractual alliance success by measuring the degree of alignment of inter-firm performance indicators. The research is conducted in the context of contractual relationships in the logistics outsourcing sector. Contractual alliances, or non-equity IFRs, are interesting when studying the alignment of objectives. Contractual alliances usually exhibit conflicting objectives in their contracts. The goal there is to maximise individual firm's benefits without the 'balancing' mechanism of the joint equity in the relationship. In CA the design of the contract and the definition of the internal SLAs must take into account the scope of the alliance and the need to align conflicting objectives.

Alignment of inter-firm performance measurement systems will be assessed by testing the congruence between i) the contract's SLAs and the actual performance values; ii) the contract's SLAs and the provider's financial objectives; and iii) the contract's SLAs and the user's financial objectives. The general argument of this research is that better alignment of inter-firm performance measures has a positive correlation with contractual alliance success. A successful contractual alliance is defined as an active relationship that is formally acknowledged by the firms involved (with a contract or formal agreement). It also, has longevity, and the terms of the agreement (and/or SLAs) are stable over time. These characteristics are known as measurements of CAS.

The following sections explain the rationale behind TCE as the theoretical lens for the research and post-positivism as the chosen philosophical position. The end of the chapter presents how the research questions, identified during the literature review, became researchable hypotheses, grounded in theory.

3.2 Transaction Cost Economics as the Theoretical Lens

'Inter-organisational relationships are institutions charged with generating rents from interdependencies between organisations' (Hennart, 2006). Transaction cost economics (TCE), as a general approach to the study of institutions and governance structures, has framed major contributions to the analysis of inter-firm relationships (Hennart and Zeng, 2005; Hennart, 1988).

TCE supports the idea that firms seek to economise with the costs involved in transacting internally or externally; that economisation takes place by firms selecting the most appropriate governance structure for different types of economic transactions. Optimal governance structures minimise transaction costs and protect the firm against unavoidable factors in business (Williamson, 1979; Williamson, 1981) such as bounded rationality and opportunistic behaviour.

In the words of Oliver Williamson (1981) 'asset specificity is the most important dimension for describing transactions'. When studying the success of contractual alliances from a TCE perspective, this dimension becomes a critical factor of aligned objectives between two firms. In TCE terms, success of an IFR can be maximised if there is great asset specificity (site, physical and human); relation-specific assets lock partners in the relationship. As an example in logistics outsourcing providers want to leverage their initial investment, and users would like to maintain the favourable initial conditions for accessing assets and services. For both parties, predicting the continuity and success of the relationship is desirable so managers can adjust their actions accordingly.

As asset specificity increases so does the complexity of transactional governance costs (i.e. more complex contracts). This complexity may translate into higher transaction costs and a potential change of initial negotiated conditions. However effective inter-firm collaboration may avoid this seemingly unavoidable result. An empirical example from the automotive sector in the U.S. and Japan (Dyer and Chu, 2003; Dyer, 1996) demonstrated that effective inter-firm alignment of objectives in the value chain prevented this effect and firms enjoyed the benefits of both high asset specificity and low transaction costs. Japanese automakers have lower transaction cost than their American counterparts primarily due to: repeated transactions with a small set of suppliers, economies of scale and scope with high volume of transactions within a small group, extensive inter-firm information sharing which avoids "guessing games" amongst partners, use of non-contractual governance mechanisms with an indefinite time horizon, and investment in co-specialised assets (Dyer, 1996).

Economic theory acknowledges that resource owners achieve greater productivity through collaboration and specialization. The literature and empirical studies correlate positively a firm's performance in inter-firm relationships if there is a previous investment in relational-specific investments or assets (Dyer, 1997; Parkhe, 1993). Many contributions in the space of IFRs and TCE are noteworthy. Grover and Malhotra (2003) developed an experimental model to explain transaction costs of long term buyer-supplier relationships. This model operationalised four dimensions of transaction cost as: a) effort to develop the relationship, b) effort to monitor supplier's performance, c) effort to address identified issues with supplier, and d) likelihood of supplier's opportunistic behaviour. The study presents some measurements of the cost of doing business in managing purchasing relations as an approximation to transaction costs in supply chain relationships. However, the dimensions from Grover and Malhotra suffer because they only consider a one-sided view of performance: purely from the perspective of the buyer. This has raised criticism in the literature about strategic alliance outcomes, and challenges the TCE's logic of correlation between co-investment in relation-specific assets and opportunistic behaviour.

Williamson insisted in the importance of describing the critical dimensions of inter-firm transactions. The dimensions that condition transaction costs and governance structures are: uncertainty, frequency of transaction and the need to invest in relation-specific assets. Governance structures need to be in place (such as contracts and letters of agreement) to compensate for two facts present in the *organisation man*: bounded rationality and opportunistic behaviour (Williamson, 1981), which, left uncontrolled, will translate in greater transaction costs.

As mentioned above, the by-products of increased asset specificity and relationship-specific governance structures are increased complexity and cost of relational governance (i.e. more complex contracts) (Alchian and Woodward, 1988) (Williamson, 1985). These by-products are evident in logistics outsourcing as the context of this research and in contractual alliances as the most prevalent governance mechanism. The investment in relationship-specific assets in logistics outsourcing is a requirement in order to play in the industry. Buyer bargaining power is high and investments are usually enforced in the contract's service level agreements (Halldórsson and Skjøtt-Larsen, 2006; Jharkharia and Shankar, 2007).

In an empirical study conducted in the U.S' health care industry (Judge and Dooley, 2006), the correlation between relation-specific assets and protection against opportunistic behaviour failed. This study challenged the TCE's correlation between co-investment in relation-specific assets and protection against opportunistic behaviour. Other results of the Judge and Dooley (2006) study, such as inter-firm relations' outcomes and determinants of the transactions, met the TCE theoretical assumptions.

The transaction cost economics lens brings to the table a multidisciplinary approach when looking at inter-firm relationships. Transaction cost economics is founded on the principles of economics, contractual law and organisational studies. Other contributors to the TCE perspective applied to IFR formation include academics that see them as possibilities to reduce cost of managing employees, avoid opportunism costs due to an arm's length relationship, reduce monitoring cost by sharing assets with the partner and overall minimise costs of doing business together (Barringer and Harrison, 2000; Hennart, 1988; Inkpen, 2000).

3.3 Philosophical Position

3.3.1 Introduction

The theoretical model proposed in this Chapter and the corresponding research methods are informed by a particular philosophical stance about what can be known and the nature of the answers derived from research. Full disclosure of such philosophical positions grants that transparency that management research requires. This transparency grants validity to the final results and claims, so the management community understands the underlying assumptions that animated the research (Easterby-Smith et al., 2008).

Philosophical positions also inform how knowledge can be acquired and through which methods. A valid research design and outcome are derived from a particular ontology of reality, and an epistemology of knowledge suggested by the nature of the research question and a theoretical lens that fits both philosophies.

This section presents the philosophical positions about the phenomenon under study and the assumptions on the nature of reality, and the context of what is being studied. The following paragraphs explain the rationale behind selecting a *representationalist* ontology accompanied by a *positivist* epistemology to inquire about the impact of performance measures alignment on contractual alliance success. The philosophical position disclosed in the section should also justify the section of *transaction cost theory* as the theoretical lens for the research.

3.3.2 Ontology

Ontology is defined as the philosophical assumption about the nature of reality. Ontological positions in the social sciences are closely matched to the ontology continuum in the natural sciences: from realism to relativism. This continuum shifts from the assumption that reality exists and can be apprehended to the conjecture that reality is subjective and can only be interpreted and constructed from a personal perspective. In the social sciences the ontology continuum can be mapped into three main positions: representationalism, relativism, and nominalism (Easterby-Smith et al., 2008). Where the representationalist and realist stances are based on the presumption that the object of analysis exists, that is objective and its behaviour is independent of the observant.

Clarke and Dawson (1999) state that given the appropriate methodology, it should be possible to describe and explain this reality independently of the researcher. Under the representationalist position, social sciences can progress, as natural sciences, through observations that have a direct correspondence to the problem being investigated. This includes specifically the evaluation of their performance (Provan and Sydow, 2006).

The history of research on performance measures and evaluation of performance began with a representationalist tradition in its three phases known as the three generations of evaluation. These generations dealt with measurement, description and judgment of performance, where the outcome is a set of conclusions, recommendations and decisions based on the assessed performance (Guba and Lincoln, 1993).

Using relativism as ontology, evaluation in the fourth generation is constructed as a joint agenda for negotiation of claims, concerns and issues (Guba and Lincoln, 1993). In Provan and Sydow's words (2008) fourth generation evaluation 'adopts a more relativistic view of the evaluation function and deals with uncertain data with multiple and contested purposes and advanced to the benefit of key stakeholders'. To date there are not any empirical studies in the field of inter-organisational relationships that evaluate a contractual alliance from a fourth generation perspective.

In the case of contractual alliances, an objective evaluation of the contract, as a unit of analysis, is feasible. There is a clear *ex ante* understanding of what constitutes a successful contract. The contract itself can be defined as an objective reality that exists and represents a particular view in time of expectations by the parties from the relationship (Reuer and Ariño, 2002 and 2007). Under the agreement that a contract and an inter-firm relationship are objective realities that exists and can be conceptualised, an evaluation can be done independently of the analyst and the unit of analysis itself (Easterby-Smith et al., 2008)

3.3.3 Epistemology

Epistemology is the branch of philosophy that investigates the origin, nature, methods, and limits of human knowledge. It also refers to a general set of assumptions about the best way to inquire on the nature of the world, or the behaviour of organisations. This specific management research is based on the belief that the unit of analysis (the world) "exists" independently of its observant (per above ontology). Thus, the epistemology should assume appropriate objective methods to discover the connections that predict the behaviour of that unit of analysis.

"*The key idea of positivism is that the social world exists externally and that its properties should be measured through objective methods, rather than being inferred subjectively through sensation, reflection or intuition*" (Easterby-Smith et al., 2008). In the positivistic epistemology the overall aim of research is to discover causality amongst different constructs, with a starting point of hypotheses to be verified or falsified. Common research methods are based on experiments using quantitative measures to establish causality and prove/disprove the stated hypotheses.

For evaluating IFRs in general and contractual alliance specifically, the positivist view is best illustrated by the abundant structural and quantitative approaches that focus on objectively detecting patterns and connections between characteristics of the dyad and the outcomes of the IFR. These patterns and connections have measurable behavioural and economic consequences (Provan and Sydow, 2006). Table 9 below translates the philosophical assumptions of positivism applied to the specific research questions, presented in Chapter 2, and the Theoretical Model and Hypotheses presented further in this chapter.

Table 9 Applied Philosophical Assumptions of Positivism

ASSUMPTIONS OF POSITIVISM
INDEPENDENCE
In the case of the proposed research, the researcher is independent from what is being evaluated, namely a set of contracts and a set of performance indicators.
VALUE FREEDOM
The issue of "alignment" as a construct to be studied and measured amongst contracts has been determined using objective criteria such as the geometrical measure of "distance" amongst sets of performance measures. Distance is a quantitative measure that is independent of human beliefs and interests.
CAUSALITY
The purpose of this research is to identify an additional explanation to contractual alliance success.

ASSUMPTIONS OF POSITIVISM
HYPOTHESIS AND DEDUCTION
In the research, the researcher hypothesises that high levels of alignment amongst performance indicators are correlated to success in contractual alliances. In order to deduct these conclusions the research method requires a representative number of contracts from both successful and unsuccessful contractual alliances and measure the level of alignment across their performance indicators.
REDUCTIONISM
It is understood (see Literature Review) that there are many drivers of contractual alliances. This research is concerned with only one of those, which is the level of alignment in performance indicators. The results of this research will contribute to the understanding of the whole problem of managing contractual alliances. I also subscribe to the view that 'explanations in the social sciences should be organised around (partial) mechanisms rather than general theories' (Elster, 1994)
GENERALISATION
To improve generalization of the conclusions of this research, there will be a representative sample of contracts with inferential power onto the wider population.
CROSS-SECTIONAL ANALYSIS
This research can be replicated across multiple samples of contracts, in different industries, countries and types of contractual alliances.

Considering the use of qualitative research methods via interviews there may be questions about the positivist nature of this research. The traditional position states that interviews are qualitative techniques and they fight the positivistic stand to measure and quantify everything (Kvale and Brinkmann, 2008). However there are streams of management research philosophers that advocate the triangulation of qualitative methods in quantitative positivistic research with the purpose of additional “validation” and “data collection” (Noor, 2008).

In this research interviews were used with the purpose of uncovering facts that “are out there”. The interview followed a pre-defined specific protocol where all questions were asked and processed in the same sequence. Considering that particular use of interviews, social philosophers still consider that the use of interviews fit in the positivist paradigm (Maseide, 1990). In fact the use of qualitative research methods in positivist quantitative research has emerged as an epistemological paradigm known as post-positivism (Godfrey and Hill, 2007). In summary, post-positivist is the philosophical stance of this research.

To proceed forward, this research will answer its main question using empirically and theoretically valid constructs such as contractual alliance success and performance measures alignment. This philosophical view determines how the data is gathered and analysed. This is not to say that a pure positivist epistemology would apply to all dimensions of the study of inter-organisational relationships or contractual alliances specifically. In fact, issues like motivations to enter IFRs, managerial responses to IFR performance, and other aspects to be studied are mostly related to understanding and interpreting human behaviour in the context of organisational social systems. For the specific research question posed here, the representationalist ontology with a post-positivist epistemology appear to be optimal. It is also worth noticing that selection of *transaction cost theory* as the theoretical lens is congruent with both the representational ontology and a post-positivist epistemology.

Based on the philosophical position stated above, the research design presented in this paper is congruent with its tenets. The ideal research design for an empirical study on evaluation is the experimental study with random assignment of subjects to an experimental or a control groups. This is considered ideal because it ensures internal validity and allows causal inferences (Provan and Sydow, 2006; Easterby-Smith et al., 2008; Clarke and Dawson, 1999; Rossi et al., 2004).

However in management research and in the study of organisations and alliances it is difficult to conduct truly random experiments. The particularities in organisations, people, contexts and circumstances involving the research question make complex to create experiments from scratch or in this case to form new IFRs - for the purpose of research. This research has proposed to work with a universe of contracts between one provider and multiple users already engaged in a contractual alliance. The contracts belong to two distinctive groups: successful alliances and failed alliances. Considering this fundamental distinction, the research will seek differences in the way their performance measures are aligned, and will correlate that alignment with the theory-based measures for success in contractual alliances.

3.4 Hypotheses Development

By stating the theoretical and philosophical frames of the research, it is possible to transform the identified knowledge gaps in the literature review into researchable hypotheses. The hypotheses will be examined and tested through quantitative and qualitative methods consonant with the philosophical positions about knowledge creation, and with transaction cost economics as the overarching management theory.

This section summarises eight researchable hypotheses based on the literature review presented in Chapter 2. The hypotheses state a series of expected correlations between the key constructs of this research: success of contractual alliances and alignment of inter-firm performance measures. Each one of these constructs will be calculated from different variables drawn from the literature and deemed important to measure success and alignment.

3.4.1 The Relation between Alignment and Success

The management literature affirms that strategic alignment is critical in order to promote sustainable firms and sustainable inter-firm relationships (Parung and Bititci, 2008; Lavie, 2006; Lavie, 2007; Bititci and El Mokadem, 2009; Bititci et al., 2004). It is also known that strategic alignment can be designed, maintained and improved using known performance indicators. The literature indicates that firms benefit more from an alliance portfolio when their partners share their strategic objectives and there is “alignment” of objectives, resources, and outcomes (Parise and Casher, 2003; Verweire and Van den Berghe, 2003).

Current measures of alliance success are merely operational and are not sufficient to either explain or justify alliance formation or dissolution (Lavie, 2007; Parise and Casher, 2003; Hoffmann, 2007). In the case of the inter-firm relationship, however, the ‘strategic fit’ literature has demonstrated that internal coherence or ‘coalignment’ of business strategies and the environment, is positively related to firm performance, or the contractual alliance performance for the purpose of this research (Verweire and Van den Berghe, 2003; Venkatraman and Prescott, 1990).

The literature on alliance success has identified specific determinants as the conditions or mediators to this outcome. The determinants can be generated by specific conditions originating from the participant firms and/or generated within the scope of the IFR (Wittmann et al., 2009; Lambe et al., 2002; Hughes and Weiss, 2007; Cravens et al., 2000/10).

This research considers alignment of inter-firm performance both a member-provided determinant and a dynamic determinant based on the scope of the inter-firm relationship (Gulati and Kletter, 2005). And as a member-provided determinant of contractual alliance success, aligned inter-firm performance measures could:

a. Improve management competencies to manage IFRs (Anand and Khanna, 2000),
b. Pool the optimal mix of resources from partners to create value and sustainable competitive advantage (Dyer and Singh, 1998; Hamel et al., 1989; Spanos and Lioukas, 2001)
c. Help build relation-specific assets that lock partners in a successful IFR (Dyer, 1997; Parkhe, 1993a; Williamson, 2005), and finally,
d. Build partner reputation that can attenuate fears of opportunism by other partners and provide legitimacy as a member of contractual alliances (Dacin et al., 2007; Levitas et al., 1997).

These member-provided reasons support the hypothesis that high levels of alignment of inter-firm performance measures could contribute to contractual alliance success. The conclusion will be that alignment of inter-firm performance measures is one of the determinants and predictors of contractual alliance success.

Dynamic determinants of contractual alliance success are those conditions generated from within the new governance structure, as opposed to being brought from the member partners as discussed above. As a dynamic determinant of CAS, greater alignment of inter-firm performance measures could improve the following conditions:

a. More formal governance frameworks that minimise relational risk and compensate for bounded rationality and opportunism (Williamson, 1993; Williamson, 1981; Nooteboom et al., 1997; Nooteboom, 1996);
b. Improved relational capabilities considering that performance measurement systems are tools for learning, communication (Neely and Najjar, 2006; Adams and Neely, 2000),
c. Increased trustworthiness as a mechanism to reduce transaction costs and improve alliance performance via aligned performance goals (Dyer and Chu, 2003); and finally
d. Alignment of inter-firm performance measures as a dynamic determinant of contractual alliance success is achieved and boosted by knowledge sharing routines (Zollo et al., 2002; Reuer et al., 2002). Alignment of objectives is achieved by frequent interactions that in turn reduce the fear of opportunism in the contractual alliance.

Keeping in mind the two types of determinants of contractual alliance success, and the connection between those determinants and aligned inter-firm performance measures, a first hypothesis is proposed:

Hypothesis 1. *The degree of alignment amongst inter-firm performance measures is positively correlated with contractual alliance success*

3.4.2 Contractual SLAs, Financial Objectives and Alignment

There must be quantitative measures of both constructs in order to assess the contribution of alignment of inter-firm performance measures to success in contractual alliances. This section discusses the hypotheses that lead the formation of a coefficient that measures inter-firm alignment.

It is known from the literature review that alignment means internal coherence of local goals with superior general goals (Venkatraman and Prescott, 1990; Venkatraman, 1990). In the context of contractual alliances there will be alignment of inter-firm measures if the service level agreements (SLAs) of the contract are congruent with the actual SLA values (Gulati and Singh, 1998;

Madhok, 2000; Madhok and Tallman, 1998) and with the performance objectives of the partners.

Initially, the contractual alliance contributes to the general goals of the partners if it delivers the results for which the alliance was formed (Ariño, 2003). Relational-level performance goals will be determined based on the scope of activities of the IFR and these target performance measures are the service level agreements (SLAs). Based on the above, hypothesis 2 is postulated as:

> **Hypothesis 2**. *The measurement of alignment between the contract's service level agreements and the actual performance values contributes significantly to the measurement of inter-firm alignment*

Alignment also means that the inter-firm relationship - contractual alliance in this case - contributes to members' performance. Initially the firm-level impact from alliance activity was measured through changes in stock price as a demonstration of alliance-driven value creation (Anand and Khanna, 2000; Lavie, 2007; Suarez and Garcia-Canal, 2002). This approach was popular given the lack of availability of objective data of companies' financial performance in connection with alliance activity.

However it is expected that successful alliance activity delivers specific firm-level results, such as performance improvements in cost, responsiveness and quality (Poppo and Zenger, 2002; Poppo and Zenger, 1998); increased profitability (Lambe et al., 2002; Taylor and Plambeck, 2003); and improved market share position and revenues (Gulati et al., 2009; Dussauge et al., 2004; Smith, 2003). Considering these expectations it can be stated that for an alliance to be aligned with partner's objectives, the goals of the alliance must fit with the specific objectives of the firm (s). Firm's objectives will be equalised to financial objectives for both provider and users involved in a contractual alliance (Neely et al., 2005; Bititci, 1994).

Based on the above discussion and considering previously tested concepts from the management literature, the following hypotheses propose that alignment of the contract's internal goals (SLAs) and the financial objectives of the partners, contributes to the overall measure of inter-firm alignment.

Hypothesis 3. *The measurement of alignment between the contract's service level agreements (SLA) and the provider's financial objectives contributes significantly to the measurement of inter-firm alignment.*

and;

Hypothesis 4. *The measurement of alignment between the contract's service level agreements (SLA) and the user's financial objectives contributes significantly to the measurement of inter-firm alignment.*

3.4.3 Measurement of Contractual Alliance Success

To achieve the research's goal, - testing the contribution of alignment of inter-firm performance measures and contractual alliance success -, it is critical to understand and measure success in contractual alliances. The development of these hypotheses is based on the concepts of alliance efficiency by Gulati (1998) and Madhok and Tallman (1998). These authors first articulated relational-level measurements from the perspective of the external effectiveness of inter-firm organisations.

Alliance effectiveness can be measured based on some external measures defined in the academic literature. The first measure is that the relationship is active and has a formal governance mechanism. In other words, the contractual alliance has avoided 'abrupt termination' (Das and Teng, 2001; Das and Teng, 2000), assuming that there was not a pre-agreed termination date. Based on the available data for this research, the successful contracts are those that are active and have a formal contract or process to govern the relation (Poppo and Zenger, 2002; Lunnan and Haugland, 2008).

The research model will test this hypothesis, derived from the literature and using the available data from contractual alliances between one logistics provider and 149 users:

Hypothesis 5. *An active inter-firm relationship governed by a formal mechanism is significantly and positively correlated to contractual alliance success*

The duration of the inter-firm relation also reflects of the degree of success of the alliance (Goerzen and Beamish, 2005) (Parkhe, 1993). Long-term alliances have a higher likelihood to meet alliance objectives enhancing the competitive position of the member firms, and acquiring critical skills from the partners (Kale and Singh, 2007; Kale et al., 2002). In this view longevity creates harmony between alliance partners, so the following hypothesis is generated:

Hypothesis 6. *The length of the inter-firm relationship is significantly and positively correlated to contractual alliance success*

Contract stability has been identified as a pre-condition to contractual alliance success. Lack of stability is considered a sign of performance problems in the alliance (Ariño and Reuer, 2004). Poorly designed inter-firm governance structures present signals of operational issues: delayed decision-making, excessive complexity and bureaucracy costs, hold-ups and moral hazards between partners (Oxley, 1997). Given those signals, renegotiations of the contract's terms are required. So, the number of contract renegotiations is perceived as an indication of misfit of the alliance with the needs of its members calling for changing strategies in the nature of the relationship (Reuer and Ariño, 2002). In light of this evidence there is a hypothesis to be tested as:

Hypothesis 7. *The number of renegotiations of the terms of the inter-firm relationship is significantly and negatively correlated to contractual alliance success*

The final measure of contractual alliance success has been described in the management literature as relative profitability. This concept is rooted in the framework of game theory, where parties are balancing the cost-benefit of cooperation versus pursuing individual objectives. The concept is also rooted in the assumption of 'opportunism' from TCE. In the words of Parkhe (1993) "*if the payoff resulting from both parties' reneging on a contract is sufficiently high relative to the payoff from cooperation, the arrangement would be jeopardized* *because whether or not firm B cooperates, firm A can still count on a sizable return*". For the purpose of this research, relative profitability is filtered by the relative importance of the relationship to each one of the members of the inter-firm relation. This importance relates to the size of the "shadow of the future" cast by the relationship and measured as the relative risk that both parties assume by engaging in the alliance. How much of the provider's revenue is tied in the alliance and how much of the user's costs depend on the relationship. Drawing from theory, it is proposed that:

Hypothesis 8. *The relative profitability of the inter-firm relationship is significantly and positively correlated to contractual alliance success*

These measurements or conditions of alliance success are research hypotheses that will be tested individually to understand their singular contribution to contractual alliance success. From the literature hypotheses 5 to 8 have isolated each measurement of contractual alliance success and have proposed a significant correlation to the overall CAS index.

3.5 Research Model

The research model is a full architecture of the research. It includes the hypotheses derived from theory, explicitly framed by the theoretical lens and the philosophical position stated above. The research model ties all these elements together. The model evolves a series of hypotheses to be tested initially, as propositions through the pilot studies, and later as quantifiable hypotheses through the full quantitative analysis.

Figure 10 below depicts the main hypothesis of a causal relationship between the degree of alignment of inter-firm performance measures and the success of a contractual alliance. The research begins with the proper operationalisation of the variables by adapting of a known method for measuring alignment (Venkatraman, 1989) across a set of performance indicators. The operationalisation methods are presented in Chapter 4.

The results of testing the principal Hypothesis 1 contribute to the theory of inter-firm management by including a new determinant and predictor of contractual alliance. Hypothesis 1 is proposed under the assumption of interconnectedness. This assures that the contractual alliance must not only deliver results according to the scope of the contract, but should improve overall firm performance for both members of the relationship. This research objective is properly rooted in the academic literature as seen in Chapter 2.

Table 10 presents a summary of research hypotheses and the corresponding variables that operationalise the hypotheses' constructs. Based on theory, the hypotheses proposed a type of relation that is expected amongst variables. Answers to the main research question will come from hypotheses testing during the full quantitative study using structural equation models (SEM). These hypotheses are considered as propositions (without statistical validity) during the quantitative pilot study in Chapter 5.

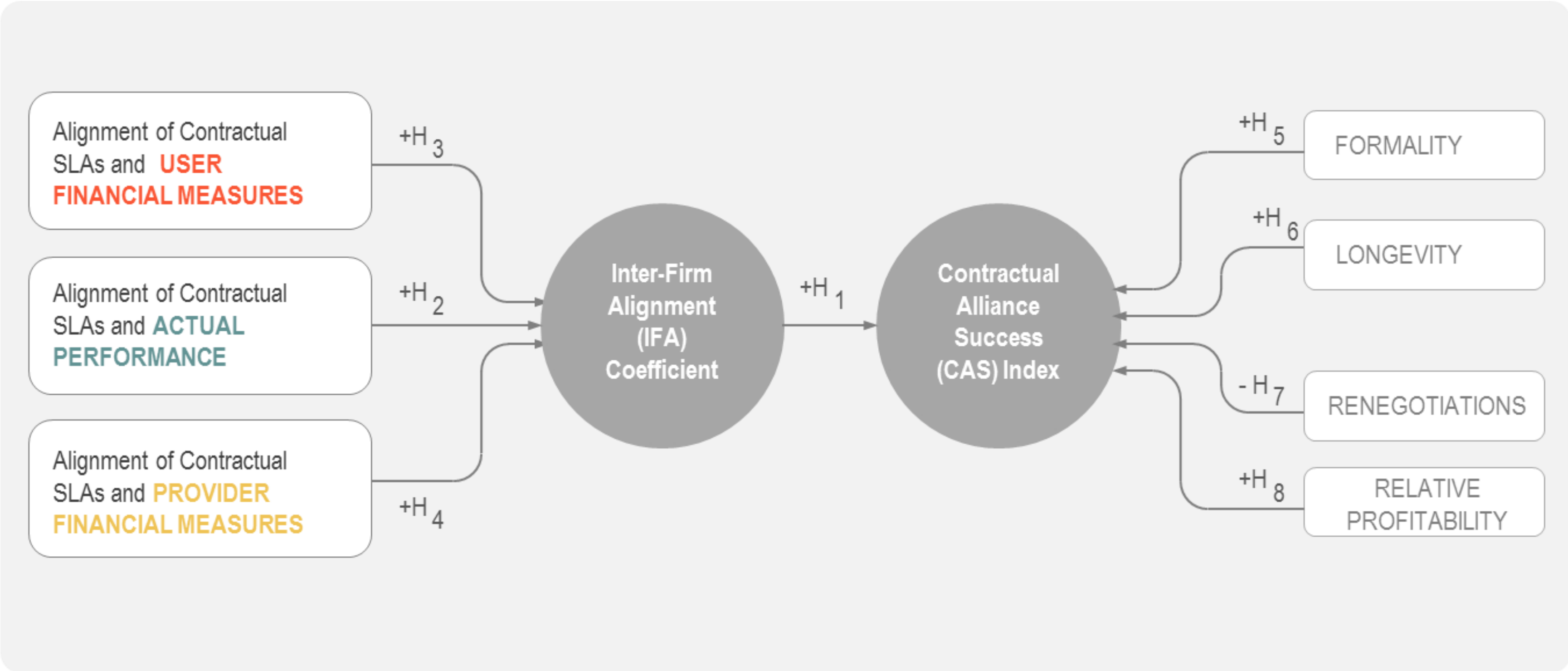

Figure 11 Research Model and Hypotheses

Table 10 Research Hypotheses and Variables

RESEARCH HYPOTHESES		VARIABLES	TYPE OF RELATIONSHIP
H_1	The degree of alignment amongst inter-firm performance measures is positively correlated with contractual alliance success	Inter-firm alignment Contractual alliance success	Positive and significant causal relation
H_2	The measure of alignment between the contract's service level agreements and the actual performance values contributes significantly to the measure of inter-firm alignment	Actual-SLA alignment Inter-firm alignment	Significantly positive contribution
H_3	The measure of alignment between the contract's service level agreements (SLA) and the provider's financial objectives contributes significantly to the measure of inter-firm alignment.	Provider-SLA alignment Inter-firm alignment	Significantly positive contribution
H_4	The measure of alignment between the contract's service level agreements (SLA) and the user's financial objectives contributes significantly to the measure of inter-firm alignment	User-SLA alignment Inter-firm alignment	Significantly positive contribution
H_5	An active inter-firm relationship governed by a formal mechanism is significantly and positively correlated to contractual alliance success	Formality Contractual alliance success index (CAS)	Significantly positive contribution
H_6	The length of the inter-firm relationship is significantly and positively correlated to contractual alliance success	Longevity Contractual alliance success	Significantly positive contribution
H_7	The number of renegotiations of the terms of the inter-firm relationship is significantly and negatively correlated to contractual alliance success	Renegotiations Contractual alliance success	Significantly negative contribution
H_8	The relative profitability of the inter-firm relationship is significantly and positively correlated to contractual alliance success	Relative profitability Contractual alliance success	Significantly positive contribution

4 RESEARCH METHODS AND DATA COLLECTION

4.1 Introduction

This section describes a combination of research techniques applied to study alignment of inter-firm performance indicators as predictors of contractual alliance success. The multi-method approach combines quantitative and qualitative methods to gather additional explanatory information for the quantitative information. It will be referred to as the QUAN-Qual[9] method.

The research design, based on the research model and data availability, was executed with one participating logistics service provider (LSP) and users of its contract logistics services. The execution of the research considered an initial pilot study, a qualitative analysis and the full quantitative analysis. Data for these three components was available from the provider. This logistics service provider made 11 contracts available for the pilot phase, and later a sample of 138 contracts for the full study. Additionally, the provider allowed the programme managers of the pilot contracts to be interviewed. The in-depth interviews contributed to the validation of the pilot analysis and better sense-making of the results. The provider, a global leader in the outsourcing logistics industry, sees the potential in the answers to the research questions as means to improve its capabilities in managing inter-organisational relationships and to be able to predict the likelihood of continuation of critical contracts.

The rationale for using a multi-method approach is founded in the fact that the research aims to answer a question never tested before. It is therefore argued theoretically but not tested empirically. The pilot study began with a quantitative effort to measure alignment amongst a set of performance measures and operationalising variables of contractual alliance success. This was done using 11 contracts made available by the provider. The quantitative results of the pilot

[9] The term in capital block letters describes the most prevalent of the methods. In this research the most prevalent methods are quantitative ones, with qualitative methods being auxiliary.

study for measuring alignment are summarised in Chapter 5 of the dissertation. The results of the full quantitative study are described in Chapter 6.

Once the quantitative results were available, interviews were scheduled with current programme managers responsible for handling user relationships. The interviews complemented the pilot quantitative results with the explanations of the current situation of each one of the relationships represented in the sample contracts. Details of the qualitative data collection follow in this section. An analysis of the qualitative results after finalising the pilot phase is documented in Chapter 5 as well right after the results of the pilot quantitative analysis.

The unit of analysis for this research is the contract, which is the instrument that governs the contractual alliance between the Provider and the User. Currently, the Provider has over multiple global contracts with different Users in selected industries. From this pool a sample of 11 contracts was selected for the pilot study, and from that pool a larger statistically significant sample of contracts was drawn for the full study.

In management research the use of multi-method research designs contributes to the understanding a managerial issue from different perspectives. This pilot study opted for a QUAN-Qual analysis that allows the researcher to obtain qualitative explanatory data to enhance understanding of previously conducted quantitative analysis and its results. The QUAN-Qual model, is also called the explanatory method (as oppose to exploratory) where quantitative data are collected prior to qualitative data and for this pilot study both results are weighted equally.

The qualitative analysis shows where the quantitative analysis is valid and where it falls short. This enhances predictability of the method. The qualitative analysis of the pilot study is based on the results of several interviews conducted with the business owners of the eleven contracts involved in the quantitative analysis. These interviewees are relevant to the research problem and the data collection techniques employed assured the validity of their responses. The qualitative data sources were presented under the Data Collection heading at the beginning of this section.

These methods are coherent with the philosophical position and theoretical lens described in Chapter 3 before, and are in line with the research questions stated in Chapter 1 and the hypotheses derived from the review of the literature in Chapter 2.

4.2 Quantitative Method

4.2.1 Data Collection: Primary Sources

The primary data source for the pilot study was a sample of 11 contracts received from the Provider. These contracts represent active users of logistics services. The scope of the contracts covers a varied portfolio of logistics services such as warehousing, transportation, distribution and inventory management.

The Users are all publicly traded firms in different industries with available financial performance information. After the pilot study was finalised the Provider made available additional 138 contracts, contracts with the same characteristics as those in the pilot sample, for a total sample size of 149. This data set represents a representative portion of the signed long-term agreements between the LSP and its users.

Each contract had available the following data elements (data presented in Table 10 below and described in detail in the Appendices):

- Operational performance indicators (based on the scope of services)
- Service level agreements (SLAs) per operational performance indicator
- Actual performance value by indicator over time (2 year horizon)
- Contract profile (signing date, active or not, with or without a programme manager, etc.)

In the SLAs both parties agree on the operational indicators that will govern and track the overall performance of the Provider, whilst also executing the contracted services. SLAs also state the performance goals for each indicator. Operational indicators are limited to the scope of contracted services for a specific User and timeframe. Some contracts have one key operational performance indicator. This is especially true in cases where services are fairly simple or limited to just one activity. Other contracts may have many indicators when the scope of services is complex and when the User prefers multiple indicators to track performance of different dimensions of the operation. Invariably, all the indicators contained in the studied contracts are operational in nature, and their performance goals are often stated in the contract or in another legally binding document.

Columns three to five of Table 11 show the main operational performance indicators in the 11 contracts of the sample for the pilot study. Contracts with Users are identified with letters, from A to K. So, Contract A is signed between User A, and the Provider. The operational performance indicators are related to logistics services offered by the Service Provider. For each performance indicator stated in the contract there is information on the SLA (required performance target value) at the starting time or renegotiation point. Additionally, the Provider delivered information on the actual performance value per indicator for the years 2010 and 2011.

The decision to maintain, renegotiate or decommission the outsourcing contract is typically based on the latest information from a set of variables from the User's perspective. Presumably it is decided based on the actual performance measures versus the SLAs. However the purpose of this research is to explore additional criteria mainly the contribution of the contract to the user's financial objectives.

Columns six to eight present contract profile data that may represent the success of the contractual alliance as stated by key academics in the field (Ariño, 2003; Zollo et al., 2002; Reuer and Zollo, 2005; Reuer and Ariño, 2007). These indicators of success include the status of the contract (1 for active contracts; 0 for non-active contracts); the longevity of the contract (number of years since signing); and the number of renegotiations of the contract's terms.

Table 11 Operational and contract success performance indicators from contracts in pilot study

Contract	Period of Analysis	Key Contract Performance Indicators			Longevity	Stability	Customer Status	Industry
Contract ID	End Q1 Year 2009	KPI1	KPI2	KPI3	(in years)	(Renegotiations)	(Active = 1; Abruptly Terminated = 0)	(as reported by provider)
	Contract Metrics	**Order Accuracy**	**Logistics Cost Reduction**	**Obsolete Inventory Reduction**				
A	Stated Contract SLA	100.0%	5%	100%	9.00	3.00	1	Consumer Electronics
	Current Performance	98.0%	4.45%	100%				
	Contract Metrics	**Fill Rate**	**Next Day Air Performance**	**Order Pick Accuracy**				
B	Stated Contract SLA	98.0%	100%	100%	3.00	1.00	1	Consumer Electronics
	Current Performance	96.0%	95%	99.70%				
	Contract Metrics	**On-Time In-Full**	**Dock-to-Stock**	**Inventory Accuracy**				
C	Stated Contract SLA	90% filled in 2 hours	4.0 hours	98%	12.00	3.00	1	Manufacturing
	Current Performance	88% filled in 2 hours	4.2 hours	97%				
	Contract Metrics	**Order Fulfillment**	**Dock-to-Stock**	**Inventory Accuracy**				
D	Stated Contract SLA	99.70%	100% in 420 minutes	99%	5.00	1.00	1	Manufacturing Equipment
	Current Performance	94.72%	95% in 420 minutes	98%				
	Contract Metrics	**On-Time Performance**						
E	Stated Contract SLA	98.0%			6.00	4.00	1	Telecommunications Equipment
	Current Performance	96.0%						
	Contract Metrics	**Delivery Performance**	**Claims Ratio**	**Aged Receivables**				
F	Stated Contract SLA	96.0%	1 claim in 700 shipments	80% in less than 90 days	3.00	1.00	1	Auto Parts
	Current Performance	94.0%	5 claims in 700 shipments	80% in less than 90 days				
	Contract Metrics	**Delivery Performance**	**Plant Disruptions**	**Aged Receivables**				
G	Stated Contract SLA	96.0%	0.0	80% in less than 90 days	2.00	2.00	1	Auto Assembly
	Current Performance	94.0%	0.0	70% in less than 90 days				
	Contract Metrics	**Delivery Performance**	**Plant Disruptions**	**Aged Receivables**				
H	Stated Contract SLA	96.0%	0.00	80% in less than 90 days	2.00	0.00	1	Auto Assembly
	Current Performance	88.0%	0.18	80% in less than 90 days				
	Contract Metrics	**Delivery Performance**						
I	Stated Contract SLA	96.0%			2.00	0.00	1	Auto Parts
	Current Performance	95.7%						
	Contract Metrics	**Delivery**	**EDI Compliance**	**Aged Receivables**				
J	Stated Contract SLA	97.00%	80.0%	90% in less than 45 Days	2.00	1.00	1	Automotive Distributor
	Current Performance	95.06%	71.2%	90% in less than 45 Days				
	Contract Metrics	**Time of Arrival of Available Freight**	**Total Transit Time**					
K	Stated Contract SLA	95.00%	4		8.00	3.00	1	Consumer Electronics
	Current Performance	90.25%	5					

4.2.2 Data Collection: Secondary Sources

Secondary data from external sources was needed to build the financial indicators of the provider and users involved in the 11 contracts. Financial indicators will be used to calculate the alignment of the contract's SLAs with the financial objectives of the participating firms.

From the myriad of financial indicators that are reported and tracked in publicly quoted firms, four indicators were selected for the study: revenue growth, profitability, cash operating cycle, and fixed asset utilisation. All are key objectives of sustainable organisations (Kaplan and Norton, 1996; Eccles, 1991; Collins and Porras, 2000) and closely connected with decisions to outsource logistics operations and the financial impact of logistics performance (Timme, 2004; D'Avanzo et al., 2003; Lambert and Burduroglu, 2000).

Public reports of financial statements for Users A to K show the values of financial performance indicators such as:

- Revenue growth percentage
- EBITDA[10] as a percentage of sales
- Days in working capital (accounts payables, inventory and accounts receivables)
- Revenue over Fixed Assets

These indicators track financial performance and are close related to logistics performance and to outsourcing decisions as well (Lambert and Burduroglu, 2000). Table 12 presents reported values of each financial indicator for the end of Q1 2009 by User.

The financial objective for in each one of the indicators was estimated using as benchmark, the performance of the first quartile of firms in the same SIC code

[10] EBITDA stands for earnings before interests, taxes, depreciation and amortisation and reflect the true operational margins for a firm

of the User[11]. For example, User D is in the SIC code 3724, currently the best performance in revenue growth for firms in the top quartile of its industry is 21.1% annual growth, thus it becomes the target performance in that indicator, where current performance by User D in revenue growth is 6.6%. From an investor's perspective, it will be a goal for User D to close the gap from its baseline to the industry's first quartile performance. Later in the document it will be discussed the implications of operational performance from an outsourcing contract on financial performance of the Provider and User. Table 13 summarises this example with detailed financial data from User D.

Table 12 Financial Indicators of Users in Pilot Study

Contract Party	SIC Code	KEY CORPORATE FINANCIAL INDICATORS			
LSP	**4215**	**Financial Indicators**	**Revenue Growth**	**% EBITDA / Sales**	**Days Sales Outstanding**
		Stated Goal Y2009	*8.50%*	*13.60%*	*32*
		Current Performance *(End Q4 2009)*	3.60%	15.20%	39
USER A	**3571**	**Financial Indicators**	**Revenue Growth**	**% EBITDA /Sales**	**Days in Inventory**
		Stated Goal Y2009	*14.70%*	*9.80%*	*21*
		Current Performance *(End Q4 2009)*	-3.60%	13.30%	26
USER B	**3651**	**Financial Indicators**	**Revenue Growth**	**% EBITDA /Sales**	**Days in Inventory**
		Stated Goal Y2009	*0.20%*	*13.10%*	*52*
		Current Performance *(End Q4 2009)*	-1.50%	7.80%	75
USER C	**7373**	**Financial Indicators**	**Revenue Growth**	**% EBITDA /Sales**	**Days in Inventory**
		Stated Goal Y2009	*26.20%*	*12.10%*	*0*
		Current Performance *(End Q4 2009)*	6.90%	8.60%	63
USER D	**3724**	**Financial Indicators**	**Revenue Growth**	**% EBITDA /Sales**	**Days in Inventory**
		Stated Goal Y2009	*21.10%*	*16.40%*	*79*

[11] Source: Finlistics, Value Manager, December 2009 www.finlistics-vm.com from Thompson Financials data. SIC stands for standard industry codes, a global industry classification of companies.

