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# **The Link between Customer Profitability in Business-to-Business Markets and the Nature of Business Relationships**

A thesis presented in partial fulfilment of the requirements for the degree of  
Doctor of Philosophy  
in  
Marketing

Massey University  
Wellington Campus

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2012

## **Abstract**

Empirical studies on customer profitability in business markets have reported wide profitability variation and a skewed distribution, typically a small number of very profitable customers and a much larger number that are marginally profitable or unprofitable. While some studies have attempted to investigate the contribution of financial factors to this pattern, the contribution to customer profitability of non-financial factors, such as the nature of business relationships, has received very little attention. This gap exists despite the wide acceptance amongst practitioners of the importance of business relationship development with customers and of business relationships as a field of academic research. Business relationship development efforts are made with an expectation that they will result in improved financial results, but academic research has not established this based on objective financial measures of customer profitability.

To investigate whether a link exists between business relationships and customer profitability, it was hypothesised that multiple facets of the business relationship should be represented and may necessitate adopting constructs from different theoretical frameworks. Thus the proposed theoretical model used behavioural and cognitive constructs based on relationship connectors, environment factors, communication quality, communication quantity, conflict, customer characteristics and commitment. The customer profitability measures were based on traditional financial data but were extended to include imputed costs of other resource usage such as delayed payments, documentation costs and shipment to multiple destinations. Since the research required matching customer profitability measured as a financial outcome with the nature of the business relationship with each customer, data was obtained from a single participating organisation.

Relevance of the proposed theoretical constructs to the context of the participating organisation was checked through a qualitative investigation using in-depth interviews with key informants. The subsequent quantitative

study used an online survey instrument to obtain data from the organisation's sales persons on the nature of the relationships with customers. Financial data for computing individual customer's profitability was obtained from relevant company records.

Structural Equation Modelling was used to test and estimate the theorised relationships between constructs. Confirmatory factor analyses revealed the need to make some changes to the original model, but the constructs in the final model demonstrated good discriminant validity. The good fit of the proposed theoretical model to the actual data confirmed the relevance of constructs used in the theoretical model to represent the multifaceted nature of business relationships.

The main finding of this research is that commitment to a business relationship with customers is adversely affected by customer profitability factors. An increase of 1 standard deviation in customer profitability variation factors results in a reduction in commitment levels of 0.28 standard deviation units. In this study, customer profitability factors are represented by four indicators: customer profit value, cost of goods, documentation cost and number of destinations. This construct reflects the relative impact of the revenue and cost indicators on individual customer profitability.

Commitment plays a central role in linking the constructs representing the nature of business relationships and customer profitability factors. The indicators for commitment assessed expectations of continuity in a relationship and whether expected benefits were realised, and these represent the affective and calculative dimensions of commitment described in the literature. The calculative dimension reflects the expectation of economic returns as a result of commitment to a relationship. Reduction in profits from the customer will adversely affect the calculative dimension and may account for the negative value for the link with customer profitability factors. On the other hand, the affective dimension of commitment reflects the attitudes and beliefs and generalised regard about the relationship and can be linked to efforts to build the business relationship. The nature of the business relationship comprises

four constructs; relationship connectors, communication quality, communication quantity and conflict, and represents facets of how a relationship is viewed; this may account for its link with commitment.

Environment factors, which include competition and market price fluctuations for the product categories, represent the main set of factors outside the control of the firm and have an impact on revenue as well as commitment to the relationship with customers. The contribution of price changes to revenue and profitability represents an additional element in determining customer profitability. In this study, substantial price increases from products sold to the top decile customers helped offset cost increases and improved the profitability of these customers.

From a practitioner's perspective, the main utility of these findings lies in the importance of integrating customer profitability measures in relationship development efforts. For a more accurate assessment of returns, customer profitability measures should go beyond normal accounting data and include estimates of other resource usage such as documentation costs. Such improved customer profitability measures can help in differentiating customers based on objective outcomes and provide a basis for developing customer portfolios with appropriate relationship development strategies. The differentiation would also imply that commitment to a business relationship has to be contingent on obtaining the expected financial return from the business relationship.

## **Acknowledgements**

I would like to thank Professor Philip Gendall for his invaluable guidance at every stage, starting with my preliminary ideas on possible research topics to completion of this thesis. His support and advice during the rough patches helped me to stay on this long journey.

I would also like to thank Professor Paul Dunmore for his valuable help in facilitating the agreement between Massey University and the participating firm as well as advice on the financial aspects of this study.

My thanks to various persons in the firm that agreed to participate in this study. Their co-operation enabled me to get access to all relevant data. Without this willing participation it would not have been possible to research this topic.

My gratitude to Massey University for the assistance provided through the Advanced Degree Award. The relief from teaching responsibilities were of great assistance in making significant progress.

A special note of appreciation for the support and encouragement received from my family. Jayshree, thanks for your help in formatting the thesis as well drawing some of the diagrams in Visio.

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# **Chapter 1 Introduction**

## **1.1 Background to Research**

The use of financial measures to assess the impact of marketing actions has found increasing acceptance in academic literature and professional practice and has been termed the ‘quiet revolution’ by Srivastava, Shervani and Fahey (1998). This trend has increased over time to include aspects such as the marketing orientation of firms as a construct to assess the impact of marketing activities on corporate performance (Maclaran, Saren, Stern, & Tadajewski, 2009), and the development of other concepts such as customer equity (Blattberg & Deighton, 1996; Libai, Narayandas, & Humby, 2002) to capture the cash flow generating potential of marketing investments.

The actual measurement of marketing performance using appropriate metrics has evolved beyond contentious issues such as universal or ‘silver metrics’ for this purpose. Past contenders for such a metric include Return on Customer, Return on Investment and variants of discounted cash flow such as Customer Equity or Customer Lifetime Value (Knowles & Ambler, 2009). The search for ‘silver metrics’ was not pursued as metrics represent the milestones in a firm’s strategic path and are in turn linked to the underlying business model that links the use of resources with performance (Knowles & Ambler, 2009).

From a practitioner’s perspective there has emerged a strident call for more responsible action by managers that involves ‘measurement and accountability’ (Farris, Bendle, Pfeifer, & Reibstein, 2010). In business markets, characterised by a small set of customers who are served through a relationship marketing approach, responsible action may imply returns obtained from each customer need to be assessed carefully to determine performance. One of the financial measures for assessing performance is individual customer profitability.

Assessing the profitability of each customer has also evolved from simply adding up the profits accrued from product sales. The need to expand traditional product-based profitability measures to include customer profitability assessment was given impetus by the work of Kaplan and others (e.g., Cooper & Kaplan, 1988). Acceptance of the need to measure customer profitability as an important metric for marketing and firm performance assessment has increased over the years. Academic research has covered different facets of customer profitability and the strategic impact of this metric to assess marketing actions as well as a firm's overall performance. From a broader perspective, the use of customer profitability, together with other financial measures, to assess and communicate marketing's contribution to the firm and shareholder value creation, addresses an important academic debate on the diminishing role of the marketing function in a firm's strategic decision making.