		Current Performance *(End Q4 2009)*	6.60%	30.90%	69
		Financial Indicators	**Revenue Growth**	**% EBITDA /Sales**	**Days in Inventory**
USER E	**3663**	*Stated Goal Y2009*	*11.00%*	*13.60%*	*31*
		Current Performance *(End Q4 2009)*	-0.70%	14.90%	28
		Financial Indicators	**Revenue Growth**	**% EBITDA /Sales**	**Days Sales Outstanding**
USER F	**3714**	*Stated Goal Y2009*	*0.00%*	*11.20%*	*35*
		Current Performance *(End Q4 2009)*	-19.00%	-2.60%	48
		Financial Indicators	**Revenue Growth Goal**	**% EBITDA /Sales**	**Days Sales Outstanding**
USER G	**3711**	*Stated Goal Y2009*	*22.70%*	*13.80%*	*22*
		Current Performance *(End Q4 2009)*	-15.20%	11.20%	161
		Financial Indicators	**Revenue Growth**	**% EBITDA /Sales**	**Days in Inventory**
USER H	**3711**	*Stated Goal Y2009*	*22.70%*	*13.80%*	*22*
		Current Performance *(End Q4 2009)*	-17.70%	-9.80%	19
		Financial Indicators	**Revenue Growth**	**% EBITDA /Sales**	**Days in Inventory**
USER I	**3714**	*Stated Goal Y2009*	*0.00%*	*11.20%*	*33*
		Current Performance *(End Q4 2009)*	-15.30%	4.60%	16
		Financial Indicators	**Revenue Growth**	**% EBITDA /Sales**	**Days Sales Outstanding**
USER J	**3713**	*Stated Goal Y2009*	*7.30%*	*10.60%*	*41*
		Current Performance *(End Q4 2009)*	6.40%	9.80%	94
		Financial Indicators	**Revenue Growth**	**% EBITDA /Sales**	**Days in Inventory**
USER K	**5085**	*Stated Goal Y2009*	*32.20%*	*14.70%*	*24*
		Current Performance *(End Q4 2009)*	25.30%	3.30%	20

Table 13 Example of Financial Benchmarks of Users by Industry

USER D SUMMARY COMPANY GAP ANALYSIS

Financial Metrics	Company USER D		Aircraft engines and engine parts (SIC: 3724) - North America: 1st Quartile [2]		Median [2]	4th Quartile [2]		Value of Gaps[3]: 1st Yr Cash Flow (Millions-USD)	LT Cash Flow (Millions-USD) [4]
Revenue Growth	6.6%		21.1%	▲	8.7%	5.1%	▼	5,746.6	13,411.4
Cost of Goods Sold[1] / Revenue	39.9%	▲	68.2%		73.9%	80.4%	▼	-	-
Gross Profit Margin	60.1%	▲	31.8%		26.1%	19.6%	▼	-	-
Selling, Gen. & Admin / Revenue	29.2%	▼	8.9%	▲	13.2%	19.0%		36,697.4	85,644.1
Research & Dev / Revenue	2.4%		0.8%	▲	1.7%	3.7%	▼	2,948.4	6,881.0
EBITDA / Revenue	30.9%	▲	16.4%		14.2%	10.2%	▼	-	-
Depr. & Amort. / Revenue	6.4%	▲	NA		NA	NA		N/A	N/A
Operating Income Margin	24.5%	▲	13.1%		10.8%	8.1%	▼	-	-
Net Income Margin	9.8%	▲	8.3%		7.1%	5.5%	▼	-	-
Days Sales Outstanding	43		40	▲	56	65	▼	1,765.4	1,765.4
Days in Inventory	69	▲	79		124	153	▼	-	-
Days Purchases Outstanding	105	▲	92		44	36	▼	-	-
Cash Operating Cycle	7	▲	61		116	170	▼	N/A	N/A
Revenue / Fixed Assets	2.30	▼	13.33	▲	6.48	2.70	▼	74,461.9	87,140.4
Revenue / Capital	0.24	▲	N/A		N/A	N/A		N/A	N/A

▲ is Best Performance

▼ is Lowest Performance

* Companyhad acquisition during year - Referto Summary/Company Profile for details

[1] Excludes Depreciation (If SG&A is N/A, COGS mayinclude SG&A)

[2] Industrybenchmarks are for each financial metric and do not collectivelyrepresent the performance of anindividual company.

[3] Value of Gap calculated using Target's financial metric compared to Benchmark.

[4] Present Value of change in annual Cash Flow. PVcalculated using cash flow of an Annuityand Target's Cost of Capital.

4.2.3 Generalities of Measuring Alignment

Given the goal of correlating alignment of inter-firm performance measures with contractual alliance success, it is required to measure 'alignment' amongst all performance indicators in the inter-firm relation. This section presents how the construct of inter-firm alignment and its components were transformed into a measurable variable that will be called the inter-firm alignment coefficient (IFA). This coefficient will become the independent variable in the full quantitative study.

The quantitative method for measuring alignment is based on earlier studies to measure 'fit' between a firm's strategy and its environment. The measurement of the IFA coefficient is in fact assessed as the alignment or distance between two variables (Venkatraman and Camillus, 1984). In the literature where the method was applied before the greater the distance the more misaligned the variables are. In this methodology, all distances are turned into Euclidean distances and this generates the alignment coefficient (Venkatraman, 1989). When the distance is very small the coefficient is closer to zero and there is more alignment. Having said so, the goal is to have IFA as close to zero as possible.

An example of measuring alignment between two constructs is presented in Table 14 below (Kathuria et al., 2007). In this example two managers rank their view on competitive priorities for their company. The example shows the poor alignment of the marketing manager's view compared to the general manager's view; the greater the number the less alignment between their views. In this example if the marketing manager had a complete opposite opinion to the general manager's the maximum coefficient of alignment will be 8. If they held the same views, the coefficient of alignment will be zero.

Table 14 Example of Alignment Calculations

COMPETITIVE PRIORITIES	VIEWS		
(Rank 1-5)	General Manager	Marketing Manager	Squared Differences
Quality	4.0	4.5	0.25
Flexibility	3.3	5.0	3.06
Delivery	2.8	3.5	0.56
Price	3.5	3.0	0.25
		Euclidean Distance	2.03

Based on applied methodology by Kathuria, Joshi and Port (2007)

4.2.4 Measuring Alignment of User's Financial Objectives and Contract SLAs

The purpose of the alignment test between a User's financial performance indicators and the contract's SLAs is to check the degree of fit between the contract's objectives and the objectives of the user in the relationship. As mentioned in the data collection section, SLAs from contracts were submitted by the Provider. Users' financial performance measures were extracted from public sources considering that all firms are publicly-quoted.

The first step was to identify the firms' financial objectives. Three key financial performance indicators of public companies were selected to represent the financial objectives of Users of contracted logistics services: *revenue growth*, profitability measured as *% EBITDA/Revenue*, and capital utilisation measured as the number of *days in working capital* (either number of days in inventory or days sales outstanding). Then, from secondary sources of financial data, it was extracted the current performance of the financial indicator and the stated goal for the current fiscal year[12]. The difference between those two values (actuals vs. benchmarks) created a performance gap that the contractual alliance's SLAs should contribute to closing.

The next step is to assess if the SLAs of the contract are aligned with the financial objectives of the firms, measured as described above. The research is

[12] See the section on secondary data sources and how the financial benchmark was calculated for each contract and each corporate performance indicator.

using known concepts of alignment of supply chain metrics to financial objectives. The AMR Hierarchy of Supply Chain Metrics presented in Figure 11 below, show the contribution of operational metrics (as those used in the outsourcing contracts) to financial performance objectives.

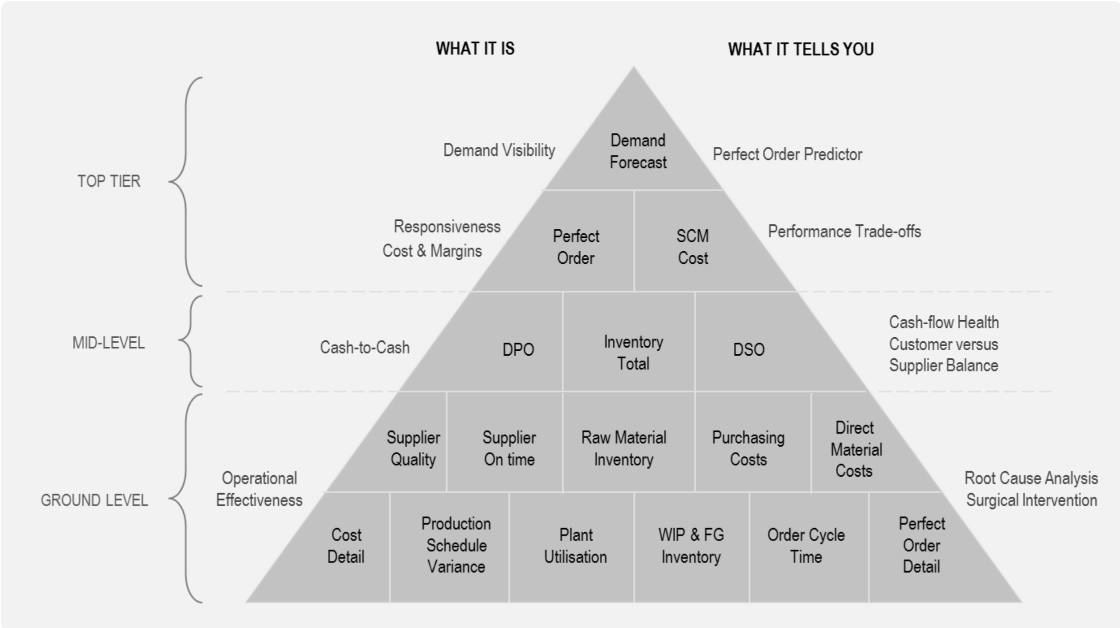

Figure 12 Hierarchy of Supply Chain Metrics

Before describing the calculation of the inter-firm alignment coefficient it is important to recall the concepts of alignment and when an indicator is aligned with other. Two performance indicators are aligned if achieving the goal of one contributes simultaneously to achieving to goal of the second. The logic is to make sure that both indicators have the same 'priorities' and they are not pursuing conflicting objectives. These ideas were formally introduced in section 2.4 of the literature review.

Achieving two goals simultaneously occurs when three conditions are shared amongst financial and operational indicators:

a) ***Inclusion:*** The operational indicator is aligned with the financial indicator if the operational indicator is a sub-component of the financial one. They are not identical because the operational indicator may be measured in a different unit of analysis or with a different level of aggregation. For example: days in inventory (operational) and working capital (financial) are aligned by inclusion because days-in-inventory is one of the components of cash-to-cash cycles that measure working capital utilisation.

b) ***Simultaneity:*** The operational indicator is aligned with the financial indicator if by achieving the goal of the operational indicator is translated immediately in improving the financial indicator. An example is fill-rate, an operational indicator that measures the percentage of orders filled completely. When fill rates improve, revenue growth (financial indicator) improves immediately.

c) ***Impact***: The operational indicator is aligned with the financial indicator if by achieving the operational indicator's goal, the impact on the financial indicator's goal is roughly in the same order of magnitude. For example: reducing days in inventory at the warehouse level has an immediate and immediate impact on reducing the days in inventory and improving working capital as a financial indicator.

Table 15 offers an example of the initial calculation of the alignment coefficient between financial performance indicators, and operational indicators. Operational indicators were summarised in the SLAs of each contract between provider and user.

Table 15 Example of Calculations - Financial and Operational Indicator Alignment

ALIGNMENT	FINANCIAL INDICATOR	OPERATIONAL INDICATOR	DISTANCES
1.00 = High 0.66 = Medium 0.33 = Low 0.00 = None	Revenue Growth Objective	Shipping Accuracy SLA Target	Squared Differences
Goal	5%	100%	
Inclusion	1.00	1.00	0.00
Simultaneity	1.00	0.33	0.45
Impact	1.00	0.33	0.45
		Euclidean Distance	0.95

Alignment improvement occurs when:

a) One operational indicator is included as the component of the financial indicator, from the example on Table 14, shipping accuracy (operational) is part of the calculations of revenue growth (financial). Better accuracy in shipping translates in more accurate revenue accounting (quantity * price), which allows for greater revenue. In this case the inclusion score = 0.00
b) The directionality of the indicators' goals is the same (i.e. shipping accuracy grows and revenue grow occurs). However, if shipping accuracy is improved by let's say 25%, it does not mean that revenue will grow by the same ratio. This means low simultaneity of objectives. In the example of Table 14, a score of 0.33 was assigned due to same directionality but lower simultaneity
c) The impact of achieving an operational goal has a significant impact on the performance of the financial indicator. Again using the previous example, improving shipping accuracy improves revenue growth and both indicators move in the same direction, however to grow revenue much more is needed than merely improving shipping accuracy. Therefore the impact is low for a score of 0.33.

This was the pilot methodology to quantify the alignment between operational SLAs stated in the contracts, and financial indicators at User firms. The sources of data were described above. These measurements created one coefficient of alignment for each contract:

USER-SLA = Coefficient of alignment between contract SLAs (operational indicators) and User's financial indicators

Table 16 below shows another example of how to calculate the coefficient of alignment between User's financial indicators and contractual SLAs (USER-SLA). The first row shows selected financial indicators with their stated goal in the second row, the current performance on the indicator in the third row and the resulting performance gap in the fourth row. The size of the performance gap is important to know when assessing the impact of the operational indicator on the gap. Then we equate each performance gap to "1" so to normalize the calculations irrespective of the type of indicator (days, money or percentages).

The alignment matrix shows how of each SLA (to the left in the sixth, seventh and eighth rows) aligns with each financial indicator to each financial objective (from the top on second, third, and fourth column). Partial Euclidean distances are calculated by subtracting the average of the contributions from the normalised alignment = 1. Values of [0, 0.33, 0.66, and 0.99] are assigned based on the three conditions of indicator alignment mentioned before: inclusion, simultaneity and impact.

Table 16 Calculation of USER-SLA Coefficients for Contract A

User A FINANCIAL INDICATORS	Revenue Growth	% EBITDA /Sales	Days in Inventory
Stated Goal Y2009 (from benchmarks)	14.70%	9.80%	21
Current Performance (from statements)	-3.60%	13.30%	26
Performance Gap	18.30%	-3.50%	(5.00)
Normalised Gap	1.00	1.00	1.00
Order Accuracy	0.66	0.66	0.66
Logistics Cost Reduction	0	0.99	0
Obsolete Inventory Reduction	0	0.33	0.99
Partial Euclidean Distance - Contract A	0.61	0.12	0.20
Value of USER-SLA Alignment for Contract A	0.96		

Then USER-SLA is generated as the square root of the sum of the squared distances against each financial indicator from the User's financial objectives. In Table 16 considering Contract A between User A and Provider the value of USER-SLA = 0.96

Below it is the general formula to calculate Euclidean distances between two values:

Equation 1 Calculation of Euclidean Distances

$$d_E(\mathbf{x}, \mathbf{y}) = \sqrt{(x_1 - y_1)^2 + (x_2 - y_2)^2 + \ldots + (x_n - y_n)^2} = \sqrt{\sum_{i=1}^{n} (x_i - y_i)^2}$$

The final step is to calculate USER-SLA values for each one of the 11 contracts in the pilot study. This becomes the first input to the inter-firm alignment coefficient (IFA). The other two are the alignment of contract SLAs and provider's financial objectives (PROVIDER-SLA), and the alignment of contract's SLAs with actual values of the operational indicators (ACTUALS-SLA).

4.2.5 Measuring Alignment of Provider's Financial Objectives and Contract SLAs

Next is the calculation of the second coefficient of alignment between the Provider's financial objectives and the contract SLAs (operational indicators). The reasoning behind this second coefficient is that if the contractual alliance is to succeed and last, it has to deliver benefits for both parties in the contract. Provider's financial indicators and objectives were obtained from secondary sources using publicly available financial data and industry benchmarks or the sector SIC Scheduled Freight Services and Warehousing Services.

The calculation of the PROVIDER-SLA values of alignment follows exactly the same method than for the USER-SLA alignment values in previous section. Once the values have been estimated for each one of the 11 contracts the data set is the second input to the general inter-firm alignment coefficient (IFA) is becomes the second coefficient of alignment between two sets of performance indicators in the contractual alliance.

PROVIDER-SLA = Coefficient of alignment between contract SLAs (operational indicators) and Provider's financial indicators

The process for assigning the alignment values is presented in Table 16 using three SLA indicators and their alignment with one financial objective.

The values are assigned assuming that if the contract performs properly in all SLAs it would have an impact on the Provider's financial goals. For example if the Provider's execution meets the requirements of *obsolete inventory reduction* stated in the contract, the Provider would receive additional revenue and greater chances for contract renewal.

Table 17 Process of Assessing Alignment between SLAs and Financial Indicators

CONTRACT'S SERVICE LEVEL AGREEMENT	RATIONAL OF ASSESSING ALIGNMENT BETWEEN CONTRACT'S SLAS AND PROVIDER'S FINANCIAL OBJECTIVES	
Alignment of Order Accuracy with Revenue Growth	The Provider wants to improve its Revenue Growth by 4.9%[13] Order Accuracy is one of the SLAs in the contract with User A	
	Is Order Accuracy included as a driver to generate more revenue to the Provider?	Answer: Yes Therefore Revenue Growth by Order Accuracy = 0.33
	Do Order Accuracy improvements simultaneously increase revenues for the Service Provider?	Answer: Yes Therefore Revenue Growth x Order Accuracy = 0.33
	Does improving Order Accuracy have a major impact on revenue growth?	Answer: Yes Therefore Revenue Growth x Order Accuracy = 0.33
Alignment of Logistics Cost Reduction with Revenue Growth	The Provider wants to improve its Revenue Growth by 4.9% Logistics Cost Reduction is one of the SLAs in the contract with User A	
	Is Logistics Cost Reduction included as a driver to generate more revenue to the Service Provider?	Answer: Yes (according to contract's variable fees) Therefore Revenue Growth x Logistics Cost Reduction = 0.33
	Do Logistics Cost Reduction improvements simultaneously increase revenues for the Service Provider?	Answer: Yes (according to contract's variable fees) Therefore Revenue Growth x Logistics Cost Reduction = 0.33
	Does reducing Logistics Cost have a major impact on revenue growth?	Answer: Yes Therefore Revenue Growth x Logistics Cost Reduction = 0.33 Total = 0.99

[13] This improvement goal is the difference between actual performance and industry benchmarks for the sector

Alignment of Obsolete Inventory Reduction with Revenue Growth	Consider the need of the Provider to improve its Revenue Growth by 4.9% Consider Obsolete Inventory Reduction as one of the indicators of the contract with User A	
	Is Obsolete Inventory Reduction included as a driver to generate more revenue to the Service Provider?	Answer: YES. Therefore Revenue Growth x Obsolete Inventory Reduction = 0.33 +
	Do Obsolete Inventory Reductions simultaneously increase revenues for the Service Provider?	Answer: NO. Therefore Revenue Growth x Obsolete Inventory Reduction + 0.00 +
	Does reducing Obsolete Inventory have a major impact on revenue growth?	Answer: NO. Therefore Revenue Growth x Obsolete Inventory Reduction + 0.00 = 0.33

Table 18 below presents the calculations of the alignment values PROVIDER-SLA for Contract A. See Equation 1 for the calculation of Euclidean distances. Values of [0, 0.33, 0.66, or 0.99] are assigned based on the three conditions of the indicator: inclusion, simultaneity and impact (as exemplified in Table 16).

Table 18 Calculation of PROVIDER-SLA for Contract A

PROVIDER Financial Indicators	REVENUE GROWTH	% EBITDA /SALES	DAYS SALES OUTSTANDING
Stated Goal Y2009	8.50%	13.60%	32
Current Performance	3.60%	15.20%	39
Performance Gap	4.90%	-1.60%	(7.00)
Normalised Gap	1.00	1.00	1.00
Order Accuracy	0	0.66	0.99
Logistics Cost Reduction	0.99	0.99	0.33
Obsolete Inventory Reduction	0.33	0	0
Euclidean Distance Contract A	0.31	0.20	0.31
Value of PROVIDER-SLA Alignment for Contract A	0.91		

The value of PROVIDER-SLA alignment for Contract A is generated using Equation 1 for Euclidean distances.

4.2.6 Measuring Alignment of Actual Performance and Target SLAs

Hypotheses H_2, H_3 and H_4 state that inter-firm alignment (IFA) is a function of the alignment amongst three different dimensions of performance: i) contract's SLAs and actual performance, ii) contract's SLAs and provider's performance objectives, and iii) contract's SLAs and user's performance objectives. The last two have been operationalised as the USER-SLA alignment and the PROVIDER-SLA alignment. The attention will be turned now to the calculation of alignment between the actual values of all operational indicators included in contract and the target values of those indicators, known as service level agreements (SLA). The name of this last variable will be ACTUAL-SLA alignment.

Equation 2 IFA Coefficient Formulation

$$\text{IFA} = f\,(\text{USER-SLA; PROVIDER-SLA; ACTUAL-SLA})$$

The calculation of the ACTUAL-SLA alignment values is less complex considering the basic arithmetic difference of two numbers with the same unit of measure. One number is the target value of the indicator and the second is the actual value of the indicator at the time of the analysis.

Given the fact that some indicators are reported as percentages, others as days or costs, a normalisation of all of the values to the same scale was required. For this data transformation the decision was to make (1) the target value of the SLA in the contract. Considering the actual value of the indicators the coefficients followed the same methodology for calculating Euclidean distances as used for USER-SLA and PROVIDER-SLA. Using again data from Contract A. Table 19 presents the calculation of the value of ACTUAL-SLA alignment. The same procedure was applied later to the remaining contracts in the pilot study.

Table 19 Calculation of ACTUAL-SLA for Contract A

OPERATIONAL INDICATORS Contract A	CONTRACT SLA TARGET	ACTUAL PERFORMANCE	SQUARED DIFFERENCES
Order Accuracy	100%	98%	
conversion	1.00	0.98	0.00
Logistics Cost Reduction	5.00%	4.45%	
conversion	1.00	0.89	0.01
Obsolete Inventory Reduction	100%	100%	
conversion	1.00	1.00	0.00
	Value of Coefficient	ACTUAL-SLA	0.11

The definition of the third input for the IFA calculation can be generalised as:

ACTUAL-SLA = Represents the coefficient of alignment between contract SLAs (operational indicators) and the actual values of the operational indicators in the period of time considered.

4.2.7 Operationalisation of Contractual Alliance Success

Hypothesis H_1 proposes a causal direct positive relation between the alignment of inter-firm performance measures and contractual alliance success. Sections 4.2.4 to 4.2.6 dealt with the operationalisation of the inter-firm alignment coefficient, as the independent variable of this research. Now it is time to turn the attention to the operationalisation of contractual alliance success (CAS), the dependent variable, and the determinants that are part of the calculation. All of these concepts were discussed in detail in the literature review, Chapter 2.

The literature review on determinants of contract success identified four variables that may indicate the degree of success of the 11 contracts in the pilot study. These determinants are formality, longevity, stability, and relative profitability (Ariño, 2003; Reuer and Ariño, 2002; Parkhe, 1993a). For the pilot study data were available on the first three. Relative profitability was later processed in the full quantitative study as the provider made more information available for the full set of contracts.

Formality is defined as a combined measure of an active contract that has a signed contract or agreement in writing. An active relationship with a signed contract takes the value of ‘1’ (one). ‘0’ (zero) indicates the contract has been decommissioned (abrupt termination) prior to its expected end-of-lifecycle (Das and Teng, 2001; Kale et al., 2001/10; Cravens et al., 2000/10). For the purpose of the pilot study all contracts had a value of ‘1’ meaning the contract is still active and valid and has a signed contract. This will change for the full study that was a sample of active and decommissioned contracts.

Longevity represents the number of years the relationship between provider and user has been active. From the perspective of the user and the provider long-term agreements are preferable to short term ones. That reduces uncertainty, reduces switching costs (for both parties) and in general it promotes trust amongst the parties (Reuer and Zollo, 2005; Parkhe, 1993b; Rahman and Korn, 2012).

Stability deals with the level of change that the relationship experiences. Stability means unchanged contractual terms, performance expectations, compensation, etc. For the purpose of the pilot study the provider shared information regarding the number of contract renegotiations that have occurred during the lifespan of the contractual relationship (Reuer and Ariño, 2002; Bolton, 1990).

Relative Profitability defined in Parkhe's (2003) terms means the relative benefit that both user and provider derive from participating in the inter-firm relationship. In the pilot study there was no data available to make inferences in terms of relative profitability. However for the full quantitative study, the provider shared the value of the contract, in terms of the dollar value of the relationship. This figure later enabled the calculation of the *relative profitability* variable using the contract value as a % of the provider's revenues, and contract value as a % of the user's SGA expenses. Chapter 6 will cover in detail the final refinement in variable operationalisation prior to loading the SEM model.

Considering that this is the pilot study with a small sample that does not allow a statistical analysis, there was a manual calculation of contractual alliance success. This was done merely to create some scenarios of successful versus non-successful alliances and the behaviour of the alignment coefficient.

During the pilot study, a contractual alliance was deemed successful if the relationship was a long-term, active, formal and stable agreement between a provider and a user. Since decommissioned relations will void all other characteristics of the contractual alliance, during the pilot study the assessment of success was measure as seen in Equation 3. In the full quantitative study, the SEM model will estimate the regression weights of each determinant and the appropriate sign that describe the type of relation between success and its determinants.

Equation 3 Contractual Alliance Success Calculation

$$\text{CAS} = [\text{FORMALITY} * (\text{LONGEVITY} - \text{RENEGOTIATIONS})]$$

4.3 Qualitative Methods

For the purpose of this research design, the qualitative results are ancillary to the pilot and full quantitative analysis. They complement the understanding of critical the issues around alignment of inter-firm performance indicators and the definition of contractual alliance success. In terms of sequence, the quantitative analysis was conducted after the pilot study. The results of the pilot analysis were presented to the Programme Managers that were interviewed in the qualitative phase. The pilot quantitative results in conjunction with specific relationship information from the PMs were used to create the cross-case analysis described below.

4.3.1 Qualitative Data Collection

For better interpretation of the pilot quantitative results, it was required additional information on each contractual alliance. This qualitative data was collected through interviews with current Programme Managers. PMs are employees of the provider and are in charge of managing the day-to-day details of the relationship with Users, including the tracking of the contract's SLAs. PMs are also in charge of discussing new services in the scope of the contract, decommissioned contracts and renegotiations of the terms.

The interviewees were highly familiar with the details of each one of the contracts, and were instructed by their supervisors to speak freely about all the stages of the contractual alliance. They were aware of the confidentiality of the provider and users' names and possible identification. The interviews were conducted over the telephone and all were recorded and transcribed verbatim. Electronic sound files are available for additional analysis if required. Table 20 presents the interview protocol that was used to guide the interviews with the Provider's Programme Managers. The topics of conversation in the interview protocol are closely linked to the main issues determining the potential answers to the research questions and to clarify the quantitative results obtained from the 11 contracts in the pilot study.

Table 20 Interview Protocol Provider's Programme Managers

GENERAL LINE OF INQUIRY	TIME	PURPOSE OF THE INQUIRY
Would you explain how these outsourcing contracts work? What is the scope of activities in the relationship that you manage?	1 min	Establishes the role of the person being interviewed and the activities the relationship/contract governs.
Who are your counterparts in the User site?	1 min	Identify the network of people that manages the relationship
What is the role indicators play in managing the outsourcing relationship?	5 min	Introduces the topic of managing contract performance through the use of indicators
How were the contract-operational indicators negotiated between Provider and the User?	5 min	Produces a historical background of how current SLAs (operational indicators) came to exist
Do you think current SLAs are aligned (coherent) with the User's financial goals?	5 min	Presents the concept of alignment. Gathers the managers' perspective on the importance of alignment of indicators.
Do you think current SLAs are aligned (coherent) the Provider' financial goals?	5 min	Introduces the concept of 3-way alignment: SLAs (target vs. actual), SLAs-User, and SLAs-Provider.
Is alignment (coherence) between contract's SLAs and financial indicators important?	10 min	Discussion based on managers' experience in different contractual relationships and explores the research main premise.
Let me share the results of the alignment calculations of some sample contracts.	5 min	Presents the basics of the alignment test and the results of the specific results for the manager's contracts in the sample
Do the results of alignment make sense in the context of the relationship you manage?	5 min	Explores the manager's reaction to the results of the test and his/her sense-making of the results in the context of the actual relationship
Has high/low alignment have any relation with high/low longevity of the relationship?	5 min	Introduces the element of predictability from the level of alignment and the success of the relationship defined as longevity.
Has high/low alignment have any relation with high/low stability of the relationship?	5 min	Continues the predictability analysis from levels of alignment and the success of the relationship defined as stability.
Do you have another question or comment that you would like to discuss?	3 min	Prompts for additional elements that may have been missing from the conversation.

In addition to individual interviews with the programme managers, two meetings were held key executives at the Provider. The participants in these meetings are the sponsors of the research and they are in charge of relationship management and structuring contracts with different Users for the provision of outsourcing services. The meetings helped with an additional layer of validation and insights into the research questions and their possible answers.

All interviews and management meetings were recorded, transcribed and coded. The results were processed in a cross-case analysis around key issues arising from the interviews, and the analysis of the quantitative results in context of the actual details of the relationship and the companies that are into it. Chapter 5 presents the results in detail.

4.3.2 Coding

Coding is an analytical technique employed to identify and summarise key constructs from a set of content, in this case from interviews and minutes of meetings with PMs from the Provider. The codes used for the transcription did not emerged from the conversation with the interviewees but rather mirror very closely the operationalised variables in the quantitative analysis that is aiming to complement. Those variables were translated initially into the interview protocol already introduced in the data collection section above.

Table 21 below shows the general codes used to analyse each one of the topics of discussion during the interviews and meetings with the representatives of the Provider.

Table 21 Coding Constructs for Qualitative Analysis of Interviews

CODING CONSTRUCTS FOR INTERVIEW ANALYSIS	DESCRIPTION
Role of Indicators	Strategic use of performance indicators in managing contractual relationships
Definition of Indicators	Describes how current indicators (SLAs) were adopted and selected to govern the relationship
Setting Targets For Indicators	Describes how both partners in the contract defined a specific value to become the target performance of the SLA
Definitions of Alignment	Explores the individual perceptions of what alignment is, why is important and how can it be measured or its presence verified
Operational Alignment	Explores personal explanations of what operational alignment is and why is important
User Alignment	Introduces the concept of contractual SLAs aligned with user's financial targets and explores the perceived importance of such concept.
Provider Alignment	Introduces the concept of contractual indicators aligned with the Provider's financial objectives and explores the perceived importance of such concept.
Contract Success	Records personal perceptions on what can be defined as a successful contract and how this concept can be measured
Drivers of Contract Success	Introduces the concept of contractual indicators aligned with user's financial objectives and explores the perceived importance of such concept.
Measurements of Alignment	After being presented with the results of alignment measures, this coding node registers the reactions of the interviewees to the coefficients
Alignment Matters?	Summarises general reactions to the research question if contractual success can be predicted by the alignment of goals across the contract and its two partners

4.3.3 Cross-Case Analysis

After a detailed documentation of each one of the eleven cases, a cross-case analysis was conducted. The cross-case analysis began with a map of the quantitative pilot results across two axes: inter-firm alignment coefficient (IFA) and the contractual alliance success (CAS). The map is organised along three segments for each variable: High, Medium and Low. The boundary of each segment was determined using the median of the data in each variable and finding the values for splitting the series in four quartiles. Table 22 presents the statistics for all dependent and independent variables calculated from the eleven contracts in the pilot study. It is important to reiterate that this analysis has no predictive capabilities since the sample is not randomised and not representative of the universe. The descriptive statistics is merely an exercise to understand the potential values that these variables (IFA, CAS, USER-SLA, PROVIDER-SLA, ACTUAL-SLA) can take and to test the feasibility of operationalising the constructs in the main study.

After the segments were defined, each contract was placed in the appropriate quadrant based on its specific values of IFA and CAS. This action allowed cross-case analysis for contractual alliances with similar behaviours and in the same scenario of performance.

Table 22 Descriptive Statistics for all Variables - Pilot Study Sample Data

Descriptive Statistics	ACTUAL-SLA Alignment	USER-SLA Alignment	PROVIDER-SLA Alignment	Inter-Firm Alignment (IFA)	Longevity	Renegotiations	Formality	Contractual Alliance Success (CAS)
Median	0.11	0.94	0.70	1.78	3.00	1.00	1.00	2.00
Average	0.46	0.94	0.76	2.16	4.91	1.73	1.00	3.27
Standard Deviation	1.18	0.18	0.23	1.11	3.45	1.35	0.00	2.49
First Quartile	0.05	0.78	0.65	**1.63**	2.00	1.00	1.00	**2.00**
Second Quartile	0.11	0.94	0.70	**1.78**	3.00	1.00	1.00	**2.00**
Third Quartile	0.16	1.05	0.78	**2.03**	7.00	3.00	1.00	**4.50**
Fourth Quartile	4.00	1.25	1.38	**5.30**	12.00	4.00	1.00	**9.00**

The qualitative analysis validated the results of the quantitative pilot and the scenarios created reflect such outcome. Based on the mapping of the contracts in the matrix, the correlation between alignment and success could be construed as ‘predicted’, ‘conflictive’ or ‘inconclusive’. Table 23 suggests the boundaries for each segment in the matrix and the definition of the scenarios.

Table 23 Map of CAS by IFA – Results from Pilot Study

Contractual Alliance Success Index (CAS)		Conflictive	Inconclusive	Predicted (I)
High Success	*9.0 < CAS< 4.5*	Conflictive	Inconclusive	Predicted (I)
Medium Success	*4.5 < CAS < 2.0*	Inconclusive	Predicted (II)	Inconclusive
Low Success	*CAS < 2.0*	Predicted (III)	Inconclusive	Conflictive
		5.30 < IFA< 2.03	*1.63 < IFA < 2.03*	*IFA < 1.63*
		Low Alignment[14] **High**	*Medium*	*High Alignment* **Low**
			Inter-Firm Alignment (IFA) Coefficient	

The **Predicted Scenario** shows contracts where the results of the calculations in the independent and dependent variables match the propositions in the research hypothesis H_1. In other words, there is a direct relation between contractual alliance success (CAS) and the inter-firm alignment (IFA) coefficient.

The **Conflictive Scenario** has contracts where the quantitative results conflict with the causal relation stated in the initial propositions. The **Inconclusive Scenario** groups contracts where the results do not confirm or reject the initial propositions and thus the qualitative explanations of the contract managers matters most.

[14] Recall that in the context of the misalignment coefficients, a high coefficient is not desirable as it indicates more distance between the two measured constructs.

4.4 Implications for Full Quantitative Study

4.4.1 Structural Equation Model as Statistical Method

The pilot quantitative study and the in-depth interviews provided insights into the research methods, the operationalisation of the variables and the general interpretation of the results. The following step was to prepare for the full quantitative study using a new sample of 149 contracts from the Provider. The full study will test the eight hypotheses presented in Chapter 3 and test the proposed research model.

Considering the theoretical lens of TCE and the philosophical position for the research, structural equation modelling (SEM) was selected as the ideal statistical method for building the research model (see Figure 10) and to test the proposed hypotheses (Shook et al., 2004). A SEM consists of a set of linear equations that simultaneously test two or more relationships amongst observable and unobservable (manifest and latent) variables. SEM has the unique ability to examine a series of inter-dependent relationships (where an endogenous variable becomes exogenous and predicts another endogenous within the same analysis), whilst also analysis multiple dependent variables.

Structural equation modelling is a popular and mature statistical method (Mueller, 1997) for data analysis to investigate theory-derived causal hypotheses. It is also known as analysis of covariance structures or causal modelling. The SEM method is suited for confirmatory purposes of cause-and-effect models by assessing in a quantitative way relationships amongst variables. SEM is also used in the prediction of latent variables.

The origins of SEM can be traced to path analysis and confirmatory factor analysis. In management sciences is considered the preeminent multivariate method of data analysis (Marcoulides and Hershberger, 1997; Mulaik, 1990) as it incorporates a set of data analysis tools that allow testing theoretically derived and a priori specified causal hypotheses.

Any research study using SEM should address four specific stages in the preparation of the full quantitative study (Mueller, 1997)

a. Initial Model Conceptualisation or Specification;
b. Parameter Identification and Estimation;
c. Data-Model Fit Assessment or Validation; and
d. Potential Model Modification and Improvements.

The results of a research study using SEM as a confirmatory statistical technique will be judged based on the following aspects that will be properly defined and reported in Chapter 6 (Shook et al., 2004).

i. Theoretical foundation for the postulated relations
ii. Accuracy in the description of the specified model
iii. Accurate description of applied estimation methods
iv. Reports on scale properties
v. Reporting on sample properties including size and data availability

4.4.2 Enhanced Primary Data for Full Study

For the full quantitative study the primary data source was the Provider sponsoring the study. As mentioned before the Provider is a world-wide leader in contract logistics services and maintains a selected group of users under a group called Programme Management Group. In this group each user is assigned a Programme Manager or PM, to manage the relationship with key users. All contract data comes from this group and represents about 50% of the managed contracts. The sample is 149 relationships between active and decommissioned contractual alliances. The Provider's customers will be referred to as Users during this research.

The database received from the Provider includes critical information for each of the contractual alliance that reflects data for the years 2010 and 2011. Table 24 below describes the fields in the Provider's database, the type of data and a brief description of the content.

Table 24 Field Description of Contract Database from Provider

FIELD	TYPE	DESCRIPTION
ID	Categorical	Provider ’s internal code for user identification
Customer	Categorical	Name of User company to be kept confidential
SLA Description	Categorical	Description of each one of the operational performance indicator included in the contract in the service level agreement (SLA)
Goal	Continuous	Quantitative value expected for each one of the operational performance indicators in the SLAs
Diff	Continuous	Calculation of the difference between the indicator’s goal and the actual average performance
Ave	Continuous	Quantitative value of the actual performance for each of the operational performance indicators in the SLAs
High/Low	Binary	Guideline to assess the performance indicator. Some indicators are better when they are HIGH (like on-time arrival), and some are better when they are LOW (time between arrival and shipping)
Contractual	Binary	Registers if the relationship has a signed contract or not
Year	Nominal	Specific year for performance reporting
Account Vertical	Categorical	Describes one of five industry verticals that applies to a particular USER
Director Name(Owner)	Text	Name of the specific Programme manager that is the owner of the contractual relationship
Report to Name (Owner)	Text	Name of the Programme manager’s supervisor
Yearly Measured SLA's	Continuous	Number of measures taken in a given calendar year for a maximum of 12 observations
YTD SLA's Met	Continuous	Number of observations where the SLAs were met
Average Performance	Continuous	Average value of the operational performance indicator for the given year of measurement

In order to complete the profiling of each one of the contractual alliances and to operationalise the constructs required for the analysis, the Provider submitted additional information by user contract in a second database with information detailed in Table 25 below. Appendices A and B present the files for both databases received from the Provider.

Table 25 Additional Primary Data Related to Contractual Success

FIELD	TYPE	DESCRIPTION
ID	Categorical	Provider 's internal code for user identification and the common field across databases
Longevity	Continuous	Number of years the User has been a user of the PROVIDER
Renegotiations	Continuous	(Azorín and Cameron, 2010; Molina-Azorin, 2012) Number of renegotiations on the conditions of the contractual relationship between User and PROVIDER
Value	Continuous	Annual value of the relationship in terms of the value of the contract
Active	Binary	Status of the relationship as active or non-active.

4.5 Summary

As presented throughout the chapter, the pilot study in all its dimensions is consonant with the philosophical position and the theoretical lens chosen to study inter-firm performance alignment. The research design, data collection methods and mixed analytical techniques to measure and analyse alignment, are congruent with the requirements of a QUAN-Qual research design (Azorín and Cameron, 2010; Molina-Azorin, 2012).

The operationalisation of variables such as inter-firm alignment and contractual alliance success has been properly demonstrated. These quantitative methods were supplemented by a qualitative validation from the actual relationship managers of the pilot contracts. Overall, the presented methods provided some initial answers to the stated research questions from the literature review. Statistical analysis to test correlation between degrees of alignment and contract success was not performed due to sample size, and considering that for the pilot study all contracts were active. The statistical analysis has been deferred for the main study with a larger data set of both types of contracts: active and decommissioned. The hypotheses will be tested during the full quantitative study. Chapters 5 and 6 summarise the results of the quantitative pilot study and the full qualitative analysis. Chapter 7 will provide a discussion of the results in light of the proposed hypotheses.

5 RESULTS FROM PILOT STUDIES

5.1 Introduction

The conducted pilot study demonstrated the feasibility of the proposed research model to measure inter-firm performance alignment (IFA) and contractual alliance success (CAS). This Chapter presents the results of a pilot quantitative analysis and a qualitative study conducted prior to the full quantitative analysis and the full set of contracts. The pilot quantitative study was conducted with a small sample of eleven logistics outsourcing contracts between one provider and 11 users. The contracts received from the Provider were not randomly selected. Rather, they were provided solely to test the viability of the proposed research methods.

The aim of the quantitative pilot study was to operationalise the constructs for contractual alliance success, alignment of inter-firm performance measures, a user's financial objectives, a provider's financial objectives, and what predicts contractual alliance success. The qualitative study was made up of in-depth interviews with the Programme Managers in charge of managing specific users in the sample contracts.

Firstly, the pilot study succeeded operationalising IFA as the result of three alignment variables named ACTUAL-SLA, USER-SLA and PROVIDER-SLA. These variables measure the alignment between actual performance values against the contract's SLAs, alignment between the user's financial objectives and contract SLA's, and alignment between the provider's financial objectives and contract SLAs, respectively. Secondly, the pilot study used profile information of the contracts to operationalise CAS as the result of the contractual alliance being active with a formal agreement (formality), for an extended period of time (longevity), and with a minimum number of renegotiations (stability). The concept of relative profitability will be tested in the main quantitative study.

In the qualitative portion of the pilot, Programme Managers provided additional contextual data and facts that complemented the interpretation of the results on contractual alliance success and inter-firm alignment.

It is useful to restate that the unit of analysis for this research is the signed contract between a Provider of logistics services and a User of such services. Each contract contains specific performance measures to govern the relationship known as service level agreements or SLAs. SLAs are both the set indicators selected to track the fulfilment of services under contract, as well as the numerical performance targets of each indicator. These indicators are also known as internal or operational performance measures.

Actual financial indicators and benchmarks were used in order to measure the alignment between the contract's SLAs and the performance objectives of provider and users. With that consideration in mind, the participating firms in the study, both users and provider, are publicly quoted firms. So their financial information is available from secondary, yet reliable sources.

The remainder of the Chapter analyses in detail the results from construct operationalisation, pilot alignment measures, success measures, and the scenarios that describe the situation of each of the 11 contracts. Additionally there is a section that describes in detail the content analysis from the interviews and the summary of their perspectives.

5.2 Quantitative Results

The quantitative pilot study demonstrated the feasibility to conceptualise, operationalise and calculate measures of alignment amongst the three sets of alignment measures. These results answer the first research question stated from the literature review. If inter-firm performance alignment is measureable then the full study can proceed to measure the correlation of IFA and contractual alliance success.

This section presents the quantitative results of the calculations and the analysis of each one of the results in the context of the pilot contracts. Chapter

4 described primary data sources and the calculations used to arrive at each one of the coefficients of alignment by contract as well as the operationalised variables for contractual alliance success, following constructs from the literature.

5.2.1 Measurement of Alignment Variables

5.2.1.1 ACTUAL-SLA

As described thoroughly in the Chapter on Research Methods, this coefficient of alignment measures the distance between the stated targets of the contract's SLA and the actual reported value of the indicator.

The SLAs tracked in the eleven contracts should be considered standard examples in the outsourcing logistics industry. They closely represent the scope of logistics services under contract between User and Provider (Krauth et al., 2005; Boyson et al., 1999). Most SLAs track the quality and response time of the logistics services performed by the Provider. It is interesting to notice, though, that within this particular sample of SLAs there were no cost or productivity indicators. The consequence of this is that many SLAs will not be aligned with the Provider's need to gain efficiencies in resource utilisation, which ultimately improves financial performance.

There is a significant interest on the role of logistics to reduce working capital. There were multiple SLAs related to shorter collection cycles, fewer days in accounts receivables and/or reducing the number of days in inventory. This is evident by the fact that four of the eleven contracts track indicators on *'aged receivables'* clearly associated with the speed of goods delivery. The most popular indicators are those related to delivery performance, transportation and shipping accuracy and on-time arrivals.

The contract sample includes SLAs related to the consequences of sub-standard logistics performance, such as 'plant disruptions' and 'claims'. There are few references to financial or cost indicators, as these typically are reported in the pricing section of the contract. However, two contracts monitor the reduction in logistics cost enabled by the Service Provider, and the overall reduction in inventory investment due to the outsourcing efforts. Table 26 presents the list of the SLAs from the eleven contracts, their type and frequency of use.

Table 26 Sample of Operational Performance Indicators

MENTIONS	SERVICE LEVEL AGREEMENTS INDICATOR DEFINITION	TYPE
5	Delivery Performance	Quality
4	Aged Receivables	Velocity
2	Inventory Accuracy	Quality
2	Plant Disruptions	Quality
2	Dock-to-Stock	Velocity
1	Logistics Cost Reduction	Cost
1	Obsolete Inventory Reduction	Cost
1	Order Accuracy	Quality
1	Fill Rate	Quality
1	Next Day Air Performance	Quality
1	Order Pick Accuracy	Quality
1	On-Time In-Full	Quality
1	Order Fulfilment	Quality
1	On-Time Performance	Quality
1	Claims Ratio	Quality
1	EDI Compliance	Quality
1	Time on Arrival of Available Freight	Velocity
1	Total Transit Time	Velocity

The coefficient of alignment between the target value of an SLA and the actual value of that SLA is an important input to the overall inter-firm alignment measure. Given that the contracts in the pilot study are still active and were hand-picked by the Provider's personnel it is expected that the alignment between target and actual be high. In other words, the value of the coefficient **ACTUAL-SLA** should be relatively close to zero, indicating a small distance between target and actual values.

Regardless of the lack of random sampling, it was expected to see a high degree of alignment between target SLAs and actual values, given that the definition of success of contractual alliances have always been related to fulfilling contractual obligations (Kale et al., 2001; Kale and Singh, 2007; Wittmann et al., 2009; Lambe et al., 2002; Segil; Stuart, 1997).

Table 27 below presents the calculated values of ACTUAL-SLA for each contract in the sample. The smallest value is zero (in the case of Contract I, where one operational performance indicator was tracked, and its actual performance was practically identical to the SLA. The indicator is ‘Delivery Performance’ and the target is 96% with an actual performance of 95.7%). It is important to remember that ACTUAL-SLA values closer than zero show more alignment, or less distance from target SLA vs. actual values of the SLA indicators.

Table 27 Values of ACTUAL-SLA Alignment for Pilot Contracts

CONTRACT	ACTUAL-SLA Alignment Coefficient
A	0.11
B	0.05
C	0.06
D	0.07
E	0.02
F	4.00
G	0.13
H	0.20
I	0.00
J	0.11
K	0.25
Average	0.46

The contract with the highest ACTUAL-SLA value is Contract F. This one has 3 operational indicators; one of its ‘Claims’ has an actual performance that is much worse than the target. The target for claims is 1/700, while the actual performance is 5/700. This difference generates a large distance between target SLA and actual value which adds up to the general coefficient of

ACTUAL-SLA. The rest of the contracts sit comfortably in the [0.05 – 0.25] interval that represents a high degree of alignment, as shown by the close distance between the contracts' SLAs and the actual performance values.

5.2.1.2 USER-SLA

The USER-SLA coefficient measures the alignment between the contract's SLAs and the financial objectives of the User. This coefficient represents the second dimension of overall inter-firm alignment of performance measurement systems.

Calculating the USER-SLA alignment for each one of the eleven contracts meant measuring the contribution of the contract's SLAs to the User's financial objectives. As defined in the research methods section, this contribution was codified for the pilot study as [HIGH, MEDIUM, LOW, NONE]. For the calculations, the codes have been translated to the values of [0.99, 0.66, 0.33, 0]. These represent nominal values for each of the codes. The rational for assigning one of these values to an operational indicator is based on the nature of the improvement of the SLA on the financial objective of the user. High contribution is assigned to those SLAs that are included in the calculations of financial indicators and that have a major and simultaneous impact on the financial objective when the SLA is met. Chapter 4, section 4.2.4 has detailed examples on the assignment of these codes by SLA and the logic followed to consider inclusion, impact and simultaneity.

Table 28 shows a general matrix of alignment between contractual SLAs and user's financial objectives. In this case the closer the number is to 1 (or 0.99) the operational indicator contributes more to a selected financial measure. Note that each operational indicator is assessed against the three financial indicators, and the alignment is different depending on the inclusion, simultaneity and impact of the SLA indicator on the financial one.

Table 28 General Contribution Matrix USER-SLA

USER´S FINANCIAL INDICATORS	REVENUE GROWTH	% EBITDA / SALES	DAYS IN WORKING CAPITAL	USER-SLA
Benchmark of Contribution	1	1	1	0.00
Inventory Accuracy	0.66	0.66	0.99	0.48
Order Pick Accuracy	0.66	0.99	0.66	0.48
Aged Receivables	0.66	0.33	0.99	0.75
Claims Ratio	0.66	0.99	0.33	0.75
Delivery Performance	0.99	0.33	0.66	0.75
Dock-to-Stock	0.66	0.33	0.99	0.75
Logistics Cost Reduction	0.33	0.99	0.66	0.75
Order Accuracy	0.99	0.66	0.33	0.75
Plant Disruption	0.66	0.99	0.33	0.75
Next Day Air Performance	0.66	0.33	0.66	0.82
On-Time Performance	0.66	0.66	0.33	0.82
EDI Compliance	0.33	0.99	0.33	0.95
Fill Rate	0.99	0.33	0.33	0.95
On-Time In-Full	0.99	0.33	0.33	0.95
Order Fulfilment	0.99	0.33	0.33	0.95
Total Transit Time	0.33	0.33	0.66	1.01
Obsolete Inventory Reduction	0.00	0.33	0.99	1.20
Time on Arrival of Available Freight	0.66	0.00	0.33	1.21

After estimating the directional alignment between operational indicators and financial indicators, a USER-SLA coefficient by contract was then calculated. The matrix shows an order of magnitude of contribution of operational indicators to key financial indicators. These are not the real values of the variable USER-SLA for the 11 contracts in the pilot.

One can deduce from Table 28 that the SLA that contributes the most to User's financial objectives is *'inventory accuracy'*. Inventory accuracy contributes highly [0.99] to reducing days in working capital. It does so by lowering the number of days in inventory due to higher accuracy in the counts. Inventory accuracy also contributes to revenue growth [0.66], since it permits selling products that were not available or visible before. It should be noted, however, that the impact here may be limited. Improving inventory accuracy contributes to improving profitability by increasing EBITDA as a per cent of sales by eliminating/reducing costs associated with inventory write-offs due to miscounts or misplacing. Another SLA with similar behaviour is *'order pick accuracy'*. This shows more impact on profitability than on reduction of working capital, but also shows high impact on revenue growth, by reducing the amount of picking errors in final customer orders.

The contract's SLAs that have lowest levels of contribution with user's financial objectives are: *'time of arrival of available freight'* and *'obsolete inventory reduction'*. Reducing obsolete inventories does not help revenue growth. It does, however, help profitability tangentially and contributes to reducing working capital. Yet the 0.00 value or no contribution in revenue growth reduces the total contribution of this indicator to user's financial objectives and ultimately to the level of alignment. *Time of arrival of available freight*, contributes to increasing sales [0.66] but it is not the major driver. It contributes to some extent in the reduction of days in inventory by shortening transit times. This contribution is again tangential so the assigned value was 0.33. As far as the contribution to profitability, this is very low, considering that fast shipping/delivery modes are more expensive and drive higher SGA costs.

After clarifying the operational-financial connection, the next step was to calculate the specific values of USER-SLA for each contract in the pilot sample. For the estimation of the alignment coefficients, the size of the financial performance gap that the User was trying to close was also taken into account. The actual financial indicators of some User firms are very close to the performance of the industry benchmark. The results show that when the financial gap is small (actual financial indicators vs. benchmark) the contribution of contract's SLAs is lower. When the user has a major financial gap, thus an aggressive financial objective, (see Contract H with a 40.4% performance gap in revenue growth to be closed), it is expected more contribution of the contractual alliance, or more alignment of the contract's SLAs and User's financial objectives.

During the discussion of the cases each one of the contracts will be reviewed in the context of their particular conditions. The Programme Managers have confirmed the validity of the approach taken here.

Table 29 Values of USER-SLA Alignment for Contracts in Pilot Study

CONTRACT	USER-SLA
A	0.94
B	0.96
C	0.75
D	0.75
E	1.25
F	0.76
G	0.98
H	0.85
I	1.11
J	0.79
K	1.23
Average	0.94

Table 29 above summarises the values of USER-SLA alignment for the 11 contracts in the pilot study. Evident here is the larger distance between this set of values and the ACTUAL-SLA coefficients (Table 26). This is expected as the considerations of alignment between contracts' SLAs and Users' financial objectives are new and not yet managed explicitly. This research should create the required awareness so managers seek this alignment by designing the right SLAs in their contractual alliances.

Nevertheless, the alignment behaviour is not homogeneous across the contracts in the pilot study. The contracts with the smallest alignment are Contract E and K. Contract E has only one indicator in its SLA: *'delivery performance'* which contributes to some degree to revenue growth, but little contribution to profitability or improved capital utilisation. In the case of Contract K, the two SLAs in the contract are two of the indicators with less alignment with financial objectives (See Table 28): *'Time of Arrival of Available Freight'* and *'Total Transit Time'*. These two SLA's may be useful for tracking the internal performance of the contract but have limited contribution to advance the strategic objectives of User K.

A potential conclusion to be drawn from the operationalisation of the USER-SLA coefficient relates to the number of indicators in the contract's SLAs. A single indicator or a small number of operational indicators miss the opportunity to find contribute to the User's financial objectives, and thus to increase alignment. A smaller number of SLAs could be easier to manage and improve ACTUAL-SLA alignment but shows limited strategic potential.

5.2.1.3 PROVIDER-SLA

The PROVIDER-SLA coefficient measures the alignment between the contract's SLAs and the financial objectives of the Provider. The provider is the firm that offers contract logistics services to Users under the structure of a contractual alliance governed by specific service level agreements or SLAs. The PROVIDER-SLA coefficient is the input of alignment amongst inter-firm indicators. It will be used to calculate total the inter-firm alignment coefficient (IFA). IFA will be used as a predictor of contractual alliance success (CAS).

The calculation method for the PROVIDER-SLA coefficient follows exactly the same method as the USER-SLA coefficient. A contribution matrix is presented that states the inclusion, simultaneity, and impact of each SLA to the financial objectives of the provider. In this case the method is the same but from an opposing perspective. The overarching question to ask is if the contract's SLAs are met what the contribution to the provider's financial objectives is. In some cases the answers may be completely opposite to the impact of SLAs on the User' financial objectives!

Table 30 presents the current values of the provider's financial indicators by the end of Q4 2009, and the financial objectives based on the industry's benchmarks. For logistics service providers the benchmark is the SIC code 4215.

In broader terms the Provider wants to more than double its rate of revenue growth, keep profitability as is (above the benchmark), and improve its ability to collect A/R faster from users. Knowing the Provider's financial objectives, the question is if the contracts' SLAs are contributing to those objectives.

Table 30 General Alignment Matrix PROVIDER-SLA

LSP CORPORATE INDICATORS	REVENUE GROWTH	% EBITDA /SALES	Days Sales Outstanding	PROVIDER-SLA
Stated Goal Y2009	8.50%	13.60%	32	
Current Performance (End Q4 2009)	3.60%	15.20%	39	
Performance Gap	4.90%	-1.60%	(7.00)	
Normalised Gap	1.00	1.00	1.00	
Logistics Cost Reduction	0.99	0.33	0	1.20
Obsolete Inventory Reduction	0.33	0	0	1.56
Delivery Performance	0.99	0.33	0.33	0.95
Inventory Accuracy	0.33	0.66	0.66	0.82
Plant Disruptions	0.33	0.99	0.33	0.95
Order Accuracy	0.99	0.66	0.66	0.48
Fill Rate	0.99	0.33	0.33	0.95
Next Day Air Performance	0.66	0.33	0.99	0.75
Order Pick Accuracy	0.99	0.66	0.66	0.48
On-Time In-Full	0.99	0.33	0.66	0.75
Order Fulfilment	0.99	0.33	0.66	0.75
On-Time Performance	0.66	0.33	0.99	0.75
Claims Ratio	0.33	0.99	0.66	0.75

EDI Compliance	0.33	0.99	0.66	0.75
Aged Receivables	0.66	0.33	0.99	0.75
Dock-to-Stock	0.33	0.99	0.66	0.75
Time of Arrival of Available Freight	0.99	0.33	0.66	0.75
Total Transit Time	0.99	0.99	0.33	0.67

If the performance gap is normalised to 1.00 for every financial objective, then how much the SLA contributes (via inclusion, simultaneity and impact) to the goal must be considered. The same scale of [0.99; 0.66; 0.33; 0] will be used to determine a HIGH | MEDIUM | LOW | NO | contribution. From the matrix in Table 29 it is noteworthy that quality indicators such as *'order pick accuracy'* and *'order accuracy'* have the most contribution to the Provider's financial objectives, and thus the greatest alignment. This means a small distance between provider's financial objectives and contract's SLA, or low PROVIDER-SLA coefficients.

Comparing both matrices of contribution in tables 28 and 30, it is noticeable that the SLA *'logistics cost reduction'* has the greatest contribution to financial objectives of both Users and Provider. The USER-SLA coefficient was 0.75 and the PROVIDER-SLA coefficient was estimated in 1.20. Other SLAs delivered equally to the objectives of Users and Providers, and should be preferred over those that are skewed towards one party or another.

To calculate the PROVIDER-SLA alignment coefficient by contract, the analysis considered SLAs present and the contribution of each indicator to the financial objectives of the Provider. Table 31 shows the results.

Table 31 Values of PROVIDER-SLA for Contracts in Pilot Study

CONTRACT	ACTUALS-SLA
A	0.57
B	0.82
C	0.75
D	0.82
E	0.75
F	0.54
G	0.70

H	0.70
I	0.67
J	0.63
K	1.83
Average	0.76

The calculations of PROVIDER-SLA coefficients complete the final set of variables required to estimate the total inter-firm alignment coefficient (IFA). IFA measures the alignment of a contractual alliance's SLAs with the objectives of its partners and the fulfilment of its operational objectives.

Following the definition on Equation 2, all components of IFA are known and the operationalisation has been fully tested in anticipation to the full quantitative study. In the full study, IFA will be a dependent variable, estimated from USER-SLA, PROVIDER-SLA, and ACTUAL-SLA as independent variables. Simultaneously IFA will be the independent variable used to estimated contractual alliance success (CAS).

The use of structural equation modelling allows for a single variable such as IFA to operate as dependent and independent in the same model.

Equation 4 IFA Coefficient Formulation

IFA = f (USER-SLA; PROVIDER-SLA; ACTUAL-SLA)

5.2.2 Measurement of Success Variables

In this research design, the main dependent variable is contractual alliance success (CAS). The main research hypothesis states that aligned inter-firm performance is a determinant of CAS. This section explores the operationalisation of CAS using information on determinants of IFR success drawn from management literature.

Most definitions of successful contractual alliances consider at least four determinants, or markers of success:

- Relationship formality continuity
- Relationship longevity

- Relationship stability
- Relationship relative profitability

A contractual alliance is deemed successful if its continuity has been guaranteed (no abrupt termination); if the relationship has longevity and if during the course of the relationship lifecycle it has been stable (subject to fewer renegotiations). Additionally, and building on game theory and switching costs, many consider that the success of a CA is based on the relative profitability of staying in the relationship. For the pilot study, the first three variables were combined into an overall index of contractual alliance success. Information on relative profitability was not available at the time of the pilot study but made available later for the full quantitative study.

The CAS index combines formality, longevity and renegotiations using the index formula from Equation 3. The larger the index, the more successful the contractual alliance. Formality (1 for all 11 cases of active and formal contracts) * the longevity in years (-) minus the number of renegotiations create an index of contractual alliance success.

Equation 5 Contractual Alliance Success - Pilot Study Calculation

$$CAS = [FORMALITY * (LONGEVITY - RENEGOTIATIONS)]$$

Table 32 below present the calculations for contractual alliance success for each one of the 11 contracts in the pilot study.

Table 32 Summary of Dependent Variables for Contract Success

CONTRACT	LONGEVITY	STABILITY	FORMALITY	CONTRACT SUCCESS
	Years	Number of Renegotiations	Active and Signed = 1 Decommissioned = 0	Formality * [Longevity - Renegotiations]
A	9.00	3.00	1	6
B	3.00	1.00	1	2
C	12.00	3.00	1	9
D	5.00	1.00	1	4
E	6.00	4.00	1	2

F	3.00	1.00	1	2
G	2.00	2.00	1	1
H	2.00	0.00	1	2
I	2.00	0.00	1	2
J	2.00	1.00	1	1
K	8.00	3.00	1	5

In the main study, the values of the CAS will be correlated to the IFA coefficients from Equation 2. The larger sample size will be larger, and the presence of active and decommissioned contractual alliances will allow for a proper statistical analysis using SEM.

This limited sample of contracts, all with formality = 1, do not show the upper boundary for alignment coefficients or the lower boundary for some of the measures of contract success. Additionally it is known that in this set of contracts for the pilot study there are special cases of very new relationships with at least one negotiation, and some very long relationships with many renegotiations in their lifecycles. Some tests need to be run regarding which one of the components may be more appropriate to correlate with individual alignment coefficients. The exploratory cases approach each one of the special situations in the sample contracts.

5.2.3 Pilot Measurement Observations

From the analysis of the 11 contracts, coefficients of alignment were obtained for each one of the three sets of inputs that determine inter-firm alignment in contractual alliances. Not surprisingly, on average the greatest alignment was found in the ACTUAL-SLA coefficient of alignment. Since historically most of the focus on contract management has been placed on achieving SLA targets, it is expected that those numbers are managed closely. In fact PMs at Provider review key SLAs with Users on a quarterly basis and draft action plans that bring them to target.

The lowest degree of alignment was found in the USER-SLA alignment coefficient. This is troublesome as this coefficient measures the congruence between the Users' financial objectives and the contracts' SLAs. The distance between users' objectives and SLA's is double the distance between actual operational metrics and SLA targets. These results suggest that contract SLAs are valuable for measuring the operational performance of the functions being outsourced, but do not contribute to the overall financial objectives of the User signing the contract. At this point, the sample is not big enough to draw any statistically significant conclusions regarding the USER-SLA coefficient and the contractual alliance success (CAS) index. The analysis will be conducted in the main study as part of the SEM research model.

The coefficient PROVIDER-SLA also showed low alignment, though not as poor as the values of the USER-SLA alignment. The results suggest that the SLAs in the contract do address better the needs of the provider than the needs of the users. As is described above in the methods section, this can be explained by the fact that if the contract delivers to its SLAs, the provider will have a financial benefit by growing its revenues from that particular user. If the improvement of the operational metric creates an additional expense for the provider, then it will have a negative contribution to its profitability metrics.

The main contribution of the pilot quantitative study was its ability to translate the measures of inter-firm alignment and the methods for assessing 'fit' from the strategic management literature to the performance measurement domain and apply the to the inter-firm context. Now when the discussion is centred on alignment of performance measurement systems, there is a method that assesses alignment beyond words.

5.3 Qualitative Analysis and Results

5.3.1 Introduction and Subjects

The previous section presented the details of the pilot quantitative study with a main objective to operationalise the calculation of key constructs in the analysis. This section presents the summary of the qualitative analysis regarding the results of the pilot study. The analysis was conducted using those interviewing techniques described in Chapter 4. The purpose of the interviews was to complement the pilot study with specific information by contract, and to receive feed-back from experts regarding the methodology, the overall aim of the research and sense-making of the results to date.

The interviewees were Programme Managers who work in one of the largest companies of the third-party logistics industry. The contracts and the managers belong to the contract logistics solutions business unit. The BU focuses on designing long-term logistics solutions for their users. In the last ten years, the parent company has acquired four smaller contract logistics providers that brought new users with existing contracts and relationships that were not negotiated by the Provider from the beginning.

Before reviewing the results of the qualitative analysis it will be useful to provide an organisational context to the Programme Managers. The Provider is organised along four specific areas that cover different aspects of managing contractual relationships with users:

<u>Business Development (BD):</u> They are in charge of scoping new solutions for existing or new users. They identify from an early point the types of performance measures that users want or need.

<u>Pricing Group</u>: Once the solution has been scoped by BD, the pricing group estimates the required investments and expenses to bring the services to life and translates those figures into a pricing structure for the user.

<u>Contracting Group</u>: If scope and price are in line of user needs the relationship evolves for contracting and goes to this group. The contracting group creates the legal documents that will govern the relationship and that includes most of the performance indicators agreed upon with the user.

<u>Programme Management Group (PMG)</u>: Charged with managing the strategic relationship with the user, the group is responsible for ‘adopting’ the user’s voice inside the Provider. Programme Managers working in the PMG are the representatives of the user in cases of requiring additional resources, requesting explanations for a given event, and

measuring and tracking the agreed upon performance indicators from the contracts and additional requirements by the user.

Programme Managers are assigned to large global accounts or to a set of accounts typically in the same industry. They have their corresponding counterparts in the User side and both meet on a regular basis to discuss performance issues or issues related to the contract lifecycle.

The Programme Managers responsible for the 11 contracts in the quantitative pilot were also selected to take part in the qualitative interviews. Given that Programme Managers represent the interests of the Users within the Provider, their perspectives are invaluable when it comes to understanding and explaining the context of specific results from the quantitative pilot.

In addition to the Programme Managers, four other people participated in two meetings that were held to present project progress to the sponsors at the Provider. The sponsors and meeting attendees represented the Strategy Group within the Provider organisation. Some participants work for the Programme Management Group but do not represent users. These last two are responsible for managing the contracts' SLAs and to prepare performance reports for scheduled meetings with users.

5.3.2 Results

5.3.2.1 Performance indicators are critical tools in managing relationships

From the interviews it was clear that performance indicators are the core tool for managing outsourcing relationships, from the perspective of the Provider and the Users. Operational issues drive the selection of the SLAs that go into the contracts. In some instances the indicators come from the user that has already decided what needs to be measured. Alternatively, in some cases, indicators are picked from a portfolio of indicators relative to the scope of contracted services.

A senior member of the Strategy Group participating in the project review meetings explains the role of performance indicators in the process of establishing a new contractual relationship:

> *SLAs are important to get agree upon expectations from both sides. The main role is expectation management and that's how we used them today. Sometimes users like to throw a big '100% completion on let's say… fill rate or something else. SLAs are how we bring reality into the mix.*

This is the most common perspective amongst interviewed Programme Managers. Performance indicators are tools to manage expectations from users and to communicate them internally. Once performance indicators are defined and agreed upon they are tracked and reported based on established schedules with the users. Typically there are quarterly reviews of the indicators, but in some cases, like with Contract E, the user requests weekly reviews of the performance indicators.

5.3.2.2 Defining operational performance indicators and setting targets

Most performance indicators are selected when scoping the required services by the Business Development Group. In two cases the relationships were inherited from an acquisition of another third-party logistics provider by the Provider, so the contracts included previously agreed upon measures. A member of the Provider's business development group offers:

> *The way we work in the Supply Chain Group is that there is a standard set of key performance indicators, KPIs, and the user will pick several that are more important to them. They become the SLAs for the contract.*

Also the Programme Manager PM_D of the relationship with User D explains that:

> *When the Provider took over the User D relationship from another contract, the metrics came with it, from the M&A with 3PL. We've had to do some stitching… One of the metrics in the current*

> *contract states 'shipping window of 40 minutes to close the order'. That metric used to be 30 minutes we negotiated it and told them that we couldn't do it in that window.*

During the initial phases of establishing the contractual relationship, process analysis and quantitative analytical data are used extensively. The head of the PMG shares an instance when defining the indicators and setting their targets required more than just a meeting. In that case the Provider had to send consultants to establish a baseline and correct logistics practices that affected performance:

> *Consultants from the LSP reviewed the company's overall shipping history, including the outbound shipment dates, the modes of shipment, and the arrival dates. The data showed that many products were traveling by air, the most expensive method, and arriving earlier than the required delivery date. Even parcels of sample products, sent free to users, were sometimes shipped by air. Interviews with company employees revealed that they were conditioned to get the products out quickly. They assigned an air shipment to many products simply out of habit.*

But not every performance indicator and target setting process is so consultative. PM_{K} tells that when User K became a user …

> *…they basically said 'here are the KPIs, if you want this business we expect you to accept them and to perform to them. And we said yes.*

The definition and setting of performance indicators and targets are not static. During the life of the contract several metrics get added and shredded based on the needs of the contract and the users. In some occasions performance indicators are added to be reviewed during the quarterly meetings with the PM. Technically the new performance indicators are 'covered' under the contract because of specific wording introduced by the Contracting Group.

> *In some instances the contract will only name the indicators to be tracked and it reads that "The Provider will meet and review the performance indicators periodically", but it does not establish a*

> *specific value to be achieved. That value is agreed and tracked in the operational quarterly meetings. The contract may state that any new indicator agreed upon both parties becomes an integral part of the contract.*

Setting the indicator's target value is typically done at a later time when the operation has already been contracted. The Provider would like to understand what is possible in terms of performance improvements before committing to a target. The basic definition of the baseline comes first and later the commitments for target performance.

> *The user can say what numbers they want, but we need to go and check if those numbers work for us. That's done after we start the operation. (PM_C)*

In the end, some PMs complain that when negotiating targets and indicators, everything seems to boil down to pricing. So the Provider must be careful on the overall increase of service cost, given the fact that committing to higher performance will require more resources, more facilities, and staff.

There was another method to select indicators and setting performance targets: by inheriting the relationship. Two of the eleven contracts studied in the pilot came into the Provider's User portfolio with pre-selected performance metrics. The contract had to be honoured as part of the commitments due from the merger with the original 3PL owner of the relationships.

It can be summarised, as a general rule, that the financial objectives of the two signing parties were not explicitly considered. This was true when selecting performance indicators to govern the relationship and when setting up the performance targets.

5.3.2.3 How Alignment of Indicators is Understood

When prompted on the importance of alignment of sets of performance indicators, the Programme Managers were not immediately sure of what the concept meant. After some probing, the most obvious interpretation of alignment is the fit between a measurement target and the actual value of the measurement.

Programme Managers agreed that alignment matters and intuitively grasp the importance of aligning the contract's SLAs with the goals of the firms in the contract; however they have never been exposed to alignment techniques. In the views of the Programme Managers financial performance of Users affect the terms of outsourcing relationships, but again they cannot articulate the magnitude of the impact or the direction of it. In words of PM_D

> *Per contract D discussion: perhaps we need to use the financial goals of the business unit, not the corporate parent, because that is what our counterpart cares about and gets paid to deliver to. When the targets get tougher (due to larger performance gaps) should we renegotiate the SLAs and the overall contract?*

5.3.2.4 Better Definitions of Contract Success are Needed

In the PMs' views contract success is continuity of service and longevity. The ultimate goal is to have the contract renewed after the agreed period and not to be subjected to abrupt termination. The drivers for contract success are grouped along some subcategories, where most interviewees agreed that the first one is good performance in the selected indicators for the service agreements. But besides that one, a recurrent them is the concept of communications.

The definition of contract success seems to be an easy one to agree on.

> *"We don't like when a user says 'We are not using you anymore', and when we ask why, typically their reaction is related to an issue when we didn't react well after recovering from a service failure". Reacting in the event of problems seems to be a critical driver of success in contractual alliances for logistics service providing.*

When asked about the current definition of contract success they say about renegotiations:

> *Renegotiations are not necessarily a bad sign. Customers like to renegotiate. That means you are still in business. Sometime we like to renegotiate to adjust pricing or something else. It's a case of renegotiate or terminate because we are losing money and there are clauses in the contract that allow us to terminate if we are not seeing the volumes we were promised.*

In most cases the reason for renegotiation is pricing rather than operational issues or changes in metrics. So as long as the relationship is good, renegotiations are not a sign of low stability. Yes, says Doug a PM for User A

> *There is the usual tension between provider and users. Providers want long term contracts and users want shorter so they can change their minds and go whenever they want to go, get better rates and things like that. The more stable contracts the better because you can plan your space and other things.*

What is missing from the definition of contract success is the monetary aspect of the relationship. Profitability.

> *At the end of the day, the Provider relies on user satisfaction surveys to track the overall success of their relationships and correct obvious flaws in the system.*

5.3.2.5 Some Drivers of Contractual Alliance Success

- Meeting operational targets, except when there is a new C-level executive
- Communications in case of not meeting performance requirements

5.3.2.6 Alignment is Not How it Looks

Alignment is higher, conceptually, to users' needs, not with provider's needs. This is especially true because they cannot have financial statements by user yet. The user drives his/her own metrics but they revolve mostly around operational issues.

The argument is if it delivers operationally it should deliver financially and strategically... If you meet the SLAs for inventory accuracy, and the user does better indirectly that also helps us get better and get more business from them. The metrics tend to be more aligned with the user needs, I don't have any data to back this up, but they are better to the users… and that's the way it should be, performance agreement to the users, and then you try to protect yourself.

5.3.2.7 Three-way Alignment

5.3.2.7.1 Operational Alignment

The key to long-lasting contractual relationships is operational performance, in the experience of Programme Managers. Operational metrics are more stringent like in the case of Contract E where they ship medical and health products.

We talk with our counterparts at the client's side and they only care about operational results. If the operational metrics are good they are happy or they don't say anything. If we have problems that's what they care. They do not really share with us the goals of the company but we suppose they are measured by those numbers as well.

5.3.2.7.2 Customer Alignment is in everybody's mind

5.3.2.7.3 Provider alignment based on the success of the user

In the minds of the Programme Managers, the alignment of the contract's indicators with the financial goals of Provider is rarely considered. They mentioned reiteratively that all the alignment that is considered is with users' objectives. Below are some of the comments expressed by different interviewees.

I have not seen many SLAs that are a direct benefit to the provider, except for the volume clauses that gives you protection around certain things. I don't know of anybody at Provider and Business Development that checks for the overall alignment of the metrics to our own corporate indicators.

Programme Managers have rationalised this lack of internal alignment by foreseeing scenarios where if the user does well, it will benefit Provider in the end. Theoretically.

> *If you meet the SLAs for inventory accuracy, and the user does better, indirectly that also helps us get better and get more business from them…*
>
> *... and by establishing that there are other ways to protect the interest of the Provider in the relationship that is not necessarily through specific performance indicators: minimum volume clauses and financial surcharges for missing volumes.*
>
> *We put things in the contract like minimum volume requirements but that's not really an SLA. That is how we protect our revenue growth. If the volumes don't match, there are going to see some charges. It's a financial penalty to make sure they have the volumes to cover the fixed cost of the infrastructure and overhead, the equipment you have. You have to have guarantees they will cover your fixed costs.*

Interestingly, the quantitative analysis showed different conclusions regarding the considerations of alignment of internal contract indicators versus the financial objectives of the Service Provider. The calculations of PROVIDER-SLA turned out to bring a higher coefficient of alignment than the USER-SLA coefficient, indicating better fit of the contracts with Provider's goals than with users' goals.

When expressed these results to the Programme Managers, they argued that in a way, contract logistics is their business and is a direct reflection into their financial statements in terms of revenue, profitability and capital utilisation. Therefore it seems more evident that the contracts take care of that first in order to assure the sustainability of the Provider's operations. Yet it was asserted before that no one checks proactively for that alignment in the Business Development group.

5.3.3 Alignment Matters, but Can be Measured?

After being introduced to the concept of alignment of operational indicators with financial indicators most interviewees agree on the potential positive implications of alignment.

> *“The numbers should deliver results both ways in order to have a more stable and longer-time contract. There is a tension in contract management; when is overpriced you drive users away or it is under-priced and we lose money on it.*
>
> *You have to take the KPIs individually and see what's going on at the user's side and at the provider's side.*
>
> *Higher alignment matters but in both ways… but I don't know yet. Sounds like it … have you done some correlations? Do they matter?*
>
> *We are about to renegotiate with User D and if we can prove them that our contract helps with their big numbers on a regular basis we are set. We can do this with all healthcare companies on a regular basis. That will keep the new CFO happy.”*

However in their daily jobs they do not foresee using this insight. From their perspective, the concepts of alignment (or alignment) will be more beneficial during the initial scoping, pricing and contracting of the services, and at times of renegotiation, when is required to demonstrate value being created by the outsourcing relationship for the user.

5.4 Pilot Results in Context

From the quantitative analysis of the sample contracts some differences were evident in terms of the success index and the values of the alignment coefficients. Table 32 maps the results of each one of the eleven contractual alliances in a matrix of CAS indices by IFA coefficient. Certainly with a limited sample like this it is impossible to draw statistically significant correlations, but in this phase of the research three scenarios are apparent from the pilot cases.

There is a predicted scenario that shows contractual alliances with results as predicted in the initial hypotheses. It will be the **‘blue’** scenario. The **‘orange’** scenario has results that contradict the initial hypotheses and propositions. The inconclusive scenario, or **‘grey’** scenario**,** presents a mix of results with behaviours that match the initial hypotheses and others challenge them.

Table 33 Contractual Alliance Placement in a Matrix of Success by Alignment

Contractual Alliance Success (CAS) Index	*Low Alignment*[15]	*Medium Alignment*	*High Alignment*
High Success			A, C (Hi-Hi)
Medium Success	F, K	B, D, E, H, I (Mid-Mid)	
Low Success	(Low-Low)	G	J
Alignment	**(+) IFA**		**Low IFA(-)**

The following section describes in detail the contextual information that provides additional explanation of these scenarios.

5.4.1 The Predicted Scenario

The predicted scenario considers those contractual alliances with expected behaviour according to the propositions (later hypotheses) stated in Chapter 3. They were validated limitedly through this pilot study. In the predicted scenario there are seven contracts out of eleven, with levels of contract success

[15] Recall that in the context of the alignment coefficients, a high coefficient is not desirable as it indicates more distance between the two measured constructs.

commensurable with their alignment coefficient. These cases are summarised in Table 34.

From the predictive scenario, three segments can be clearly separated:

I. Hi-Hi Group: with high indices for contract success (***CAS*** > 4.5 defined as the edge of the fourth quartile in the data) and high levels of alignment (***IFA*** < 1.63 as the first quartile of the data series). This group has actual SLA performance practically identical to the SLA goals thus showing low ACTUAL-SLA coefficients (0.11 or less). The contracts in the group are A and C.

II. Mid-Mid Group: with contractual alliance success index in the second and third quartile (4.5 < ***CAS*** < 2.0) and alignment coefficients in the second and third quartile of the data series as well (1.63 < ***IFA*** < 2.03) Contracts in this sub-group are B, D, E, H, I.

III. Low-Low Group: with low indices for contract success (***CAS*** < 2.0) in the first quartile of the data series and low levels of alignment (1.63 < ***IFA*** < 5.03) of less than 1.63 as the first quartile of the data series. It is a qualitative confirmation on the methodology that this quadrant is empty, since decommissioned contracts were not provided for the pilot study.

Table 34 Quantitative Results of Contracts in the Predicted Scenario

CONTRACT	ACTUAL -SLA	USER-SLA	PROVIDER -SLA	IFA COEFFI-CIENT	LONGE-VITY	RENEGO-TIATIONS	FORMA-LITY	CAS INDE X	SCENA-RIO
C	0.06	0.75	0.75	1.56	12.00	3.00	1	9	Predicted
A	0.11	0.94	0.57	1.62	9.00	3.00	1	6	Predicted
D	0.07	0.75	0.82	1.64	5.00	1.00	1	4	Predicted
H	0.20	0.85	0.70	1.75	2.00	0.00	1	2	Predicted
I	0.00	1.11	0.67	1.78	2.00	0.00	1	2	Predicted
B	0.05	0.96	0.82	1.83	3.00	1.00	1	2	Predicted
E	0.02	1.25	0.75	2.02	6.00	4.00	1	2	Predicted

Contract C, the highest ranked contract in the pool, is an example of a relationship with a loyal user according to the Provider’s records. Inherited from an acquisition by the Provider close to eight years ago, the relationship is strong, with predictable contract renewals every four years, and over a decade in business with the Provider. The services offered by the Provider are complex and the outsourced operation is closely embedded with User C's manufacturing practices. The Programme Manager qualifies the relationship as 'good', not excellent, but satisfactory for both parties. Excepting opportunities to improve inventory turns, User C seems to be performing strongly in revenue generation but has some financial gaps to close in terms of profitability. See Table 35 below.

Table 35 Contractual SLAs and Financial Objectives for User C

FINANCIAL INDICATORS User C	Revenue Growth	% EBITDA / SALES	Days in inventory
Stated Goal Y2009	26.20%	12.10%	0
Current Performance (End Q4 2009)	6.90%	8.60%	63
Performance Gap	19.30%	3.50%	(63.00)
Normalised Gap	1.00	1.00	1.00
On-Time In-Full	0.99	0.33	0.99
Dock-to-Stock	0.33	0.33	0.99
Inventory Accuracy	0.33	0.66	0.99
USER-SLA Coefficient	0.20	0.31	0.05

User A is the second contractual alliance with best performance in this scenario and in the Hi-Hi group. One of the world's largest technology companies has an aim "to simplify the technology experience for consumers and businesses". User A has a portfolio of products that spans printing, personal computing, software, services and IT infrastructure. It is a public company listed in the New York Stock Exchange.

User A has totally outsourced its service parts logistics operations to the Provider. Accordingly with the Programme Manager for this account (PM_A)

> *Provider offers the "high-speed logistics solutions that high-tech companies require. With product obsolescence speed increasing each year, there is a much smaller window of time to get merchandise to market - or they are risking taking a loss".*

Since the beginning, both parties deemed the relationship critical to their companies' operations. User A depends on the Provider's performance for supporting its field operations, manufacturing sites and post-sales user service, with components, parts and spares. The Provider regards User A as a key global account with enough visibility to determine most of its strategy for the high electronics industry, and with sufficient volume and scale to justify the allocation of specialized resources to manage the account. The contractual relationship between User A and Provider has been in place for nine years and according to the terms of the contract it is due for renegotiation every three years.

> *So far, it has been successfully renewed three times. The relationship can be described as 'somehow a manageable tension' with lots of 'stressful times'. The times we've had renegotiations are 'because the CEO and CFO have change the targets and now we need to renegotiate our targets… and naturally with service up and costs down.*

The challenge in managing this relationship comes from the amount of indicators to track in the contract with User A. Indeed, in some cases it looks like a mix of targets, processes, recommendations and activity profiles, some measured in the field and some at specific distribution centres. Certainly this makes it difficult to verify alignment of over 30 critical operational indicators with the financial goals of a major corporation.

User A is noticeably one of the few companies in the sample that has exceeded the financial targets of its industry in terms of profitability. This is due to excellent attention at controlling logistics costs and providing optimal field support (see these indicators as key ones in the analysis). In terms of revenue growth and days in inventory User A has some gaps to close. These last two indicators account for poor alignment, so the Provider must ensure that the operational indicators do not focus solely on cost reduction as is the case today. See Tables 36 and 37 for additional detail on these indicators.

Table 36 Contractual SLAs and Financial Objectives for User A

FINANCIAL INDICATORS User A	Revenue Growth	% EBITDA / SALES	Days in inventory
Stated Goal Y2009	14.70%	9.80%	21
Current Performance	-3.60%	13.30%	26
Performance Gap	18.30%	-3.50%	(5.00)
Normalised Gap	1.00	1.00	1.00
Order Accuracy	0.99	0.66	0.33
Logistics Cost Reduction	0.00	0.99	0.00
Obsolete Inventory Reduction	0	0.33	0.99
USER-SLA Coefficient	0.45	0.12	0.31

The second group in the Predicted Scenario has five contracts that have medium levels of success and medium coefficients of alignment. They are considered with the ‘predictable’ scenario given that their success and alignment results match the diagonal in the matrix where inter-firm alignment predicts contractual alliance success.

In this group two of the users belong to the automotive sector: User H and User I, two operate of the electronics and technology sector (User B and User D) and User E is in telecommunications.

User D is one of the cases of medium alignment and medium level of success. It belongs to the Predicted Scenario, with correlation between both variables, but it is worth taking a detailed look at this contractual alliance as it informs similar situations with the other four relationships.

User D is a conglomerate and the Health Care Business Units is the Provider’s user. Even though the USER-SLA coefficient shows good fit between the contract’s SLAs and the User’s financial objectives, the Programme Manager in charge of the relationship suggested that alignment should be measured against the financial objectives of the business unit in particular and not of the conglomerate’s objectives. This is request is reasonable but perhaps difficult to implement since the conglomerate does not reports data at the Business Unit level.

Contractual alliance with User D is another case of quasi-perfect alignment in the ACTUALS-SLA coefficient. In the words of the lead $PM_{D:}$

> *User D is in an industry that tolerates no mistakes, and that is within a company that makes very few operational mistakes. "We are not quite six-sigma yet but we have learned with them over the last five years and they will renew the contract for other five years. In this case the measurement of operational indicators is tight. They are tracked weekly and are bundled to a rolling report from the last 11 weeks."*

According to the PM_D in charge there has been only one week in the last 11 where performance was lower than target and that was by 0.35%. This is consistent with one of the lowest values of ACTUALS-SLA for Contract D = 0.07. The level of detail in the operational performance indicators is indicative of this situation. Table 37 below contains exemplar references to how many minutes are allocated to certain activities. The issue in this contractual alliance revolves around the contract's SLAs contribution to the Provider's financial objectives.

Table 37 Contract's SLAs with User A

SPL	Receipt of Material	98%	X-Dock orders 15 minutes	FSL 1
SPL	Receipt of Material	98,00%	Air/Unused returns 4 hours	FSL 2
SPL	Receipt of Material	98,00%	Ground 8 hours	FSL 2
SPL	Net inventory accuracy	99,50%		FSL 3
SPL	Cycle Counts	98%		FSL 5
SPL	PRT Receipts	99%	6 hours	FSL 6
SPL	PRT Receipts	100%	EOB next business day	FSL 6
SPL	Pick, Pack and Ship quality	99,50%		FSL 7
SPL	FSL shipments	99,50%	3 day	FSL 9
SPL	Delivery/Pick Up performance	98%	Mission Critical	FSL 10
SPL	Delivery/Pick Up performance	97%	Same Day Reactive	FSL 10
SPL	FSL shipments	99,50%	same day	FSL 11
SPL	FG Receipts	98%	same day	DC 1
SPL	FG PRT receipts	99%	same day	DC 2
SPL	FG PRT actions	99%	EOB next business day	DC 3
SPL	Defective PRT receipts	99%	same day	DC 4

SPL	Defective PRT actions	99%	EOB next business day	DC 5
SPL	Blank	Blank	Blank	DC 6
SPL	Repack, re-box, re-label receipts	97%	EOB next business day	DC 7
SPL	Part conversions hot requests	99%	4 hours	DC 8
SPL	Part conversions standard requests	99%	EOB next business day	DC 9
SPL	Priority Repack, re-box, re-label receipts	99,50%	same day	DC 10
SPL	FG priority receipts	99,50%	4 hours	DC 11
SPL	Order accuracy	99,75%	Pick, pack, ship quality	DC 12
SPL	Audit findings	0	Major non-conformance	DC 13
SPL	UPS SCS caused purge	<.5%	UPS SCS caused parts to be purged	DC 14
SPL	Hold/Purge requests	100%	30 minutes	DC 15
SPL	Kitting past due orders	<50	Kitting requests >10 business days	DC 16
SPL	NDA order fulfilment	99,90%	same day	DC 17
SPL	Non-NDA order fulfilment	99%	same day	DC 18
SPL	Defective shipping	99,50%	EOB next business day	DC 19
SPL	Defective order accuracy	99,75%	Pick, pack, ship quality	DC 20
SPL	Cross dock	99,50%	same day	DC 21
SPL	Obsolescence orders	100%	3 weeks	DC 22
SPL	Inventory shrinkage	99,70%	per year	DC 23
SPL	Gross value variance	<.75%	per quarter	DC 24
SPL	Cycle Counts	98%	cycle count accuracy	DC 25

Contract D has the third lowest alignment coefficient in the PROVIDER-SLA measurement, suggesting that much attention has been placed on meeting the user's required SLAs and the user's financial objectives but less on checking alignment with the Provider's financial needs.

> *"This contract has been in place for five years with one renegotiation. The PM_D explains the context of some of the renegotiations and the future outlook of the relationship. The one renegotiation was mostly around pricing because we proposed it.*
>
> *We were performing more services that we scoped and we had to charge them for it. Needless to say they weren't happy about it... We are up for renegotiation again after a 3 year contract. There are some operational issues that we are tidying up but if by April 2010 they are arranged, User D has committed to 4 more years with us.*

And, hey, in the next round we will make sure we prove that the metrics fit their goals."

Table 38 Contract's SLAs with User D

SCOPE OF SERVICE	SLAs	SLA Targets	COMMENTS
Distribution	WPS	100% (End of Day/210 Minutes)	Facility has an end of day, global is 210
Distribution	WCP / WDR / WDD	100% (40 minutes)	
Distribution	WEA	100% (48 hours / 22 hours)	
Distribution	Inventory Accuracy	99%	
Distribution	Order Fulfilment	99.70%	
Distribution	Dock-to-Stock	100% (420 minutes)	
Distribution	Re-pack	100% (840 minutes)	
Distribution	Scrap	100% (96 hours)	
Distribution	Outbound Quality	99.50%	Audition IB and OB quality proper quantity, part numbers, manual audit
Distribution	Inbound Quality	99.50%	

The SLAs in Contract D, summarised in Table 38, reflect very accurately the context of the quantitative measurements of success and alignment in terms of relationship management. Contracts H, I, B, E, have very similar IFA coefficients and all of them have exactly the same contractual alliance success index **CAS = 2**

5.4.2 The Conflictive Scenario

The Conflictive Scenario includes the one contractual alliance with a contract that does not match the prediction of correlation between alignment (IFA) and the contract success index (CAS). Contract J is the relationship in that category. Contract J is considered an immature relationship by its PM_J. It has been active for two years but already has some renegotiation activity recorded.

Contract J is a relationship with a high level of alignment (IFA < 1.63) but has the lowest index of contractual alliance success in the eleven contracts provided for the pilot study, with CAS = 1. The qualitative phase of the analysis allowed the collection of additional information from executives familiar with the unique circumstances and context of this CA that may explain the reasons for the conflict.