Customer profitability has been investigated by academics for its pivotal role in strategic marketing decisions regarding allocation of resources (Cardinaels, Roodhooft, & Warlop, 2004), improving productivity (Breffni, Noone, Peter, & Griffin, 1997) and building a portfolio of customers for the future growth of an organisation (Campbell & Cunningham, 1983; Yorke & Droussiotis, 1994). The relevance of addressing customer profitability, rather than traditional measures of accounting or product profitability, first attracted attention in the mid-1980's in professional journals of management (Shapiro, Rangan, Moriarty, & Ross, 1987) and management accounting (Howell & Soucy, 1990), and in academic accounting journals (Foster & Gupta, 1994). The services marketing literature stream has also examined various facets of service quality and its linkage with customer profitability or economic worth of customers (Zeithaml, 2000). In the area of business markets, customer profitability measurement issues and the variables that influence it have been the focus of recent studies (e.g., Niraj, Gupta & Narasimhan, 2001; van Raaij, Vernooij & van Triest, 2003). However, the number of empirical studies is few and only some factors that affect customer profitability in business markets have been identified.

One phenomenon noted in various studies on customer profitability is the wide dispersion in customer profitability. This phenomenon was first highlighted by Cooper and Kaplan (1991) when making the case for accurately tracking organisations' resource usage. Cooper and Kaplan (1991) supported this with the example of Kanthal, a wire manufacturer, where 20% of customers were generating 225% of profits; 70% were around breakeven and 10% of customers were contributing to a loss equivalent to 125% of profits. In the services area, Storbacka (1997) reported that 10% of the customers in a bank accounted for 100% of the profits, though a lower degree of concentration (50%) was reported in a New Zealand bank context (Garland, 2002). In business-to-business markets, empirical studies involving clear specifications for calculating individual customer profitability reported similar skewed distributions (Mulhern, 1999; Niraj et al., 2001; van Raij et al., 2003).

The possible reasons for this profitability variation have been attributed to customer characteristics such as demographic profiles, or to behaviour such as loyalty. However, both represent a limited view since customer characteristics could be viewed as a profile of customers representing the desirable outcome, whereas loyalty as a predictor of profitability has been variable, especially in business markets (Reinartz & Kumar, 2000).

To investigate the reasons for the skewed variation in customer profitability, Mulhern (1999) suggested that future research should address factors that act as determinants of customer profitability and factors that determine the degree of disparity of profits across customers. Sanders (2005) used a structural model to demonstrate the pathways through which sales value as an antecedent influenced customer profitability, and Niraj et al. (2001) developed and tested a generic model to identify the factors that determine customer profitability. Thus, to some extent, the factors that determine or underlie customer profitability have been investigated. However, to understand possible variation in profitability other factors may need to be examined. Mulhern (1999) argued that, while profitability is obviously an outcome of prices, unit costs, unit

volume, purchase frequency and variable costs, there could be other, non-economic factors, such as tenure of a customer relationship and links with customer satisfaction, that are likely to be related to profitability.

Aspects of customer satisfaction and how long a customer continues to purchase from a seller, and ensuring that customers are satisfied in their dealings, are some of the key aspects that are focused on in the paradigm of relationship marketing. Researchers in the service stream have attempted to demonstrate the link between customer satisfaction and profitability using the Service Profit Chain (SPC) link model, but the results have been contradictory (Bowman & Narayandas, 2004). Only one study has attempted to extend the SPC link model to business markets, but with only a few elements considered for both customer profitability and relationships with customers (Bowman & Narayandas, 2004). Mainstream research into business relationships has tended to evaluate various facets of a business relationship, with outcomes based on rating scales, even for financial dimensions, rather than on profitability based on accounting data. Only a few studies have attempted to use financial data, but these have employed simple measures such as gross margin, or focused more on aspects such as estimating the lifetime value (see Chapter 2 for a more comprehensive review of the extant literature). Thus, there is a gap in the literature with regard to whether customer profitability variation in business markets is linked in any way to the business relationship with a customer and, if it exists, the nature of this link.

## **1.2 Research Question**

The main focus of this research was the following question:

Is the nature of the business relationship with a customer in a business market linked to customer profitability?

The research was deemed worth pursuing for several reasons. It attempts to address a gap in the literature resulting from the fact that there is a large body



of knowledge on business relationships and empirical evidence for the wide dispersion in customer profitability, but no reported attempts to investigate whether there is a link between relational development efforts and customer profitability.

If this link is established, it may provide some insight into whether customer profitability variation is a cause or an effect of the nature of business relationships. Additional questions that may be answered include the best way to represent the nature of business relationships. Understanding interactions between the variables concerned may also provide pointers to which of the relational dimensions are more important with regard to profitability variation, so that efforts to reduce this variation could be implemented in a more systematic manner.

From a practitioner's perspective, understanding the nature of the link may provide some guidance on managing different facets of it so that overall profitability is improved through a reduction in profitability variation. It may also facilitate decisions on developing a portfolio of customers that balances returns and risks arising out of the wide dispersion in customer profitability.

To answer this research question, an empirical study was conducted with a participating firm that was operating in business markets and was willing to provide access to relevant financial data for computing customer profitability. The nature of the link between customer profitability and the firm's business relationships was hypothesised on the basis of a theoretical model using constructs drawn from extant theories of business relationships. Customer profitability was computed using actual financial data and estimates of other resources the organisation used to provide the required services to customers. The model was tested using structural equation modelling and conclusions were drawn about the relevance of the hypothesised constructs, interactions between them and their link to customer profitability variation.

Due to the confidentiality agreement with the participating firm, details regarding the firm such as size, nature of industry, product details number and position of persons interviewed are not provided in the thesis.

### **1.3 Thesis Structure**

The thesis is structured along the following lines.

Chapter 2 outlines the various approaches used to measure customer profitability and focuses on specifics of the research problem with regard to the wide dispersion in customer profitability, financial determinants and non-financial dimensions of customer profitability.

Chapter 3 outlines the theoretical frameworks used to investigate business relationships and to assess the suitability of the various approaches to addressing the research problem identified for this study.

Chapter 4 integrates the measurement approaches used to assess customer profitability with methods used to assess the nature of business relationships and proposes a comprehensive theoretical framework to address the research question. Drawing on extant literature, a set of hypotheses is proposed as a basis for assessing how customer profitability variation may be linked to the nature of business relationships with customers. A brief overview of the methodology used to test the model is outlined, along with confidentiality of information specific to this research resulting from the use of commercially sensitive data.

Chapter 5 provides details of the process used to collect relevant financial information from the participating firm and the steps adopted to process the data to arrive at the profitability of customers selected for this study. Measures of the aggregate level customer profitability are provided and compared with existing studies. Additional analysis included isolating individual components

of customer profitability and their contribution to the observed variation. These components are integrated in a detailed model of customer profitability.

Chapter 6 focuses on the methods used to collect survey data for assessing the nature of the business relationship with each customer. Steps to clean the data and address non-response are outlined. Characteristics of the constructs used to assess the nature of the business relationship with customers are discussed.

Chapter 7 focuses on the structural equation modelling approach used to test the theoretical model that links constructs representing the nature of the business relationship and customer profitability. A confirmatory factor analysis was conducted on the latent constructs used to represent the components of the nature of business relationships and customer profitability. Post hoc exploratory analyses were undertaken to arrive at a model that represented the data well and exhibited good reliability and validity. The updated measurement models were then incorporated in a structural model to assess which of the proposed hypotheses were supported.

Chapter 8 discusses the contribution the research makes to understanding the nature of the link between customer profitability variation and efforts to maintain business relationships. The integration of multiple theoretical frameworks for representing multiple facets of a business relationship and implications for future studies are outlined. The chapter also discusses the limitations of the study and outlines suggestions for future research on the understanding of the interaction between customer profitability variation and the nature of business relationships.