Table 39 Quantitative Results of Contracts in Conflictive Scenario

CONTRACT	ACTUAL-SLA	USER-SLA	PROVIDER-SLA	IFA COEFFI-CIENT	LONGE-VITY	RENEGO-TIATIONS	FORMA-LITY	CAS INDEX	SCENA-RIO
J	0.11	0.63	0.79	1.54	2.00	1.00	1	1	Conflicting

Programme Manager PM_J for Contract J has some reasonable explanations for the renegotiation event in the short life of the contract. According to PM_J there was an acquisition transaction in the near past. User J used to be an independent automaker and merged three years ago with another global player. The parent company of User J is in difficult financial strides and is trying to reduce costs and increase sales at any cost. User J shows a better than average financial situation for a company in the automotive sector. So it is expected that after the renegotiations are completed and the new spin-off or selling of the company happens the terms of the relationship will be more stable. That is the expectation from the PM_J:

> *Right now we are not doing much to support the lack of cash in our user's coffers since we have our own requirements for lower accounts receivables. In that sense you could understand the bad metrics we got to align with our user's metrics and with our own targets. In fact if you look at the metrics and how operational they are, there seems to be an opportunity to have a conversation with somebody higher up.*

Table 40 Contractual SLAs and Financial Objectives for User J

FINANCIAL INDICATORS User J	REVENUE GROWTH	% EBITDA / SALES	DAYS IN INVENTORY

Stated Goal Y2009	7.30%	10.60%	41
Current Performance (End Q4 2009)	6.40%	9.80%	94
Performance Gap	0.90%	0.80%	(53.00)
Normalised Gap	1.00	1.00	1.00
Delivery	0.66	0.00	0.66
EDI Compliance	0.66	0.99	0.00
Aged Receivable	0.66	0.33	0.99
USER-SLA Coefficient	0.12	0.31	0.20

Table 41 Contract's SLAs with User J

USER	PROVIDER SERVICE	INDICATOR	PERFORMANCE TARGET
User J	Forwarding, Freight, Package	Delivery	96%
User J	Forwarding, Freight, Package	Delivery	98%
User J	Forwarding, Freight, Package	Aged Receivables	90% $$ <45 Days
User J	Forwarding, Freight, Package	Claims Ratio	1/700 claim paid/shipment handled
User J	Forwarding, Freight, Package	Invoicing Accuracy	95%
User J	Forwarding, Freight, Package	EDI Compliance	80%
User J	Forwarding, Freight, Package	Operating Ratio	Variable

The analysis of the interviews and the additional data show that User J is experiencing business issues that may render it impossible to run the analytical tests designed in the quantitative section of this pilot with confidence. It is important, however, to document the results of this contract since it is very likely that the full study will encounter users and contracts with similar profiles.

5.4.3 The Inconclusive Scenario

The inconclusive scenario includes contractual alliances that do not fit the behavioural prediction in terms of contract success and/or coefficients of alignment. In this category, there are three relationships whose contracts present inconclusive results from the quantitative section of the pilot study.

Table 42 Quantitative Results of Contracts in the Inconclusive Scenario

CONTRACT	ACTUAL -SLA	USER-SLA	PROVIDER -SLA	IFA COEFFI-CIENT	LONGE-VITY	RENEGO-TIATIONS	FORMA-LITY	CAS INDEX	SCENARIO
K	0.25	1.23	1.38	2.87	8.00	3.00	1	5	Inconclusive
F	4.00	0.76	0.54	5.30	3.00	1.00	1	2	Inconclusive
G	0.13	0.98	0.70	1.81	2.00	2.00	1	1	Inconclusive

The relationships in the 'inconclusive' scenario need to be singly studied as two of the three belong to the same industry. User F and User G, not only operate both in the beleaguered automotive sector but they are also interconnected. User F is a spin-off of User G and remains as its main supplier for parts and components. Both users manage against the same SLAs in their contracts with the Provider; the target SLAs for both users also identical.

Moreover, relationship management for users in the automotive sector is specific that the Provider has a specialised team within the Programme Management Group to handle the contractual alliances in the sector. Programme Management for Users F and G is led by the same PM supported by additional staff. Some of his comments apply for all the users in the vertical, but he made some unique remarks considering the special situation of Contracts F and G, in the Inconclusive Scenario.

> *Given the critical situation of the automotive sector, sometimes users walk into a meeting and simply say 'I need a 2% cost reduction across the board'. This measure is outside the contract and outside the agreement, but considering the size of the revenue we may accept it and it may have consequences for the Provider goals, because we really do not check that alignment. (Programme Manager, Automotive Sector)*

Table 43 below shows the specific financial objectives of User F and the alignment coefficient with the SLAs in Contract F. The interviews suggest that it is important to consider alignment of contractual SLAs indicators in contracts that are more prevalent in the industry where the users operate. The Programme Manager for Automotive Sector offered his point of view on the issue of types of industries and types of logistics outsourcing contracts.

> *In the pharmaceutical and electronics industry the outsourcing contracts tend to be long-term and exclusive and the scope is a set of embedded activities within the user's manufacturing and internal operations. In the automotive and packaged goods sector, the contracts are short-term and non-exclusive and the nature of activities under contract are more transactional in nature, not embedded in the planning of the business.*

One explanation to the unpredictable behaviour of these two contracts is that during the life of the relationship some SLAs have been added but not on a permanent basis. The new SLAs could be added a shipment-by-shipment basis, depending on the particular needs of the User at the time. With this clarification it seems relevant to look at the alignment coefficients, and at the indices of contractual alliance success considering the perspective of the industry and the nature of the services contracted.

Table 43 Contractual SLAs and Financial Objectives for User F

FINANCIAL INDICATORS User F	REVENUE GROWTH	% EBITDA / SALES	DAYS IN INVENTORY
Stated Goal Y2009	0.00%	11.20%	35
Current Performance (End Q4 2009)	-19.00%	-2.30%	48
Performance Gap	19.00%	13.80%	(13.00)
Normalised Gap	1.00	1.00	1.00
Delivery Performance	0.66	0.00	0.66
Claims Ratio	0.66	0.99	0.99
Aged Receivables	0.66	0.00	0.99
USER-SLA Alignment Coefficient	0.12	0.45	0.01

Table 44 below shows the financial objectives of User G and the specific SLAs within the contract. When shown the high alignment ACTUAL-SLA and low alignment USER-SLA and PROVIDER-SLA, the reaction from one of the analysts in the Automotive Sector of the PMG was:

> *How can you plan any alignment with financial goals when you have a company with a goal to grow their top-line by 22% in a year, and ended up losing 15% of sales, and yet financing users for 136 days. It is a miracle they have enough to pay us at the end of the month. I don't think they are too worried about the alignment of the contract's performance metrics.*

Table 44 Contractual SLAs and Financial Objectives for User G

FINANCIAL INDICATORS User G	REVENUE GROWTH	% EBITDA / SALES	DAYS IN INVENTORY
Stated Goal Y2009	22.70%	13.80%	22
Current Performance (End Q4 2009)	-15.20%	11.20%	161
Performance Gap	37.90%	2.60%	(139.00)
Normalised Gap	1.00	1.00	1.00
Delivery Performance	0.66	0.00	0.66
Plant Disruptions	0.33	0.99	0.00
Aged Receivables	0.66	0.00	0.66
USER-SLA alignment coefficient	0.20	0.45	0.31

The last contract in the Inconclusive Scenario is one signed with User K. It is a company with relatively high CAS index (the third highest in the pilot contracts) but one that also exhibits very low alignment. The low alignment in this contract is generated from the fact that they track only two SLAs that are very narrow in scope and with limited direct contribution to the financial objectives of the User and the Provider. Given the User's focus on consumer electronics, their SLAs zeroed in speed and transportation transit times.

Table 28 in section 5.2 calculated the low alignment levels of these two indicators with revenue growth, profitability and capital utilisation.

Table 45 Contract's SLAs with User K

CLIENT	SCOPE OF SERVICE	METRIC	GOAL
Telecommunications	International Air Freight	Actual Time of Arrival to Freight Available	8 hours - DFW 12 hours - ORD 95% effectiveness
Electronics	International Air	Total Transit Time	4 days; not measured

However once the Programme Manager explained the issue it seems that it is worth revising. This is the way PM_K refers to the issue:

> *The permanent operational and strategic concern for User K is the status of their shipments and issues of transit time by lane. It is a very operational relationship, but with a solid argumentation on the strategic implications of this focus:*
>
> *The only reason why I get a phone call from User K is if they need me as an internal liaison between them and someone in the front-line of Service Provider. It's just to resolve issues. The issue could be related to moving the freight, could be about a bill they received or any IT issues. I guess that's why we're called Programme Management!*

According to PM_K User K is not very interested in having the Provider participating in discussions on the strategic implications of logistics performance.

> *They don't expect us to understand their strategy or have a say where they go or what to do. They just want us to perform according to the operational indicators. We could use our good performance in delivering those results to get more business from them.*

It also seems that current good financial performance in User K makes them less aware of the need of aligning all operational activities and metrics to the overall goals of the company. This is also the case for Companies F and G in the automotive sector. Table 46 shows a very different picture in terms of financial performance from the ones in Tables 43 and 44.

Table 46 Contractual SLAs and Financial Objectives for User K

FINANCIAL INDICATORS User K	REVENUE GROWTH	% EBITDA / SALES	DAYS IN INVENTORY
Stated Goal Y2009	32.20%	14.70%	24
Current Performance (End Q4 2009)	25.30%	3.30%	20
Performance Gap	6.90%	11.40%	4.00
Normalised Gap	1.00	1.00	1.00
Time of Arrival of Available Freight	0.66	0.00	0.00
Total Transit Time	0.33	0.00	0.00
USER-SLA Alignment Coefficient	0.26	1.00	0.26

5.5 Conclusions and Implications for the Full Study

The quantitative pilot study and the qualitative complement provided critical input for the full quantitative study. The calculation of the alignment coefficients was refined with the results from the quantitative pilot. The pilot also suggested changes in the operationalisation of variables that were implemented in the full study. One of the suggested changes was getting more granularities in the levels of alignment between contractual SLAs and financial objectives. The following Chapter describes the modifications as the operationalisation of variables for the SEM is explained.

The qualitative analysis from the interviews with the Programme Managers helped formalise the constructs of contractual alliance success and inter-firm alignment. Clearly some measures of success derived from the literature were challenged by the PMs' opinions regarding their importance as a proxy of success. The variable 'renegotiations' is one of them. This is where some Programme Managers accept that too many renegotiations harm long-term partnerships. But most of the PMs consider renegotiation a sign of a healthy and active relationship. One issue that arose from the data on renegotiations was the fact that it does not distinguish who initiated the renegotiation effort. That fact could be relevant.

For this research all contractual alliances are operational in nature, so users or providers may not perceive the strategic potential of the relationship. That being the case, little effort will be allocated towards managing the contractual alliance from a strategic perspective, at least until some alarms go off and there is a renewed pressure to perform or to align. The alignment to SLAs may be that alarm as the use of contractual SLAs is prevalent throughout the life if the contractual alliance. They become a form of communication across all echelons of the Provider's and User's management pyramid.

The pilot study encountered a connection between the degree of alignment of the USER-SLA coefficient and the User's financial performance. If the User is in financial distress they seem to be more interested in aligning everything to their financial objectives. If the User is in relative good financial health, the focus turns to excellence in operational performance. There is a need to revise the matrix of contribution from operational indicators to financial indicators. Several Programme Managers pointed out connections and impacts not previously documented. These will clearly impact the way the alignment coefficients USER-SLA and PROVIDER-SLA are estimated.

The perception of the Programme Managers is that as a rule, the Provider's top management is not aware about the alignment of the contract's SLAs and their own financial objectives. The perception is that they are focused on getting the business and the revenues from Users. This is a reality despite the fact that within the Strategy Group there is a concern about the contract's impact on new investments and fixed costs. Programme Managers may not be equipped or interested in having a strategic conversation with Users and the Providers top management, but they suspect that people in the Business Development group are not either.

The interviews suggested that it is important to consider alignment of contractual SLAs based on in two types of services, which are closely related to the industry where the user operates. Rick, Programme Manager for the whole Automotive Sector offered this point of view on the issue of types of industries and types of logistics outsourcing contracts.

> *In the pharmaceutical and electronics industry the outsourcing contracts tend to be long-term and exclusive and the scope is a set of embedded activities within the user's manufacturing and internal operations. In the automotive and packaged goods sector, the contracts are short-term and non-exclusive and the nature of activities under contract are more transactional in nature, not embedded in the planning of the business.*

With this clarification it seems relevant to look at the inter-firm alignment (IFA) coefficient and the contractual alliance success indices with a fresh look.

At the end of the pilot study phase there was a scheduled meeting with the key sponsors of the research at the Provider. They not only embraced the initial results but also granted access to the requested set of contracts to be used in the main quantitative study. The set contains 138 contracts in addition to the initial 11. They provide data and contractual SLAs for the years 2010 and 2011 which becomes the sample size of the full quantitative study.

6 QUANTITATIVE RESULTS OF FULL STUDY

6.1 Structural Equation Modelling

This Chapter describes the preparation and results of the full quantitative study. The full study measures the proposed research model using statistical techniques for data analysis and hypotheses testing. The process and results summarised in this Chapter have benefited form suggestions derived from the pilot study and the qualitative analysis. The data sources for the full study include performance indicators and behavioural data from 149 contractual alliances between Provider and Users.

Eight research hypotheses derived from the literature (presented in Chapter 3) will be tested simultaneously using structural equation modelling for the quantitative analysis. The quantitative model follows the theoretical and research models introduced in chapters 3 and 4, respectively. Section 4.4 discussed the rational for selecting structural equation modelling (SEM) as the ideal statistical method to test this particular set of hypotheses. SEM is an ideal and mature statistical method (Mueller, 1997) for data analysis. It is also useful when investigating theory-derived causal hypotheses, commensurate with a post-positivist philosophical stand.

A structural equation model consists of a set of linear equations that simultaneously test two or more relationships amongst observable (manifest) and unobservable (latent) variables. SEM has the unique ability to examine a series of interdependent relationships (where an endogenous variable becomes exogenous and predicts another endogenous variable within the same analysis), whilst also analysing multiple dependent variables (Shook et al., 2004). The SEM method is suited for confirmatory purposes of cause-and-effect models by assessing in a quantitative way relationships amongst variables. SEM is also known as analysis of covariance structures or causal modelling, which permits its use in the prediction of latent variables.

The co-variance-based SEM is used as a regression model that is more suitable for confirmatory and explanatory efforts rather than exploratory modelling[16]. In management sciences it is considered the preeminent multivariate method of data analysis (Marcoulides and Hershberger, 1997; Mulaik, 1990). This is because it incorporates a set of data analysis tools to test theoretically derived and a priori specified causal hypotheses.

The full quantitative analysis was conducted using a model of structural equations to simultaneously establish bivariate correlations (for individual hypotheses) and the overall fit of the estimated model versus existing data. The SEM output calculates the goodness-of-fit of the estimated model to validate the theoretical model. The bivariate correlations in the SEM model estimates the regression weights and the appropriate sign for individually theorised hypotheses (see them in Table 8).

The process to conduct the full quantitative study included data preparation, specification of the structural and measurement models, final model identification and testing of results (Mueller, 1997). The model testing section includes the hypothesised model's goodness-of-fit indices and the estimated parameters with their significance tests. This chapter summarises the output results generated from AMOS 19.0, which is the statistical software used to create the model and run the SEM analysis[17]. The structure of this chapter strictly follows the guidelines and recommendations for reporting SEM research by Schumacker and Lomax (2010). The discussion of the results in the context of the proposed management research will be reported in Chapter 7.

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[16] SEM as a system of independent and response variables is based on the OLS regression or canonical correlation. An alternative method is the PLS regression that is typically used in exploratory modeling. PLS is less than satisfactory as an explanatory technique because it is low in power to filter out variables of minor causal importance (Garson, 2012)

[17] It is the statistical package from IBM-SPSS available by Cranfield School of Management and with which the researcher was most experienced. Alternative packages include LISREL, SAS's Proc Calis, SmartPLS, among others.

6.2 Data Preparation

6.2.1 Data Source and Variables

The results from the quantitative pilot study and qualitative study confirmed the feasibility of the calculations of the inter-firm alignment coefficient (IFA) by measuring Euclidean distances between two constructs as advocated by Venkatraman and Prescott (1990). The pilot study also confirmed the ability to operationalise a measurement for contractual alliance success (CAS) based on behavioural information from each contract. The results confirmed that the theoretical constructs could be operationalised into variables with existing data. It should be noted, however, that the results also, indicated the need to refine some constructs and to gather additional information about the contracts prior to conducting the full quantitative study using structural equation models.

The hypothesised model states that alignment of three inter-firm performance measurement systems at play in a contractual alliance[18] is positively correlated to contractual alliance success (CAS). Contractual alliance success was defined by the formality of an active relationship, its longevity and stability, and the relative profitability of the relationship for both user and provider. The theoretical base of the hypothesised causality between alignment and success in inter-firm relationships was fully discussed in Chapter 3. The research methodology and the operationalisation of constructs were presented in Chapter 4. The results of the pilot tests are summarised in Chapter 5.

As stated in Chapter 4, data for the analysis comes from two sources. The primary source is a sample of logistics outsourcing contracts between one Provider and its Users. The secondary data for the analysis comes from publicly available financial performance indicators of the firms involved in the contracts. For the purpose of this research and its hypotheses the unit of analysis is the "contract" akin to the relationship.

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[18] The three systems include 1) the contract's service level agreements or SLAs; 2) the user's financial objectives; and 3) the provider's financial objectives

Table 47 below presents a description of the variables available for the full statistical analysis from the primary data source. Variables were categorised in three groups:

- The first group contains “raw variables” indicating those that were used as presented by the Provider;
- The second group contains “calculated variables” which were computed through arithmetic manipulation of raw variables;
- The third group contains “multivariate variables” where new variables were generated using inferential statistics processes to determine their values. These “multivariate variables” will later become latent or unobserved variables in the SEM analysis.

Table 47 Variables[19] Used in Full Quantitative Study

VARIABLE	TYPE	SCALE	DESCRIPTION
1. REVENUE	Raw variable	Numerical	This variable serves as an input to calculate other variables that will go in the SEM analysis. Revenue will be used to measure RELATIVE PROFITABILITY as a determinant of CAS.
2. SGA-TOTAL	Raw variable	Numerical	This variable serves as an input to calculate other variables that will go in the SEM analysis. SGA will be used to measures RELATIVE PROFITABILITY as a determinant of CAS.
3. CONTRACT-VALUE	Raw variable	Numerical	Reflects the annual amount of services procured by the User from the Provider. In conjunction with REVENUE and SGA TOTAL help quantify the RELATIVE PROFITABILITY variable, a determinant of CAS.
4. KPI-SLA	Raw variable	Numerical	Number of key operational performance indicators to govern the scope of the CA between User and Provider. Specific KPIs form the SLAs of the contract.
5. ACTIVE	Raw variable	Binary	The 1/0 values reflect the fact that the relationship is active or not. An active relationship is described as one where the User has utilised the services of the PROVIDER at least once in the last year.
6. SIGNED	Raw variable	Binary	The 1/0 values reflect the fact that the User-Provider relationship is governed by a written signed contract, making the SLAs legally binding.
7. RENEGOTIATIONS	Raw variable	Numerical	This variable represents the stability of the contractual alliance for Users and Provider as the number of renegotiations that have taken place during the length of the relationship.
8. LONGEVITY	Raw variable	Numerical	This variable represents the stability of the relationship measured by the number of years the User has been in a contractual alliance relationship with the Provider.
9. REVENUE GROWTH	Raw variable	Numerical	This variable calculates the current revenue growth rate of each one of the firms in the analysis and the gap between current growth and expected growth.
10. PROFITABILITY	Raw variable	Numerical	This variable calculates each firm’s current profitability (EBITDA/REVENUE) and the gap between current profitability rate and expected profitability.

[19] All these variables are theory derived from the literature review on inter-firm relationships, performance measurement systems and strategic alignment.

11. WORKING CAPITAL	Raw variable	Numerical	This variable calculates each firm's current days in cash-to-cash cycles as a measure of working capital utilisation) and the gap between current C2C and expected C2C.
12. FIXED ASSET UTILISATION	Raw variable	Numerical	This variable calculates the current fixed asset utilisation of each one of the firms in the analysis and the gap between current growth and expected growth.
13. ACTUAL-SLA	Calculated variable	Numerical	This variable represents the coefficient of alignment between the target levels of the contract's SLAs and the actual values of those SLAs during the year of analysis. The greater the value, the lower the alignment between contracted and actual values. Perfect alignment is a perfect match between targets and actuals thus ACTUAL-SLA= 0.
14. USER-SLA	Calculated variable	Numerical	This variable represents the coefficient of alignment between the target levels of the contract's SLAs and the User's financial objectives. The greater the value, the lower the alignment between contracted SLAs and User's financial objectives. Perfect alignment is a perfect match between SLAs and financial objectives thus USER-SLA= 0.
15. PROVIDER-SLA	Calculated variable	Numerical	This variable represents the coefficient of alignment between the target levels of the contract's SLAs and the Provider's financial objectives. The greater the value, the lower the alignment between contracted SLAs and Provider's financial objectives. Perfect alignment is a perfect match between SLAs and financial objectives thus PROVIDER-SLA= 0.
16. FORMALITY	Calculated variable	Numerical	This variable is a combination of two determinant of contractual alliance success: active relationship and a signed Contract that seals the agreement.
17. RELATIVE PROFITABILITY	Calculated variable	Numerical	Indicates a ratio between the CONTRACT VALUE and Provider's REVENUE and User's SGA TOTAL.
18. INTER-FIRM ALIGNMENT COEFFICIENT (IFA)	Latent Multivariate	Numerical	This variable will capture all the contributions to alignment from the three sources of alignment described above (ACTUAL-SLA; USER-SLA; PROVIDER-SLA)
19. CONTRACTUAL ALLIANCE SUCCESS (CAS)	Latent Multivariate	Numerical	This variable will be estimated from the data regarding determinants of contractual alliance success: FORMALITY; LONGEVITY; RENEGOTIATIONS; RELATIVE PROFITABILITY.

6.2.2 Descriptive Statistics, Missing Data and Sample Size

Descriptive statistics of the raw and calculated variables provide insight into the information they represent. Not every single raw variable was included in the analysis as some were compounded into a calculated variable or simply did not fit into the hypothesised and later specified model.

Table 48 below summarises basic descriptive statistics of the variables. This includes observations per variable, mean value, range and standard deviation. Some missing data was encountered in the CONTRACT-VALUE and SGA-TOTAL variables. Even though it was not a significant problem in this database, one of AMOS 19.0 functionality is to generate additional values for missing data using maximum likelihood (ML) estimates and not standard methods such as maximum or mean value replacements (Blunch, 2008).

Regarding outliers, the database contains six atypical points, identified as observations farthest from the centroid, calculated using Mahalanobis distances. These points correspond to observations number 23, 25, 37, 40, 82, and 112. In a first model estimation these atypical values were eliminated, for a new sample size of 143, and the model was evaluated in terms of fit. However when comparing this model with the final measured one, the elimination of outliers did not improve the goodness-of-fit indicators. A decision was made to maintain all 149 observations in the final estimated model.

Guidelines recommend (Blunch, 2008; Schumacker and Lomax, 2004) at least 10 observations for each exogenous variables in the SEM analysis. Based on that consideration the sample size of 149 was more than adequate for the SEM assumptions, and not so large as to overestimate goodness-of-fit for the model (Schermelleh-Engel et al., 2003b).

Table 48 Descriptive Statistics for Selected Raw and Calculated Variables

	Variable	obs.	Mean	Max	min	s.d.
RAW VARIABLES	REVENUE	145	40,397,831,790.59	785,498,000,000.00	50,000,000.00	85,632,636,485.88
	SGA TOTAL	141	7,598,050,485.17	186,948,524,000.00	27,400,000.00	18,888,873,565.67
	CONTRACT VALUE	134	34,979,998.66	284,225,891.26	6,818.42	47,790,071.30
	ACTIVE	149	0.90	1.00	0.00	0.29
	LONGEVITY	149	9.81	50.00	0.00	7.39
	CONTRACT-SIGNED	149	0.81	1.00	0.00	0.39
	RENEGOTIATIONS	148	2.49	20.00	0.00	2.98
CALCULATED VARIABLES	RELATIVE PROFITABILITY-USER	144	0.02	0.46	0.00	0.05
	RELATIVE PROFITABILITY- PROVIDER	149	0.00	0.03	0.00	0.01
	ACTUALS-SLA	148	0.11	4.00	0.00	0.36
	USER-SLA	149	1.94	8.87	1.65	0.64
	PROVIDER-SLA	149	1.67	1.92	1.57	0.07

6.2.3 Data Transformations to Improve Normality

Most statistical tests use assumptions of normality in order to analyse specific details in the data and build representative models of reality. In light of that, it is always desirable to work with variables that are normally distributed. However considering the nature of this research, the single source of the data, and the computations associated with calculated variables, non-normality and skewness were expected. Fortunately SEM techniques do not use normality as an assumption for the analysis (Blunch, 2008). This was a consideration in the selection of SEM as the analytical tool for the research. Nonetheless, it is a recommended step in data preparation to attempt to improve non-normality conditions by different data transformation techniques.

During the analysis, the input variables were highly skewed and showed elevated kurtosis indices of the distribution. Because of that, data transformation was justified and more normality was achieved by the following procedures:

i. Normalising the variable RENEGOTIATIONS
ii. Using the square root (SQRT) of the variables RELATIVE-PROFITABILITY, LONGEVITY, ACTUALS-SLA, PROVIDER-SLA, and USER-SLA.
iii. Doubling the values of variable FORMALITY

For the purpose of clarity, from this point forward the names of the variables will remain the same, although it needs to be clear that they have been transformed as input into the model. Appendix C shows the original variables, the transformed variables and the assessment for normality of the transformed variables showing skewness, kurtosis and critical ratios for each variable.

6.2.4 Measurement level and properties of the variables

Once the variables were transformed they were ready to be loaded into AMOS to specify, identify, estimate, and test the structural equations that will confirm the proposed pathways and correlations amongst variables. Within SEM methods, AMOS uses a unique typology to describe variables included in the model. It is critical however, to be aware that the scope of SEM is more general than that of a regression. The key distinction is that a variable can act as both independent and dependent variable, depending on the path of the model. Thus is preferable not to use the traditional regression notation but to follow SEM's particular terminology.

Observed Variables: These are the measured variables, also called manifest variables or indicators. In AMOS they are represented by rectangles or squares.

Unobserved Variables: These are factors that have two or more indicators, also called latent variables, or constructs. Unobserved variables are represented by circles or ovals in path diagrams. In the hypothesised model the constructs INTER-FIRM ALIGNMENT COEFFICIENT and CONTRACTUAL ALLIANCE SUCCESS are the unobserved variables, as well as the measurement errors of each one of the proposed variables.

Endogenous Variables: When building the specified model, the researcher uses two different kinds of variables, namely exogenous and endogenous variables. An endogenous variable is one that regresses on another variable, even if this same variable is also used as a variable to be regressed on. Endogenous variables are recognized in AMOS graphic path analysis as the receivers of an arrowhead in the model.

Exogenous Variables: In the graphic model specification these variables do not have any arrows pointing at them. In the hypothesised model the variable INTER-FIRM ALIGNMENT COEFFICIENT is an exogenous unobserved variable, as well as the measurement errors of each one of the endogenous variables. Exogenous variables can be recognized in a graphical version of the model, as the variables sending out arrowheads, denoting which variable it is predicting them. In summary the distinction between these two types of variables is whether the variable regresses on another variable or not.

Table 49 Summary of Variables

Number of Variables in the Hypothesised Model = 17	Endogenous[20] = 8	Exogenous[21] = 9
Observed[22] = 7	USER-SLA ACTUAL-SLA PROVIDER-SLA LONGEVITY FORMALITY RELATIVE PROFITABILITY RENEGOTIATIONS	
Unobserved[23] = 17	CONTRACTUAL ALLIANCE SUCCESS (CAS)	INTER-FIRM ALIGNMENT COEFFICIENT e1 e2 e3 e5 e4 e12 e10 e9

Table 49, above, summarises all variables in the hypothesised model by their unique typology. The input matrix into AMOS was composed of two (2) latent unobserved variables: INTER-FIRM ALIGNMENT COEFFICIENT and CONTRACTUAL ALLIANCE SUCCESS, plus 8 unobserved variables from the error in each one of the endogenous variables.

Typical regression models require that there should not be any correlation amongst observed variables (no multicollinearity). One additional reason to use SEM is that lack of multicollinearity is not a required assumption therefore the

[20] This is a particular notation of AMOS for variables that are dependent variables also called mediating or downstream variables. For purposes of the hypothesized model "CAS" is the latent endogenous variable, being predicted by the interactions of the exogenous and observed variables.
[21] This is a particular notation of AMOS for independent variables, which are assumed to be measured without error. These variables are also called upstream variables.
[22] Observed variables, also called manifest variables, are directly measured by researchers
[23] Unobserved variables, also known as latent variables, are not measured directly but are inferred by the relationships or correlations amongst measured variables in the analysis.

variables were not treated to eliminate it. Appendix 3 offers the full database as loaded into AMOS, including the variables before and after transformation

6.2.5 Validity of Latent Variables (Constructs)

The effectiveness of SEM analysis and the explanatory power of the model depend heavily on measurement issues. This research involves cross-sectional data with very solid theoretical underpinnings to hypothesise causal inferences. During the course of data preparation and analysis, several transformations were conducted to improve normality in the data, allowed when strong theoretical foundation suggests keeping the original model specification. This section also provided reflective loadings for the latent variables, and the assessment of reliability, convergent and discriminant validity.

The results of the SEM analysis rely on the ability of the latent variables to describe and explain the concepts embedded in the variables. This includes success of the contractual relationship and alignment of performance measurement systems. It is critical to assess the overall validity of the measures representing the constructs of interest (Carmines and Zeller, 1979), before presenting the results of the structural relationships between the latent variables. The validity of the latent variables is ensured when the measures pass for tests: content validity, unidimensionality, reliability and statistical validity.

6.2.5.1 Content Validity

Quantitative validity is irrelevant if there are not conceptual and theoretical arguments supporting the operationalisation of the construct. Content validity is a precursor of other validity tests because gives sense to select the components and to the operations required to calculate measures that represent the domain of the construct (Viswanathan, 2005).

The content validity of the two latent variables in this research, INTER-FIRM ALIGNMENT and CONTRACTUAL ALLIANCE SUCCESS, is assessed on theoretical and methodological grounds rather than just statistical testing

(Diamantopoulos and Winklhofer, 2001). Content validity requires evaluating the correspondence amongst the components selected to become part of the final operationalised construct and its conceptual definition (Anderson et al., 2006).

Chapters 3 and 4 provided an extensive description of theoretical basis for construct derivation and the operations amongst components to measure each one of the unobserved variables in the study. Chapter 5 presented all data sources and pilot studies used to measure constructs and the validation with industry and academic experts to ensure content validity prior to approaching the full quantitative study presented in this chapter.

Based on the results of both quantitative and qualitative pilot studies, minor adjustments were made in terms of the operationalisation of the measures but within the initial theoretical framework and the appropriate management practice validation. We argue, then, that both latent variables developed for this research satisfy the conditions for content validity.

6.2.5.2 Unidimensionality, Convergent Validity and Composite Reliability

This section provides a discussion of direct, indirect and total effects of the independent variables on the latent constructs, including unidimensionality. Unidimensionality describes the property of a measurement that refers to a single trait or concept, underlying the construct. There are two conditions for establishing unidimensionality (O'Leary-Kelly and J Vokurka, 1998) 1) that the observed measures must be significantly associated with the underlying latent variable (unobserved construct), and 2) that the observed measures are associated with one and only one latent variable. In theory confirmation studies, unidimensionality is assessed through confirmatory factor analysis (CFA) and in exploratory studies through exploratory factor analysis (EFA) (Pedhazur and Schmelkin, 1991). Considering the confirmatory nature of this research CFA was selected as the method for construct unidimensionality, as the proposed measurement model was specified a priori.

Confirmatory factor analyses for both latent variables were conducted using AMOS 19.0 with Maximum Likelihood estimates. The INTER-FIRM ALIGNMENT construct exhibits unidimensionality as shown by the results from the CFA displayed in Table 50. The factor loading of the three items composing the scale was statistically significant at p<.002 and their standardised values are 0.895 for PROVIDER-SLA (alignment between provider's financial objectives and contract's SLAs); 0.711 for USER-SLA (alignment between User's financial objectives and contract's SLAs); and 0.284 for ACTUAL-SLA (alignment between contract's target SLAs and actual SLAs).

The first two estimates exceed the recommended lower value of 0.5 (Anderson et al., 2006). The model fit indices suggest good fit considering CMIN/DF The ratio of x^2 to *df* ≤ 3 is useful to assess acceptable fit since data are continuous. The rest of the goodness-of-fit ratios are larger than the 0.95 threshold. Figure 12 below presents the standardised factor loading for the inter-firm alignment coefficient.

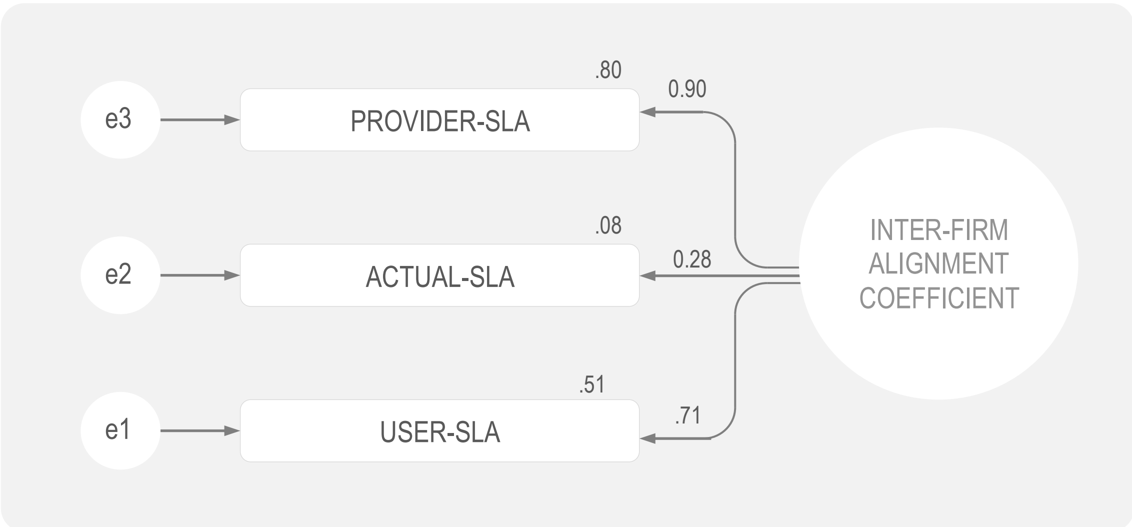

Figure 13 Standardised Factor Loading for IFA

Table 50 Regression Weights and Standardised Regression Weights for IFA

Regression Weights: (Group 1 – Default model)			Estimate	S.E.	C.R.	P	Label
USER-SLA	<---	IFA	1.00				
ACTUAL-SLA	<---	IFA	.382	.124	3.093	.002	

PROVIDER-SLA	<---	IFA	1.490	.478	3.118	.002	
Standardised Regression Weights: (Group 1 – Default model)			Estimate				
USER-SLA	<---	IFA	.711				
ACTUALS-SLA	<---	IFA	.284				
PROVIDER-SLA	<---	IFA	.895				

The unidimensionality analysis of the construct CONTRACTUAL ALLIANCE SUCCESS follows the same methodology, using CFA in AMOS 19.0. Reviewing the standardised regression weights, LONGEVITY has the highest correlation with CONTRACTUAL ALLIANCE SUCCESS. This is followed by RENEGOTIATIONS. The lowest correlation to success was RELATIVE PROFITABILITY of the contract, followed by the FORMALITY of the relationship. The factor loadings of the component measures of the latent variable are significant with a confidence level > 93%.

Table 51 Regression Weights and Standardize Regression Weights in CAS

Regression Weights: (Group number 1 - Default model)			Estimate	S.E.	C.R.	P	Label
LONGEVITY	<---	CAS	1.00				
RELATIVE PROFITABILITY	<---	CAS	.039	.022	1.766	.077	
FORMALITY	<---	CAS	.344	.169	2.036	.042	
RENEGOTIATIONS	<---	CAS	.119	.055	2.153	.031	
Standardised Regression Weights: (Group number 1 - Default model)			Estimate				
LONGEVITY	<---	CAS	.606				
RELATIVE PROFITABILITY	<---	CAS	.237				
FORMALITY	<---	CAS	.296				
RENEGOTIATIONS	<---	CAS	.527				

Chi-square = 5,473 with 2 degrees of freedom with 93.5% of confidence. The ratio of x^2 to *df* ≤ 3 is a relative value of chi-square is an index of how much of the fit of data to model has been reduced by dropping one or more paths.

A common rule of thumb suggests that if the value is greater than 3 the model has dropped too many paths, meaning that CONTRACTUAL ALLIANCE SUCCESS is explained by more measures than LONGEVITY, FORMALITY,

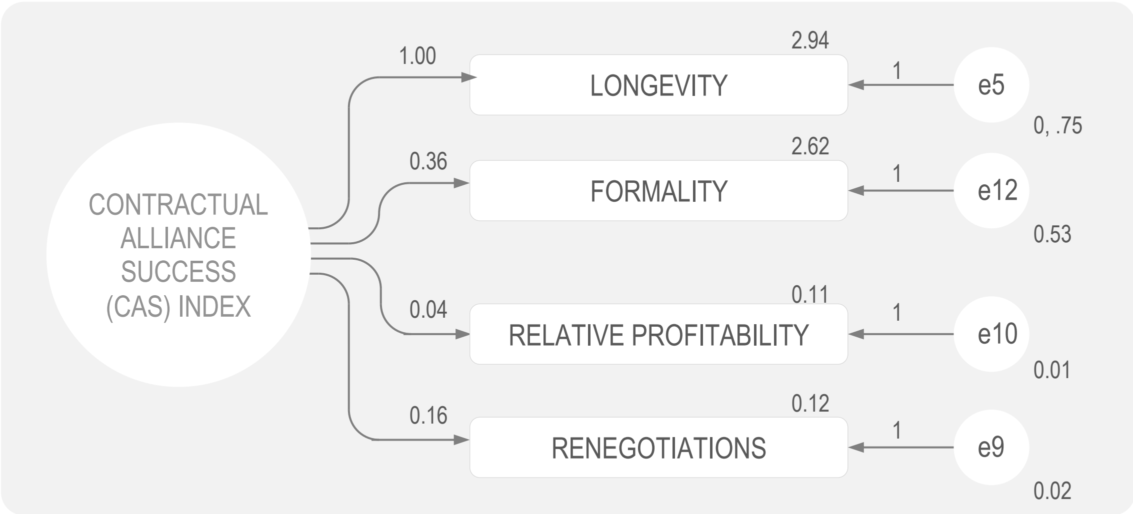

Figure 14 Unstandardized Factor Loading For CAS Measurement Model

RELATIVE PROFITABILITY, and RENEGOTIATIONS. CMIN/DF is equal to = 2.737. This figure is high considering the saturated model, but less than 50% of the worst possible fit represented by the Independence model. These values are significant with a 93.5% of confidence.

RMSEA, is an useful goodness-of-fit measurement. It shows the adequate fit value of 0.108. This suggests a reasonable fit (based on Browne et al., (1993) threshold of <.10) where the fitness may improve as RMSEA improves when the complexity of the model is greater as in the overall SEM analysis.

Table 52 Goodness-of-Fit Measurements

CMIN					
Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	12	5.473	2	.065	2.737
Saturated model	14	.000	0		
Independence model	8	32.263	6	.000	5.377
RMSEA					
Model		RMSEA	LO 90	HI 90	PCLOSE
Default model		.108	.000	.222	.134
Independence model		.172	.117	.232	.000
BASELINE COMPARISONS					

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.830	.491	.885	.603	.868
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

6.2.5.3 Reliability of Measurements for Composite Latent Variables

The reliability assessment describes the degree of consistency between multiple measurements of the latent construct (Anderson et al., 2006). Reliability indicates the amount of random error presented in a measurement scale; lower errors translate in higher probability that the conclusions about relationships between constructs are correct.

Cronbach's alpha is the most commonly used statistic for reporting test reliability based on item variances. However, the coefficient has several limitations including the assumption of equal contribution of all items to reliability (Bollen and Lennox, 1991). A better choice for assessing reliability is **Composite Reliability**, which draws on the standardize loadings and measurement error for each item that is part of a composite variable.

Composite reliability is estimated using equation 6 below. Based on Fornell and Larcker (1981) an accepted threshold for composite reliability is 0.70, with each indicator’s reliability above 0.50 (Shook et al., 2004).

Equation 6 Formulation of Composite Reliability

$$\rho_c = \frac{\left(\sum_{i=1}^{m} \lambda_i\right)^2}{\left(\sum_{i=1}^{m} \lambda_i\right)^2 + \left(\sum_{i=1}^{m} (\theta_i)\right)}$$

Considering the standardised regression weights for the latent variable IFA (reported in Table 52), and the error variances presented in Table 53 below, the composite reliability is .9720 well above the recommended threshold.

Table 53 Error Variances for Item Loadings in Composite Variable: IFA

	Estimate	S.E.	C.R.	P	Label
IFA	.032	.012	2.710	.007	
e1	.031	.011	2.960	.003	
e2	.054	.006	8.377	***	
e3	.018	.022	.793	.428	

The calculation of composite reliability for the latent variable CAS uses standardised regression weights of each item in the composite (presented in Table 52) and the error variances for item loadings in Table 54 below. The value of composite reliability is 0.68 below 0.7. This suggests that the variable may be a formative one rather than a reflective variable. Nonetheless, given the strong theoretical support for the composite variable, it will be part of the final model specification and estimation.

Table 54 Error Variances for Item Loadings in Composite Variable: CAS

	Estimate	S.E.	C.R.	P	Label
Success	.434	.228	1.908	.056	
e5	.749	.219	3.417	***	
e12	.532	.068	7.823	***	
e10	.011	.001	8.132	***	
e9	.016	.003	4.672	***	

6.3 Model Specification

In the construction of structural equation models, model specification means the formal description of the model to be tested. Fundamentally, it presents the suggested path analysis for the two unobserved variables (CAS). It also specifies the pattern by which IFA (in this particular case the exogenous latent variable) influences (i.e. cause) changes in the values of CAS (the endogenous latent variable in the model). The rationale and value of using SEM for these research questions in the context of the hypothesised theoretical model, was described in Chapter 4 in the quantitative methods section.

The measurement model defines relations between the observed and the unobserved variables. In other words it provides the link between scores on a measuring instrument and the underlying constructs they are design to measure. The measurement model, then, represented the CFA models described for each one of the latent variables of INTER-FIRM ALIGNMENT (IFA) and CONTRACTUAL ALLIANCE SUCCESS (CAS) and it specifies the pattern by which each measure loads on a particular factor, and analysed in Section 6.2.

Figure 14 presents the specified structural model, in conjunction with the measurement model, which explores the causal relationship between contractual alliance success and the degree of alignment amongst performance measurement systems of the contract's SLAs and those of the User and PROVIDER involved in the relationship.

The SEM analysis was conducted using AMOS 19.0 (Arbuckle, 2011). It was conducted on the three variables that measure alignment of measurement systems (Venkatraman, 1989; Venkatraman and Ramanujam, 1986) and the four variables that measure alliance success (Ariño, 2003; Lambe et al., 2002; Cravens et al., 2000). Ovals represent latent variables (unobserved) and rectangles represent measured (observed) variables.

During the specification process parameters are determined to be free or fixed. *Fixed parameters* are not estimated from the data and are typically fixed at zero (indicating no relationship between variables). *Free pathways* are estimated from the observed data and are regarded, from the theoretical model, to be non-zero. This is the contribution of the research when considering the hypothesised causal relationship between **IFA** and **CAS** .The indication of free and fixed parameters is extremely important because it determines which parameters will be used to compare the hypothesised diagram with the sample population variance and covariance matrix in testing the fit of the model during the Model Testing phase.