## **1.4 Summary**

The use of financial measures to assess marketing performance has found increasing acceptance in marketing literature. In business markets, one phenomenon reported in a number of empirical studies is the wide dispersion

in customer profitability. The nonfinancial reasons for this dispersion have not been investigated and represent a gap in literature that is worth investigating. An outline of the thesis provides an overview of the process adopted to address this gap.

## **Chapter 2 Customer Profitability**

### **2.1 Introduction**

Research into profits, profitability and related concepts are usually viewed as falling in the domain of accounting and finance disciplines. Hence, research that attempts to investigate customer profitability from a marketing perspective requires some background to explain the context of the research and the rationale for adopting a cross disciplinary approach.

This chapter first outlines the evolving research stream in marketing that attempts to integrate financial theories and concepts into marketing frameworks. The context of customer profitability in this evolving stream is explained, followed by clarification of some key terms, to avoid the confusion over their use in some journal articles. The empirical studies in this area are outlined and their implications for the research question articulated for this study are discussed.

### **2.2 Overview - Financial Concepts in Marketing Literature**

The general disconnect between marketing strategies and results expressed in financial terms has been highlighted by many researchers (e.g., Moorman & Rust, 1999). However, attempts have been made to bridge this gap over the last 10 years.

The impetus for linking financial outcomes to marketing actions and strategy may have been triggered by the broader acceptance of financial concepts such as shareholder value increase theory in strategy literature and the need to demonstrate that marketing contributes to shareholder value increase through the creation of intangible assets (Rappaport, 1988). Another possible influence is the political dimension of the diminishing role of marketing in the corporate

hierarchy due to a perceived lack of accountability and, as a consequence, the research generated into ways of bridging this credibility gap.

The integration of financial concepts in marketing theory started with the conceptual frameworks proposed regarding the contribution of marketing to an organisation's strategic direction through creation of strategic assets (Day & Fahey, 1988). Day and Fahey's work could be viewed as an attempt to link the creation of marketing assets to the concept of shareholder value addition proposed by Rappaport (1998). Rappaport (1988) argued that the primary task of management is to increase the wealth of shareholders in the organisation and that all actions of the firm should contribute to this end. This focus on increasing shareholder wealth (or shareholder value) was considered as a possible comprehensive metric to assess the value of marketing actions and marketing assets, with the proviso that to be relevant to marketing practice there was a need to link it to non-financial measures of marketing effectiveness, such as sales and market share (Rust et al., 2004).

The perspective of marketing's function as creating intangible assets has resulted in the development of a range of related concepts such as customer equity, brand equity, and customer relationship value, to name a few. With the introduction of the assets perspective, this research stream extended investigations into various facets such as measuring returns on assets from marketing actions (Chiquan Guo & Jiraporn, 2005), creating a portfolio of assets (Ang & Taylor, 2005; Dubinsky & Ingram, 1984; Eng, 2004), assessing the riskiness of the assets (Ryals, 2002; Tarasi, Bolton, Hutt, & Walker, 2011) and moving further at an aggregate level to link stock market valuation of a firm to marketing actions (Bolton, 2004; Sunil Gupta, Lehmann, & Stuart, 2004; Pauwels, Silva-Risso, Srinivasan, & Hanssens, 2004; Srinivasan & Hanssens, 2009).

The integration of financial theory is being further expanded, especially with the notion of efficient markets, to marketing actions with stock market valuation changes, as proposed by Srinivasan and Hanssens (2009). This

convergence in research has created increasing awareness among researchers in the finance and accounting discipline of the need to integrate some of the concepts and approaches developed in marketing literature into areas of accounting/finance practice and research (Kimbrough et al., 2009; McManus & Guilding, 2008).

One of the major political debates among marketing academics has been the decline in marketing's influence in the organisation (Doyle, 2000; Verhoef & Leeflang, 2009, 2010). This decline has been attributed to the lack of accountability for the expenses incurred and the inability of marketing managers to demonstrate productivity in financial terms (Sheth & Sisodia, 1995). This inability to be accountable for marketing actions has prompted some researchers to comment that:

“misguided marketing strategies have destroyed more shareholder value.....than shoddy accounting or shady fiscal practices”

(McGovern, Court, Quelch, & Crawford, 2004, p. 70).

Using financial information to support marketing decisions, thereby making the marketing function more accountable for contributing to shareholder value, was proposed by Doyle (2000) as a way to reverse the perceived lack of credibility of the marketing function in an organisation (Rust, Ambler, Carpenter, Kumar, & Srivastava, 2004). The Marketing Science Institute also recognised the need to research appropriate metrics that would more accurately reflect marketing's contribution and help marketing professionals make more informed decisions. Bringing to centre stage the failure of both researchers and practitioners to articulate the contribution of marketing to the firm may have been the impetus for the large increase in research using financial outcomes as one measure of marketing productivity and contribution. Another consequence was the emergence of integrated guides to marketing practitioners on the need for developing an appropriate ‘dashboard’ of metrics to assess performance (Koen et al., 2009), and books that provide relevant

metrics and guide the process for selecting the appropriate ones (e.g., Farris, 2010).

### **2.3 Customer Profitability – Relevance to Marketing**

Just as the asset perspective was used for assessing the long-term impact of marketing actions, the concept of profit was also modified and adapted to reflect marketing actions more accurately. This follows from one of the fundamental changes in marketing theory and practice, namely, the increasing focus on the customer rather than the products of the organisation as the key source of the organisation's wellbeing (Doyle, 2000). An important metric for facilitating this process is customer profitability.

Customer profitability measures help in ascertaining the extent to which marketing strategies have been effective, if there is a relationship between customer related costs and profitability, and the extent to which customer profitability improvements have led to increased shareholder value (Jacobs, Johnston, & Kotchetova, 2001). The asset and long term revenue generating perspective has resulted in a number of researchers using Customer Lifetime Value (CLV) as the appropriate metric to measure marketing's outcome (Berger, Weinberg, & Hanna, 2003; Jain & Singh, 2002). Many researchers in marketing emphasise the importance of this 'forward looking' metric to overcome possible distortions when assessing profitability based on shorter time spans. Initial support for this view was provided by Reichheld and Teal (1996), who showed that long term customers were more profitable.

CLV features as a central construct in a large stream of research covering the basis for allocation of resources for customer acquisition, retention and maintenance, and strategies to improve firm profitability and determine marketing actions for optimal results (Hogan et al., 2002; Kumar, Venkatesan, & Reinartz, 2008; Pfeifer, Haskins, & Conroy, 2005; Venkatesan & Kumar,



2004; Venkatesan, Kumar, & Bohling, 2007). Other aspects of CLV research cover forecasting the time that a customer will stay with a firm and the volume of business that is likely to be generated (Fader, Hardie, & Ka Lok Lee, 2005; Glady, Baesens, & Croux, 2009; Ya-Yeuh Shih & Chung-Yuan, 2003). CLV has also been promoted as the most appropriate way to measure a firm's value and to serve as a benchmark to assess shareholder value addition (Sunil Gupta, et al., 2004; Sunil Gupta & Zeithaml, 2006). Despite this varied body of research into CLV and its implications, a shortcoming in most of the research is the simplistic approach used; for example, using gross margin as a substitute for current customer profitability. A more accurate measure of current profitability for most customers will provide a more accurate CLV calculation as current profitability is one of the key inputs used in different calculation methods (Jain & Singh, 2002).