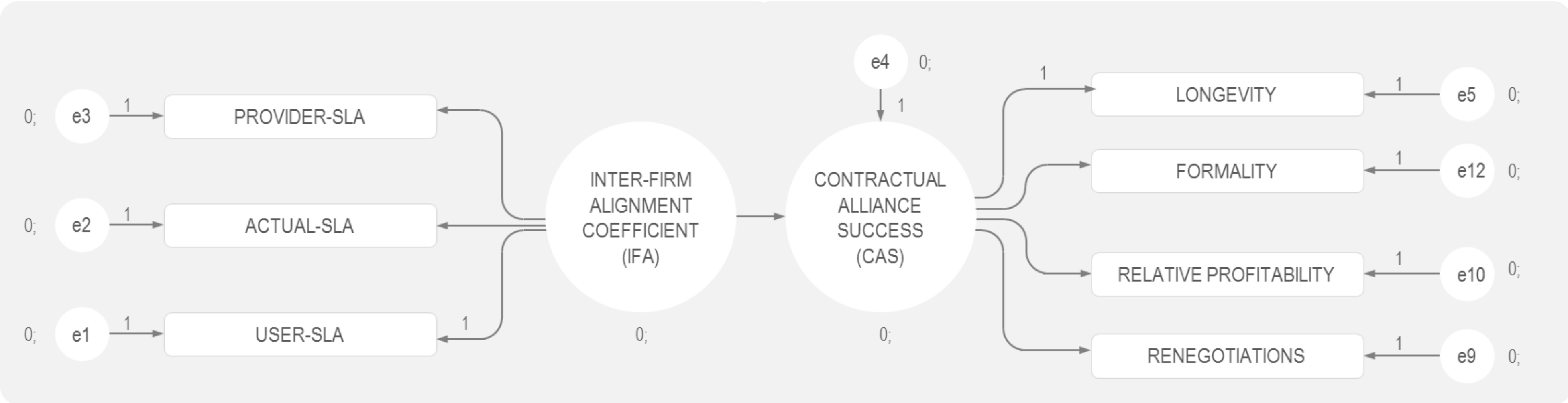

Figure 15 Specification for Default Model with Second-Order Structure for Residual Errors

Chapters 2 and 3 have described the theoretical basis for the measurement and structural models, as well as the description of all available data collected from external sources, their operationalisation into the variables and constructs and the treatment of data prior to loading it in AMOS for the SEM analysis.

The conceptualised model tests the causal relationship between alignment of inter-firm performance measurement systems and contractual alliance success. However, the IFA is really the misalignment or the distance between two constructs. Based on this, we expect that the causal relationship will be inverse (negative sign in the estimator between IFA --- > CAS) as theoretical models hypothesised that lack of goal alignment amongst alliance members will be detrimental to the success of the relationship. The expected magnitude of the parameter estimates should be relatively low, as this relationship is a new and unobserved cause of relationship failure. It seems, from the results of the literature review in Chapter 2 that many other obvious and major factors have already been described, tested and probably corrected over time.

Section 6.2 in this Chapter provided a description of every free parameter in the SEM model that need to be estimated. Chapter 2 presented other alternative parameters not included in this analysis. One extremely important caveat in working with SEM is to always tally the number of parameters in the model to be estimated prior to running the analyses. This will be critical to know if the model to be tested is statistically identified (MacCallum, 1995). In the SEM analysis for this research there are 22 different parameters to be estimated (32 in total – 10 parameters fixed to 1.0 in the regressions) summarised in Table 55 below.

Table 55 Parameter Summary for Default Model

	WEIGHTS	COVARIANCES	VARIANCES	MEANS	INTERCEPTS	TOTAL
Fixed	10	0	0	0	0	10
Labelled	6	0	0	0	0	22
Unlabelled	0	0	9	0	7	0
Total	16	0	9	0	7	32

6.4 Model Identification

Research should always specify a set of theoretically plausible models in order to assess whether the hypothesised model is the best of the set of possible models. This research must account for the theoretical reasons for building the model as it is. The research design must also take into account the number of data points and the number of parameters that the model must estimate to identify the model.

One identified model is one in which a specific parameter value uniquely identifies the model, and where no other equivalent formulation can be given by a different parameter value. A data point is a variable with observed scores. An example of this is “LONGEVITY”, a variable that indicates how old the relationship is, measured in years. The parameter is the value of interest, which might be a regression coefficient between the exogenous and the endogenous variable or the factor loading (regression coefficient between an indicator and its factor). If there are fewer data points than the number of estimated parameters, the resulting model is "unidentified", since there are too few reference points to account for all the variance in the model. The solution is to constrain one of the paths to zero, which means that it is no longer part of the model

An SEM model is identified if the known information available implies that there is one “best value” for each parameter in the model whose value is not known. It assures that the system of equations has as many “known” as “unknown” variables. In SEM, the “knowns” are mostly variances and covariances with the measured variables[24] (Bollen and Lennox, 1991). The determination of how much data is “known” to work with is compiled by the variances and covariances of the observed variables (28 = 7*(7+1)/2) and the means and

[24] As Bollen (1991) notes, the parameters of a structural equation model are generally considered identified if the researcher can solve the covariance structure equations for the unknown parameters. That is, the researcher must express the parameters as independent functions of the elements of the covariance matrix. Unfortunately, the covariance structure equation quickly become complex as the model grows, making algebraic solution "tedious and error-prone," to use Bollen's words. Researchers who adopt this approach must also beware of dependencies concealed within the solution

intercepts (7), less the number of distinct parameters to be estimated, the default model is an overidentified model with 13 degrees of freedom (See Table 56). AMOS uses covariance matrices throughout the analyses. This calculation follows the 'rank and order condition[25]' for model identification (Bollen and Lennox, 1991; Chen et al., 2008).

Table 56 Output with Computation of Degrees of Freedom (Default Model)

Number of distinct sample moments:	35
Number of distinct parameters to be estimated:	22
Degrees of freedom (35 - 22):	13

When reporting model identification it is worth remarking that no parsimonious[26] models were used to assist with identification. The SEM analysis of the default model avoided non-recursive models until identification was assured (Schumacker and Lomax, 2010).

6.5 Model Estimation

6.5.1 Estimation Method and General Results

Using Maximum Likelihood estimates the SEM analysis achieved the minimum results to be able to calculate the required parameter estimates. The general estimation result had a chi-square = 21.488, with 13 degrees of freedom and a probability level = .064

Maximum Likelihood (ML) is deemed an appropriate estimation technique for multivariate data with small to moderate sample sizes and produces better estimates than other estimation methods such as ADF, CVM or WLS (Finney and DiStefano, 2006). The analyses did not generate any Heywood cases

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[25] The order condition is the state of a set of simultaneous equations in an econometric system such that all its parameters may be identified. For an equation in a system of equations to be identified, the number of excluded exogenous variables in that equation must be at least as great as the number of included endogenous variables, less one. However, a stronger argument is the rank condition which is both necessary and sufficient for identification.

[26] The term parsimony has come to be equated with having relatively few free parameters or relatively many degrees of freedom in the factor analysis and SEM literature (Mulaik, 1990). The terms are used here in their broader sense to encompass all factors contributing to a model's degree of falsifiability.

(cases with negative variance), no non-positive definite matrices, no non-convergence problems or inadmissible solutions.

6.5.2 Software Package for SEM

For the purposes of this study the SEM method was applied using AMOS 19 (Analysis of Moments Structures) software from IBM SPSS. AMOS provides multiple methods for estimating structural equations models such as maximum likelihood (ML), un-weighted least squares, and generalized least squares and Bayesian estimation. One of the key features of AMOS is how it deals with missing data. When confronted with missing data AMOS performs state-of-the-art estimation by full information maximum likelihood instead of relying on ad-hoc methods like listwise or pairwise deletion or mean imputation (Arbuckle, 2011).

6.5.3 Tests of Parameters Estimates

The first noteworthy feature of the proposed model is the negative relationship between CAS and IFA, as illustrated by the statistically significant unstandardized regression coefficient of -0.776. This is conceptually and statistically satisfactory. Conceptually, as discussed in Chapter 3, we theorised that lack of alignment (high distance) in the inter-firm performance measures would lead to more fragile relationships (low success).

The following tables analyse the estimated parameters and their significance tests using critical ratios and p-values. Table 57 presents the regression weights and the estimates, SE, critical ratio and P values for the causal analysis between the two latent variables (exogenous and endogenous), as well as for each one of the parameters of the structural model. P levels are lower than .1, suggesting that all covariances are significant with a minimum 92% of confidence level or higher for some estimates.

Table 57 Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
CAS	<---	IFA	-.776	.452	-1.716	.086	
USER-SLA	<---	IFA	1.000				
ACTUAL-SLA	<---	IFA	.386	.125	3.089	.002	
PROVIDER-SLA	<---	IFA	1.747	.549	3.184	.001	
LONGEVITY	<---	CAS	1.000				
RELATIVE PROFITABILITY	<---	CAS	.043	.023	1.847	.065	
FORMALITY	<---	CAS	. 356	.172	2.069	.039	
RENEGOTIATIONS	<---	CAS	.158	.067	2.344	.019	

Table 58 presents the standardised regression weights by each one of the parameters, allowing specific comparison of the relative importance of specific observed variables in the behaviour of the latent variables in the default model. In this case the estimates report correlations from the individual regression models, as oppose to covariances in Table 57.

Table 58 Standardised Regression Weights (Group number 1 - Default model)

			Estimate
CAS	<---	IFA	-.223
USER-SLA	<---	IFA	.657
ACTUAL-SLA	<---	IFA	.265
PROVIDER-SLA	<---	IFA	.969
LONGEVITY	<---	CAS	.530
RELATIVE PROFITABILITY	<---	CAS	.231
FORMALITY	<---	CAS	.269
RENEGOTIATIONS	<---	CAS	.614

6.5.3.1 Hypothesis H_1 CAS < --- IFA

As was predicted by the hypothesised model the correlation between alignment and success has a negative sign. They are negatively correlated as expected by theory. The alignment of three sets of performance measures could explain the 22.3% of the success index of a contract (see Table 58). We established before that contractual alliance success was explained by many individual factors. Given that, and according to the results of this research, alignment of performance measures should be included as an additional contributor to contractual alliance failure (or success).

6.5.3.2 Observed Factors < --- IFA

All signs are positive and in line with the expectations from the hypothesised model. The order of magnitude of the correlations is different than predicted by extant theories but confirmatory of the new theoretical model in this research. Looking at the three factors that are part of the alignment coefficient, the highest standardised weight of alignment comes from alignment between the contract's SLAs and the financial objectives of the Provider (PROVIDER-SLA < --- IFA = 0.969). This is followed by the alignment between the contract's SLAs and the financial objectives of the User (USER-SLA < --- IFA = 0.657). The most interesting and confirmatory result is the low relative contribution of ACTUAL-SLA and alignment. To recap, ACTUAL-SLA reflects the gap between actual performance and expected performance measured by the contract's SLAs (ACTUAL-SLA < --- IFA = 0.265). In other words, 96.9% of the inter-firm alignment coefficient is explained by the degree of alignment between the contract's SLAs and the financial objectives of the provider, 65.7% is explained by the alignment between the contract's SLAs and the user's financial objectives and 26.5% is explained by the match between target and actual SLAs values.

The view has long been held that success in contractual alliances is driven by the ability of the Provider to meet the target contractual SLAs, thereby closing the gap between expected and actual performance. This view is so prevalent, that within the Provider's organisation the Programme Management Group's single *raison d'être* is to monitor and report operational performance indicators against SLA targets. What these coefficients show is that whilst those assurances are important, aligning with the performance objectives of User and Provider is more critical to the total alignment of the metrics. This alignment contributes more to the success of the relationship.

6.5.3.3 Observed Factors < --- CAS

Table 58 above presents the relative weights of observed factors as measures of success in the relationships in the study. The observed factors were derived from theory. They include LONGEVITY, RELATIVE PROFITABILITY, FORMALITY, and RENEGOTIATIONS of the relationship. According to theory, the first three factors are positive measures of success whereas RENEGOTIATIONS was a negative measure of contractual alliance success, according to the proposed theoretical model.

The results of the standardised regression weights of the data versus the SEM model actually shows that variability measured by the variable RENEGOTIATIONS <--- CAS= 0.614, has the largest explanatory weight in the CAS construct. This rejects the hypothesised relationship and subsequently presents a different result than extant research in the contractual alliance success literature. This result however was anticipated in the qualitative study using interviews with PMs. They suggested that actually variability is a positive measure of success denoting flexibility and relational activity. Longevity, measured by the number of years User and Provider have been into a contractual alliance, is another important measure of IFR success contributing 53% to explain CAS.

The correlations between RELATIVE PROFITABILITY and CAS, and between FORMALITY and CAS, are positive as expected. However these two variables have the lowest explanatory power of contractual alliance success. This differs from what has been suggested in the management literature. The presence of an active and signed contract accounts for 26.9% of the measurement of CAS. The relative profitability of the relationship, measured as the share of the contract's value on the users' SGA expenses and the provider's revenue, accounts for 23.1% of the measurement of CAS. These two variables and their contribution to success are captured in the variables:

RELATIVE PROFITABILITY	<--- CAS = 0.231
FORMALITY	<--- CAS = 0.269

6.5.3.4 Total, Direct and Indirect Effects

The following tables include standardised total, direct and indirect effect sizes with 90% confidence intervals (using AMOS bias-corrected percentile method), for lower bound and a two-tail interval. Tables 59 and 60 compare the results of the estimated model against a default model generated by AMOS. These results confirm the results presented in the previous analysis of total effects of endogenous variables on the unobserved ones.

Table 59 Standardised Direct Effects - Lower Bounds

	IFA	CAS
CAS	-.422	.000
RENEGOTIATIONS	.000	.221
RELATIVE PROFITABILITY	.000	-.019
FORMALITY	.000	.059
LONGEVITY	.000	.177
PROVIDER-SLA	.714	.000
ACTUAL-SLA	.093	.000
USER-SLA	.441	.000

Table 60 Standardised Indirect Effects - Lower Bounds

	IFA	CAS
CAS	.000	.000
RENEGOTIATIONS	-.293	.000
RELATIVE PROFITABILITY	-.193	.000
FORMALITY	-.148	.000
LONGEVITY	-.217	.000
PROVIDER-SLA	.000	.000
ACTUAL-SLA	.000	.000
USER-SLA	.000	.000

In summary all parameters have the expected direction and magnitude considered in the hypothesised model. The confidence levels are lower than customary (90% vs. 95%). However, considering the unexplored nature of the management phenomena being addressed and the source and characteristics of the data, these values are confirmatory of the theorised model. Figure 14 below presents a graphic representation of the estimated structural and measurement model with the standardised regression weights for the each one of the modelled paths.

6.6 Model Testing

6.6.1 Estimating Global Model Fit

Assessing a model's fit is one of the most controversial aspects of structural equation modelling (Shook et al., 2004) and is the core of the post-analysis activities. Scholars recommend that before assessing individual parameters researchers must evaluate the overall fit of the observed data to an a priori model and this is accomplished framed by the dichotomous decision process of hypothesis testing. The model was either accepted as providing good fit to the data, or rejected as fitting the empirical data poorly. SEM as a method is essentially different in the way its fitness is evaluated. SEM relies on non-significance. Fit indices ascertain if the covariance matrix derived from the hypothesized model is different from the covariance matrix derived from the sample. A non-significant difference indicates that the errors are non-significant, lending support to the model.

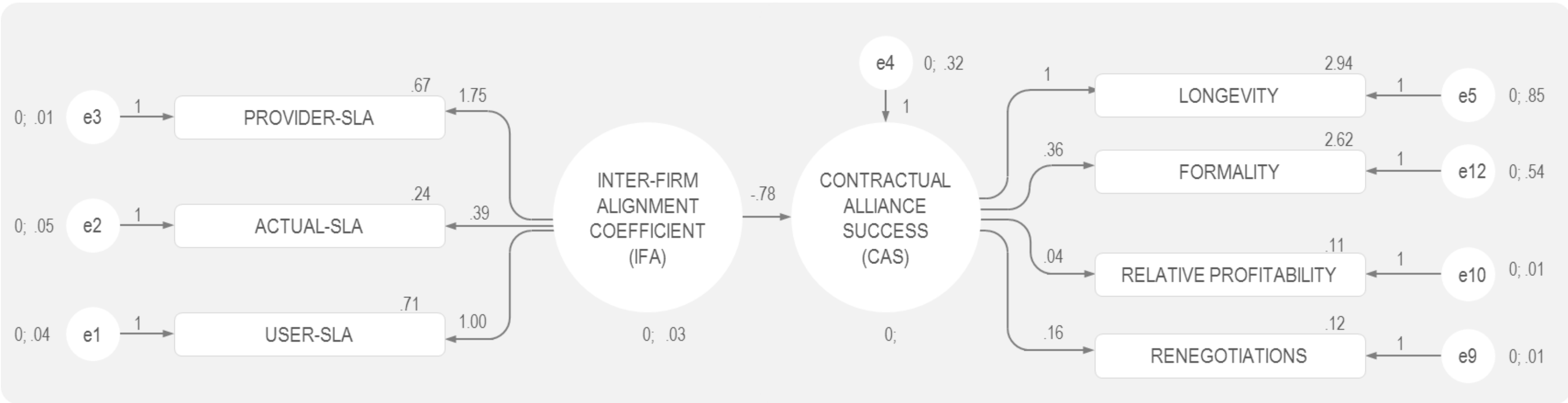

Figure 16 SEM Results for Default Model with Unstandardized Regression Weights

AMOS reports all of the recommended statistics for the proposed model by the researcher (default) and for the saturated and independence models discussed above in Section 6.5. The proposed model lies at the two extremes of the saturated and independence model. It takes into consideration that the saturated model assumes no constrains on the population moments whereas the independence model all the observed variables are assumed to be uncorrelated with each other.

6.6.2 Tests of Absolute Fit

It is recommended that researchers use multiple indices to determine model fitness (Ullman and Bentler, 2003; Schermelleh-Engel et al., 2003). Table 61 below presents the first two tests of absolute fit of the model with goodness-of-fit measures: chi-square values and RMSEA[27] values for the default model (hypothesised model specified Section 6.3) and for the saturated and the independence model. These last two models are comparison models automatically fitted by AMOS as part of every analysis.

Table 61 Chi-Square and RMSEA Estimates with Critical Ratios and P-values

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	22	15.578	13	.273	1.198
Saturated model[28]	35	.000	0		
Independence model[29]	14	129.178	21	.000	6.151

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.037	.000	.095	.577
Independence model	.190	.160	.223	.000

[27] Root Mean Square Error of Approximation (RMSEA) is one test of model fit. RMSEA values <.05 are considered to indicated good fit. An RMSEA of .1 or more is often taken to indicate poor fit.
[28] The saturated model contains as many parameter estimates as there are available degrees of freedom or inputs into the analysis. The saturated model is thus the least restricted model possible that can be fitted by AMOS.
[29] The independence model, by contrast of the saturated model, is one of the most restrictive models that can be fit; it contains estimates of the observed variables only. In other words, the independence model assumes all relationships between the observed variables are zero.

As stated by Shook et al (2004), the chi-square test is the most common fit measure, recommended for moderate samples between 100 and 200 observations. The chi-square test evaluates overall model fitness and is labelled CMIN in the AMOS 19.0 output. For the default model in the study, the CMIN is 15.578 with 13 degrees of freedom, returning a probability value of 0.273 that a chi-square value this large or larger would be obtained by chance if the null hypothesis that the model fits the data is true. The 13 degrees of freedom represent the level of overidentification of the model for the chi-square test of overall model fit. Since the probability value of the chi-square test is larger than the 0.05 level used by convention, we will accept the null hypothesis that the model fits the data. The ratio of x^2 to *df* ≤ 2 is useful to assess accept Table fit since data are continuous.

The root mean error of approximation (RMSEA) is another fit index that suggests that values smaller than .05 indicate a good fit of the default model, in this case against the independence model where variables have no relationship between them. RMSEA is also one of the indexes that are less influenced by sample size and by the use of estimation methods (Fan et al., 1999). For the purpose of this research the RMSEA = .037, clearly below the threshold of .05 suggested by Schreiber et al., (2006), or of 0.05 suggested by Fan et al., (1999). Lower values of RMSEA (Root mean square error of approximation) would indicate a reasonable error of approximation and suggest not employing a model with a RMSEA greater than 0.1 (Browne et al., 1993).

6.6.3 Tests of Relative Fit

This section examines how well the proposed model fits the sample data, and how much better the proposed model (default model in AMOS' terms) behaves versus selected competing models. Competing models include the saturated model from AMOS (ideal fit), the independent model from AMOS (a model that accepts all null hypotheses) and some selected models that were estimated in the previous phase.

It is, however, recommended that researchers provide multiple measures of fitness given the fact that in SEM models are evaluated based on rules of thumb and not significance tests. Some authors recommend disclosing the effects of sample size, estimation methods and model specification on structural equation modelling fit indexes. This way, readers can evaluate the fit indices in context (Gerbing and Anderson, 1992).

The default model also performs well in the comparative fit index (CFI) analysis against the absolute fit of the independence model. The greater the gap between the two models the larger the values of these descriptive statistics. In general the CFI should be ≥ .95 for acceptance. In the hypothesized default model CFI = .976 for acceptable fit, and .000 for the independence model. Another test of comparative fitness is the Tucker-Lewis Index (TLI) also required to be above .95 for acceptance. In the default model TLI = .962; Bollen's (1989) Incremental Fitness Index (IFI) = .978 greater than the required .95 for fitness acceptance, and IFI values close to 1 indicating a very good fit (Shook et al., 2004a; Shook et al., 2004b) .In the baseline comparisons only the normed fit index (NFI) is guaranteed to be between 0 and 1, with values close to 1 indicating a perfect fit. For the default model NFI = .879 less than the expected threshold of .95

Table 62 Tests of Relative Fit Using Baseline Comparisons

MODEL	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.879	.805	.978	.962	.976
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

This report intentionally excludes some fit indexes that are very sensitive to model misspecification, such as GFI, AGFI and CENTRAL. This is important considering that SEM methods have been used in this research for theory testing against empirical data and thus will be difficult to assess in terms of the ultimate quality of its specification. (The exception here is how the predicted relation pattern should behave based on theory). Additionally GFI and AGFI are two indexes which values are strongly influenced by sample size.

In general all indexes have downward bias under small size conditions. According to (Fan et al., 1999) “The existence of such downward bias suggests that sample fit indexes tend to present a somewhat more pessimistic picture about a model fit than what is true in reality, especially when sample size is small”. Therefore the good results of the default model in the six fit indexes described above (chi-square, RMSEA, CFI, NFI, TLI, IFI) serve as an indication of the fitness of the hypothesized model to fit empirical data and speaks of good model specification and estimation grounded by theory.

6.6.4 Cross-Validation Indices

The Expected Cross-Validation Index (ECVI) is central to the analysis of model fit. The ECVI measures the discrepancy between the fitted covariance matrix in the analysed sample, and the expected covariance matrix that would be obtained in another sample of equivalent size (Browne et al., 1993). Application of the ECVI assumes a comparison of models where an ECVI index is computed for each mode, and then all ECVI vales are placed in rank order; the model having the smallest ECVI exhibits the greatest potential for replication. Because ECVI coefficients can take on any value, there is no determined appropriate range of values (Browne et al., 1993).

To test the fit of the default hypothesised model, Table 63 below presents the default model’s ECVI value of .444 with those of the saturated model (ECVI = .473) and the independence model (ECVI = 1.124). Given the lower ECVI value for the hypothesised model, compared with both the independence and the saturated models, it can be asserted that the default hypothesised model represents the best fit to the data.

Table 63 Expected Cross-Validation Index (ECVI) for Hypothesised Model

MODEL	ECVI	LO 90	HI 90	MECVI
Default model	.442	.385	.556	.459
Saturated model	.473	.473	.473	.500
Independence model	1.124	.898	1.401	1.135

6.7 Model Modification

During the course of this research study the initial hypothesised model did not suffer any respecifications. This is consistent with the initial theoretical model proposed in Chapter 3. In the course of the model identification some alternative paths were considered but those yielded less fitting results. During the tentative respecifications of the model no paths were added (no Lagrange manipulations) and no paths were dropped.

6.8 Model Validation

Some alternative changes that can be incorporated into the model may drive future research projects. Results from the Holter's Critical N (CN) test describe the suitability of adding new observations for a larger sample size in order to improve the confidence levels for the chi-square parameter estimation. The Hoelter's CN test is the last statistic appearing on the AMOS SEM analyses output in Hoelter's Critical N (CN) test, labelled as HOELTER .05 and .01.

Table 64 Hoelter Critical Test

MODEL	HOELTER .05	HOELTER .01
Default model	155	191
Independence model	35	42

This fit statistic focuses directly on the adequacy of sample size that would be sufficient to yield an adequate model fit for a chi-square test (Hu and Bentler, 1998) cited in (Schermelleh-Engel et al., 2003a). The results for this test provide an interesting suggestion for model improvement, because they propose that the new sample size required to make the default model's chi-square results significant at a 95% confidence level, should be 155. For a 99% confidence level, the sample ought to be 191 observations in size. With a current sample size of 149 (and a chi-square significant at 91.4%) one may conclude that this is a satisfactory sample size, although short of Hoelter's benchmark that states that the CN should exceed 200. This could be an improvement of the model for future research.

Alternative SEM validation actions include replicating the Default model using another sample data from another logistics service provider, or sample contracts from the same provider but for a different kind of contracted services. These actions are beyond the scope of this doctoral research but should be considered for future research projects.

6.9 Results of Hypotheses Testing

6.9.1 Hypothesis 1 - Correlation of Inter-Firm Alignment and Success

The previous sections analysed the results of the complete measurement model that predicts contractual alliance success, using alignment of inter-firm performance measure as a determinant of that success. As demonstrated in the previous sections the theoretical model presented in Chapter 3 was successfully estimated and tested. The model shows a significant and positive causal relation between the degree of alignment of the inter-firm performance measurement systems (IFA) and the contractual alliance success (CAS).

The empirical results of the structural equation model show that the variable IFA explains 77.6% of the success results of contractual alliances in the logistics outsourcing industry using data from 149 with a confidence level of more than 90% ($p=0.086$). This means that if alignment improves by 1 unit, success of the relationship will improve by 0.776 units ceteris paribus. Even though the confidence level is not the highest and indicates that the conclusion relates more to the sample than the population, the measures for the model global fit indicate that hypothesis 1 can be confirmed.

It also confirms that inter-firm alignment of performance measures <u>is one but not the only</u> variable that explains alliance success as confirmed by theory.

What was not known was the ability of IFA to contribute to the explanation of CAS. This is a significant contribution of the research, because it considers alignment of inter-firm performance measures a predictor of contractual alliance success. In summary the principal hypothesis, hypothesis 1 has been confirmed.

6.9.2 Hypotheses 2-4 – Observed Factors of Inter-Firm Alignment (IFA)

The IFA coefficient was derived by three observed variables:

i. The alignment between the actual values of the SLAs and the target SLAs in the contract (ACTUAL-SLA);
ii. The alignment between contract's SLAs and the financial objectives of the Users (USER-SLA); and
iii. The alignment between the contract's SLAs and the financial objectives of the Provider (PROVIDER-SLA).

Hypotheses 2-4 dealt with the components of the IFA coefficient and the relative contributions of each one of the three observed variables.

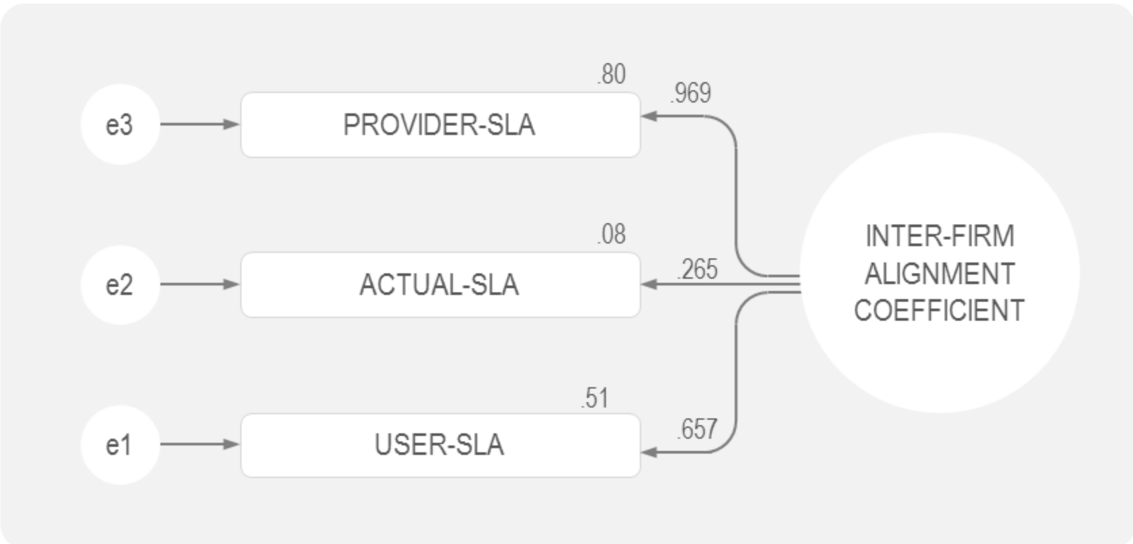

Figure 17 Estimated Model for IFA Coefficient

Hypothesis 2 stated that the variable ACTUAL-SLA was positively correlated to the variable IFA. In other words, the alignment between the actual values of the contract's SLAs versus the target SLAs contribute in a positive and significant way to the total inter-firm alignment. Although the correlation is positive, the level of contribution to IFA is the lowest of the three components. The coefficient of 0.265 makes the contribution of ACTUAL-SLA to the overall IFA for the contractual alliance smaller than previously theorised in the literature, where it was considered the most important factor of aligned objectives. Hypothesis 2 is partially confirmed with a 90% confidence level, that the contribution of ACTUAL-SLA to IFA is positive but less significant than expected.

Hypothesis 3 stated that the variable USER-SLA was correlated in a significant and positive way to the inter-firm alignment coefficient IFA. The results of the specific path in the SEM model between USER-SLA and IFA show a positive loading coefficient of 0.657. This makes alignment of USER-SLAs three-times more significant to explain inter-firm alignment than the variable ACTUAL-SLA. This confirms Hypothesis 3 and highlights the importance of aligning the contract's objectives with the users' financial objectives.

Hypothesis 4 stated that the variable PROVIDER-SLA was correlated in a significant and positive way to the inter-firm alignment coefficient IFA. The correlation results between those two variables show a positive and significant correlation of 0.969. This means that to explain the total alignment of inter-firm performance measures the variable that contributes the most is the level of alignment between the contract's SLAs and the Provider's financial objectives. Additionally the value of the R^2 is high (0.94) explaining 94% of variance of the model. The p value of the critical ratio ($p=0.001$; $p < 0.01$) confirms the significance of the variable PROVIDER-SLA as a contributor to the IFA coefficient. These results confirm Hypothesis 4.

In summary these correlations confirm the hypotheses related to inter-firm alignment. They demonstrate the greater relative importance of alignment with the financial objectives of the alliance partners, over alignment between actual and target internal performance measures.

6.9.3 Hypotheses 5-8 – Observed Factors of Contractual Alliance Success (CAS)

One of the aims of this research was to build a more robust measure of contractual alliance success using variables that were conceptualised in the literature but not empirically tested as a set. Empirical testing has been challenging in the field of inter-firm relationships due to lack of access to good quality data. This study had very detailed and good quality information from 149 contractual alliances, so it was a good opportunity to test some hypotheses.

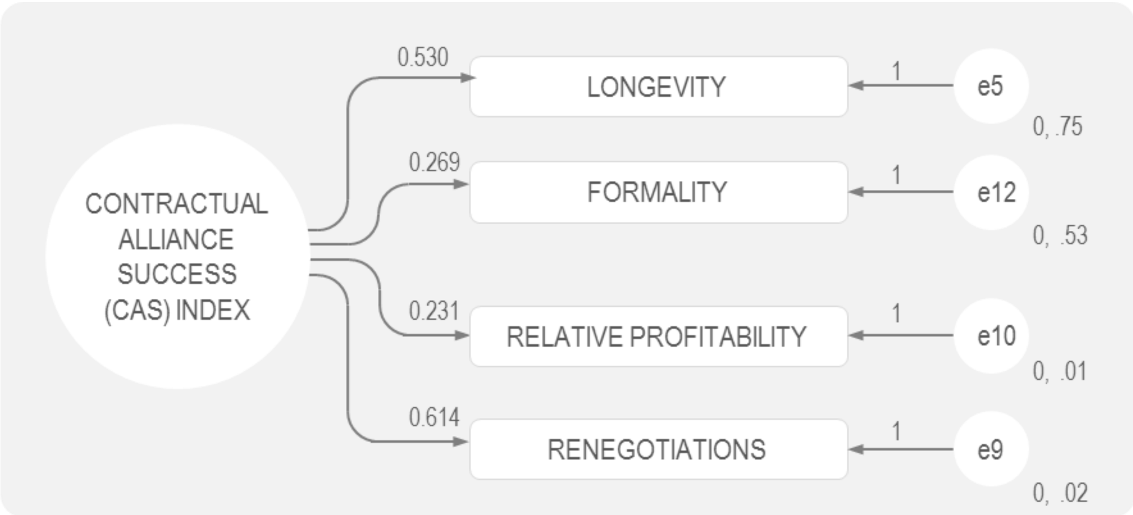

Figure 18 Estimated Model for CAS Index

CONTRACTUAL ALLIANCE SUCCESS or CAS is a composite construct that includes multiple measures of what it is regarded as a successful inter-firm relationship. The full quantitative study validated the contribution of specific variables to the composite construct. The results of the quantitative study are significant from a confirmatory perspective, but also in proposing new areas of research regarding determinants of success in contractual alliances.

Hypothesis 5 stated that active contracts with a signed agreement are determinants of more successful contractual alliances. The results of the model show a positive correlation between both variables FORMALITY and CAS with a level of confidence of 95% (c.r. with p=0.039). The calculated variable of FORMALITY explains only 26.9% of the relationship success. This result may seem more significant in the context of the other measures tested in the rest of the hypotheses. Given the literature, it was expected a higher contribution under the assumption that a signed contract was a more formal element of a successful relationship. This confirms Hypothesis 5 as a positive correlation between the variables with low significance.

Hypothesis 6 stated that LONGEVITY was a positive and significant measure of contractual alliance success (CAS). According to the model LONGEVITY explains 53% of CAS. This hypothesis was confirmed by the model with an estimated parameter of 0.53, with a positive sign. In the case of this variable the model cannot estimate the critical ratio nor the confidence level since it is a variable with a priori value for the model to operate. However the correlation is significant. Thus Hypothesis 6 has been confirmed as predicted in the literature.

Hypothesis 7 suggested a negative correlation between CONTRACTUAL ALLIANCE SUCCESS and RENEGOTIATIONS as predicted from the literature. Key authors in the field of inter-firm alliances state that renegotiations are a measure of alliance failure (Ariño, 2003; Reuer and Ariño, 2002; Bolton, 1990). However this research shows that there is a positive correlation between RENEGOTIATIONS and CAS. The correlation is also the most significant among the four determinants of CAS studied in these set of hypotheses. The correlation between renegotiations and success has a positive coefficient of 0.614 with a p value of 0.002 ($p<0.01$) for the critical ratio. This is the most powerful of all four observed variables. What this coefficient indicates is that for every 1 unit of increase in renegotiations, the alliance success index will increase by 0.61 units. This result rejects Hypothesis 7 but is consistent with the results of the qualitative analysis presented in Chapter 5.

Hypothesis 8 stated that the RELATIVE PROFITABILITY of the relation for both users and provider has a positive and significant correlation with CONTRACTUAL ALLIANCE SUCCESS. The correlation was positive but not as significant as expected based on conceptual propositions from the literature. The contribution to CAS had a coefficient of (0.269) with a p value of 0.065

($p<0.1$) for the critical ratio. It is a lower confidence level than in other measures but there is a significant correlation with the unobserved endogenous variable, CAS.

This concludes the presentation of the full quantitative study to specify, estimate and test a model that predicts contractual alliance success determined by the degree of alignment among inter-firm performance measures. The model was specified using structural equation models that test the fit of the estimated model versus the theoretical model and bivariate correlations with observed and unobserved variables. Chapter 7 will discuss the implications of these quantitative results, the specific contributions from the research, the limitations of this work and opportunities for future research.

7 DISCUSSION, CONTRIBUTIONS AND LIMITATIONS

7.1 Introduction

Chapter 7 presents a critical examination of the findings described in previous chapters. The discussion connects back the findings in the context of the three literature domains that inform this research: inter-firm relationships, performance measurement systems, and strategic alignment. The discussion claims new knowledge from the results as contributions to theory, methods and management practice. This inquiry began with a need to understand some factors that make contractual alliances successful. This is not a new topic in the literature, but one that could use new approaches. Previous chapters described the role that aligned inter-firm performance measures play in making alliances successful. Below there is a discussion of the results and the highlighted contributions.

Section 7.2 presents a detailed discussion of the research results along the following themes rooted in theory:

- The role of performance measurement in managing inter-firm relationships
- The design of inter-firm performance measurement systems
- Strategic alignment in inter-firm performance measurements
- The definition of success of contractual alliances
- Alignment of inter-firm performance measures as a predictor of contractual alliance success

The contributions presented in Section 7.3 are a summary of the specific claims this research makes. The results of this research are centred on contributions to:

- Theory in inter-firm relationship management
- Methods to measure performance alignment
- Practice by contributions to methods and practice.

These contributions are deeply rooted in the methods used during the research, a sound identification of knowledge gaps in the literature and the previous discussion of results. Chapter 7 also highlights the limitations of this research, that may spark new research ideas to close knowledge gaps still open in the literature and to address the identified limitations.

7.2 Discussion of Results

7.2.1 The role of performance measurement in managing inter-firm relationships

Prior to discussing the key research question of this dissertation – the impact of aligned inter-firm performance measures on alliance success – it is worth discussing the role of performance measurement systems (PMS) in managing inter-firm relationships, as a matter of introduction.

The literature review presented in Chapter 2 highlights two applications of PMS in alliance management: i) the use of performance measurement to assess the alliance's ability to deliver results according to the scope of the relationship (<u>relational-level measures</u>) (Gulati and Singh, 1998; Madhok, 2000; Madhok and Tallman, 1998); and ii) to justify the positive impact of the inter-firm relation on the members' own performance (<u>firm-level measures</u>) (Kale et al., 2001; Zollo et al., 2002; Lambe et al., 2002).

i. Regarding <u>relational-level measures,</u> the literature presents two streams of contributions: a) measures about goals and processes within the relationship, mostly known as service level agreements (SLAs) (Ariño, 2003; Lunnan and Haugland, 2008; Geringer and Hebert, 1991; Parkhe, 1993); b) measures about the degree of effectiveness of the alliance per se as a governance mechanism. This will be related to the longevity of the alliance and/or the avoidance of unexpected termination (Madhok and Tallman, 1998; Parkhe, 1993; Goerzen and Beamish, 2005; Cravens et al., 2000; Das and Teng, 2000), the stability of the mechanism (Chan et al., 1997; Anand and Khanna, 2000; Ariño and Reuer, 2004), and the quantification of relative profitability for the partners in the alliance (Parkhe, 1993; Chan et al., 1997; Chang et al., 2008; Huang and Chan, 2005; Gleason et al., 2003; Dyer et al., 2001). The relational-level measures will change based on the goals and scope of the relationship, and will create specific metrics to monitor alliance's performance and contribution.

ii. The firm-level measures do not measure internal alliance performance but rather the impact on firm's performance due to alliance activity. The literature is extensive when measuring firm performance improvement and the contributions have been grouped along three moments in time with specific foci on the analysis. The contemporary authors (1990-1999) are focused on measurements at the stockholder level, stock appreciation and the generation of quasi-rents (Madhok and Tallman, 1998; Chan et al., 1997; Zajac and Olsen, 1993). The established contemporaries (2000-2005) take a look at 'softer' benefits of alliance activity such as cumulative experience (Zollo et al., 2002; Tomkins, 2001/3), firm's customer satisfaction (Poppo and Zenger, 1998), and general improvement in market share position (Dussauge et al., 2004; Dussauge et al., 2000). The contemporary innovators (2006-2012) approach the benefits of alliance activity, at the firm-level from improvements in innovation (Kotabe et al., 2003; Murray and Kotabe, 2005), improved reputation derive from taking a central role in the coordination of a network (Koka and Prescott, 2008; Adams and Neely, 2000), and finally the expectation of better future performance (Lavie, 2007; Bititci et al., 2004).

The results of this research highlight an additional role of performance measurement systems in managing inter-firm relationships beyond the first two roles. Inter-firm Performance Measures ought to become a management tool (Kaplan and Norton, 2006), a tool for communication (Kaplan and Norton, 1996), for learning (Neely and Najjar, 2006; Bourne et al., 2000), not only for setting expectations and measuring outcomes, but to open channels across the firms involved in the relationship. These are not new concepts. The PMS literature has abundant contributions on the multiple uses of performance measures but mostly centred in intra-firm contexts. This research claims that inter-firm performance measures are truly management tools to drive successful alliances and the qualitative and quantitative results confirm this claim. By demonstrating how aligned inter-firm performance measures contribute to alliance success, it is clear that the design of the inter-firm performance measurement system should go beyond setting service level agreements and monitoring their delivery.

7.2.2 The design of inter-firm performance measurement systems

The management literature on performance measurement systems is vast and yet limited in its current scope (Neely et al., 2005; Bourne et al., 2003; Franco-Santos et al., 2012; Garengo et al., 2005; Najmi et al., 2005; Kennerley and Neely, 2000; Eccles, 1991; Kaplan and Norton, 1992). Many of the key contributors exalt the characteristics of well-designed performance measurement systems: they should be aligned with strategy, they should drive firm's success by meeting stakeholder expectations and truly the concept of measuring performance is at the core of all strategic management theories (Venkatraman and Ramanujam, 1986).

Yet the fact that most discussions on the design of PMS take place in an intra-firm context shows the need for additional research in the field. Some authors have started the discussion by extending the scope of financial reporting tools outside the boundaries of the firm (Dekker, 2004; Dekker, 2003). Others propose a certain level of hierarchical aggregation of firm-level metrics into a super-structure of PMS for extended enterprises and connected supply chains (Lehtinen and Ahola, 2010; Bititci et al., 2005; Lin et al., 2000; Mullin, 1996; Busi and Bititci, 2006). All of these approaches are sound and will yield some improvements, but they are based on an assumption that practice dispels. They assume that inherently partners have similar objectives and that the alliance will contribute to each party's objectives simultaneously.

However the key distinction between intra-firm and inter-firm performance measurement systems lies in the concept of alignment. Intra-firm PMS - as complex as they may be -, can eventually be aligned around common objectives of the firm (Kaplan and Norton, 2006; Kathuria et al., 2007; Decoene and Bruggeman, 2006; McAdam and Bailie, 2002). In large organisations it may be a herculean task, but conceptually doable. The challenge with non-equity inter-firm relationships (IFR), like contractual alliances, is that they lack a central point of governance with evident common objectives. Moreover contractual alliances, using the case of outsourcing, tend to have evident conflicts of interest (Tsai et al., 2012; Stainer and Grey, 2007; Rothaermel et al., 2006). In fact there are voices advocating a new way to structure these kinds of IFRs seeking more collaboration and vested interests within the relationship (Vitasek and Manrodt, 2012; Vitasek and Ledyard, 2009; Boer et al., 2006), yet from those contributions the discussion around “aligned objectives” is still more philosophical than operational.

The position of this research is that alignment of objectives must go beyond words and be actionable through the appropriate design of an inter-firm performance measurement system. This inter-firm PMS should consider relational-level performance measures, connecting them with firm-level performance measures in an aligned manner. This connection will be a synergistic design rather than the mere aggregation of two separate systems, as described in section 7.2.1 above. If the question is how to connect those two levels in a synergistic manner, the answer will not be through mere aggregation of indicators. The answer revolves around inter-firm PMS that are truly aligned to deliver results against conflictive objectives.

7.2.3 Strategic alignment in inter-firm performance measurements

As this discussion explores the need to drive alignment in inter-firm performance measures it reaches the point of discussing what is known about strategic alignment. In the strategy literature alignment refers to the internal congruence of a lower level construct with a higher level construct (Venkatraman and Prescott, 1990; Olson et al., 2005). It has been applied to assess the level of fit between a functional strategy and a corporate one and coherence between a corporate strategy and its environment (Venkatraman, 1989; Venkatraman and Camillus, 1984; Drazin and Van de Ven, 1985). These early contributions devised methods to quantify the degree of alignment (or misalignment) between these constructs.

Currently, the field of inter-firm relations management also calls for greater ‘alignment’ between the corporate strategy of the firm and its alliance activity (Douma et al., 2000; Nielsen, 2010; Nielsen and Gudergan, 2012). Some authors advocate trust, as a way to find this congruence, and they also propose new mechanisms to build that relational capital (Yu et al., 2006; Claro et al., 2003; Levin, 2003; Baker et al., 2002; Poppo and Zenger, 2002). In their view, relational measures will improve the level of alignment between the firms’ objectives and the objectives of the new governance structure (Murray and Kotabe, 2005; Hamel, 1991; Parkhe, 1999). Certainly driving alignment is just not a matter of aligning inter-firm performance measures, but it is also not just humans’ desire to cooperate and work together. If one acknowledges the power of performance measures to change behaviour, clearly the power of aligned inter-firm performance goals should contribute to building trust and relational capital (Yu et al., 2006; Claro et al., 2003; Levin, 2003; Baker et al., 2002; Poppo and Zenger, 2002; Pittino and Mazzurana, 2013; Wittmann et al., 2009; Gulati, 2007; Vandaele et al., 2007). It will also help if managers know the applications alignment and measurement fit.

The methods proposed in this research have been built upon widely known tests to measure strategic alignment, coupled with the extant theories on aligned performance measures and alignment between a firm’s strategy and its inter-firm alliance activities. The contributions revolve around new contexts to measure alignment, and combining methods used in the strategic alignment field, and now applying them into the inter-firm management domain.

Chapter 3 presented the theoretical foundations of transaction-cost economics applied to inter-firm relationships (Judge and Dooley, 2006; Williamson, 1979; McIvor, 2009), and the suitability of applying methods to align inter-firm objectives. Chapter 4 operationalised a coefficient of inter-firm performance alignment using Venkatraman's tests. Chapter 5 tested all these concepts in a pilot study with results that were validated qualitatively with alliance managers. Chapter 6 presented the results of the calculations of an inter-firm alignment coefficient (IFA) for 149 contracts between a service provider and its users. It also discussed the correlation between alignment of inter-firm performance measures and contractual alliance success. This research has contributed to theory testing in two ways: i) by applying existing concepts of alignment of strategic constructs and testing them to measure alignment of inter-firm performance measures, and ii) by assessing alignment among performance measures as an extension of strategic co-alignment techniques.

7.2.4 The definition of success of contractual alliances

The main hypothesis of this research proposes that aligned inter-firm performance measures could predict contractual alliance success. After discussing concepts related to performance management and alignment it is now the time to discuss the measurement of contractual alliance success.

The characteristics of successful alliances are also the measures of that success. These measures (relational-level indicators) were reviewed in section 7.2.1 but the concepts will be revisited here, in order to discuss the pertinence of such measures as definitions of success. Operationalising contractual alliance success (CAS) is fundamental for the development of this research, as the CAS index becomes the dependent variable in the SEM model tested in Chapter 6.

Key researchers in alliance theory have identified four observable characteristics that when present will point to a successful inter-firm relationship. These are not determinants of success; they are considered measures of success:

i. The formality of the relational activity including the lack of abrupt termination situations (Zollo et al., 2002; Ariño, 2003; Das and Teng, 2000; Reuer and Ariño, 2002; Reuer and Zollo, 2005; Sengun and Wasti, 2007)

ii. The longevity of the relationship as a marker of a long-term commitment between partners (Kale et al., 2001; Goerzen and Beamish, 2005; Anand and Khanna, 2000; Kale et al., 2002; Parkhe, 1991)

iii. The stability of the terms of the contract and dealing with the level of change that the relationship experiences (Ariño and Reuer, 2004; Reuer and Ariño, 2002; Bolton, 1990/5; Ariño et al., 2001)

iv. The relative profitability derived by the members of the alliance, a characteristic aimed at testing game theory behaviours among alliance members (Lavie, 2007; Parkhe, 1999; Parkhe, 1993)

The empirical testing of this research considered a sample of 149 contracts both ‘successful’ and ‘failed’ (measured by the fact that the relationships were still active or decommissioned) to measure alliance success (CAS) according to theory’s characteristics. Each one of the contracts, made available by the logistics service provider sponsoring the research, had information on the degree of formality, longevity, stability and relative profitability of the relationship. The results of the operationalisation of contractual alliance success (CAS) were described in depth in Chapters 5 and 6. They include results from the pilot study, from the qualitative in-depth interviews with all Programme Managers, and from the full quantitative study presented in Chapter 6.

Below is a discussion on the results of each of the four measures of contractual alliance success, and how much they contribute to the CAS index.

i. Formality of the relational activity is a significant measure of contractual alliance success, this confirms the hypothesised correlation from theory (c.r.=2.069 ; $p<0.05$). These results emphasise the need to maintain formal documentation of the relationship, scheduled performance reviews and the role of the Programme Management Group in the case of the Provider. Theory predicted that the contribution to success was very large; results from this research show that only 26.9% of contractual alliance success is explained by the formality of the relational activity.

ii. Longevity is the most relevant and confirmed measure of success in contractual alliances. The SEM model does not provide the value for the critical ratio (c.r.) of this specific variable given the need to pre-assign a value for the model to run. However is recommended that more iterations of the model will be run to let the c.r. and p value be generated. Theory predicted the importance of long-term relationships as a measure of success; this research confirms the relation and attaches a measurable coefficient of contribution calculated at 53% of the explanation of success.

iii. The predicted correlation from theory between stability and success was not confirmed. In fact the sign is the opposite of what was expected. The hypothesis stated that the renegotiation variable was negatively correlated with success but the available data showed that in this context of contractual alliances, more renegotiations are significantly correlated (c.r.= 0.019 ; $p<0.05$) with success. These results were also triangulated with 12 Programme Managers that are responsible for these contractual alliances and they confirmed the importance of the renegotiation activity to ‘keep the relationship alive’. This finding has profound implications for those involved in relationship management as they have to manage simultaneously a certain degree of ‘formality’ with the flexibility to accommodate changes in the terms of the relationship over time. Theory predicted a negative contribution of renegotiations and success; this research confirms a positive and significant contribution of the renegotiation activity and contractual alliance success with 61.4% of the explanatory power.

iv. As for relative profitability, the contribution as a measure of the overall success of the contractual alliance is low with an estimate of 0.043, so for every 1 unit that relative profitability changes, CAS will vary by 0.043 units. The estimation is significant at a 90% confidence level (c.r.=1.847 ;

p = 0.065). It is important for the discussion to remember that the operationalisation of this variable was done using the value of the contract in light of the provider's revenue and the user's expenses. The assumption was that the higher the share of revenues or expenses, the more to lose by the partner when there are issues with the alliance. This measure may need to be operationalised with more complex values and ratios. Theory predicts a significantly positive contribution of relative profitability and alliance success; this research finds a positive but limited contribution, as relative profitability has been measured here.

This research confirms the contribution of formality, longevity and relative profitability as measures of contractual alliance success, but disputes the claim of 'stability' as a characteristic of successful inter-firm relationships. The implications of the last claim are profound for theory and practice and calls for additional studies with multiple providers and different types of relationships. As outsourcing and alliance management continue to evolve it is possible that there is a new generation of managers that want more flexibility in the terms of engagement and some wiggle room to accommodate changes and new needs.

7.2.5 Alignment of inter-firm performance measures as a predictor of contractual alliance success

This section discusses the principal hypothesis and the original research question of this dissertation, why successful alliances fail? The proposed hypothesis was that even though an alliance may be delivering to its SLAs, if the SLAs are not aligned with the partners' financial objectives the relationship may fail. Sections 7.2.1 to 7.2.4 have reviewed all the relevant theory regarding management of inter-firm relations, the role of performance measurement systems in IFR management, strategic alignment and measuring contractual alliance success.

The conclusions from this analysis are profound; firstly there is a significant causality between alignment and alliance success. In other words, not only the relation and the sign are correct but also the directionality means causality, as it was meant to be measured by choosing SEM as the statistical method. If alignment improves by one unit, success of the alliance improves by 0.776 units. The reliability of the estimates is high for the selected sample. The global fit of the SEM model is good by all the measures presented in section 6.6.

Moreover, given a set of contracts, with a 91% confidence, if the inter-firm alignment (IFA) coefficient is calculated, the probability of contractual alliance success can be estimated using the estimate ratio of 1.00 to 0.776 as estimated by the SEM model.

Of all the variables that are part of the IFA coefficient, the variable that contributes the most to overall alignment is PROVIDER-SLA, the alignment between the contract's SLAs and the provider's financial objectives. Meaning that, for contracts to have greater alignment, the SLAs should really contribute to the financial objectives of the provider. This is a counter-intuitive conclusion since the perception by practitioners and theorist was that the alignment that matters was the alignment of target SLAs and actual values (ACTUAL-SLA) and/or the contribution to the user's financial objectives (USER-SLA).

These conclusions are innovative both for theory and for management practice. They actually provide a blue print for how to set-up service level agreements in contractual alliances, how to align them to user's and provider's financial objectives and how to measure and monitor success. For service providers with a portfolio of contractual alliances this research provides an opportunity to measure degrees of alignment of inter-firm performance measures (starting with the contractual SLAs) and from there estimate the risk levels of the portfolio. For users with multiple alliances with different service providers, this research explores the value of better aligning those relationships with the needs of the providers.

For theory, the results of this analysis add to the body of knowledge on the measurements of contractual alliance success. Additionally, it is known now the contribution of aligned inter-firm performance measures as a predictor of contractual alliance success.

7.3 Contributions

The main objective of this research was to address the question of whether alignment of performance objectives amongst partners in an alliance matter to its success. This question is relevant in the context of firms' increasing use of inter-firm structures (IFRs) to fulfil their strategic objectives. The performance management literature suggests the importance of performance objectives alignment across different functions or activities but there is no evidence of a practical mechanism to measure such alignment. This methodological gap has been exposed in the design of inter-firm performance measurement systems to govern IFRs. The above generalisation was evident in the logistics outsourcing industry, - which served as the source of data for this research -, where leading service providers witness conflicting signals in relationships that survive or die regardless of the fulfilment of the SLAs between users and provider.

Thus the two key constructs of analysis are contractual alliance success and alignment of inter-firm performance. The management literature presented in Chapter 2 defines both contractual alliance success and performance alignment. Contractual alliance success is defined from two perspectives: the firm-level impact of the alliance and the relational-level impact. The firm-level impact is defined as the contribution of the IFR to the performance objectives of the member firms. The data used for firm-level impact in this research were the financial objectives of the firms involved in the CA (Table 5). The relational-level impact considered the fulfilment of the agreed upon SLAs and the overall effectiveness of the IFR as a governance mechanism (Figure 9), including the stability, formality and longevity of the relationship. Measuring alignment of performance objectives in an inter-firm context assumes that the performance objectives of both firms in the CA are congruent with the internal SLAs of the CA.

This research contributes to theory, practice and methods in the fields of performance management systems and inter-firm relationships. The study conceptualises and measures the inter-firm alignment coefficient (IFA) by adapting an existing method from the strategy literature. The method is based on measuring Euclidean distances between the numerical values of two or more constructs and had been used extensively to test alignment of functional strategy and corporate strategy (Venkatraman and Camillus, 1984; Venkatraman and Prescott, 1990; Venkatraman, 1989).

The study calculates contractual alliance success using existing variables proposed and tested individually in the management literature. The CAS index includes contractual alliance characteristics such as longevity (Parkhe, 2003), stability (Ariño, 2001), formality and importance of the relationship for the partners. Using data from 149 contracts this study shows the contribution of each variable to the overall CAS index.

The study correlates the values of the IFA and the CAS index and estimates the contribution of aligned performance measurement systems to the success of the inter-firm relationship. This analysis is conducted using a model of structural equations (SEM) that simultaneously establishes bivariate correlations and the overall fit of the estimated model versus the existing data. The analysis' output measures the goodness of fit of the model to validate all research hypotheses.

Successful organisations and their performance measurement systems have negotiated effectively conflicting objectives by seeking alignment towards a common goal (Kaplan and Norton, 2006; Kathuria et al., 2007; Decoene and Bruggeman, 2006). By adapting and testing a method to measure degrees of alignment of inter-firm objectives and the effect on successful contractual alliances this research extends current PMS and IFR theories.

Applied research must also inform and shape management practice. Considering the high level of activity in the formation (and dissolution) of contractual alliances, it is important that management research addresses the expanding use of service providers to manage non-core business functions (Gulati and Singh, 1998; Gulati and Kletter, 2005). The conclusions and methods of this research will inform managers on how to set-up better SLAs and the importance of aligning them to the Financial objectives of both signing parties. Especially for existing contractual alliances, service providers will be able to identify and predict outcomes of relationships that have a high risk of dissolution and low probability of success. Having this kind of predictive ability is what motivated the sponsoring logistics service provider to support this research and to provide access to their internal contractual alliances. Hopefully the contextual application of this research in the logistics services industry can be extrapolated to many other industries facing the same challenges of aligning objectives across IFRs when conflicting goals and complex service level agreements are present.

Table 65 Final Contributions from Hypotheses Testing

RESEARCH HYPOTHESES		FINAL RELATIONSHIP CONFIRMED	RESEARCH CONTRIBUTION
H_1	The degree of alignment amongst inter-firm performance measures is positively correlated with contractual alliance success	Positive and significant causal relation	Hypothesis confirmed
H_2	The measure of alignment between the contract's service level agreements and the actual performance values contributes significantly to the measure of inter-firm alignment	Positive contribution Non-significant	Hypothesis partially confirmed
H_3	The measure of alignment between the contract's service level agreements (SLA) and the provider's financial objectives contributes significantly to the measure of inter-firm alignment.	Significantly positive contribution	Hypothesis confirmed
H_4	The measure of alignment between the contract's service level agreements (SLA) and the user's financial objectives contributes significantly to the measure of inter-firm alignment	Positive contribution Non-significant	Hypothesis partially confirmed
H_5	An active inter-firm relationship governed by a formal mechanism is significantly and positively correlated to contractual alliance success	Significantly positive contribution	Hypothesis confirmed
H_6	The length of the inter-firm relationship is significantly and positively correlated to contractual alliance success	Significantly positive contribution	Hypothesis confirmed
H_7	The number of renegotiations of the terms of the inter-firm relationship is significantly and negatively correlated to contractual alliance success	Significantly Positive Contribution	Hypothesis rejected as it predicted a negative contribution

RESEARCH HYPOTHESES		FINAL RELATIONSHIP CONFIRMED	RESEARCH CONTRIBUTION
H_8	The relative profitability of the inter-firm relationship is significantly and positively correlated to contractual alliance success	Positive contribution Non-significant	Hypothesis partially confirmed

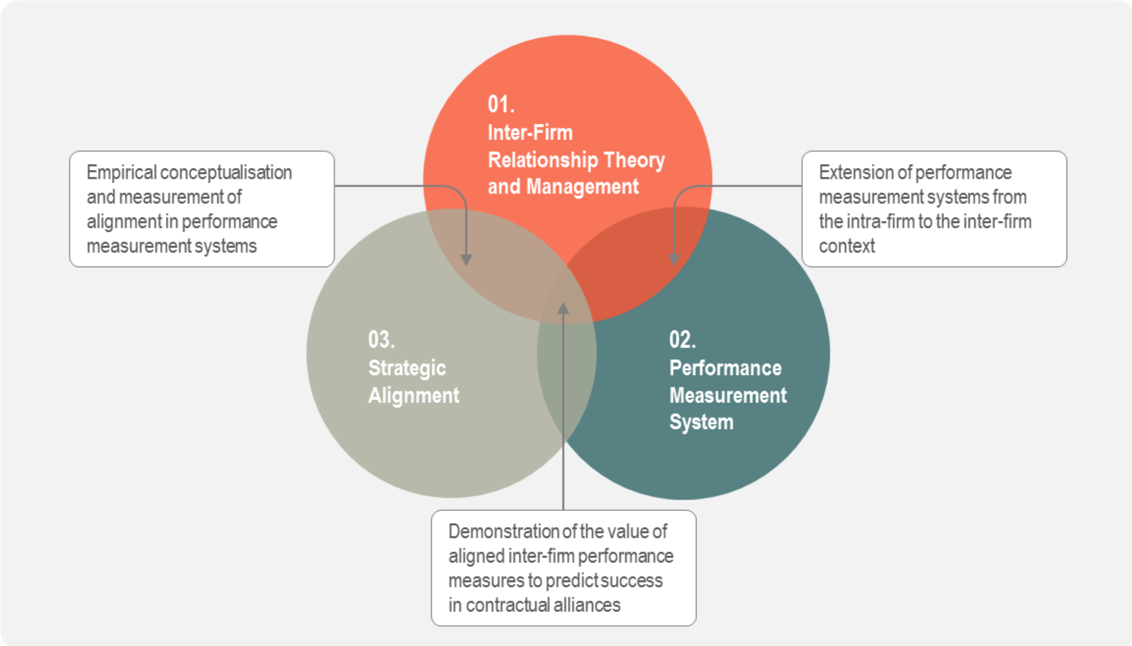

Figure 19 Loci of Confirmed Contributions from Research

7.4 Limitations

The research process forces certain early decisions and methodological preferences that later become limitations of the application of the research results. In this case, limitations arise from the simplification of the constructs, the research design, the sources of data, the selected research methods, and the choice of specific theoretical lenses and philosophical positions. It is the objective of this section not only to disclose such limitations, but to challenge future research studies to overcome them.

- Limitations from Simplification of Constructs: As discussed in Chapter 4, the operationalisation of the contractual alliance success (CAS) index was done by using observable factors from the pool of alliances considered in the study. These factors are those dimensions of success related to outcomes from formal mechanisms of CA governance. The CAS index included the formality of the relationship, its longevity, stability and relative profitability of the inter-firm relationship. However, it is important to acknowledge that there are other factors that determine and the success of an alliance. These factors of alliance success were introduced in Chapter 2, Section 2.2.4.2 when discussing Dynamic Determinants of Success. They include factors such as Knowledge Sharing Routines, Relational Capabilities, and building Relational Capital as a measure of alliance success. Future studies could add external factors and 'softer' determinants to the operationalisation of the CAS index.

- <u>Limitations from research design</u>: The main limitation from research design is the fact that the contractual alliances subject to study are between a common service provider and their own existing customers. This design may introduce a bias towards certain contract structure and a particular profile of customers that have outsourced their logistics operations to this provider. Also, the design is based on sectional data considering one year of SLA information for the contracts, as opposed to a longitudinal review of SLAs.
- <u>Limitiations from available data:</u> The data was provided by a single primary source. The single source may have introduced a bias in the way contracts are structured and how SLAs are defined. Also, due to the requirements for financial information, all firms in the study are publicly quoted firms, which skew the sample towards firms of a certain size and reporting disciplines. Considering this, the results may not apply to privately held companies where the financial performance requirements are less transparent or stringent.
- <u>Limitations from selected research methods:</u> Early on the research design called for the use of structural equation modelling. The use of this technique is favoured by quantitative researchers that want to test full causal models for theory-testing. This introduces a particular bias in the

analysis when considering the assumptions and limitations of SEM that were discussed in Chapter 4.

- Limitations from theoretical lenses and philosophical positions: The choice of Transaction Cost Economics adds to the explanatory power of the model of IFA to predict CAS. However, it also brings some assumptions that may limit the generalisation of the results. Using TCE coloured the selection of variables to include in the calculation of the CAS index, and in the assumptions behind the concept of inter-firm alignment (IFA). We still believe TCE is a powerful theoretical lens to study contractual alliances. Nonetheless, we acknowledge the limitations of this choice. From a philosophical position, the post-positivist stance may cause some problems for those looking at a more constructivist explanation of contractual alliance success.

Section 8.4 of the conclusions proposes avenues for future research that may overcome some of the limitations presented above.

8 CONCLUSIONS

8.1 Aim of the Research and Research Questions

The aim of the research was to investigate why seemingly successful inter-firm relationships fail and get abruptly terminated. More specifically why contractual alliances, a particular type of inter-firm relations, may deliver results according to their pre-specified goals (SLAs) and still be terminated. Contractual alliances are a complex type of inter-firm relationship because the participating partners do not share equity in the new governance structure. They create value by interchanging products and services with each other, with one acting as the provider and the other as the user.

The management literature has explored in depth the three domains of knowledge that this research connects: inter-firm relationships, performance measurement systems and strategic alignment. The concepts of alignment of strategic objectives are mature and well operationalised. So is the theory behind performance measurement systems, especially in an intra-firm context. The extant literature on inter-firm relationships is vast and covers all aspects of typologies, motivations to enter an IFR, determinants of success, causes of its failures, and the measurement of alliance success.

What this research does is connecting the literature on PMS with the IFR domain via aligned performance measures in an inter-firm context, as an additional explanatory variable of IFR success. The key proposition, later a research hypothesis, is that lack of alignment between the partners' objectives and the goals of the contractual alliance contributes to explain the failure of the relationship.

This chapter summarises the key elements of the research and its results. Section 8.2, a summary of chapters 4 and 5, reviews the research methods and the process followed to answer the research questions. Section 8.3 summarises the key contributions to knowledge from this research in the context of the literature domains presented in chapter 2. The full discussion of contributions and limitations of the research was presented in chapter 7. Section 8.4 proposes future research ideas in order to address current limitations and close additional knowledge gaps acknowledged in this research.

8.2 Research Methods and Process

Based on the general aim of the research, the methods and processes answered specific questions:

1. How to measure inter-firm alignment amongst the performance objectives of the provider, the performance objectives of the user, and the internal service level agreements between both parties?
2. How to measure contractual alliance success and what are the critical dimensions that contribute to that success?
3. How much inter-firm performance alignment explains contractual alliance success?

The main hypothesis was that relationships fail because the so called ‘success’ was partial. This means that ‘success’ is only measuring the ability of the contractual alliance to fulfil the contract’s promises. However, current measures of success do not address the relationship’s ability to contribute to specific financial objectives of the partnering firms.

The research questions were initially analysed in a review of the management literature on the subject of inter-organisation relationships (IFRs) and the features of optimal performance measurement systems. The key conclusions of what is known in the literature about these domains are:

- Success in IFRs is defined by the fulfilment of the internal goals of the relationship. This success is measured by indicators of alliance-level effectiveness. They include the use of service level agreements (SLAs) to track the relationship’s ability to fulfil its objectives (Ariño, 2003; Madhok and Tallman, 1998).
- The overall effectiveness of the new inter-firm organisational form is tracked by measurements of abrupt termination (Das and Teng, 2000;

Lunnan and Haugland, 2006), longevity (Beamish, 1988; Parkhe, 1993; Lin and Germain, 1998) and, contract stability (Chan et al, 1997; Anand and Khanna, 2000; and Ariño, 2003).

- Alliance success is also measured by the impact of the alliance activity on firm performance. Measurements of firm-level impact include measures of stock price appreciation post-alliance formation (Chan et al, 1997; Madhok and Tallman, 1998; Kale, Dyer and Singh, 2002). A different type of impact is the generation of relational rents derived from alliance activity (Lavie, 2006 and 2007, Koka and Prescott, 2008).
- Alignment is seen as a desirable feature of intra-firm performance measurement system. It is defined as the congruency amongst the goals and objectives across different metrics (Bititci et al, 2006; Busi and Bititci, 2006; Hitt, 1998; Neely et al, 2005; Yeung et al, 2006; Kaplan and Norton, 2006). This feature is prominent when discussing alignment of functional objectives against a corporate goal. There are references to alignment between inter-firm performance measurement systems, but mostly as a desirable feature without much operationalisation of the way to get it.
- There are methodologies to assess alignment between two constructs. In the management literature the methodology has been applied to assess strategic alignment between a functional and a corporate strategy (Venkatraman and Camillus, 1984; Venkatraman, 1990), and the fit of a corporate strategy and its environment (Venkatraman and Prescott, 1990; Ittner et al, 2003). The most popular method for measuring alignment is based on geometric distances between two points (Euclidean distances based on the square root of the differences between two values of the same construct).

Transaction Cost Economics (TCE) has been used frequently as the theoretical lens to study inter-firm relationships and the role of aligned performance measures to manage this particular governance mechanism. It was evident that

PMS serves a purpose to mitigate opportunism and bounded rationality, thus it was selected as the theoretical lens for this research.

In summary, from the review of the relevant literature, there was not found an empirical study connecting the role of aligned inter-firm performance measures to explain contractual alliance success. Generally, is alignment of inter-firm performance measures a predictor of contractual alliance success?

Considering the hypothesis and the extant knowledge gap, the research set out to operationalise and measure alignment of inter-firm performance measures (IFA), and to operationalise and measure contractual alliance success (CAS). According to the results of the research, these two variables are positively and inter-firm alignment is an additional causal factor of contractual alliance success.

The two constructs - Inter-firm Alignment Coefficient (IAC) and Contractual Alliance Success (CAS) – were operationalised and measured through an initial pilot study based on a small set of logistics outsourcing contracts, furnished by a leading logistics service provider. The results of the pilot study and a explanatory qualitative study are presented in Chapters 4 and 5 of this document.

The satisfactory results of the pilot study and qualitative study gave way to a full quantitative study using a sample of 149 contracts between a logistics service provider and some key users. All firms involved in the research, - provider and users- are publicly-traded companies with full access to past and current financial performance indicators. Financial indicators were selected as proxy for the performance objectives of the firms in the relationship in order to assess alignment between the contract’s SLAs and the firms’ objectives.

The full quantitative study relied on a statistical technique known as structural equation modelling (SEM) that tests in a simultaneous way multiple correlations between dependent and independent variables. In this case the independent variable was the inter-firm alignment coefficient (IAC) measuring the distance between the internal contract's SLAs and the partners' financial objectives. The dependent variable was the contractual alliance success (CAS) index. This index defines a successful relationship by its longevity, stability measured as the number of renegotiations, the degree of formality and the relative profitability for the members. Relative profitability was defined considering the value of the contract as a per cent of the users' SGA costs or as a per cent of the provider's revenues. The qualitative study confirmed the relevance of these measures of CAS as suggested by the literature.

8.3 Research Findings and Contributions

The conclusion of the full quantitative study is that there is a significant and positive correlation between the degree of alignment of inter-firm performance measures and the success of the relationship. However, not all components of alignment are equally important. Alignment between the contract's SLAs and the provider's financial objectives is more important (has a greater statistical contribution), than SLAs and the provider's financial objectives. What is more interesting is that alignment between target SLAs and actual service levels has the lowest contribution to the inter-firm performance alignment coefficient (IFA).

The contributions to the literature on management of inter-firm organisations are centred on the determinants of IFR success. Current knowledge identifies two types of determinants of success: member-provided determinants (existing within the partners prior to alliance formation) and dynamic determinants (generated as post-formation dynamics).

The member-provided determinants of IFR success include:

- Network resources and relation-specific assets (Dyer, 1997; Gulati and Kletter, 2005; Madhok, 2000; Gulati, 2007 Williamson, 2005).
- Collaborative management competencies (Anand and Khana, 2000; Lambe, 2002, Bititci et al, 2007; Khale and Singh, 2007)
- Reputation and legitimacy to the new IFR provided by its members (Parkhe, 1993; Dacin, 2007).

This research adds a new member-provided determinant with significant correlation to contractual alliance success: aligned inter-firm performance measurement systems. The new determinant is regarded as a management competency, where participating firms are capable of designing aligned performance measurement systems for the new organisational form.

As for dynamic determinants the literature considers a number of alliance post-formation determinants of success, such as:

- Relational capabilities, including concepts of trust, commitment, willingness to collaborate and compromise (Huxham, 1996; Bruner and Speckman, 1998; Ariño et al, 2001; Das and Teng, 2001; Zineldin and Bredenlow, 2003; Bititci et al, 2007)
- Governance frameworks, critical in the study of alliances under the TCE lens (Williamson, 1981; Oxley, 1997; Dyer, 1997; Das and Teng, 2001; White, 2005)
- Information and knowledge sharing routines to create relational capital (Parkhe, 1993; Zollo, 2002; Poppo and Zenger, 2002; Greve, 2003; Ariño and Reuer, 2004; Bititci et al, 2007)

This research adds a determinant, called aligned inter-firm performance measures, which should be introduced in governance frameworks as a dynamic determinant of IFR success, considering that the tracking of firms' objectives and SLAs is a continuous effort throughout the duration of the relationship. The results confirm the importance of understanding the financial objectives of the partners and quantify the effectiveness of translating this understanding onto the right set of contract's SLAs. The quantification is achieved with the coefficient of alignment of inter-firm performance measures (IFA).

Additionally, the results of the research confirm the correlation of renegotiations, as an information and knowledge sharing routines, and contractual alliance success.These findings enhance previous knowledge in the literature by extending the measurements of alliance-level effectiveness beyond the use of SLAs to track the relationship's ability to fulfil its objectives (Ariño, 2003;

Madhok and Tallman, 1998). It adds to the literature on measurement of alliance success by introducing the concept of aligned inter-firm performance as an indicator of success.

Regarding contractual alliance success (CAS), the model demonstrated that there is a positive correlation, as predicted by the literature, between longevity and success (Beamish, 1988; Parkhe, 1993; Lin and Germain, 1998). However two different bodies of literature predicted different results regarding stability (or renegotiation activity in the alliance. In the alliance literature stability is considered a measure of success (Chan et al, 1997; Anand and Khanna, 2000; and Ariño, 2003), whereas in the organisational learning and performance feed-back literature, less stability and more renegotiations are opportunities to improve performance and increase knowledge (Greve, 2003; Brass, et all, 2004; Bititici et al, 2007). Therefore the results of this research confirm empirically the benefits of constant performance feed-back as means to organisational learning and contractual alliance success.

The contributions to the performance management literature are mostly relatd to the design of PMS for extended enterprises. Since the conceptualisation of inter-firm relationships, the performance management literature has proposed different mechanisms to extend intra-firm, or intra-function performance measurements outside of the boundaries of the firm (Busi and Bititci, 2006). In some instances the focus has been on considering the objectives of external stakeholders (Atkinson et al, 1997; Adams and Neely, 2000; Kaplan and Norton, 1992 and 1996), or by applying multi-objective optimisation techniques that create a single common objective (Altiparmak et al, 2006). In the management accounting literature some authors propose extending current financial statements and aggregate them to those of the partnering firms (Dekker, 2003 and 2004; Coletti et al, 2005).

The theoretical model tested in this research proposes a design of an inter-firm performance measurement system that is not created by aggregation of local metrics or by the elimination of partners' goals. It is generated by aligning partner objectives to the metrics of the alliance. This is achieved through the IFA (inter-firm performance alignment) coefficient, as described in chapters 4 and 5, and measured quantitatively through SEMs presented in chapter 6.

Table 66 presents explicitly the contributions of the research in the context of the literature domains that inform the knowledge gaps and research questions of this thesis. The research results contribute to knowledge on management of inter-firm relationships, design of performance measurement systems in extended enterprises, and furthered the methods to assess alignment amongst performance measures.

The main objective of this research was to explain contractual alliance success based on the degree of alignment between the alliance's performance measures and the partners' goals. It is clear that aligned inter-firm measures are not the only determinants of alliance success, but they are significant contributors. This is the main contribution of the research; testing empirically a new determinant of contractual alliance success.

Table 66 Summary of main contributions to knowledge

Literature Domain	Previous Knowledge	Contributions to Knowledge
Management of Inter-firm organisations. (Member-provided determinants of IFR success)	The extant literature on inter-firm organisations acknowledges determinants of IFR success provided by its members, i.e.: i. Network resources and relation-specific assets (Dyer, 1997; Gulati and Kletter, 2005; Madhok, 2000; Gulati, 2007 Williamson, 2005). ii. Collaborative management competencies (Anand and Khana, 2000; Lambe, 2002, Bititci et al, 2007; Khale and Singh, 2007) iii. iv) reputation and legitimacy to the new IFR provided by its members (Parkhe, 1993; Dacin, 2007)	(1) This research adds a new member-provided determinant with significant correlation to contractual alliance success: aligned inter-firm performance measurement systems. The new determinant is regarded as a management competency, where participating firms are capable of designing aligned performance measurement systems for the new organisational form.
Management of Inter-firm organisations. (Dynamic determinants of success)	The literature considers a number of alliance post-formation determinants of success, such as: i. Relational capabilities, including concepts of trust, commitment, willingness to collaborate and compromise (Huxham, 1996; Bruner and Speckman, 1998; Ariño et al, 2001; Das and Teng, 2001; Zineldin and Bredenlow, 2003; Bititci et al, 2007) ii. Governance frameworks, critical in the study of alliances under the TCE lens (Williamson, 1981;	(2) This research adds a determinant, called aligned inter-firm performance measures, which should be introduced in governance frameworks as a dynamic determinant of IFR success, considering that the tracking of firms' objectives and SLAs is a continuous effort throughout the duration of the relationship. (3) The results confirm the importance of understanding the financial objectives of the partners and quantify the effectiveness of translating this understanding onto the right set of contract's SLAs. The quantification is achieved with the

Literature Domain	Previous Knowledge	Contributions to Knowledge
	Oxley, 1997; Dyer, 1997; Das and Teng, 2001; White, 2005) iii. Information and knowledge sharing routines to create relational capital (Parkhe, 1993; Zollo, 2002; Poppo and Zenger, 2002; Greve, 2003; Ariño and Reuer, 2004; Bititci et al, 2007)	coefficient of alignment of inter-firm performance measures (IFA). (4) The results of the research confirm the correlation of renegotiations, as an information and knowledge sharing routines, and contractual alliance success.
Performance Measurement Systems (Alignment as a Feature)	- Multiple streams of the performance measurement system literature agree on the importance of alignment of measures, on their internal congruence (Bititci et al, 2006; Busi and Bititci, 2006; Hitt, 1998; Neely et al, 2005; Yeung et al, 2006; Kaplan and Norton, 2006) - Alignment has been operationalised and measured in the strategic management literature, by evaluating the degree of congruence (or fit) between functional and corporate strategy (Venkatraman and Camillus, 1984; Venkatraman, 1990), and the fit of a corporate strategy and its environment (Venkatraman and Prescott, 1990; Ittner et al, 2003).	(5) This research contributes to the performance measurement literature but developing a method to assess degrees of alignment between two sets of measures, using Venkatraman's technique for strategic alignment (Euclidean distances)
Performance Measurement Systems for Extended Enterprises	- Since the conceptualisation of inter-firm relationships, the performance management literature has proposed different mechanisms to extend intra-firm, or intra-function performance measurements outside of the boundaries of the	(6) The theoretical model tested in this research proposes a design of an inter-firm performance measurement system that is not created by aggregation of local metrics or by the elimination of partners' goals. It is generated by aligning partner objectives to the metrics of the alliance. This is

Literature Domain	Previous Knowledge	Contributions to Knowledge
	firm (Busi and Bititci, 2006). - In some instances the focus has been on considering the objectives of external stakeholders (Atkinson et al, 1997; Adams and Neely, 2000; Kaplan and Norton, 1992 and 1996), or by applying multi-objective optimisation techniques that create a single common objective (Altiparmak et al, 2006). - In the management accounting literature some authors propose extending current financial statements and aggregate them to those of the partnering firms (Dekker, 2003 and 2004; Coletti et al, 2005).	achieved through the IFA (inter-firm performance alignment) coefficient.
Measurement of Contractual Alliance Success	- Alliance success has been measured in the inter-firm relationship literature in two different ways. One way measures the impact of alliance activity on firm performance. The second mechanism measures the effectiveness of the alliance itself. Currently these measurements have been considered individually. - Measurements of firm-level impact include measures of stock price appreciation post-alliance formation (Chan et al, 1997; Madhok and Tallman, 1998; Kale, Dyer and Singh, 2002). A different type of impact is the generation of relational rents derived from alliance activity (Lavie, 2006 and	(7) This research combines in a single construct indicators of contractual alliance success both at the firm-level impact and alliance effectiveness. This index was calculated as the CAS including relative profitability (firm-level impact), stability, formality and longevity (alliance-level).

Literature Domain	Previous Knowledge	Contributions to Knowledge
	2007, Koka and Prescott, 2008). - Oher measurements of firm-level impact are the relative benefits for both parties to be involved in the relationship (Parkhe, 1993) mainly by bargaining a collective benefit rather than an individual one (game-theory). - Measurements of alliance-level effectiveness include the use of SLAs to track the ability to fulfil objectives (Ariño, 2003; Madhok and Tallman, 1998), as well as the effectiveness of the organisational form. - This effectiveness is tracked by measurements of abrupt termination (Das and Teng, 2000; Lunnan and Haugland, 2006), longevity (Beamish, 1988; Parkhe, 1993; Lin and Germain, 1998), and contract stability (Chan et al, 1997; Anand and Khanna, 2000; and Ariño, 2003).	(8) The results of the research confirm the importance of renegotiations as a dimension of CAS and in line of the organisational learning literature, but opposed to alliance literature suggesting stability as a dimension of success.

8.4 Recommendations and Future Research

8.4.1 Recommendations

The formation of inter-firm relationships will continue to grow. It is time management research, and all domains of management science move away from the intra-firm paradigm, and fully embrace the understanding and analysis of the inter-firm phenomena.

Performance measurement and management will need to step-up into a world where the ability to design and measure controlled processes is diminished. One of the key challenges of managing and measuring inter-firm operations is the limited access to partner information. These fields will have to embrace mobility in data collection, and social networks as means to collect and analyse inter-firm performance information.

The future of research in strategic alignment has to encompass more than philosophical and verbal congruence. An important step in developing the construct in performance measures but an initial step nevertheless. Strategic alignment must deliver almost immediate feed-back to those making decisions. Instant feed-back will keep managers seeking system-wide optimisation, over local improvements. Commensurately, incentives and pay-per-performance should embrace the need for alignment to general objectives. Measuring alignment at the inter-firm or intra-firm level will not matter if performance measurement systems mostly reward local success.

This research matters to theory, to methods, and to practice. It matters to theory because it advances the conversation on how to manage, practically, inter-firm relationships and the role of PMS in it. Performance measurement systems need more than frameworks to explain how metrics fit with each other or how they must be classified. Performance measurement systems need to become communication tools, not punishment or bragging tools, but mechanisms that allow people in business to tell each other what is going on and act accordingly.

This research matters to methods, mostly because it uses an existing one, the measurement of strategic co-alignment, and applies it in another context to derive new conclusions. Finally, this research matters to practice. The outsourcing industry is really a love-to-hate industry. Firms may despise it but they cannot live without it. In the advent of managing a firm's periphery, as its core shrinks, using tools like PMS in a smart way makes a difference to practitioners.

8.4.2 Future Research

Research projects are limited by design in their scope. However, the findings and contributions from this research suggest new avenues for future research.

- It was clear from the beginning of the research, that alignment of inter-firm performance measures was isolated as a causal factor to contractual alliance success. It will be interesting to propose a research that combines the effects of inter-firm performance alignment with other known determinant of alliance success, such as relational capabilities, and explore the impacts of both determinants combined.
- This research design considered one service provider with n-number of users. This design assured access to data from a single company with a fairly standard contract structure. Future studies may consider a research design with one user and n-number of providers for different services, or similar services. An extension of Dyer's (1997) studies with buyer-supplier relationships may incorporate this design with alignment as a key construct to test and explore.
- The triangulation of methods seems to enrich the conclusions and the understanding of research results. The topic of alignment of inter-firm performance measures and inter-firm success seems suitable for case study research, with access to multiple relationship managers, a full periphery of business partners within industries that rely heavily on inter-firm alliances. The Quan-Qual methods provide interesting inter-play of results as demonstrated in this thesis.

- One of the main contributions of this research was the operationalisation of the variables IFA and CAS. Of those variables, contractual alliance success is the most interesting to revisit. The results of this research highlighted the importance of renegotiations and longevity as measures of contractual alliance success. Both relations need to be retested in a study that specifically explores these measures.
- The concept of relative profitability (Parkhe, 1993) needs to be fully developed and operationalised in light of game theory and TCE assumptions. This concept may become a powerful contributor to understand inter-firm relationship success mostly in contractual bi-lateral non-equity alliances.
- The industry setting of this research was the logistics outsourcing industry. Future studies may consider replicating the same research design in other outsourcing sectors with similar or more challenging conditions. One of these sectors is the IT outsourcing industry, plagued by the same illness of failed alliances even when delivering results according to agreed upon SLAs.
- Finally, future inquiries into the role of aligned inter-firm performance measurement systems should move beyond contractual alliances, and move into different type of inter-firm relationships. Interesting choices will be equity-based IFRs such as joint ventures and triads.

At the speed at which inter-firm relationships are formed many more new questions will arise to keep management researchers interested and managers curious. Hopefully this research has contributed to both.

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APPENDICES

Appendix A Primary Contract SLAs from Service Provider

The full content of this appendix is contained in an Excel spread sheet that accompanies this manuscript. The content could be obtained from maria.rey@cranfield.ac.uk as well. Enclosed is a sample screen of the data contained in the file. It shows 138 records of contracts between the Provider and the Users. The additional 11 contracts were added from the pilot study for a total of 149 contracts in the study and were presented in Chapter 5.