Implicit in the CLV model is the accurate assessment of the lifetime of the customer and the assumptions that retention efforts lead to benefits from a loyal customer base and that long-term customers are profitable. However, benefits from loyal customers may be context sensitive and their existence has been questioned (Dowling & Uncles, 1997). Research in business markets has shown that long-term customers have lower profitability due to a 5% to 7% lower price realisation, depending on category, compared with new customers (Reinartz & Kumar, 2002).

The attempt to assess customer profitability changes over time and linking them to marketing strategies and tactics is crucial in increasing marketing productivity from a given customer base (Ang & Taylor, 2005). The process of setting up a system to accurately measure customer profitability (Cooper & Kaplan, 1991) will also help an organisation understand the needs of customers and develop marketing and negotiation strategies for more favourable outcomes (Shapiro et al. 1987; Noone & Griffin, 1997; Smith & Dikolli, 1995). Despite the documented usefulness of measuring customer profitability, including the process of setting up a system to measure it, very few organisations assess customer profitability on a regular basis. This could

be due to the need to modify traditional accounting practices, which are oriented towards product-focused measurements. This will be discussed in a subsequent section. Considering the growing importance of customer profitability, section 2.4 will attempt to formalise a definition of the term.

Thus, for the reasons discussed, research in marketing has evolved significantly over the last 10 years, with increasing emphasis on using financial metrics to assess marketing actions and to demonstrate marketing's contribution to the firm. Despite the progress made, many aspects are yet to be delineated and a number of methodological issues are yet to be addressed. Some of these issues will be discussed in the following sections.

## **2.4 Customer Profitability - Definition**

Any attempt to define customer profitability needs to take cognisance of the different disciplines and investigation approaches that can influence the definition and use of this term. This section will examine the various interpretations of the term 'customer profitability' in academic literature and the rationale for the different perspectives, and provide a working definition of the term for this research.

There are varying definitions of the term 'customer profitability'. Mulhern (1999), in a review of literature on customer profitability, found that the terms used included lifetime value, customer lifetime value, customer evaluation, customer lifetime valuation, customer relationship value and customer equity. Mulhern (1999) added his own definition of customer profitability as the net dollar contribution made by individual customers to an organisation. The reasons underlying the different definitions could be traced to two important considerations for measurement, the time interval to be considered and what should be included under costs and revenues/benefits accruing to the organisation.

The unit of time used for measuring profitability could be based on the traditional accounting approach of using a calendar year or other shorter interval. Underlying this measurement approach is the assumption that all efforts of the organisation result in immediate returns and are fully realised in the defined period. On the other hand, many researchers question this assumption as marketing and other organisational efforts targeted at customers are in the nature of investments, and benefits accrue over multiple time periods, even if all the costs are incurred in one short, defined time period. It is argued that not considering the longer term pay-offs will seriously undervalue such investments and may lead to a short term orientation, resulting in possible adverse consequences in the long term. The various approaches to assessing long term profitability, represented conceptually as mathematical formulae, are outlined in the paper by Berger and Nasr (1998).

The arguments for using customer lifetime value are relevant and this may be the correct approach when the task is an examination of resource allocation/investment and assessment of its possible consequences. For the purposes of this research, the phenomenon to be investigated is the spread of customer profitability at a point in time and is not concerned with decisions of resource allocation or profitability optimisation. While there would be influences from past investments, it appears appropriate to use a specific time-period to compute profitability, as the issue being addressed is the dispersion of profitability at a point in time. Further, knowing the current profitability of a customer is a pre-requisite to calculating their future contributions and worth to the organisation (Mulhern, 1999; Niraj, Gupta, & Narasimhan, 2001; Smith & Dikolli, 1995). This could then form the basis for further development and integration with other research streams addressing the optimisation of resource allocation, as discussed under CLV research.

As indicated earlier, the multiplicity of interpretations and the resulting confusion in the terminology used with regard to customer profitability has led some researchers to observe that:

....there is an unhealthy amount of confusion today over the meanings of two of the most important terms in interactive marketing: *customer lifetime value and customer profitability*

(Pfeifer, et al., 2005., p. 11)

To avoid confusion and preserve consistency with the terminology in the accounting discipline, the definition adopted for this study will be the one provided by Pfeifer, et al. (2005, p. 14).

*Customer profitability is the difference between the revenues earned from and the costs associated with the customer relationship during a specified period.*

This definition of customer profitability is almost identical to the one used by Niraj et al. (2001).

## **2.5 Customer Profitability – Measurement Approaches**

The importance of an accurate measurement of a customer's contribution to a seller's overall profitability is well recognised in academic literature (Mulhern, 1999). However, methodologies in this regard have had to overcome the limitations of traditional accounting approaches. A brief discussion of relevant aspects will provide the background to the options for collecting data for computing profitability of a specific customer that more accurately reflect the return to the organisation after considering the true costs incurred to service the customer.

### **2.5.1 Profitability - Traditional Accounting Approaches and their Shortcomings**

The term profitability itself has been the subject of debate over how it is to be measured. Ryals (2002) indicated that profitability as an accounting concept is often flawed because customers considered profitable might in fact contribute to erosion of shareholder value. Cooper and Kaplan (1992) demonstrated how newer approaches to accurately track the use of resources can result in many products being identified as a loss to an organisation. These newer approaches are designed to overcome shortcomings in cost data based on traditional accounting approaches.

Traditional approaches to calculating customer profitability based on product costs may be inappropriate due to the methods adopted for overhead allocation (Seppanen & Lyly-Yrjanainen, 2002). Traditional accounting systems were developed for the manufacturing era, when product ranges were narrow and direct material and labour were the largest components of total cost (Cooper & Kaplan, 1988; Howell & Soucy, 1990). This is not true now. One reason for this is the lack of a causal relationship between the way in which overhead is allocated and the actual production process (Hughes & Paulson Gjerde, 2003b). Hence, using costs based on traditional overhead allocation models can provide a distorted picture and result in incorrect decisions, such as focusing on the wrong customers (Cooper & Kaplan, 1988; Lere, 2001).

From a resources perspective, costs calculated on a product/production basis take into account resources that are usually dedicated to a single product or process and are not applicable to a range of products (Foster & Gupta, 1994). On the other hand, the resources for serving customers can be more easily utilised with different customers (Connelly & Ashworth, 1994, cited in Seppanen, 2002). This implies that aggregation and allocation of costs such as marketing and customer service cannot be carried out in the same way as for manufacturing costs (Foster & Gupta, 1994). Apart from the specificity of resources, the reason why product costing would be inappropriate is that

meeting customer demands means performing different activities. Even if two customers require the same activities, the time demanded to perform these could vary between them. Therefore, service processes are different and have customer specific variations. This is not reflected in cost based only on product costs.

To overcome many of the shortcomings discussed above and to provide managers with an accurate estimate of the true cost of a product or service sold, activity based costing (Cooper & Kaplan, 1988, 1992) or resource accounting (Howell & Soucy, 1994) are now recommended as the correct approach.

### **2.5.2 Activity Based Costing (ABC) System**

Activity based costing systems are systems that estimate the cost of resources used in organisational processes to produce outputs (Cooper & Kaplan, 1992). To create a system for activity based costing Cooper and Kaplan (1988) provide guidelines on factors to be considered, which take into account the most expensive indirect resources, with an emphasis on consumption that varies across product or product type. Inputs to develop the system are obtained by examining the actual activity and by interviewing section managers on their experience with different activities and the usage of resource by the products or organisation processes. Activity costing involves charging the product or other processes based on the usage of a resource. Activity cost drivers for each activity (the ABC generalisation for an assignment or allocation base) represent the demand that outputs make on each activity (Cooper & Kaplan, 1992). A proper activity based system is usually developed using a team drawn from different functional disciplines (van Raaij et al., 2003).