The file includes the following fields:

- User ID (replacing name of customer that will remain confidential)
- SLA Description (name of key performance indicator)
- Goal (target value of the SLA)
- Average (average performance for the period of time of the report)
- Difference (between Goal and Average)
- High/Low (clarification if high is better or low is better by indicator)
- Contractual (Yes/No for existing contract of relational activity)
- Year of Data
- Months of the Year with specific values
- Account Vertical (industry represented)
- Director of the Account and Programme Manager

ID	Edit	Customer ID	SLA Description	Goal	Diff	Ave	High/Low	Contractual	Year	January	February	March	April	May	June	July	August	account_vertical	DirectorName(Owner)	Report to
1073	[...]	USER 1 |1051467000	North American AirFreight - On Time %	0.960	(0.026)	0.98553636	High	TRUE	2009	0.9862	0.9816	0.9838	0.9878	0.9966	0.9848	0.9831	0.984	HealthCare	Davis, John	Groome, .
712	[...]	USER 2|1042415000	On Time Shipping Performance	0.950	(0.015)	0.96454545	High	FALSE	2009	1	0.95	0.97	0.98	0.95	0.96	0.95	0.98	HealthCare	Davis, John	Dill, Tina
1259	[...]	USER 2|1042415000	% On Time Shipping	1.000	0.004	0.99609091	High	TRUE	2009	0.977	0.997	0.999	0.996	0.996	1	0.999	0.997	HealthCare	Vallee, Michel	SchinUSE
1260	[...]	USER 2|1042415000	% On Time Receiving	1.000	0.015	0.98454545	High	TRUE	2009	0.909	0.982	0.979	1	1	1	1	1	HealthCare	Vallee, Michel	SchinUSE
1261	[...]	USER 2|1042415000	% On Time Returns	1.000	0.220	0.78036364	High	TRUE	2009	0.61	0.857	0.522	0.662	0.561	0.754	0.955	0.948	HealthCare	Vallee, Michel	SchinUSE
1262	[...]	USER 2|1042415000	% Order Accuracy	1.000	0.005	0.9955	High	TRUE	2009	0.998	0.995	0.996	0.995	0.995	0.996	0.996	0.997	HealthCare	Vallee, Michel	SchinUSE
1263	[...]	USER 2|1042415000	% Inventory Accuracy	0.995	(0.003)	0.99820909	High	TRUE	2009	0.999	0.999	1	0.999	1	0.999	1	0.999	HealthCare	Vallee, Michel	SchinUSE
1264	[...]	USER 2|1042415000	% Cycle Count Accuracy	0.980	(0.004)	0.984	High	TRUE	2009	0.989	0.975	0.987	0.988	0.992	0.98	0.993	0.99	HealthCare	Vallee, Michel	SchinUSE
1265	[...]	USER 2|1042415000	% Call Abandon	0.001	(0.004)	0.00490909	Low	TRUE	2009	0.003	0.007	0.002	0.003	0.003	0.007	0.006	0.005	HealthCare	Vallee, Michel	SchinUSE
1087	[...]	USER 3|1042697000	On Time Performance	0.950	0.012	0.938	High	FALSE	2009								0.922	Retail/Industrial	Davis, John	Webb, Ri
1088	[...]	USER 3|1042697000	On Time Performance	0.950	(0.008)	0.958	High	FALSE	2009								0.958	Retail/Industrial	Davis, John	Webb, Ri
344	[...]	USER 4|1043385000	F3 Domestic Air	0.950	(0.033)	0.98281818	High	TRUE	2009	0.9813	0.9794	0.9796	0.9804	0.98	0.98	0.9917	0.9884	High Tech	Grace, Patrick	Graves (H
345	[...]	USER 4|1043385000	F4 Overall Air/Ocean OTP	0.950	(0.036)	0.98636364	High	TRUE	2009	0.9863	0.9832	0.9841	0.9881	0.985	0.9858	0.9886	0.9893	High Tech	Grace, Patrick	Graves (H
342	[...]	USER 4|1043385000	F1 International Air	0.950	(0.040)	0.99024545	High	TRUE	2009	0.9952	0.9892	0.994	0.9957	0.9938	0.9938	0.9863	0.9862	High Tech	Grace, Patrick	Graves (H
343	[...]	USER 4|1043385000	1.F2 International Ocean	0.950	(0.050)	1	High	TRUE	2009	1	1	1	1	1	1	1	1	High Tech	Grace, Patrick	Graves (H
333	[...]	USER 4|1043385000	Q2 Cycle Count Performance	0.990	(0.009)	0.99872727	High	TRUE	2009	0.9982	0.9962	0.9974	0.9991	0.9973	0.9991	0.9996	0.9999	High Tech	Grace, Patrick	Graves (H
334	[...]	USER 4|1043385000	Q3 Total Receiving Compliance (Shared Metric)	0.980	(0.014)	0.99364545	High	TRUE	2009	0.9855	0.9851	0.9855	1	1	0.9952	0.9965	0.9952	High Tech	Grace, Patrick	Graves (H
335	[...]	USER 4|1043385000	Q4 Part Availability	0.990	(0.003)	0.99348182	High	TRUE	2009	0.9898	0.9864	0.9903	1	0.9923	0.9919	0.9926	0.9961	High Tech	Grace, Patrick	Graves (H
336	[...]	USER 4|1043385000	Q5 Small Package OTP (Overall)	0.980	(0.011)	0.9914	High	TRUE	2009	0.9865	0.9904	0.9914	0.9874	0.989	0.9919	0.9926	0.9961	High Tech	Grace, Patrick	Graves (H
337	[...]	USER 4|1043385000	Q6 ARS Compliance	0.985	(0.012)	0.99730909	High	TRUE	2009	0.992	0.991	0.9934	0.9966	0.9995	0.9993	0.9998	0.9996	High Tech	Grace, Patrick	Graves (H
338	[...]	USER 4|1043385000	I1 Controllable OTP	0.985	(0.014)	0.99931818	High	TRUE	2009	0.9999	0.9998	0.9997	0.9966	0.9981	0.9999	0.9996	0.9998	High Tech	Grace, Patrick	Graves (H
339	[...]	USER 4|1043385000	I2 Overall OTP	0.975	(0.024)	0.99882727	High	TRUE	2009	0.9998	0.9997	0.9998	0.9967	0.9954	0.9974	0.9996	0.9998	High Tech	Grace, Patrick	Graves (H
340	[...]	USER 4|1043385000	I3 Next Day Controllable OTP	0.985	(0.015)	1	High	TRUE	2009	1	1	1	1	1	1	1	1	High Tech	Grace, Patrick	Graves (H
341	[...]	USER 4|1043385000	I4 Open Orders Compliance	0.985	(0.010)	0.99491818	High	TRUE	2009	0.9931	0.9978	0.9956	0.9948	0.9953	0.9942	0.9941	0.9945	High Tech	Grace, Patrick	Graves (H
346	[...]	USER 4|1043385000	Q3 Pick and Transport accuracy (EMEA)	0.980	(0.018)	0.99754545	High	TRUE	2009	0.9987	0.9962	0.997	0.9997	0.998	0.9975	0.9972	0.9971	High Tech	Grace, Patrick	Graves (H
347	[...]	USER 4|1043385000	Q3 OTR (EMEA)	0.960	(0.020)	0.98	High	TRUE	2009	0.968	0.9751	0.9834	0.9897	0.98	0.98	0.9802	0.9803	High Tech	Grace, Patrick	Graves (H
348	[...]	USER 4|1043385000	Q3 OTD (EMEA)	0.980	(0.014)	0.99364545	High	TRUE	2009	0.9872	0.9867	0.9979	0.9947	0.995	0.995	0.9951	0.995	High Tech	Grace, Patrick	Graves (H
530	[...]	USER 4|1043385000	Turnaround Time for Returns/Replacement Material Receive	0.900	(0.049)	0.94931818	High	FALSE	2009	0.915	0.9068	0.95	0.95	0.95	0.9558	1	0.96	High Tech	Grace, Patrick	Graves (H
531	[...]	USER 4|1043385000	Time Required for Returns to be Received from Customer (I	0.900	(0.051)	0.95131818	High	FALSE	2009	0.924	0.9124	0.932	0.932	0.932	0.931	1	0.98	High Tech	Grace, Patrick	Graves (H
532	[...]	USER 4|1043385000	Time Required for Returns to be Received from Customer (I	0.900	(0.033)	0.93317273	High	FALSE	2009	0.9054	0.91	0.92	0.92	0.92	0.9345	0.9201	0.9312	High Tech	Grace, Patrick	Graves (H
533	[...]	USER 4|1043385000	Time Required for Returns/Replacement Material to be Shi	0.900	(0.055)	0.9553	High	FALSE	2009	0.9028	0.9036	0.95	0.965	0.965	0.96	0.9544	0.9542	High Tech	Grace, Patrick	Graves (H
534	[...]	USER 4|1043385000	-Time Required for Returns/Replacement Material to be Shi	0.900	(0.074)	0.97438182	High	FALSE	2009	0.923	0.9248	0.99	0.99	0.99	0.97	0.981	0.9752	High Tech	Grace, Patrick	Graves (H
537	[...]	USER 4|1043385000	Problem Log- Customer- DOS-	0.900	(0.864)	1.76381818	High	FALSE	2009	0.92	0.934	9.94	0.93	0.94	0.945	0.9441	0.95	High Tech	Grace, Patrick	Graves (H
538	[...]	USER 4|1043385000	Problem Log- Vendor- DOS	0.900	(0.037)	0.93681818	High	FALSE	2009	0.94	0.9325	0.9238	0.9238	0.9238	0.9239	0.9311	0.945	High Tech	Grace, Patrick	Graves (H
1216	[...]	USER 4|1043385000	Turnaround Time for Returns Received from Customers and	0.900	0.097	0.80328182	High	TRUE	2009	0.3144	0.5898	0.6172	0.7296	0.9539	0.8175	0.9958	0.9798	High Tech	Vallee, Michel	Vallee, M
1217	[...]	USER 4|1043385000	Turnaround Time for Returns/Replacement Material Receive	0.900	(0.046)	0.94560909	High	TRUE	2009	0.8058	0.8897	0.974	0.9442	0.9658	0.9281	0.9694	0.9508	High Tech	Vallee, Michel	Vallee, M
1218	[...]	USER 4|1043385000	Time Required for Returns to be Received from Customer (I	0.900	(0.084)	0.98371818	High	TRUE	2009	0.9437	0.9845	0.9854	0.979	0.9836	0.9854	0.9937	0.9925	High Tech	Vallee, Michel	Vallee, M
1219	[...]	USER 4|1043385000	Time Required for Returns to be Shipped to Repair Vendor	0.900	0.019	0.88052727	High	TRUE	2009	0.4447	0.7273	0.7908	0.9277	0.9605	0.8808	0.9831	1	High Tech	Vallee, Michel	Vallee, M
1220	[...]	USER 4|1043385000	Time Required for Returns/Replacement Material to be Shi	0.900	(0.079)	0.97858182	High	TRUE	2009	0.8415	0.9619	0.9983	1	1	0.9875	0.9896	0.9927	High Tech	Vallee, Michel	Vallee, M
211	[...]	USER 5|1042459000	Ocean Export KPI(s)	0.950	(0.005)	0.95454545	High	TRUE	2009	0.92	0.96	0.96	0.96	0.96	0.96	0.95	0.96	Retail/Industrial	Davis, John	Groome, .
210	[...]	USER 5|1042459000	Brokerage KPI(s)	0.950	(0.039)	0.98909091	High	TRUE	2009	0.99	0.99	0.99	0.98	0.99	0.98	1	0.99	Retail/Industrial	Davis, John	Groome, .
689	[...]	USER 6|1043379000	On-Time Performance (Controllable)	0.935	(0.020)	0.95535455	High	FALSE	2009	0.9301	0.9517	0.9577	0.9665	0.9618	0.9713	0.9716	0.9632	HealthCare	Davis, John	Webb, Ri
690	[...]	USER 6|1043379000	Moved as Booked	0.935	(0.040)	0.97472727	High	FALSE	2009	0.992	0.972	0.974	0.979	0.984	0.989	0.97	0.965	HealthCare	Davis, John	Webb, Ri
691	[...]	USER 6|1043379000	Claim-Free shipments	0.995	(0.002)	0.99657273	High	TRUE	2009	0.997	0.999	0.999	0.997	0.998	0.9973	0.995	0.995	HealthCare	Davis, John	Webb, Ri
980	[...]	USER 7|1043360000	USER 7 air performance	0.950	(0.039)	0.98863636	High	FALSE	2009	1	1	1	1	1	0.875	1	1	High Tech	Davis, John	Dill, Tina
981	[...]	USER 7|1043360000	USER 7 Ocean performance	0.900	(0.095)	0.99518182	High	FALSE	2009	0.947	1	1	1	1	1	1	1	High Tech	Davis, John	Dill, Tina
698	[...]	USER 8.|1042890000	On Time Performance	0.980	0.185	0.7952	High	FALSE	2009	0.97	0.96	0.99	0.96	0.99	0.1	0.1	0.9359	High Tech	Davis, John	Dill, Tina
699	[...]	USER 8.|1042890000	On Time Performance	0.980	0.419	0.56110909	High	FALSE	2009	0.9	0.96	0.99	0.91	0.97	0.9422	0.1	0.1	High Tech	Davis, John	Dill, Tina
1072	[...]	USER 9|1057226000	Ocean Freight Transportation - Port to Port Transit Time	0.960	0.009	0.951	High	TRUE	2009	0.92	0.93	0.86	0.8	1	1	1	1	Retail/Industrial	Davis, John	Dill, Tina
871	[...]	USER 10|1042417000	Transmitting to ABI within 4 hours of obtaining COB, excluc	0.980	(0.003)	0.98254545	High	TRUE	2009	0.991	0.989	0.99	0.984	0.98	0.983	0.981	0.98	High Tech	Fitzhugh, Jim	Fitzhugh,
872	[...]	USER 10|1042417000	Billing and EDI sent by 5th working day after release.	0.980	0.012	0.96754545	High	FALSE	2009	0.957	0.97	0.945	0.987	0.95	0.97	0.966	0.972	High Tech	Fitzhugh, Jim	Fitzhugh,
352	[...]	USER 11|1043153000	C2 Gross$ Accuracy (Absolute Variance) (NACDC)	0.995	(0.004)	0.99864545	High	TRUE	2009	0.9979	0.9984	0.9981	0.9938	0.9999	0.9997	0.9998	0.9988	High Tech	Grace, Patrick	Grace, Pa
353	[...]	USER 11|1043153000	C2 Gross$ Accuracy (Absolute Variance) (ACDC)	0.995	(0.005)	0.9999	High	TRUE	2009	1	0.9999	0.9994	1	1	1	0.9999	0.9997	High Tech	Grace, Patrick	Grace, Pa
354	[...]	USER 11|1043153000	Q1 Distribution Quality PPM (NACDC)	500.000	######	786.454545	Low	TRUE	2009	0	161	1211	667	1383	598	1105	1105	High Tech	Grace, Patrick	Grace, Pa
355	[...]	USER 11|1043153000	Q1 Distribution Quality PPM (ACDC)	500.000	######	194.363636	Low	TRUE	2009	166	120	102	102	111	351	553	345	High Tech	Grace, Patrick	Grace, Pa

Figure 20 Appendix A Screen Capture for Primary Data File

Appendix B Financial Information for All Firms in the Analysis

The full content of this appendix is contained in an Excel spread sheet that accompanies this manuscript. It could also be obtained from maria.rey@cranfield.ac.uk. Enclosed is a sample screen capture of the data contained in the file.

The file includes the following fields:

- Contract ID (Replacing name and ID of User will remain confidential)
- SIC Code (Identifying the key economic activity of the firm. Critical to establish the financial gaps and objectives)
- Revenue (Annual sales of the firm in the analysis in USD)
- SGA as % of Sales (SGA Expenses as a percentage of sales)
- SGA Value (Annual expenditure in sales, general and administrative expenses in USD)
- Days in AP (Days in accounts receivables)
- Revenue Growth (Percentage of change in revenues on an annual basis)
- EBITDA/Revenue (Percentage of operational margin related to sales)
- Cash Operating Cycle (Number of days of the cash conversion cycle)
- Revenue/Fixed Assets (Equivalent to the asset turnover of the firm and its capital utilisation)
- This information is repeated for three different moments in time:
    - Actual Performance (as reported in financial statements)
    - Performance Target (based on the value of the best performance by indicator in the same SIC code)
    - Performance Gap to Close (difference between actual and target, used to estimate financial objectives)

						Actual Performance				Performance Target				Performance Gap to Close				
Contract ID	SIC Code	Revenue	SGA as % of Sales	SGA Value	Days in A/P	Revenue Growth	EBITDA /Revenue %	Cash Operating Cycle	Revenue / Fixed Assets	Revenue Growth	EBITDA /Revenue %	Cash Operating Cycle	Revenue / Fixed Assets	Revenue Growth	EBITDA /Revenue %	Cash Operating Cycle	Revenue / Fixed Assets	Top Line Improvement
P0000000001	4513	8,700,000,000	27.3%	2,375,100,000	42	-12.40%	12.40%	-12	2.51	-2.20%	15.30%	-17	2.73	10.20%	2.90%	5.00	0.22	887,400,000
1051467000	2834	636,981,736	29.5%	187,909,612	47	14.30%	25.70%	125	4.41	44.50%	32.30%	-10	22.11	30.20%	6.60%	135.00	17.70	192,368,484
1042415000	2834	35,166,700,000	29.5%	10,374,176,500	42	4.20%	27.80%	143	4.04	41.90%	30.30%	15	19.92	37.70%	2.50%	128.00	15.88	13,257,845,900
1042697000	3523	6,630,000,000	9.5%	629,850,000	43	-21.30%	5.70%	77	7.03	19.00%	14.70%	69	8.54	40.30%	9.00%	8.00	1.51	2,671,890,000
1043385000	3661	15,160,000,000	19.2%	2,910,720,000	154	-10.80%	4.40%	67	12.03	19.30%	16.50%	39	45.09	30.10%	12.10%	28.00	33.06	4,563,160,000
1042459000	333X	18,745,000,000	5.5%	1,030,975,000	30	-31.50%	2.20%	50	0.93	-22.00%	11.50%	56	2.68	9.50%	9.30%	6.00	1.75	1,780,775,000
1043379000	38XX	6,500,000,000	29.8%	1,937,000,000	79	3.90%	38.10%	154	5.2	14.50%	21.30%	75	9.53	10.60%	-16.80%	79.00	4.33	689,000,000
1043360000	4813	41,227,000,000	30.6%	12,615,462,000	36	10.70%	28.30%	19	1.18	8.80%	40.00%	0	5.23	-1.90%	11.70%	19.00	4.05	(783,313,000)
1042890000	367X	2,820,000,000	11.8%	332,760,000	58	-12.90%	20.80%	92	8.47	4.90%	14.90%	64	11.3	17.80%	-5.90%	28.00	2.83	501,960,000
1057226000	3499	347,000,000	16.1%	55,867,000	33	-6.30%	7.30%	118	5.06	20.20%	17.40%	71	7.53	26.50%	10.10%	47.00	2.47	91,955,000
1042417000	3571	42,603,000,000	9.7%	4,132,491,000	114	31.20%	28.40%	-46	14.42	52.70%	29.70%	10	13.65	21.50%	1.30%	56.00	(0.77)	9,159,645,000
1043153000	3674	5,013,600,000	14.8%	742,012,800	53	-38.30%	1.20%	181	4.6	6.50%	18.00%	67	10.82	44.80%	16.80%	114.00	6.22	2,246,092,800
1042582000	4813	123,018,000,000	24.7%	30,385,446,000	54	-0.80%	33.50%	0	1.23	8.80%	40.00%	-16	5.23	9.60%	6.50%	16.00	4.00	11,809,728,000
1043390000	2844	10,383,000,000	51.0%	5,295,330,000	74	-2.90%	12.40%	105	6.72	8.70%	16.40%	97	21.95	11.60%	4.00%	8.00	15.23	1,204,428,000
1054133000	2834	417,000,000	33.7%	140,529,000	52	-15.00%	20.40%	47	9.91	43.40%	31.80%	-10	23.51	58.40%	11.40%	57.00	13.60	243,528,000
1042416000	2834	31,168,000,000	31.2%	9,724,416,000	76	-5.30%	20.50%	180	3.31	13.60%	28.00%	73	10.15	18.90%	7.50%	107.00	6.84	5,890,752,000
1042412000	3841	7,403,800,000	24.2%	1,791,719,600	33	4.90%	29.90%	158	2.39	16.60%	22.60%	103	16.7	11.70%	-7.30%	55.00	14.31	866,244,600
1054054000	2836	4,377,000,000	25.7%	1,124,889,000	178	6.80%	39.40%	324	2.67	59.30%	39.40%	161	28.91	52.50%	0.00%	163.00	26.24	2,297,925,000
1046906000	3845	923,910,000	32.3%	298,422,930	59	6.60%	14.90%	112	7.44	20.10%	22.70%	62	11.66	13.50%	7.80%	50.00	4.22	124,727,850
1042730000	3999	1,208,700,000	34.4%	415,309,320	61	4.20%	15.70%	63	8.65	4.20%	26.90%	52	8.87	0.00%	11.20%	11.00	0.22	-
1042437000	3011	28,200,000,000	24.8%	6,993,600,000	37	-19.70%	9.90%	99	2.41	14.80%	18.90%	53	2.77	34.50%	9.00%	46.00	0.36	9,729,000,000
1052595000	5065	3,590,000,000	13.7%	491,830,000	54	-8.70%	1.70%	45	38.69	8.10%	3.70%	26	136.22	16.80%	2.00%	19.00	97.53	603,120,000
1042617000	5941	2,632,200,000	33.1%	871,258,200	51	3.10%	8.70%	58	3.24	6.00%	8.20%	58	12.7	2.90%	-0.50%	-	9.46	76,333,800
1047518000	384X	2,500,000,000	44.2%	1,105,000,000	48	5.70%	13.20%	143	6.35	16.60%	22.60%	103	16.7	10.90%	9.40%	40.00	10.35	272,500,000
1042714000	353X	32,430,000,000	12.4%	4,021,320,000	49	-36.80%	14.60%	104	2.62	-7.80%	17.80%	69	6.92	29.00%	3.20%	35.00	4.30	9,404,700,000
1042418000	3711	1,500,000,000	9.3%	139,500,000	35	-17.70%	8.40%	145	2.29	-6.60%	8.80%	13	4.49	11.10%	0.40%	132.00	2.20	166,500,000
1042780000	3661	36,117,000,000	26.7%	9,643,239,000	25	10.90%	28.00%	38	10.16	10.10%	14.40%	36	22.54	-0.80%	-13.60%	2.00	12.38	(288,936,000)
1066921000	3841	1,527,300,000	46.0%	702,252,540	72	-9.10%	-0.44%	97.8	0.39	16.60%	22.60%	103	16.7	25.70%	23.04%	5.20	16.31	392,516,100
1016707010	30XX	19,083,400,000	32.3%	6,163,938,200	46	-0.66%	14.20%	80	9.82	-3.10%	16.10%	62	8.18	-2.44%	1.90%	18.00	(1.64)	(465,634,960)
1043370000	362X	5,069,600,000	17.2%	871,971,200	42	-22.30%	14.20%	53	6.93	9.20%	16.30%	59	6.67	31.50%	2.10%	6.00	(0.26)	1,596,924,000
1046915000	3714	2,414,100,000	7.6%	183,471,600	34	24.10%	10.40%	47	4.1	34.90%	13.90%	25	9.19	10.80%	3.50%	22.00	5.09	260,722,800
1042883000	3357	5,395,000,000	16.3%	879,385,000	80	-9.30%	26.50%	55	0.67	-5.30%	15.40%	62	5.02	4.00%	-11.10%	7.00	4.35	215,800,000
1042747000	5331	71,422,000,000	10.1%	7,213,622,000	32	9.10%	3.70%	2	6.89	9.40%	9.40%	21	11.18	0.30%	5.70%	19.00	4.29	214,266,000
1087164000	3841	10,429,000,000	30.9%	3,222,561,000	51	-2.30%	25.00%	130	4	16.60%	22.60%	103	16.7	18.90%	-2.40%	27.00	12.70	1,971,081,000
1075744000	5065	200,000,000	13.7%	27,400,000	51	-8.70%	1.70%	47	38.69	8.10%	3.70%	8	136.22	16.80%	2.00%	39.00	97.53	33,600,000

Figure 21 Appendix B Screen Capture for Financial Information of Participating Firms.

Appendix C Information on Contract Profiles

The full content of this appendix is contained in an Excel spread sheet that accompanies this manuscript. It could also be obtained from maria.rey@cranfield.ac.uk. Enclosed is a sample screen capture of the file with contract profile information.

The file includes the following fields:

- Contract ID (Replacing name and ID of User will remain confidential)
- SIC Code (Identifying the key economic activity of the firm. Critical to establish the financial gaps and objectives)
- Revenue (Annual sales of the firm in the analysis in USD)
- Contract Value (Annual value of the services rendered by the provider and paid by the user; in USD)
- KPIs in SLAs (number of key performance indicators in the service level agreements)
- Active or Decommissioned? (status of the current relationship)
- Contract Longevity (number of years of the contractual alliance between provider and user)
- Program Manager in Place? (Y/N to a dedicated relationship manager from the provider's PMG)
- Signed Contract in Place (Y/N to a signed legal document to govern the relationship)
- Number of Renegotiations (during the length of the relationship how many times has it been renegotiated)
- Contract Value as % of SGA (of User) and % of Revenue (of Provider)

Contract ID	SIC Code	Firm's Revenue	SGA Value	Contract Value US$	KPIs in SLAs	Active or Decommissioned	Contract Longevity	Program Manager in Place?	Signed Contract in Place?	Number of Renegotiations	Contract Value as % of User's SGA for RELATIVE PROFITABILITY (and i)	Contract Value as % of Provider's Revenue for RELATIVE PROFITABILITY
P0000000001	4513	8,700,000,000	2,375,100,000									
1051467000	2834	636,981,736	187,909,612	5,794,615	1	1	6	1	1	2	3.08%	0.07%
1042415000	2834	35,166,700,000	10,374,176,500	2,797,900	8	1	6	1	1	2	0.03%	0.03%
1042697000	3523	6,630,000,000	629,850,000	8,555,215	1	1	3	1	0	0	1.36%	0.10%
1043385000	3661	15,160,000,000	2,910,720,000	29,324,914	21	1	10	1	1	3	1.01%	0.34%
1042459000	333X	18,745,000,000	1,030,975,000	20,295,791	0	1	20	1	1	7	1.97%	0.23%
1043379000	38XX	6,500,000,000	1,937,000,000	9,838,226	0	1	10	1	1	3	0.51%	0.11%
1043360000	4813	41,227,000,000	12,615,462,000	2,736,224	2	1	5	1	1	0	0.02%	0.03%
1042890000	367X	2,820,000,000	332,760,000	5,547,722	2	1	10	1	0	0	1.67%	0.06%
1057226000	3499	347,000,000	55,867,000	-	1	0	6	0	0	2	0.00%	0.00%
1042417000	3571	42,603,000,000	4,132,491,000	174,182,078	2	1	6	1	1	2	4.21%	2.00%
1043153000	3674	5,013,600,000	742,012,800	16,251,708	12	1	5	1	1	2	2.19%	0.19%
1042582000	4813	123,018,000,000	30,385,446,000	46,870,625	1	1	15	1	1	2	0.15%	0.54%
1043390000	2844	10,383,000,000	5,295,330,000	77,468,832	1	1	4	1	1	2	1.46%	0.89%
1054133000	2834	417,000,000	140,529,000	361,750	5	1	10	1	1	3	0.26%	0.00%
1042416000	2834	31,168,000,000	9,724,416,000	13,548,664	2	1	15	1	1	2	0.14%	0.16%
1042412000	3841	7,403,800,000	1,791,719,600		16	1	5	0	1	2	0.00%	0.00%
1054054000	2836	4,377,000,000	1,124,889,000	1,659,729	4	1	12	1	1	2	0.15%	0.02%
1046906000	3845	858,000,000	277,134,000	-	6	0	5	0	1	1	0.00%	0.00%
1042730000	3999	1,208,700,000	415,309,320	8,506,402	4	0	1	1	0	0	2.05%	0.10%
1042437000	3011	28,200,000,000	6,993,600,000	-	1	0	10	0	1	1	0.00%	0.00%
1052595000	5065	3,590,000,000	491,830,000	4,180,520	1	1	5	1	0	n/a	0.85%	0.05%
1042617000	5941	2,632,200,000	871,258,200	42,648,917	8	1	6	1	1	2	4.90%	0.49%
1047518000	384X	2,500,000,000	1,105,000,000	3,128,429	5	1	2	1	1	1	0.28%	0.04%
1042714000	353X	32,430,000,000	4,021,320,000	39,303,501	2	1	30	1	0	1	0.98%	0.45%
1042418000	3711	1,500,000,000	139,500,000	64,503,383	1	1	10	1	1	0	46.24%	0.74%
1042780000	3661	36,117,000,000	9,643,239,000	54,613,823	28	1	11	1	1	0	0.57%	0.63%
1066921000	3841	1,527,300,000	702,252,540	10,390,236	5	1	5	1	1	1	1.48%	0.12%
1016707010	30XX	19,083,400,000	6,163,938,200		9	1	5	0	1	1	0.00%	0.00%
1043370000	362X	5,069,600,000	871,971,200	14,377,112	5	0	15	1	1	3	1.65%	0.17%
1046915000	3714	2,414,100,000	183,471,600	14,377,112	2	0	30	1	1	2	7.84%	0.17%
1042883000	3357	5,395,000,000	879,385,000	19,942,887	2	1	10	1	1	1	2.27%	0.23%
1042747000	5331	71,422,000,000	7,213,622,000	50,353,721	1	1	10	1	1	1	0.70%	0.58%
1087164000	3841	10,429,000,000	3,222,561,000	13,091,389	40	1	10	1	0	3	0.41%	0.15%

Figure 22 Appendix C Screen Capture for Contract Profile Information

Appendix D Data Transformations for the SEM Model

As explained in Chapter 6, prior to loading the data into AMOS, some variables need to be transformed. This transformation is done to improve normality, reduce collinearity (although irrelevant in SEM analysis), calculate missing values, etc. The file presented in this appendix contains the original data from the calculations of the variables and the transformed variables that went into AMOS. The final variables were used for the estimation and testing of the SEM model to correlate Inter-Firm Alignment (IFA) and Contractual Alliance Success (CAS), and the estimation of CAS = f(LONGEVITY; FORMALITY; RENEGOTIATIONS; RELATIVE PROFITABILITY), and IFA = f(USER-SLA; ACTUAL-SLA; PROVIDER-SLA).

The full content of this appendix is contained in an Excel spread sheet that accompanies this manuscript. It could also be obtained from maria.rey@cranfield.ac.uk. Enclosed is a sample screen capture of the data contained in the file.

- Active Relationship: Tested as
    - 2AS (double the product active and signed contract)
- Renegotiations
    - Renegotiations Normalised
    - Renegotiations SQRT (Square Root)
- SGA
    - SGARev (Product of SGA as % of Revenue)

USER ID	Active_Relationship	Contract_Longevity	Signed_Contract	Active_Signed	2AS	Stability	Renegotiations	Renegotiations_Normalized	Stability_SQRT	Renegotiations_SQRT	SGA	Revenue	SGARev	SGARev_SQRT	SGA5Rev	SGA10Rev	SGA5Rev_SQRT	SGA10Rev_SQRT	MIS_PRCON	MIS_CONACT	MIS_USCON
1	1	6	1	2	3	1.00	2	0.10	1.0	1.4	3.1%	0.1%	3.2%	17.7%	3.4%	3.7%	18.5%	19.4%	0.341	0.000	0.636
2	1	6	1	2	3	1.00	2	0.10	1.0	1.4	0.0%	0.0%	0.1%	2.4%	0.2%	0.3%	4.3%	5.9%	0.988	0.220	1.023
3	1	3	0	1	2	0.25	0	0.00	0.5	0.0	1.4%	0.1%	1.5%	12.1%	1.8%	2.3%	13.6%	15.3%	0.039	0.028	0.235
4	1	10	1	2	3	1.00	3	0.15	1.0	1.7	1.0%	0.3%	1.3%	11.6%	2.7%	4.4%	16.4%	20.9%	1.228	0.056	1.279
5	1	20	1	2	3	1.00	7	0.35	1.0	2.6	2.0%	0.2%	2.2%	14.8%	3.1%	4.3%	17.7%	20.7%	0.281	0.030	0.628
6	1	10	1	2	3	1.00	3	0.15	1.0	1.7	0.5%	0.1%	0.6%	7.9%	1.1%	1.6%	10.4%	12.8%	0.694	0.045	0.652
7	1	5	1	2	3	1.00	0	0.00	1.0	0.0	0.0%	0.0%	0.1%	2.3%	0.2%	0.3%	4.2%	5.8%	0.039	0.108	0.314
8	1	10	0	1	2	0.25	0	0.00	0.5	0.0	1.7%	0.1%	1.7%	13.2%	2.0%	2.3%	14.1%	15.2%	0.206	0.457	0.737
9	0	6	0	0	0	0.00	2	0.10	0.0	1.4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.491	0.010	0.338
10	1	6	1	2	3	1.00	2	0.10	1.0	1.4	4.2%	2.0%	6.2%	24.9%	14.2%	24.2%	37.7%	49.2%	0.827	0.013	0.992
11	1	5	1	2	3	1.00	2	0.10	1.0	1.4	2.2%	0.2%	2.4%	15.4%	3.1%	4.1%	17.7%	20.1%	0.895	0.080	0.956
12	1	15	1	2	3	1.00	2	0.10	1.0	1.4	0.2%	0.5%	0.7%	8.3%	2.8%	5.5%	16.9%	23.5%	0.708	0.030	0.700
13	1	4	1	2	3	1.00	2	0.10	1.0	1.4	1.5%	0.9%	2.4%	15.3%	5.9%	10.4%	24.3%	32.2%	0.129	0.002	0.294
14	1	10	1	2	3	1.00	3	0.15	1.0	1.7	0.3%	0.0%	0.3%	5.1%	0.3%	0.3%	5.3%	5.5%	0.668	0.011	0.830
15	1	15	1	2	3	1.00	2	0.10	1.0	1.4	0.1%	0.2%	0.3%	5.4%	0.9%	1.7%	9.6%	13.0%	0.742	0.210	0.545
16	1	5	1	2	3	1.00	2	0.10	1.0	1.4	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.886	0.908	0.377
17	1	12	1	2	3	1.00	2	0.10	1.0	1.4	0.1%	0.0%	0.2%	4.1%	0.2%	0.3%	4.9%	5.8%	1.027	0.379	0.670
18	0	5	1	1	1	0.75	1	0.05	0.9	1.0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.636	0.071	0.867
19	0	1	0	0	0	0.00	0	0.00	0.0	0.0	2.0%	0.1%	2.1%	14.6%	2.5%	3.0%	15.9%	17.4%	0.378	0.080	0.739
20	0	10	1	1	1	0.75	1	0.05	0.9	1.0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.039	0.000	0.144
21	1	5	0	1	2	0.25	5	0.25	0.5	2.2	0.8%	0.0%	0.9%	9.5%	1.1%	1.3%	10.4%	11.5%	0.288	0.035	0.271
22	1	6	1	2	3	1.00	2	0.10	1.0	1.4	4.9%	0.5%	5.4%	23.2%	7.3%	9.8%	27.1%	31.3%	0.860	0.214	1.112
23	1	2	1	2	3	1.00	1	0.05	1.0	1.0	0.3%	0.0%	0.3%	5.6%	0.5%	0.6%	6.8%	8.0%	0.502	0.033	0.722
24	1	30	0	1	2	0.25	1	0.05	0.5	1.0	1.0%	0.5%	1.4%	12.0%	3.2%	5.5%	18.0%	23.4%	0.332	0.016	0.219
25	1	10	1	2	3	1.00	0	0.00	1.0	0.0	46.2%	0.7%	47.0%	68.5%	49.9%	53.7%	70.7%	73.2%	0.000	0.010	0.304
26	1	11	1	2	3	1.00	0	0.00	1.0	0.0	0.6%	0.6%	1.2%	10.9%	3.7%	6.8%	19.2%	26.2%	1.234	0.043	1.009
27	1	5	1	2	3	1.00	1	0.05	1.0	1.0	1.5%	0.1%	1.6%	12.6%	2.1%	2.7%	14.4%	16.4%	0.859	0.059	1.077
28	1	5	1	2	3	1.00	1	0.05	1.0	1.0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.615	0.026	0.892
29	0	15	1	1	1	0.75	3	0.15	0.9	1.7	1.6%	0.2%	1.8%	13.5%	2.5%	3.3%	15.7%	18.2%	0.252	0.018	0.427
30	0	30	1	1	1	0.75	2	0.10	0.9	1.4	7.8%	0.2%	8.0%	28.3%	8.7%	9.5%	29.4%	30.8%	0.210	0.050	0.592
31	1	10	1	2	3	1.00	1	0.05	1.0	1.0	2.3%	0.2%	2.5%	15.8%	3.4%	4.6%	18.5%	21.4%	0.000	0.037	0.483
32	1	10	1	2	3	1.00	1	0.05	1.0	1.0	0.7%	0.6%	1.3%	11.3%	3.6%	6.5%	19.0%	25.5%	0.288	0.188	0.149
33	1	10	0	1	2	0.25	3	0.15	0.5	1.7	0.4%	0.2%	0.6%	7.5%	1.2%	1.9%	10.8%	13.8%	0.770	0.023	0.680
34	1	2	1	2	3	1.00	0	0.00	1.0	0.0	18.9%	0.1%	18.9%	43.5%	19.2%	19.5%	43.8%	44.1%	0.979	0.010	1.066
35	1	25	1	2	3	1.00	3	0.15	1.0	1.7	0.8%	0.3%	1.0%	10.1%	2.1%	3.5%	14.5%	18.6%	0.250	0.247	0.176
36	1	10	1	2	3	1.00	2	0.10	1.0	1.4	4.7%	3.3%	7.9%	28.2%	21.0%	37.3%	45.8%	61.1%	1.581	0.419	1.606

Figure 23 Appendix D Screen Capture for File with Data Transformation

Appendix E Statistical Output Model from AMOS 19.0

Analysis Summary of Estimated Model

Date: Saturday, January 21, 2012
Time: 18:08:24
Title: Model IFA vs. CAS: Saturday, January 21, 2012 18:08
Notes: Details of each bootstrap sample are not available for a parametric bootstrap.

Groups
Group number 1 (Group number 1)
Notes for Group (Group number 1)
The model is recursive.
Sample size = 149

Variable Summary (Group number 1)
Your model contains the following variables (Group number 1)

Observed endogenous variables
MIS_USCON SQRT[30]
MIS_CONACT SQRT[31]
MIS_PRCON SQRT[32]
Longevity SQRT[33]
2AS[34]
SGA SQRT[35]
Renegotiations Normalized[36]

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[30] Equivalent to USER-SLA variable after transformation of the square root of the coefficient of misalignment between user's financial objectives and contract's SLAs in the calculation of IFA
[31] Equivalent to ACTUAL-SLA variable after transformation of the square root of the coefficient of misalignment between contract's SLAs and actual values of the KPIs in the calculation of IFA
[32] Equivalent to PROVIDER-SLA variable after transformation of the square root of the coefficient of misalignment between provider's financial objectives and contract's SLAs in the calculation of IFA
[33] Equivalent to the square root of the number of years of the relationship between provider and user known as the LONGEVITY variable in the calculation of CAS
[34] Equivalent to twice the product of an active relationship with a signed contract known as the FORMALITY variable in the calculation of CAS
[35] Equivalent to the square root of the value of the contract as a % of the Users' SGA or the Provider's revenue, known as the RELATIVE PROFITABILITY variable in the calculation of CAS
[36] Equivalent to the normalized values of the number of renegotiations that have taken place during the life of the contract, known as the RENEGOTIATIONS variable in the calculation of CAS

Unobserved Endogenous variables

Success[37]

Unobserved exogenous variables

Misalign[38]

e1

e2

e3

e5

e4

e12

e10

e9

Variable counts (Group number 1)

Number of variables in your model:	17
Number of observed variables:	7
Number of unobserved variables:	10
Number of exogenous variables:	9
Number of endogenous variables:	8

Parameter summary (Group number 1)

	Weights	Covariances	Variances	Means	Intercepts	Total
Fixed	10	0	0	0	0	10
Labelled	0	0	0	0	0	0
Unlabelled	6	0	9	0	7	22
Total	16	0	9	0	7	32

Assessment of normality (Group number 1)

Variable	min	max	skew	c.r.	kurtosis	c.r.
Renegotiations Normalized	.000	1.000	2.635	13.129	9.614	23.956
SGA SQRT	.000	.680	2.527	12.591	9.446	23.536
2AS	.000	3.000	-2.138	-10.657	3.814	9.504
Longevity SQRT	.000	7.071	.595	2.965	1.176	2.930
MIS_PRCON SQRT	.000	1.257	-.633	-3.153	-.092	-.230

[37] Corresponds to the unobserved endogenous variable known as the "Contractual Alliance Success" index or CAS throughout the manuscript, calculated as a f(LONGEVITY, FORMALITY, RENEGOTIATIONS, RELATIVE PROFITABILITY)

[38] Corresponds to the unobserved exogenous variable known as the "Inter-Firm Alignment" coefficient or IFA throughout the manuscript, calculated as a f(USER-SLA, ACTUAL-SLA, PROVIDER-SLA)

MIS_CONACT SQRT	.000	2.000	3.344	16.665	18.037	44.941
MIS_USCON SQRT	.000	1.267	-.201	-1.003	-.425	-1.059
Multivariate					38.482	20.924

Observations farthest from the centroid (Mahalanobis distance) (Group number 1)

Observation number	Mahalanobis d-squared	p1	p2
37	56.332	.000	.000
112	37.509	.000	.000
25	33.636	.000	.000
40	30.425	.000	.000
82	23.020	.002	.000
84	20.379	.005	.000
76	17.431	.015	.007
149	16.940	.018	.005
19	16.819	.019	.002
30	16.590	.020	.001
34	15.996	.025	.001
135	15.408	.031	.003
107	15.100	.035	.002
148	15.096	.035	.001
139	14.937	.037	.000
118	14.648	.041	.000
106	14.349	.045	.000
9	13.351	.064	.007
43	12.937	.074	.014
108	12.625	.082	.020
64	12.306	.091	.029
16	12.082	.098	.034
124	11.741	.109	.057
70	11.456	.120	.082
113	10.846	.145	.251
79	10.677	.153	.268
110	10.606	.157	.236
31	10.203	.177	.400
73	9.860	.197	.557
122	9.771	.202	.540
41	9.402	.225	.720
24	9.305	.231	.715
146	9.195	.239	.721
81	9.079	.247	.732
103	8.842	.264	.816
20	8.735	.272	.824
138	8.661	.278	.814
36	8.607	.282	.794

8	8.441	.295	.838
46	8.380	.300	.825
35	8.064	.327	.926
77	8.015	.331	.916
131	7.813	.349	.951
111	7.525	.376	.984
114	7.440	.385	.986
85	7.426	.386	.980
136	7.345	.394	.981
7	7.333	.395	.973
109	7.285	.400	.969
52	7.064	.422	.988
87	7.062	.422	.981
74	7.060	.423	.972
115	6.777	.453	.993
29	6.624	.469	.997
104	6.524	.480	.998
123	6.502	.482	.997
96	6.500	.483	.994
143	6.476	.485	.993
133	6.475	.486	.989
58	6.417	.492	.988
92	6.381	.496	.986
145	6.375	.497	.980
18	6.335	.501	.977
93	6.325	.502	.969
137	6.074	.531	.992
66	6.068	.532	.988
98	5.754	.569	.999
130	5.748	.569	.998
68	5.626	.584	.999
53	5.554	.593	.999
99	5.542	.594	.999
78	5.454	.605	.999
127	5.300	.623	1.000
132	5.250	.629	1.000
39	4.976	.663	1.000
3	4.919	.670	1.000
47	4.810	.683	1.000
134	4.738	.692	1.000
63	4.656	.702	1.000
57	4.512	.719	1.000
129	4.488	.722	1.000
56	4.421	.730	1.000

119	4.335	.740	1.000
32	4.325	.742	1.000
120	4.268	.748	1.000
83	4.267	.749	1.000
17	4.219	.754	1.000
94	4.136	.764	1.000
22	4.089	.769	1.000
140	4.059	.773	1.000
42	4.057	.773	1.000
142	3.939	.787	1.000
60	3.822	.800	1.000
5	3.817	.801	1.000
126	3.487	.837	1.000
4	3.427	.843	1.000
26	3.421	.844	1.000
72	3.376	.848	1.000
97	3.366	.849	1.000
49	3.288	.857	1.000

Sample Moments (Group number 1)

Sample Covariances (Group number 1)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Renegotiations Normalized	.022						
SGA SQRT	.001	.012					
2AS	.018	.018	.584				
Longevity SQRT	.054	.017	.115	1.183			
MIS_PRCON SQRT	-.009	-.005	.016	-.015	.089		
MIS_CONACT SQRT	-.001	-.003	-.016	-.023	.018	.058	
MIS_USCON SQRT	-.003	-.001	.025	-.005	.048	.012	.064

Condition number = 118.654

Eigenvalues

1.208 .565 .132 .051 .027 .018 .010

Determinant of sample covariance matrix = .000

Sample Correlations (Group number 1)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Renegotiations Normalized	1.000						
SGA SQRT	.055	1.000					
2AS	.159	.218	1.000				
Longevity SQRT	.337	.147	.138	1.000			
MIS_PRCON SQRT	-.201	-.155	.069	-.046	1.000		
MIS_CONACT SQRT	-.038	-.133	-.086	-.087	.254	1.000	
MIS_USCON SQRT	-.086	-.033	.129	-.018	.637	.202	1.000

Condition number = 5.657
Eigenvalues
1.907 1.485 1.069 .829 .771 .602 .337
Sample Means (Group number 1)

Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
.125	.105	2.624	2.939	.674	.242	.714

Models
Default model (Default model)
Notes for Model (Default model)

Computation of degrees of freedom (Default model)

Number of distinct sample moments:	35
Number of distinct parameters to be estimated:	22
Degrees of freedom (35 - 22):	13

Result (Default model)
Minimum was achieved
Chi-square = 21.488
Degrees of freedom = 13
Probability level = .064

Group number 1 (Group number 1 - Default model)
Estimates (Group number 1 - Default model)
Scalar Estimates (Group number 1 - Default model)
Maximum Likelihood Estimates

Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
Success	<---	Misalign	-.776	.452	-1.716	.086	
MIS_USCON SQRT	<---	Misalign	1.000				
MIS_CONACT SQRT	<---	Misalign	.386	.125	3.089	.002	
MIS_PRCON SQRT	<---	Misalign	1.747	.549	3.184	.001	
Longevity SQRT	<---	Success	1.000				
SGA SQRT	<---	Success	.043	.023	1.847	.065	
2AS	<---	Success	.356	.172	2.069	.039	
Renegotiations Normalized	<---	Success	.158	.067	2.344	.019	

Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
Success	<---	Misalign	-.223
MIS_USCON SQRT	<---	Misalign	.657
MIS_CONACT SQRT	<---	Misalign	.265
MIS_PRCON SQRT	<---	Misalign	.969
Longevity SQRT	<---	Success	.530
SGA SQRT	<---	Success	.231
2AS	<---	Success	.269
Renegotiations Normalized	<---	Success	.614

Intercepts: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P	Label
MIS_USCON SQRT	.714	.021	34.406	***	
MIS_CONACT SQRT	.242	.020	12.155	***	
MIS_PRCON SQRT	.674	.025	27.468	***	
Longevity SQRT	2.939	.089	32.863	***	
Renegotiations Normalized	.125	.012	10.246	***	
SGA SQRT	.105	.009	11.912	***	
2AS	2.624	.063	41.790	***	

Variances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P	Label
Misalign	.027	.010	2.682	.007	
e4	.316	.164	1.934	.053	
e1	.036	.009	3.918	***	
e2	.054	.006	8.435	***	
e3	.005	.025	.214	.831	
e5	.850	.174	4.899	***	
e12	.541	.068	8.013	***	
e10	.011	.001	8.178	***	

e9	.014	.004	3.562	***	

Squared Multiple Correlations: (Group number 1 - Default model)[39]