Though the ABC system appears to have many advantages, its adoption by organisations is low. In a survey of organisations using different cost systems, it was found that only about 20% have adopted the ABC approach (Hughes &

Paulson Gjerde, 2003a). Further, most implementations covered only direct material, labour and factory overheads; only a few implementations had extended the system to cover R & D, sales, marketing and logistics. The cost and time involved in building an ABC system may have led to its abandonment by many companies (Kaplan & Anderson, 2004).

The setting up of an ABC system appears to be an involved and expensive process. The main issue appears to be the extensive effort required to ascertain the demand on various resources to arrive at activity cost drivers. Attempts at simplification of this process include the use of weight indexes in which an individual activity can be divided into different levels and weight indexes describing each level are determined as a basis for allocation (Seppanen & Lyly-Yrjanainen, 2002), building a two-tier activity based model comprising macro- and micro-activities (Smith & Dikolli, 1995), or using managerial estimates of the resource demands imposed by each transaction based on time (Kaplan & Anderson, 2004).

Customer profitability is most accurately assessed using activity based costing so that demands placed on the resources of the organisation are best reflected in the cost structure. Recent studies in assessing customer profitability have taken this approach (Bowman & Narayandas, 2004; Niraj et al., 2001; van Raaij et al., 2003).

To summarise, despite the complexities involved, an activity based costing system is the appropriate approach to computing customer profitability. The difficulties of setting up a full-fledged system can be avoided by using simpler approaches based on estimates, as proposed by Kaplan and Anderson (2004).

### **2.5.3 Definition of a Customer**

The specification of who constitutes a customer is an important consideration, as it has implications on the way revenues and costs are aggregated. Traditionally, a customer is a single legal entity and all revenues and

associated costs are aggregated to compute the profitability of this entity. This is appropriate as long as the customer is not geographically spread out and decisions regarding a customer are made at a single point. However, where customers are spread out over various locations across the world, as is likely in a multinational organisation, each location could be treated as a customer (van Raaij et al., 2003). In this research, a customer represents the legal entity that takes decisions on purchasing and enters into a contract with the selling firm for supplying specific products.

## **2.6 Empirical Research - Customer Profitability in Marketing Literature**

Since the initial work by Cooper and Kaplan (1988, 1992) to highlight the importance of ascertaining the true profitability of customers, much attention from various perspectives has focused on this aspect. Studies adopting a case study approach have investigated customer profitability in different organisations and industries. Accounting professionals and academics have investigated the various approaches to developing customer profitability systems with a view to improving the various shortcomings cited earlier (Kwon, 2002; Lawson, Hatch, Desroches, & Stratton, 2010; Marshall, 2002; Maynard, 2008; Michael, 2005; Miller, 2008; Payant, 2004; Sherratt, 2003; Zhang & Smith, 2006).

Customer profitability has also been investigated by marketing academics and some of the main studies are summarised in Table 2-1.



**Table 2-1: Main Findings of Empirical Research into Customer Profitability**

<b>Authors</b>	<b>Context</b>	<b>Cost components in profitability model</b>	<b>Findings</b>
Mulhern (1999)	Direct marketing-pharmaceuticals to physicians	Sales person's travel expenses, samples and direct mail.	-50% customer accounted for 95.5% of profits; top 35% customers accounted for 65.5% profits. -15% customers unprofitable.
Niraj et al. (2001)	Supply chain	Direct cost, logistics and all support costs determined based on Activity based cost system.	-Top 2% of customers by revenue accounted for 80% of revenues and profits. -32% of customers unprofitable.
Van Raaij <i>et al.</i> (2003)	Industrial cleaning services	Activity based costing used to identify cost pools and relevant cost drivers.	-Top 20% customers provide 93% revenues and 95% profits; top 1% customers contribute 50% revenues and 49% profits.
Bowman and Narayandas (2004)	Vendor in the processed metal industry	Two broad pools of cost - inputs to individual customer, access to shared services.	-31% of the customer relationships showed a negative operating margin. Operating margin (as % of sales) variation- max: 29.3; min:-17.5.
Van Triest (2005)	Business to business market- hygiene industry	Customer specific costs considered: product costs, logistics, targeted customer costs and allocation of sales and general costs based on customer market sector.	As a % of sales, firm profits was 28.2%, average customer profitability was 21.9% with a std dev of 23.8%. Using path analysis, customer size was shown to impact customer profitability indirectly, mainly through exchange efficiency.

Authors	Context	Cost components in profitability model	Findings
Niraj, Foster, Gupta and Narasimhan (2008)	Distributor in a supply chain	Activity costs developed based on following activity drivers: order processing, sales, delivery, expedited delivery, quality management, purchasing, and warehousing. Customer profitability computed for two consecutive years to track change.	Average customer profitability based on decile was: 90 <sup>th</sup> = \$4021; 50 <sup>th</sup> = \$60; 10 <sup>th</sup> = -\$1406. Profitability increased in the second year for largest customers but declined for the loss makers.  Satisfaction program seemed to improve profitability of larger customers who were already satisfied but made no difference to the smaller customers who were moderately satisfied.
Van Triest, Bun, van Raij and Vernooij (2009)	Company providing hygiene services; assessed impact of providing free equipment on customer profitability over four years	Customer specific profitability ascertained from revenues, product costs (based on transfer price), cost of equipment provided free and service mechanics time for visits (used as basis for allocating service department costs).	Targeted expense such as providing free equipment had a positive impact on customer profit from large customers but had no impact on smaller customers. Impact on large customers was attributed to retention that resulted in greater profits. Did not seem to help in developing new customers into larger profitable ones.

The studies by Mulhern (1999), Niraj et al. (2001) and van Raij et al. (2003) were focused on determining ways to represent in finer detail the elements that need to be considered to arrive at an accurate estimate of customer profitability. The other studies represent attempts at understanding customer profitability and its relationship with financial and non-financial antecedents.

The main conclusions that can be drawn from the studies summarised are the wide variation in profitability, the skewed distribution in customers' contribution to overall sales and profits, and the fact that customers with larger sales volume tend to have a significant effect on the contribution to the profits of the organisations (referred to as the sales volume effect). This sales volume effect has been attributed to the larger base available to spread the cost of transactions, but does not explain the significant variation in profitability, even among large customers (Niraj, et al., 2001). Hence, there may be other factors that contribute to observed variations in customer profitability. The research contributions of these papers will be discussed below with a view to identifying the areas that have not yet been explored.

Mulhern's (1999) study represents an important landmark because it was the first empirical study to determine individual customer profitability in a business-to-business market context with a clear specification of parameters involved in computing customer profitability. However, the customer profitability model used has limited generalisability because the research was conducted in a direct marketing context and only a few elements of cost were considered.

The reasons for the skewed distribution in profitability were not investigated by Mulhern (1999), but he suggested that future research should address factors that act as determinants of customer profitability and what factors determine the degree of disparity of profits across customers. Mulhern argued that while profitability is obviously an outcome of prices, unit costs, unit volume, purchase frequency and variable costs, there could be other, non-

economic, factors that are likely to be related to profitability. These include tenure of a customer relationship and customer satisfaction.

Niraj, et al. (2001) advanced research on customer profitability in two major areas: a generalised customer profitability model that was applicable in other business market contexts and specification of the factors that affect customer profitability. Their research established that customer profitability could be linked to four factors: volume, price/gross margin, complexity factors and efficiency factors. While the first two factors are applicable in all situations, the other two may be context dependent. Complexity factors refer to the number of orders, number of items, degree of product mix customisation, and number of delivery locations. These complexity factors contribute to higher customer service costs and lower customer profits. Efficiency factors refer to customer-specific factors that lead to cost savings. An example would be direct shipment of orders from manufacturer to the customer. In such instances, despite more effort required in terms of the processing and paperwork, less physical handling and storage is required. This results in lower service costs and contributes to higher customer profits.

Apart from demonstrating the existence of the skewed pattern in customer profitability, Van Raaij et al. (2003) examined the process of development, implementation and refinement of a customer profitability model in the organisation as well as its impact on strategies towards customers.

Bowman and Narayandas (2004) attempted to adapt the Service Profit Chain (SPC) model to a business market. Their analysis also attempted to look at differences between operating margin as a primary supplier and as a secondary supplier. The distribution patterns were similar in both the instances. Other noteworthy results were that, consistent with the predictions of the SPC model, a greater share of customer's wallet yields greater margins, other things being equal. Bowman and Narayandas also found that the contribution margin is higher for large volume customers, which confirms findings from other studies (e.g., Niraj et al., 2001). However, computation of the profitability of

individual customers appears to be somewhat simplified. Only two broad pools of costs are specified, inputs directly attributable to individual customers and providing access to shared services.

This restricted definition of costs adopted in Bowman and Narayandas' (2004) study was the customer margin, defined as revenue minus cost of goods sold minus sales and marketing expenses attributable to the customer. Thus, compared with the study by Niraj et al. (2001), important issues of logistic costs, complexity factors and the possible impact of efficiency factors were not considered. Hence, the computed customer margin, though indicative of the customer's contribution to the overall profitability, is not the same as customer profitability. This has also been pointed out by the authors in the limitations of the study, where they mention that activity based costing systems would enable costs related to support functions, such as billing, to be included.

Van Triest (2005) furthered the understanding of customer profitability by examining the relationship between customer size and customer profitability margin. The model used had five variables: customer size, product margin, exchange efficiency, support costs and customer profitability margin. Structural equation modelling was used to analyse the relationship between variables, specifically customer size and profitability margin. Van Triest found that customer size does not have a direct effect on margin, but operates through other variables, mainly exchange efficiency. Hence, the increased profitability margin of large customers is not the result of larger customers paying higher product margins or having fewer customer support demands. This to some extent reconciles the conflicting results of larger customers negotiating lower prices, with empirical studies consistently showing higher contributions to profitability by larger customers (Reinartz & Kumar, 2002).

Niraj et al.'s (2008) research represents the first serious attempt to investigate whether a specific marketing action, such as a customer satisfaction programme, resulted in improvements in customer profitability over time. The

key aspect of this study is that customer profitability was computed from a fairly accurate estimate of the use of the resources, based on activity drivers. The results seemed to indicate a clear differential response to the same initiative; the larger and more satisfied customers showed a clear improvement in profitability compared with the smaller and moderately satisfied customers.

Van Triest (2009) investigated the customer level profit impact of another specific marketing investment in the form of free equipment for use amongst business customers in the industrial hygiene market. Similar to the findings of Niraj et al. (2008), a differential impact was noted whereby the larger customers responded positively, resulting in improved profitability, whereas no improvement was noted for the smaller customers. This improvement was attributed to improved retention amongst large customers in response to the provision of free equipment. Chapter 3 will present some of the theoretical frameworks where provision of free equipment is akin to making relationship specific investments that facilitate relational exchanges and also increase switching barriers.

To summarise, the following points emerge from the empirical research into customer profitability: there is a wide dispersion in customer profitability reported in business markets; activity based costing provides a more accurate picture of customer profitability; turnover or customer size positively influences customer profitability, mainly through exchange efficiencies or through differential response, possibly due to closer business relationships; and customer characteristics such as tenure and share of wallet may also influence profitability.

## **2.7 Influence of Non-financial Factors on Customer Profitability**

Of the two questions raised by Mulhern (1999) about possible causes of the wide dispersion in customer profitability, it appears that factors that determine profitability have been addressed in a robust manner by the work of Niraj et al. (2001). Further, the pathways through which customer size impacts customer profitability have been demonstrated by Van Triest (2005). However, the second question, regarding factors that may contribute to the dispersion in customer profitability, remains largely unanswered, despite the various research attempts to examine factors that may be associated with profitability. Though Mulhern (1999) has speculated that this dispersion could be due to variations in factors such as customer characteristics or relationship with the customer, the question still remains as to how these factors impact on customer profitability. Some of the approaches used to address this aspect are discussed in the following paragraphs.

Researchers in the services research stream have attempted to develop models to link customer satisfaction to profitable outcomes, both at the aggregate firm level and at the individual customer level. Heskett, Jones, Loveman, Sasser Jr, and Schlesinger (1994) proposed the chain link model representing profitability as an outcome of satisfaction and loyalty. However, empirical attempts to establish the link have produced equivocal results (Bowman & Narayandas, 2004). One explanation for this is variation across industries (Anderson, Fornell, & Mazvancheryl, 2004). Although other research appears to indicate a lagged effect between satisfaction and firm performance (Guo, Kumar, & Jiraporn, 2004), the link with financial performance, though positive, varies significantly across industries.

Customer profitability in banks using the Service Profit Chain link model and attempts at extension of this model to business markets have provided important clues to additional factors associated with customer profitability,

such as customer characteristics, share of customer wallet, and duration of a customer relationship (Bowman & Narayandas, 2004; Garland, 2002, 2004). Specific factors relevant to business markets include factors such as tenure of representative, information exchange and tenure of sales representative (Bowman & Narayandas, 2004). Despite these contributions, especially the work by Bowman and Narayandas (2004), the overall framework suffers from the following shortcomings: a strong service orientation, which may not be appropriate for business markets, and an implicit assumption that customer satisfaction and long term loyalty lead to improved customer profitability, which is not necessarily the case in business markets. Another important factor is the relatively low focus on business relationship factors that are prevalent in business markets. Hence the customer satisfaction paradigm and related frameworks such as Service Profit Chain link model may not be appropriate for answering the question on the reasons for the variation in customer profitability in business markets.

Other researchers investigating customer profitability using business relationship constructs have tended to focus on customer lifetime value (CLV) and various facets of computing CLV and how CLV measures aspects of marketing. Customer life time computation covers aspects such as estimating the active customer base (Fader, et al., 2005), mean life time (Pfeifer & Bang, 2005) and determining the focus of offerings and communication resources to maximise CLV values (Duen-Ren Liu & Ya-Yueh, 2005; Venkatesan & Kumar, 2004).

However, none of the research in this stream has attempted to ascertain the current profitability of customers in a rigorous manner to serve as a base for forecasting anticipated lifetime values. The useful contribution of this research comes from the findings of researchers such as Venkatesan and Kumar (2004), who have identified some of the factors that may contribute to increase in lifetime values. Apart from marketing actions, recent research has attempted to demonstrate that improvement in CLV will contribute to increased shareholder value and stock market valuation (Kumar & Shah, 2009). Despite the



popularity of CLV, some researchers have warned of the difficulties inherent in arriving at an accurate value (Bechwati & Eshghi, 2005). Thus, research into CLV has not addressed factors that cause the variation in customer profitability in the current period.