	Estimate
Success	.050
Renegotiations Normalized	.377
SGA SQRT	.054
2AS	.072
Longevity SQRT	.281
MIS_PRCON SQRT	.940
MIS_CONACT SQRT	.070
MIS_USCON SQRT	.431

Matrices (Group number 1 - Default model)
Residual Covariances (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Renegotiations Normalized	.000						
SGA SQRT	-.001	.000					
2AS	-.001	.013	.000				
Longevity SQRT	.002	.003	-.003	.000			
MIS_PRCON SQRT	-.003	-.003	.029	.022	.000		
MIS_CONACT SQRT	.000	-.003	-.013	-.015	.000	.000	
MIS_USCON SQRT	.000	.000	.032	.016	.000	.002	.000

Residual Means (Group number 1 - Default model)

Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
.000	.000	.000	.000	.000	.000	.000

[39] *Squared multiple correlations are also independent of units of measurement. Amos displays a squared multiple correlation for each endogenous variable. The squared multiple correlation of a variable is the proportion of its variance that is accounted for by its predictors. In the present example, knowledge, value, and satisfaction account for 40% of the variance of performance.*

Standardized Residual Covariances (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Renegotiations Normalized	.000						
SGA SQRT	-1.049	.000					
2AS	-.064	1.890	.000				
Longevity SQRT	.128	.287	-.049	.000			
MIS_PRCON SQRT	-.823	-1.277	1.548	.831	.000		
MIS_CONACT SQRT	-.024	-1.450	-.849	-.673	-.031	.000	
MIS_USCON SQRT	.047	.010	2.049	.720	.002	.334	.000

Standardized Residual Means (Group number 1 - Default model)

Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
.000	.000	.000	.000	.000	.000	.000

Factor Score Weights (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Misalign	-.007	-.002	.000	-.001	.512	.011	.043
Success	1.759	.603	.100	.180	-.191	-.004	-.016

Total Effects (Group number 1 - Default model)

	Misalign	Success
Success	-.776	.000
Renegotiations Normalized	-.122	.158
SGA SQRT	-.033	.043
2AS	-.276	.356
Longevity SQRT	-.776	1.000
MIS_PRCON SQRT	1.747	.000
MIS_CONACT SQRT	.386	.000
MIS_USCON SQRT	1.000	.000

Standardized Total Effects (Group number 1 - Default model)

	Misalign	Success
Success	-.223	.000
Renegotiations Normalized	-.137	.614

SGA SQRT	-.052	.231
2AS	-.060	.269
Longevity SQRT	-.118	.530
MIS_PRCON SQRT	.969	.000
MIS_CONACT SQRT	.265	.000
MIS_USCON SQRT	.657	.000

Direct Effects (Group number 1 - Default model)

	Misalign	Success
Success	-.776	.000
Renegotiations Normalized	.000	.158
SGA SQRT	.000	.043
2AS	.000	.356
Longevity SQRT	.000	1.000
MIS_PRCON SQRT	1.747	.000
MIS_CONACT SQRT	.386	.000
MIS_USCON SQRT	1.000	.000

Standardized Direct Effects (Group number 1 - Default model)

	Misalign	Success
Success	-.223	.000
Renegotiations Normalized	.000	.614
SGA SQRT	.000	.231
2AS	.000	.269
Longevity SQRT	.000	.530
MIS_PRCON SQRT	.969	.000
MIS_CONACT SQRT	.265	.000
MIS_USCON SQRT	.657	.000

Indirect Effects (Group number 1 - Default model)

	Misalign	Success
Success	.000	.000
Renegotiations Normalized	-.122	.000
SGA SQRT	-.033	.000
2AS	-.276	.000
Longevity SQRT	-.776	.000
MIS_PRCON SQRT	.000	.000
MIS_CONACT SQRT	.000	.000
MIS_USCON SQRT	.000	.000

Standardized Indirect Effects (Group number 1 - Default model)

	Misalign	Success
Success	.000	.000
Renegotiations Normalized	-.137	.000

SGA SQRT	-.052	.000
2AS	-.060	.000
Longevity SQRT	-.118	.000
MIS_PRCON SQRT	.000	.000
MIS_CONACT SQRT	.000	.000
MIS_USCON SQRT	.000	.000

Modification Indices (Group number 1 - Default model)

Covariances: (Group number 1 - Default model)

			M.I.	Par Change
e12	<-->	e10	4.345	.014

Variances: (Group number 1 - Default model)

			M.I.	Par Change

Regression Weights: (Group number 1 - Default model)

			M.I.	Par Change

Means: (Group number 1 - Default model)

			M.I.	Par Change

Intercepts: (Group number 1 - Default model)

			M.I.	Par Change

Bootstrap (Group number 1 - Default model)

Bootstrap standard errors (Group number 1 - Default model)

Scalar Estimates (Group number 1 - Default model)

Regression Weights: (Group number 1 - Default model)

Parameter			SE	SE-SE	Mean	Bias	SE-Bias
Success	<---	Misalign	.543	.027	-.634	.142	.038
MIS_USCON SQRT	<---	Misalign	.000	.000	1.000	.000	.000
MIS_CONACT SQRT	<---	Misalign	.137	.007	.396	.010	.010
MIS_PRCON SQRT	<---	Misalign	.881	.044	1.856	.109	.062
Longevity SQRT	<---	Success	.000	.000	1.000	.000	.000
SGA SQRT	<---	Success	.116	.006	.069	.026	.008
2AS	<---	Success	.805	.040	.526	.170	.057
Renegotiations Normalized	<---	Success	.336	.017	.217	.059	.024

Standardized Regression Weights: (Group number 1 - Default model)

Parameter			SE	SE-SE	Mean	Bias	SE-Bias
Success	<---	Misalign	.162	.008	-.181	.042	.011
MIS_USCON SQRT	<---	Misalign	.158	.008	.682	.025	.011

MIS_CONACT SQRT	<---	Misalign	.093	.005	.275	.010	.007
MIS_PRCON SQRT	<---	Misalign	.206	.010	.975	.006	.015
Longevity SQRT	<---	Success	.177	.009	.520	-.011	.013
SGA SQRT	<---	Success	.196	.010	.277	.046	.014
2AS	<---	Success	.164	.008	.307	.038	.012
Renegotiations Normalized	<---	Success	.347	.017	.615	.002	.025

Intercepts: (Group number 1 - Default model)

Parameter	SE	SE-SE	Mean	Bias	SE-Bias
MIS_USCON SQRT	.021	.001	.715	.001	.001
MIS_CONACT SQRT	.019	.001	.241	.000	.001
MIS_PRCON SQRT	.026	.001	.677	.003	.002
Longevity SQRT	.090	.004	2.932	-.006	.006
Renegotiations Normalized	.012	.001	.124	-.001	.001
SGA SQRT	.009	.000	.105	.000	.001
2AS	.062	.003	2.622	-.002	.004

Variances: (Group number 1 - Default model)

Parameter	SE	SE-SE	Mean	Bias	SE-Bias
Misalign	.020	.001	.031	.004	.001
e4	.229	.011	.336	.020	.016
e1	.019	.001	.032	-.004	.001
e2	.006	.000	.053	-.001	.000
e3	.040	.002	.000	-.005	.003
e5	.237	.012	.811	-.039	.017
e12	.105	.005	.511	-.031	.007
e10	.003	.000	.010	-.001	.000
e9	.019	.001	.011	-.003	.001

Squared Multiple Correlations: (Group number 1 - Default model)

Parameter	SE	SE-SE	Mean	Bias	SE-Bias
Success	.056	.003	.059	.009	.004
Renegotiations Normalized	.853	.043	.498	.122	.060
SGA SQRT	.215	.011	.115	.062	.015
2AS	.159	.008	.121	.049	.011
Longevity SQRT	.194	.010	.301	.020	.014
MIS_PRCON SQRT	.460	.023	.994	.054	.033
MIS_CONACT SQRT	.049	.002	.084	.014	.003
MIS_USCON SQRT	.296	.015	.490	.059	.021

Matrices (Group number 1 - Default model)

Sample Covariances - Standard Errors (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Renegotiations Normalized	.003						
SGA SQRT	.001	.001					
2AS	.009	.006	.065				
Longevity SQRT	.015	.009	.066	.139			
MIS_PRCON SQRT	.004	.003	.018	.026	.010		
MIS_CONACT SQRT	.003	.002	.015	.022	.006	.007	
MIS_USCON SQRT	.003	.002	.016	.020	.007	.005	.007

Sample Correlations - Standard Errors (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Renegotiations Normalized	.000						
SGA SQRT	.076	.000					
2AS	.080	.073	.000				
Longevity SQRT	.078	.074	.079	.000			
MIS_PRCON SQRT	.083	.080	.079	.080	.000		
MIS_CONACT SQRT	.081	.078	.080	.083	.075	.000	
MIS_USCON SQRT	.079	.079	.083	.073	.052	.071	.000

Sample Means - Standard Errors (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Renegotiations Normalized	.012	.009	.062	.090	.026	.019	.021

Factor Score Weights - Standard Errors (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT

Misalign	.060	.083	.010	.005	.283	.061	.495
Success	.805	.510	.073	.200	.169	.019	.085

Total Effects - Standard Errors (Group number 1 - Default model)

	Misalign	Success
Success	.543	.000
Renegotiations Normalized	.099	.336
SGA SQRT	.047	.116
2AS	.296	.805
Longevity SQRT	.543	.000
MIS_PRCON SQRT	.881	.000
MIS_CONACT SQRT	.137	.000
MIS_USCON SQRT	.000	.000

Standardized Total Effects - Standard Errors (Group number 1 - Default model)

	Misalign	Success
Success	.162	.000
Renegotiations Normalized	.104	.347
SGA SQRT	.068	.196
2AS	.068	.164
Longevity SQRT	.081	.177
MIS_PRCON SQRT	.206	.000
MIS_CONACT SQRT	.093	.000
MIS_USCON SQRT	.158	.000

Direct Effects - Standard Errors (Group number 1 - Default model)

	Misalign	Success
Success	.543	.000
Renegotiations Normalized	.000	.336
SGA SQRT	.000	.116
2AS	.000	.805
Longevity SQRT	.000	.000
MIS_PRCON SQRT	.881	.000
MIS_CONACT SQRT	.137	.000
MIS_USCON SQRT	.000	.000

Standardized Direct Effects - Standard Errors (Group number 1 - Default model)

	Misalign	Success
Success	.162	.000
Renegotiations Normalized	.000	.347
SGA SQRT	.000	.196
2AS	.000	.164
Longevity SQRT	.000	.177

MIS_PRCON SQRT	.206	.000
MIS_CONACT SQRT	.093	.000
MIS_USCON SQRT	.158	.000

Indirect Effects - Standard Errors (Group number 1 - Default model)

	Misalign	Success
Success	.000	.000
Renegotiations Normalized	.099	.000
SGA SQRT	.047	.000
2AS	.296	.000
Longevity SQRT	.543	.000
MIS_PRCON SQRT	.000	.000
MIS_CONACT SQRT	.000	.000
MIS_USCON SQRT	.000	.000

Standardized Indirect Effects - Standard Errors (Group number 1 - Default model)

	Misalign	Success
Success	.000	.000
Renegotiations Normalized	.104	.000
SGA SQRT	.068	.000
2AS	.068	.000
Longevity SQRT	.081	.000
MIS_PRCON SQRT	.000	.000
MIS_CONACT SQRT	.000	.000
MIS_USCON SQRT	.000	.000

Bootstrap Confidence (Group number 1 - Default model)
Percentile method (Group number 1 - Default model)
90% confidence intervals (percentile method)
Scalar Estimates (Group number 1 - Default model)

Regression Weights: (Group number 1 - Default model)

Parameter			Estimate	Lower	Upper	P
Success	<---	Misalign	-.776	-1.553	.340	.261
MIS_USCON SQRT	<---	Misalign	1.000	1.000	1.000	...
MIS_CONACT SQRT	<---	Misalign	.386	.161	.622	.017
MIS_PRCON SQRT	<---	Misalign	1.747	.978	3.699	.010
Longevity SQRT	<---	Success	1.000	1.000	1.000	...
SGA SQRT	<---	Success	.043	-.006	.182	.131
2AS	<---	Success	.356	.091	1.300	.028

Renegotiations Normalized	<---	Success	.158	.065	.464	.014

Standardized Regression Weights: (Group number 1 - Default model)

Parameter			Estimate	Lower	Upper	P
Success	<---	Misalign	-.223	-.422	.130	.261
MIS_USCON SQRT	<---	Misalign	.657	.441	.903	.010
MIS_CONACT SQRT	<---	Misalign	.265	.093	.433	.016
MIS_PRCON SQRT	<---	Misalign	.969	.714	1.364	.010
Longevity SQRT	<---	Success	.530	.177	.806	.010
SGA SQRT	<---	Success	.231	-.019	.594	.131
2AS	<---	Success	.269	.059	.529	.029
Renegotiations Normalized	<---	Success	.614	.221	1.128	.014

Intercepts: (Group number 1 - Default model)

Parameter	Estimate	Lower	Upper	P
MIS_USCON SQRT	.714	.681	.747	.010
MIS_CONACT SQRT	.242	.209	.274	.010
MIS_PRCON SQRT	.674	.635	.721	.010
Longevity SQRT	2.939	2.767	3.074	.010
Renegotiations Normalized	.125	.106	.145	.010
SGA SQRT	.105	.090	.120	.010
2AS	2.624	2.529	2.741	.010

Variances: (Group number 1 - Default model)

Parameter	Estimate	Lower	Upper	P
Misalign	.027	.012	.056	.010
e4	.316	.034	.774	.010
e1	.036	.013	.050	.053
e2	.054	.043	.063	.010
e3	.005	-.080	.043	.739
e5	.850	.397	1.154	.023
e12	.541	.378	.637	.017
e10	.011	.007	.013	.019
e9	.014	-.007	.021	.136

Squared Multiple Correlations: (Group number 1 - Default model)

Parameter	Estimate	Lower	Upper	P
Success	.050	.000	.184	.010
Renegotiations Normalized	.377	.049	1.272	.010

Parameter	Estimate	Lower	Upper	P
SGA SQRT	.054	.001	.353	.010
2AS	.072	.005	.280	.010
Longevity SQRT	.281	.031	.649	.010
MIS_PRCON SQRT	.940	.510	1.861	.010
MIS_CONACT SQRT	.070	.009	.187	.010
MIS_USCON SQRT	.431	.194	.816	.010

Matrices (Group number 1 - Default model)

Sample Covariances (Group number 1 - Default model)

Sample Covariances - Lower Bounds (PC) (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Renegotiations Normalized	.018						
SGA SQRT	-.001	.010					
2AS	.003	.009	.486				
Longevity SQRT	.029	.004	.005	.949			
MIS_PRCON SQRT	-.015	-.010	-.021	-.057	.071		
MIS_CONACT SQRT	-.006	-.007	-.040	-.058	.008	.047	
MIS_USCON SQRT	-.008	-.004	-.005	-.039	.035	.005	.051

Sample Covariances - Upper Bounds (PC) (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Renegotiations Normalized	.026						
SGA SQRT	.003	.014					
2AS	.035	.029	.698				
Longevity SQRT	.078	.033	.231	1.399			
MIS_PRCON SQRT	-.002	-.001	.038	.034	.105		
MIS_CONACT SQRT	.003	.000	.009	.011	.028	.069	
MIS_USCON SQRT	.002	.003	.046	.028	.061	.020	.075

Sample Covariances - Two Tailed Significance (PC) (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Renegotiations Normalized	.010						
SGA SQRT	.425	.010					
2AS	.062	.010	.010				
Longevity SQRT	.010	.018	.090	.010			
MIS_PRCON SQRT	.040	.043	.539	.492	.010		
MIS_CONACT SQRT	.600	.126	.331	.339	.012	.010	
MIS_USCON SQRT	.254	.594	.231	.667	.010	.010	.010

Sample Correlations (Group number 1 - Default model)

Sample Correlations - Lower Bounds (PC) (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Renegotiations Normalized	1.000						
SGA SQRT	-.074	1.000					
2AS	.029	.097	1.000				
Longevity SQRT	.203	.038	.006	1.000			
MIS_PRCON SQRT	-.312	-.290	-.088	-.175	1.000		
MIS_CONACT SQRT	-.165	-.258	-.221	-.222	.116	1.000	
MIS_USCON SQRT	-.209	-.165	-.029	-.140	.545	.090	1.000

Sample Correlations - Upper Bounds (PC) (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT

Renegotiations Normalized	1.000						
SGA SQRT	.189	1.000					
2AS	.302	.339	1.000				
Longevity SQRT	.454	.273	.268	1.000			
MIS_PRCON SQRT	-.046	-.030	.170	.109	1.000		
MIS_CONACT SQRT	.098	.013	.047	.046	.381	1.000	
MIS_USCON SQRT	.058	.106	.233	.099	.724	.340	1.000

Sample Correlations - Two Tailed Significance (PC) (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Renegotiations Normalized	...						
SGA SQRT	.425	...					
2AS	.062	.010	...				
Longevity SQRT	.010	.019	.090	...			
MIS_PRCON SQRT	.040	.044	.539	.492	...		
MIS_CONACT SQRT	.599	.125	.331	.339	.012	...	
MIS_USCON SQRT	.254	.593	.231	.668	.010	.010	...

Sample Means (Group number 1 - Default model)

Sample Means - Lower Bounds (PC) (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Renegotiations Normalized	.106	.090	2.529	2.767	.635	.209	.681

Sample Means - Upper Bounds (PC) (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT

Renegotiations Normalized	.145	.120	2.741	3.074	.721	.274	.747

Sample Means - Two Tailed Significance (PC) (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Renegotiations Normalized	.010	.010	.010	.010	.010	.010	.010

Factor Score Weights (Group number 1 - Default model)

Factor Score Weights - Lower Bounds (PC) (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Misalign	-.052	-.025	-.003	-.005	.194	-.110	-.376
Success	.096	-.002	-.019	-.035	-.381	-.032	-.133

Factor Score Weights - Upper Bounds (PC) (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Misalign	.102	.045	.006	.008	.797	.072	.647
Success	2.820	1.423	.214	.546	.152	.030	.142

Factor Score Weights - Two Tailed Significance (PC) (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Misalign	.852	.859	.864	.872	.053	.779	.739
Success	.057	.114	.168	.158	.361	.843	.863

Total Effects (Group number 1 - Default model)

Total Effects - Lower Bounds (PC) (Group number 1 - Default model)

	Misalign	Success
Success	-1.553	.000
Renegotiations Normalized	-.288	.065
SGA SQRT	-.141	-.006
2AS	-.759	.091
Longevity SQRT	-1.553	1.000
MIS_PRCON SQRT	.978	.000
MIS_CONACT SQRT	.161	.000
MIS_USCON SQRT	1.000	.000

Total Effects - Upper Bounds (PC) (Group number 1 - Default model)

	Misalign	Success

Success	.340	.000
Renegotiations Normalized	.030	.464
SGA SQRT	.019	.182
2AS	.225	1.300
Longevity SQRT	.340	1.000
MIS_PRCON SQRT	3.699	.000
MIS_CONACT SQRT	.622	.000
MIS_USCON SQRT	1.000	.000

Total Effects - Two Tailed Significance (PC) (Group number 1 - Default model)

	Misalign	Success
Success	.261	...
Renegotiations Normalized	.251	.014
SGA SQRT	.351	.131
2AS	.281	.028
Longevity SQRT	.261	...
MIS_PRCON SQRT	.010	...
MIS_CONACT SQRT	.017	...
MIS_USCON SQRT	...	...

Standardized Total Effects (Group number 1 - Default model)

Standardized Total Effects - Lower Bounds (PC) (Group number 1 - Default model)

	Misalign	Success
Success	-.422	.000
Renegotiations Normalized	-.293	.221
SGA SQRT	-.193	-.019
2AS	-.148	.059
Longevity SQRT	-.217	.177
MIS_PRCON SQRT	.714	.000
MIS_CONACT SQRT	.093	.000
MIS_USCON SQRT	.441	.000

Standardized Total Effects - Upper Bounds (PC) (Group number 1 - Default model)

	Misalign	Success
Success	.130	.000
Renegotiations Normalized	.048	1.128
SGA SQRT	.030	.594
2AS	.066	.529
Longevity SQRT	.056	.806
MIS_PRCON SQRT	1.364	.000
MIS_CONACT SQRT	.433	.000

MIS_USCON SQRT	.903	.000

Standardized Total Effects - Two Tailed Significance (PC) (Group number 1 - Default model)

	Misalign	Success
Success	.261	...
Renegotiations Normalized	.251	.014
SGA SQRT	.350	.131
2AS	.281	.029
Longevity SQRT	.261	.010
MIS_PRCON SQRT	.010	...
MIS_CONACT SQRT	.016	...
MIS_USCON SQRT	.010	...

Direct Effects (Group number 1 - Default model)

Direct Effects - Lower Bounds (PC) (Group number 1 - Default model)

	Misalign	Success
Success	-1.553	.000
Renegotiations Normalized	.000	.065
SGA SQRT	.000	-.006
2AS	.000	.091
Longevity SQRT	.000	1.000
MIS_PRCON SQRT	.978	.000
MIS_CONACT SQRT	.161	.000
MIS_USCON SQRT	1.000	.000

Direct Effects - Upper Bounds (PC) (Group number 1 - Default model)

	Misalign	Success
Success	.340	.000
Renegotiations Normalized	.000	.464
SGA SQRT	.000	.182
2AS	.000	1.300
Longevity SQRT	.000	1.000
MIS_PRCON SQRT	3.699	.000
MIS_CONACT SQRT	.622	.000
MIS_USCON SQRT	1.000	.000

Direct Effects - Two Tailed Significance (PC) (Group number 1 - Default model)

	Misalign	Success
Success	.261	...
Renegotiations Normalized	...	.014
SGA SQRT	...	.131

2AS	...	.028
Longevity SQRT	...	...
MIS_PRCON SQRT	.010	...
MIS_CONACT SQRT	.017	...
MIS_USCON SQRT	...	...

Standardized Direct Effects (Group number 1 - Default model)

Standardized Direct Effects - Lower Bounds (PC) (Group number 1 - Default model)

	Misalign	Success
Success	-.422	.000
Renegotiations Normalized	.000	.221
SGA SQRT	.000	-.019
2AS	.000	.059
Longevity SQRT	.000	.177
MIS_PRCON SQRT	.714	.000
MIS_CONACT SQRT	.093	.000
MIS_USCON SQRT	.441	.000

Standardized Direct Effects - Upper Bounds (PC) (Group number 1 - Default model)

	Misalign	Success
Success	.130	.000
Renegotiations Normalized	.000	1.128
SGA SQRT	.000	.594
2AS	.000	.529
Longevity SQRT	.000	.806
MIS_PRCON SQRT	1.364	.000
MIS_CONACT SQRT	.433	.000
MIS_USCON SQRT	.903	.000

Standardized Direct Effects - Two Tailed Significance (PC) (Group number 1 - Default model)

	Misalign	Success
Success	.261	...
Renegotiations Normalized	...	.014
SGA SQRT	...	.131
2AS	...	.029
Longevity SQRT	...	.010
MIS_PRCON SQRT	.010	...
MIS_CONACT SQRT	.016	...
MIS_USCON SQRT	.010	...

Indirect Effects (Group number 1 - Default model)

Indirect Effects - Lower Bounds (PC) (Group number 1 - Default model)

	Misalign	Success
Success	.000	.000
Renegotiations Normalized	-.288	.000
SGA SQRT	-.141	.000
2AS	-.759	.000
Longevity SQRT	-1.553	.000
MIS_PRCON SQRT	.000	.000
MIS_CONACT SQRT	.000	.000
MIS_USCON SQRT	.000	.000

Indirect Effects - Upper Bounds (PC) (Group number 1 - Default model)

	Misalign	Success
Success	.000	.000
Renegotiations Normalized	.030	.000
SGA SQRT	.019	.000
2AS	.225	.000
Longevity SQRT	.340	.000
MIS_PRCON SQRT	.000	.000
MIS_CONACT SQRT	.000	.000
MIS_USCON SQRT	.000	.000

Indirect Effects - Two Tailed Significance (PC) (Group number 1 - Default model)

	Misalign	Success
Success	...	...
Renegotiations Normalized	.251	...
SGA SQRT	.351	...
2AS	.281	...
Longevity SQRT	.261	...
MIS_PRCON SQRT	...	...
MIS_CONACT SQRT	...	...
MIS_USCON SQRT	...	...

Standardized Indirect Effects (Group number 1 - Default model)

Standardized Indirect Effects - Lower Bounds (PC) (Group number 1 - Default model)

	Misalign	Success
Success	.000	.000

Renegotiations Normalized	-.293	.000
SGA SQRT	-.193	.000
2AS	-.148	.000
Longevity SQRT	-.217	.000
MIS_PRCON SQRT	.000	.000
MIS_CONACT SQRT	.000	.000
MIS_USCON SQRT	.000	.000

Standardized Indirect Effects - Upper Bounds (PC) (Group number 1 - Default model)

	Misalign	Success
Success	.000	.000
Renegotiations Normalized	.048	.000
SGA SQRT	.030	.000
2AS	.066	.000
Longevity SQRT	.056	.000
MIS_PRCON SQRT	.000	.000
MIS_CONACT SQRT	.000	.000
MIS_USCON SQRT	.000	.000

Standardized Indirect Effects - Two Tailed Significance (PC) (Group number 1 - Default model)

	Misalign	Success
Success	...	...
Renegotiations Normalized	.251	...
SGA SQRT	.350	...
2AS	.281	...
Longevity SQRT	.261	...
MIS_PRCON SQRT	...	...
MIS_CONACT SQRT	...	...
MIS_USCON SQRT	...	...

Bias-corrected percentile method (Group number 1 - Default model)
90% confidence intervals (bias-corrected percentile method)
Scalar Estimates (Group number 1 - Default model)

Regression Weights: (Group number 1 - Default model)

Parameter			Estimate	Lower	Upper	P
Success	<---	Misalign	-.776	-1.710	.094	.127
MIS_USCON SQRT	<---	Misalign	1.000	1.000	1.000	...
MIS_CONACT SQRT	<---	Misalign	.386	.123	.611	.024

MIS_PRCON SQRT	<---	Misalign	1.747	1.095	4.730	.004
Longevity SQRT	<---	Success	1.000	1.000	1.000	...
SGA SQRT	<---	Success	.043	-.012	.160	.182
2AS	<---	Success	.356	.042	.832	.059
Renegotiations Normalized	<---	Success	.158	.082	1.796	.003

Standardized Regression Weights: (Group number 1 - Default model)

Parameter			Estimate	Lower	Upper	P
Success	<---	Misalign	-.223	-.451	.063	.154
MIS_USCON SQRT	<---	Misalign	.657	.407	.843	.019
MIS_CONACT SQRT	<---	Misalign	.265	.048	.376	.051
MIS_PRCON SQRT	<---	Misalign	.969	.716	1.453	.008
Longevity SQRT	<---	Success	.530	.201	.827	.007
SGA SQRT	<---	Success	.231	-.109	.429	.397
2AS	<---	Success	.269	.012	.455	.074
Renegotiations Normalized	<---	Success	.614	.350	2.114	.003

Intercepts: (Group number 1 - Default model)

Parameter	Estimate	Lower	Upper	P
MIS_USCON SQRT	.714	.676	.743	.019
MIS_CONACT SQRT	.242	.208	.273	.012
MIS_PRCON SQRT	.674	.632	.710	.020
Longevity SQRT	2.939	2.795	3.104	.006
Renegotiations Normalized	.125	.108	.148	.004
SGA SQRT	.105	.090	.120	.010
2AS	2.624	2.539	2.766	.004

Variances: (Group number 1 - Default model)

Parameter	Estimate	Lower	Upper	P
Misalign	.027	.011	.050	.018
e4	.316	.067	.879	.004
e1	.036	.021	.055	.021
e2	.054	.046	.068	.002
e3	.005	-.082	.043	.758
e5	.850	.488	1.213	.013
e12	.541	.457	.711	.002
e10	.011	.009	.016	.001
e9	.014	-.029	.020	.216

Squared Multiple Correlations: (Group number 1 - Default model)

Parameter	Estimate	Lower	Upper	P
Success	.050	.002	.202	.005
Renegotiations Normalized	.377	.122	4.480	.002

SGA SQRT	.054	.000	.184	.056
2AS	.072	.001	.207	.030
Longevity SQRT	.281	.041	.684	.007
MIS_PRCON SQRT	.940	.512	2.111	.008
MIS_CONACT SQRT	.070	.002	.141	.034
MIS_USCON SQRT	.431	.166	.711	.019

Matrices (Group number 1 - Default model)

Sample Covariances (Group number 1 - Default model)

Sample Covariances - Lower Bounds (BC) (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Renegotiations Normalized	.018						
SGA SQRT	-.001	.010					
2AS	.003	.004	.498				
Longevity SQRT	.034	.004	-.032	1.004			
MIS_PRCON SQRT	-.015	-.010	-.016	-.054	.072		
MIS_CONACT SQRT	-.006	-.007	-.043	-.071	.007	.048	
MIS_USCON SQRT	-.007	-.004	.002	-.035	.036	.005	.052

Sample Covariances - Upper Bounds (BC) (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Renegotiations Normalized	.027						
SGA SQRT	.003	.014					
2AS	.034	.028	.718				
Longevity SQRT	.084	.032	.200	1.496			
MIS_PRCON SQRT	-.002	-.001	.043	.040	.106		
MIS_CONACT SQRT	.003	.000	.007	.006	.027	.069	
MIS_USCON SQRT	.003	.004	.059	.030	.061	.020	.076

Sample Covariances - Two Tailed Significance (BC) (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Renegotiations Normalized	.006						
SGA SQRT	.534	.005					
2AS	.069	.019	.004				
Longevity SQRT	.004	.024	.206	.002			
MIS_PRCON SQRT	.038	.030	.373	.626	.007		
MIS_CONACT SQRT	.548	.092	.273	.190	.020	.007	
MIS_USCON SQRT	.335	.897	.084	.819	.009	.015	.006

Sample Correlations (Group number 1 - Default model)

Sample Correlations - Lower Bounds (BC) (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Renegotiations Normalized	1.000						
SGA SQRT	-.083	1.000					
2AS	.004	.069	1.000				
Longevity SQRT	.205	.034	-.046	1.000			
MIS_PRCON SQRT	-.312	-.284	-.069	-.159	1.000		
MIS_CONACT SQRT	-.169	-.261	-.231	-.266	.103	1.000	
MIS_USCON SQRT	-.189	-.144	.000	-.131	.542	.068	1.000

Sample Correlations - Upper Bounds (BC) (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Renegotiations Normalized	1.000						
SGA SQRT	.173	1.000					
2AS	.291	.327	1.000				
Longevity SQRT	.456	.270	.232	1.000			
MIS_PRCON SQRT	-.046	-.022	.183	.122	1.000		
MIS_CONACT SQRT	.088	-.005	.035	.028	.362	1.000	
MIS_USCON SQRT	.075	.128	.276	.113	.718	.311	1.000

Sample Correlations - Two Tailed Significance (BC) (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Renegotiations Normalized	...						
SGA SQRT	.568	...					
2AS	.095	.018	...				
Longevity SQRT	.009	.024	.246	...			
MIS_PRCON SQRT	.040	.058	.360	.700	...		
MIS_CONACT SQRT	.565	.092	.273	.199	.020	...	
MIS_USCON SQRT	.347	.876	.098	.859	.013	.025	...

Sample Means (Group number 1 - Default model)

Sample Means - Lower Bounds (BC) (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Renegotiations Normalized	.108	.090	2.539	2.795	.632	.208	.676

Sample Means - Upper Bounds (BC) (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Renegotiations Normalized	.148	.120	2.766	3.104	.710	.273	.743

Sample Means - Two Tailed Significance (BC) (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Renegotiations Normalized	.004	.010	.004	.006	.020	.012	.019

Factor Score Weights (Group number 1 - Default model)

Factor Score Weights - Lower Bounds (BC) (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Misalign	-.355	-.684	-.033	-.016	.267	-.100	-.398
Success	.775	-.017	-.018	.003	-.646	-.057	-.201

Factor Score Weights - Upper Bounds (BC) (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Misalign	.015	.006	.002	.002	.877	.076	.489
Success	3.301	1.367	.220	.687	-.006	.012	.078

Factor Score Weights - Two Tailed Significance (BC) (Group number 1 - Default model)

	Renegotiations Normalized	SGA SQRT	2AS	Longevity SQRT	MIS_PRCON SQRT	MIS_CONACT SQRT	MIS_USCON SQRT
Misalign	.274	.316	.450	.380	.025	.722	.836
Success	.011	.152	.160	.091	.082	.374	.497

Total Effects (Group number 1 - Default model)

Total Effects - Lower Bounds (BC) (Group number 1 - Default model)

	Misalign	Success
Success	-1.710	.000
Renegotiations Normalized	-.313	.082
SGA SQRT	-.169	-.012
2AS	-.879	.042
Longevity SQRT	-1.710	1.000
MIS_PRCON SQRT	1.095	.000
MIS_CONACT SQRT	.123	.000
MIS_USCON SQRT	1.000	.000

Total Effects - Upper Bounds (BC) (Group number 1 - Default model)

	Misalign	Success
Success	.094	.000
Renegotiations Normalized	.016	1.796
SGA SQRT	.013	.160
2AS	.113	.832
Longevity SQRT	.094	1.000
MIS_PRCON SQRT	4.730	.000
MIS_CONACT SQRT	.611	.000
MIS_USCON SQRT	1.000	.000

Total Effects - Two Tailed Significance (BC) (Group number 1 - Default model)

	Misalign	Success
Success	.127	...
Renegotiations Normalized	.147	.003
SGA SQRT	.257	.182
2AS	.167	.059
Longevity SQRT	.127	...
MIS_PRCON SQRT	.004	...
MIS_CONACT SQRT	.024	...
MIS_USCON SQRT	...	...

Standardized Total Effects (Group number 1 - Default model)

Standardized Total Effects - Lower Bounds (BC) (Group number 1 - Default model)

	Misalign	Success
Success	-.451	.000
Renegotiations Normalized	-.335	.350
SGA SQRT	-.235	-.109
2AS	-.173	.012
Longevity SQRT	-.252	.201

MIS_PRCON SQRT	.716	.000
MIS_CONACT SQRT	.048	.000
MIS_USCON SQRT	.407	.000

Standardized Total Effects - Upper Bounds (BC) (Group number 1 - Default model)

	Misalign	Success
Success	.063	.000
Renegotiations Normalized	.010	2.114
SGA SQRT	.020	.429
2AS	-.002	.455
Longevity SQRT	-.003	.827
MIS_PRCON SQRT	1.453	.000
MIS_CONACT SQRT	.376	.000
MIS_USCON SQRT	.843	.000

Standardized Total Effects - Two Tailed Significance (BC) (Group number 1 - Default model)

	Misalign	Success
Success	.154	...
Renegotiations Normalized	.121	.003
SGA SQRT	.246	.397
2AS	.091	.074
Longevity SQRT	.092	.007
MIS_PRCON SQRT	.008	...
MIS_CONACT SQRT	.051	...
MIS_USCON SQRT	.019	...

Direct Effects (Group number 1 - Default model)

Direct Effects - Lower Bounds (BC) (Group number 1 - Default model)

	Misalign	Success
Success	-1.710	.000
Renegotiations Normalized	.000	.082
SGA SQRT	.000	-.012
2AS	.000	.042
Longevity SQRT	.000	1.000
MIS_PRCON SQRT	1.095	.000
MIS_CONACT SQRT	.123	.000
MIS_USCON SQRT	1.000	.000

Direct Effects - Upper Bounds (BC) (Group number 1 - Default model)

	Misalign	Success
Success	.094	.000
Renegotiations Normalized	.000	1.796
SGA SQRT	.000	.160
2AS	.000	.832
Longevity SQRT	.000	1.000
MIS_PRCON SQRT	4.730	.000
MIS_CONACT SQRT	.611	.000
MIS_USCON SQRT	1.000	.000

Direct Effects - Two Tailed Significance (BC) (Group number 1 - Default model)

	Misalign	Success
Success	.127	...
Renegotiations Normalized	...	.003
SGA SQRT	...	.182
2AS	...	.059
Longevity SQRT	...	...
MIS_PRCON SQRT	.004	...
MIS_CONACT SQRT	.024	...
MIS_USCON SQRT	...	...

Standardized Direct Effects (Group number 1 - Default model)

Standardized Direct Effects - Lower Bounds (BC) (Group number 1 - Default model)

	Misalign	Success
Success	-.451	.000
Renegotiations Normalized	.000	.350
SGA SQRT	.000	-.109
2AS	.000	.012
Longevity SQRT	.000	.201
MIS_PRCON SQRT	.716	.000
MIS_CONACT SQRT	.048	.000
MIS_USCON SQRT	.407	.000

Standardized Direct Effects - Upper Bounds (BC) (Group number 1 - Default model)

	Misalign	Success
Success	.063	.000
Renegotiations Normalized	.000	2.114
SGA SQRT	.000	.429
2AS	.000	.455
Longevity SQRT	.000	.827

MIS_PRCON SQRT	1.453	.000
MIS_CONACT SQRT	.376	.000
MIS_USCON SQRT	.843	.000

Standardized Direct Effects - Two Tailed Significance (BC) (Group number 1 - Default model)

	Misalign	Success
Success	.154	...
Renegotiations Normalized	...	.003
SGA SQRT	...	.397
2AS	...	.074
Longevity SQRT	...	.007
MIS_PRCON SQRT	.008	...
MIS_CONACT SQRT	.051	...
MIS_USCON SQRT	.019	...

Indirect Effects (Group number 1 - Default model)

Indirect Effects - Lower Bounds (BC) (Group number 1 - Default model)

	Misalign	Success
Success	.000	.000
Renegotiations Normalized	-.313	.000
SGA SQRT	-.169	.000
2AS	-.879	.000
Longevity SQRT	-1.710	.000
MIS_PRCON SQRT	.000	.000
MIS_CONACT SQRT	.000	.000
MIS_USCON SQRT	.000	.000

Indirect Effects - Upper Bounds (BC) (Group number 1 - Default model)

	Misalign	Success
Success	.000	.000
Renegotiations Normalized	.016	.000
SGA SQRT	.013	.000
2AS	.113	.000
Longevity SQRT	.094	.000
MIS_PRCON SQRT	.000	.000
MIS_CONACT SQRT	.000	.000
MIS_USCON SQRT	.000	.000

Indirect Effects - Two Tailed Significance (BC) (Group number 1 - Default model)

	Misalign	Success
Success	...	...
Renegotiations Normalized	.147	...
SGA SQRT	.257	...
2AS	.167	...
Longevity SQRT	.127	...
MIS_PRCON SQRT	...	...
MIS_CONACT SQRT	...	...
MIS_USCON SQRT	...	...

Standardized Indirect Effects (Group number 1 - Default model)

Standardized Indirect Effects - Lower Bounds (BC) (Group number 1 - Default model)

	Misalign	Success
Success	.000	.000
Renegotiations Normalized	-.335	.000
SGA SQRT	-.235	.000
2AS	-.173	.000
Longevity SQRT	-.252	.000
MIS_PRCON SQRT	.000	.000
MIS_CONACT SQRT	.000	.000
MIS_USCON SQRT	.000	.000

Standardized Indirect Effects - Upper Bounds (BC) (Group number 1 - Default model)

	Misalign	Success
Success	.000	.000
Renegotiations Normalized	.010	.000
SGA SQRT	.020	.000
2AS	-.002	.000
Longevity SQRT	-.003	.000
MIS_PRCON SQRT	.000	.000
MIS_CONACT SQRT	.000	.000
MIS_USCON SQRT	.000	.000

Standardized Indirect Effects - Two Tailed Significance (BC) (Group number 1 - Default model)

	Misalign	Success
Success	...	...
Renegotiations Normalized	.121	...
SGA SQRT	.246	...
2AS	.091	...
Longevity SQRT	.092	...
MIS_PRCON SQRT	...	...
MIS_CONACT SQRT	...	...
MIS_USCON SQRT	...	...

Minimization History (Default model)

Iteration		Negative eigenvalues	Condition #	Smallest eigenvalue	Diameter	F	NTries	Ratio
0	e	3		-.153	9999.000	175.697	0	9999.000
1	e*	1		-.208	1.533	54.654	21	.607
2	e	1		-.049	.407	29.278	6	.880
3	e	0	2754.191		.464	25.709	5	.674
4	e	0	425.626		.330	24.223	4	.000
5	e	0	464.414		.440	22.190	1	1.172
6	e	0	836.184		.211	21.590	1	1.172
7	e	0	957.467		.151	21.495	1	1.081
8	e	0	1100.244		.031	21.488	1	1.039
9	e	0	1111.465		.004	21.488	1	1.005
10	e	0	1108.677		.000	21.488	1	1.000

Bootstrap (Default model)

Summary of Bootstrap Iterations (Default model)

(Default model)

Iterations	Method 0	Method 1	Method 2
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	1	1
11	0	0	0
12	0	3	0

13	0	9	0
14	0	7	0
15	0	13	2
16	0	17	0
17	0	30	1
18	0	10	0
19	0	94	12
Total	0	184	16

0 bootstrap samples were unused because of a singular covariance matrix.
68 bootstrap samples were unused because a solution was not found.
200 usable bootstrap samples were obtained.

Bootstrap Distributions (Default model)

ML discrepancy (implied vs sample) (Default model)

```
                        |--------------------
                13.219  |***
                16.226  |***
                19.234  |*******
                22.241  |************
                25.248  |***************
                28.255  |***************
                31.262  |***********
N = 200         34.269  |************
Mean = 29.704   37.276  |*********
S. e. = .584    40.283  |*******
                43.290  |****
                46.297  |***
                49.304  |**
                52.311  |
                55.318  |*
                        |--------------------
```

ML discrepancy (implied vs pop) (Default model)

```
                        |--------------------
                30.321  |*
                33.759  |******
                37.196  |*************
                40.634  |**************
                44.071  |*************
                47.509  |*****************
                50.946  |**********
```

```
N = 200           54.384   |**********
Mean = 47.307     57.821   |********
S. e. = .659      61.259   |***
                  64.696   |***
                  68.134   |***
                  71.571   |
                  75.009   |*
                  78.446   |*
                           |--------------------
```

K-L overoptimism (unstabilized) (Default model)

```
                           |--------------------
                  -83.555  |*
                  -63.806  |**
                  -44.056  |**
                  -24.307  |**
                  -4.558   |*****
                  15.192   |*********
                  34.941   |**************
N = 200           54.691   |*********
Mean = 52.094     74.440   |********
S. e. = 3.476     94.190   |********
                  113.939  |*******
                  133.688  |**
                  153.438  |*
                  173.187  |*
                  192.937  |*
                           |--------------------
```

K-L overoptimism (stabilized) (Default model)

```
                           |--------------------
                  19.161   |*
                  24.724   |*****
                  30.287   |*******
                  35.850   |*********
                  41.413   |**************
                  46.977   |*************
                  52.540   |***************
N = 200           58.103   |***************
Mean = 51.879     63.666   |******
S. e. = 1.121     69.230   |********
                  74.793   |*****
                  80.356   |*
                  85.919   |**
```

```
                  91.482   |***
                  97.046   |*
                           |--------------------
```

ML discrepancy (implied vs pop) (Default model)

```
                           |--------------------
                  30.321   |*
                  33.759   |******
                  37.196   |*************
                  40.634   |**************
                  44.071   |*************
                  47.509   |*****************
                  50.946   |**********
N = 200           54.384   |**********
Mean = 47.307     57.821   |********
S. e. = .659      61.259   |***
                  64.696   |***
                  68.134   |***
                  71.571   |
                  75.009   |*
                  78.446   |*
                           |--------------------
```

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	22	21.488	13	.064	1.653
Saturated model	35	.000	0		
Independence model	14	138.386	21	.000	6.590

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.845	.749	.932	.883	.928
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.619	.523	.574
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	8.488	.000	25.319
Saturated model	.000	.000	.000
Independence model	117.386	83.863	158.408

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	.145	.057	.000	.171
Saturated model	.000	.000	.000	.000
Independence model	.935	.793	.567	1.070

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.066	.000	.115	.264
Independence model	.194	.164	.226	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	65.488	68.002		
Saturated model	70.000	74.000		
Independence model	166.386	167.986		

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	.442	.385	.556	.459
Saturated model	.473	.473	.473	.500
Independence model	1.124	.898	1.401	1.135

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	155	191
Independence model	35	42

Execution time summary

Minimization:	.047
Miscellaneous:	.953
Bootstrap:	7.359
Total:	8.359