## **2.8 Conclusions**

Marketing actions that create marketing assets increasingly use financial concepts as a metric to demonstrate the level of contribution to the organisation. Customer profitability is one such measure to gauge a customer's response to marketing efforts. Despite numerous empirical studies on customer profitability in business markets and recent investigations into the link between specific marketing programmes and their impact on customer profitability, one aspect that remains to be addressed is the wide variation in customer profitability in business markets. One of the suggested approaches to this phenomenon is to investigate aspects of business relationship characteristics such as age of the relationship, tenure of the sales representative and so on. This approach may prove worthwhile since relationship marketing as a field of academic enquiry has investigated various facets of a business relationship and may provide relevant constructs for a theoretical basis to research this phenomenon.

## **Chapter 3 Theoretical Frameworks for Investigating Business Relationships**

### **3.1 Introduction**

The interaction between a seller and a customer results in business transactions which may lead to long term business relationships if the parties desire it. The transaction as the unit of analysis has provided valuable insights into determinants of profitability, some of which are outlined in the empirical work on customer profitability (e.g., Niraj et al., 2001). However, to gain a better understanding of the possible reasons for the wide variation in customer profitability, the dynamics of the interaction between customers and sellers and the resulting transactions entered into may need to be considered. This approach is in line with the suggestions of Mulhern (1999), who proposed that variations in customer profitability may be the result of factors such as loyalty, length of relationship and customer satisfaction. These factors could be broadly grouped under the category of the nature of customer relations and have been the focus of a broad stream of academic enquiry into business relationships with customers.

Consideration of business relationships assumes that the interaction with a customer is of an on-going nature rather than a series of individual discrete transactions. The decision to conduct business transactions as an integral part of an overarching relationship, or to keep the interactions and transactions on an arm's length basis, rests with the interacting parties based on their respective expectations. A business relationship can be said to exist only when both parties are interested in pursuing it for mutual benefit. From a seller's perspective it has been shown that sellers who adopt a relational approach in their dealings with customers tend to have a higher profitability at a firm level than those who adopt a transactional approach (Kalwani & Narayandas, 1995). The significant body of research into various facets of business relationships supports the positive effects of relationship marketing on business performance (Palmatier, Dant, Grewal, & Evans, 2006a).

The decision to adopt a more relational approach is common in a business market setting as customers are fewer in number. Coviello, Brodie, Danaher and Johnston (2002) confirmed this by demonstrating that firms operating in a business market tend to adopt a more relational approach with customers as compared to those operating in consumer markets.

### **3.2 Business Relationships and Marketing**

The on-going interaction in business markets may lead to formation of links of different types for the purposes of enhancing efficiency and effectiveness. These links, both formal and informal, occur at the organisational and personal level and have been the subject of academic enquiry from various disciplines. Aspects of this enquiry from the point of view of the seller could be called the field of relationship marketing.

Numerous definitions of relationship marketing exist, but a comprehensive definition is: "relationship marketing occurs when an organisation is engaged in proactively creating, developing and retaining committed, interactive and profitable exchanges with selected customers or partners over time" (Harker, 1999; cited in Rao & Perry, 2002). This definition was arrived at after a review of 26 definitions in the literature, which on analysis had seven conceptual categories: creation, development, maintenance, interactive, long-term, emotional content and output. A common element in these definitions is the need for such relations to be profitable. However, empirical work relating the relational approach and profitable outcomes using financial measures are somewhat scarce. This shortcoming highlights the need for more work in this area.

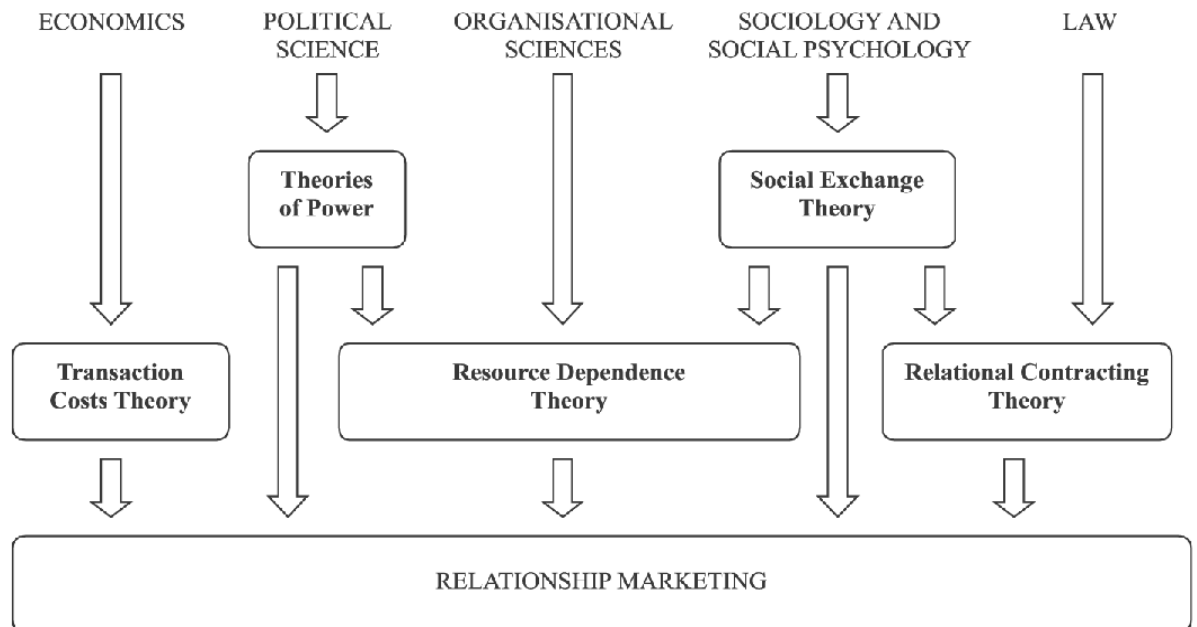
The advent of relationship marketing represents an evolution of research in marketing where the focus shifted to assessing relationships between customers and organisations instead of just the transactions. Payne and Holt (2001), citing previous work done, identified relationship marketing as one of the key developments of marketing and called it a paradigm shift in marketing

approach and orientation. One of the reasons given for this emphasis on relationships rather than on transaction based exchanges is that it explains marketing practice better than other approaches (Sheth & Parvathy, 2000; cited in Payne & Holt, 2001). Other researchers have questioned the notion of a paradigm shift and have expressed a range of views in this regard (Lindgreen, Palmer, Vanhamme, & Wouters, 2006). Nevertheless, academic research into business relationships has provided several theoretical frameworks for a systematic investigation of various facets of the interaction between buyer and seller and the consequences of this interaction.

### 3.2.1 Theoretical Foundations of Relationship Marketing Research

The main theoretical frameworks influencing academic research in relationship marketing have been drawn from disciplines outside marketing, as illustrated in Figure 3-1.

**Figure 3-1: Theoretical Frameworks in Relationship Marketing Research**



(Source: Eiriz and Wilson, 2006)

The following sections provide a brief outline of each of the theoretical frameworks, followed by a discussion of how they have been used in analysing business relationships.

### **3.2.2 Transactional Cost Economics (TCE)**

Transaction cost economics (also known as transaction cost analysis, or TCA) looks into basic issues such as why firms exist, the limits to the firm, specifically limits to vertical integration, with a view to minimising production and transaction costs by focusing on the transaction as the basic unit of analysis (Williamson, 1980; cited in Brennan, Turnbull & Wilson, 2003). The transaction costs include costs of negotiating, monitoring and enforcing contracts with external entities, costs of coordination and the costs or risks of power imbalances and opportunistic behaviour between firms (Eiriz & Wilson, 2006).

Transaction cost economies are realised through the selection of a governance structure that involves competitive assessment of discrete institutional alternatives - the classical market contract is located at one extreme, and a centralised, hierarchical organisation is located at the other. The middle ground comprises mixed modes of firm and market organisation. The focus on cost reduction in transactions implies efficiency, which in turn depends on asset specificity (i.e., idiosyncratic physical and human assets that a firm can use in transactions) and the choice of governance structures.

This approach led Noordewier, John and Nevin (1990) to view TCE as representing a normative model which implies that firms following its prescriptions will have better performance due to lower transaction costs than those that do not. The TCE framework has been used to investigate vertical integration decisions, foreign market entry strategy, sales force control and compensation, industrial purchasing strategy and distribution channel management (Rindfleisch & Heide, 1997).

One of the criticisms levelled at transaction cost economics theory is that opportunism drives customer behaviour even in relational exchanges. However, Berthon et al. (2003) argued that transactions would not occur, even where specific investments are made, if there was no mechanism or

governance device to instil some sort of trust between the parties in an exchange (Barney & Ouchi, 1988). Another criticism is the assumption of bounded rationality, since human beings are sometimes prone to opportunistic behaviour (Williamson, 1980; cited in Brennan et al., 2003). However, it has been argued that bounded rationality is a reasonable assumption as otherwise contracts would need to be specified completely (Brennan et al., 2003). This, as will be seen in the following section, is not done, nor is it feasible in a relational setting.

### **3.2.3 Relational Contract Theory**

Relational contract theory looks at how contracts are set up between parties in a relationship. Contracts represent one of the governance mechanisms used in business exchanges. Some of the underlying reasons for contracts are specialisation of roles, the element of choice in entering into a contract, and as a mechanism to reduce risk and uncertainty for both parties (MacNeil, 1980; cited in Lusch & Brown, 1996).

The nature of the exchange is likely to influence the type of contract. Discrete transactions are characterised by very limited communications and content, and the identity of parties in a transaction is ignored as otherwise relations intrude. On the other hand, relational exchange transpires over time and each transaction may be viewed in terms of its history and its anticipated future. Thus, the basis for future collaboration may be supported by implicit and explicit assumptions, trust, and planning. Hence, contracts may be classified according to content. One approach is that adopted in TCE, which distinguishes between classical, neoclassical, and relational contracting in business exchanges.

Classical contracts are complete and explicit and are enforceable by third parties in courts (Seshadri & Mishra, 2004). The neoclassical variety (including agency theory contracts) is complete but implicit and includes royalties, fees, expenses, profit-sharing and the like. Relational contracts are

incomplete and longer-term; they recognise problems of unverifiable outcomes and actions. Issues of sharing of information and verifiability of disagreements vary according to the type of contract. Despite the complexity in a business relationship that makes it difficult to verify outcomes, Mishra and Seshadri (2004) argue that the ability to use contractual forms of governance is crucial to enhance the scope of relationship marketing. The possible justification for this could be the uncertainty reduction role of contracts.

### **3.2.4 Social Exchange Theory**

Social exchange theory is one of the most influential theoretical frameworks used in investigations of business relationships. A large body of published work draws on the concepts and constructs of this theoretical framework.

In 1959, Thibaut and Kelly posited a theory of interpersonal relations and group functioning with a focus on dyadic relationships which, along with few other related works, have come to be known as social exchange theory (Anderson & Narus, 1984). The exchange relationship was analysed using a conceptual tool called the 'outcome matrix'. The outcome matrix showed the behaviours that each participant could enact and the resultant outcomes of such behaviour, dependent upon the behaviour of the other participant. The outcomes represented the rewards obtained and costs incurred by each participant from performing a particular behaviour. Power and its antecedents were considered explicitly in the framework. Subsequent refinements and enhancements to the outcome matrix include consideration of the psychological perspective of participants, information exchange through formal and informal communication to reduce interpersonal conflict and arrive at a compromise solution, and reduction in interpersonal uncertainty and co-ordination (Anderson & Narus, 2004).

Social exchange theory has been also been used to explain the dyadic nature of marketing transactions through use of other terms such as reciprocity, trust,

mutual adaptations, and exclusivity of relationships (Jancic & Zakbar, 2002). This theory formed the framework for explaining two fundamental processes in human exchange interactions - the process of friendship building and the opposite process of power relations (Jancic & Zakbar, 2002).

One point worth noting is that although conventional marketing did not consider the constructs of trust, reciprocity, mutual adaptations and exclusivity in the initial stages of development, they have been addressed by the IMP Group (e.g., Ford, 1990; Hakansson, Snehota, 1997; cited in Jancic & Zakbar, 2002).

### **3.2.5 Theories of Power and Resource Dependence**

Power can be defined as the ability of one party to influence the decision of another party, or a potential for influencing another firm's beliefs and behaviour (Frazier, 1983). The basis for one party's possession of power in a dyadic relationship lies in the other party's dependence and its need to maintain the relationship in order to achieve desired goals (Emerson, 1962; cited in Frazier, 1983).

In a business relationship, the structure of interdependency can influence behaviour (Lusch & Brown, 1996). If dependence is high and symmetric, both members exhibit relational behaviour, which in turn leads to less conflict. When dependence is unilateral, or one party has more power than the other, the weaker member may contribute more to the relationship than the stronger member, and the stronger member may make unilateral demands and be less flexible in outlook (Buchanan, 1992; cited in Lusch & Brown, 2003). The nature of the interdependency will also affect the nature and content of contracts in such relationships (Jap & Ganesan, 2000).

Power and conflict in channels has received much attention in marketing literature (Berthon et al., 2003). Power plays a role in various situations such as the development of operational linkages, providing channel training and



other areas of interest to the focal dyad. Power is obtained through the possession and control of resources that are valued by the other party (Stern & El-Ansary, 1992; cited in Berthon et al., 2003). These resources are the assets, attributes and conditions within a relationship that generate and represent each channel member's dependence on the other.

The important role of resources of an organisation and the impact they have on firms' ability to initiate and engage in relationships is the focus of resource dependence theory. This approach is based on the work done on power and social exchange, with implicit assumptions being rationality, competence and control over organisations' behaviour by concerned managers (Eiriz & Wilson, 2006).

Power dependence structures need to be differentiated from power strategies (Rokkan & Haughland, 2002). Even if relationships are symmetrical, this does not preclude actors from using power strategies, and this conclusion is supported by empirical evidence. In symmetrical relationships, there is more frequent use of non-coercive power strategies and less of coercive power strategies (Gundlach & Cardotte, 1994; Rokkan & Haughland, 2002).

### **3.2.6 The IMP (International Marketing and Purchasing) Approach**

The IMP (International Marketing and Purchasing) group conceptualised the interaction approach, which includes the development of long term relationships (Hakansson, 1982). The conceptualisation of the interaction process involves exchange episodes (short term) and long term relationships. The exchange involves product or service, information, financial and social dimensions. The long term relationships involve institutionalising adaptations that firms make to facilitate exchanges. The interaction process is influenced by the atmosphere between the firms, which could be characterised by power/dependence, cooperation, closeness, and expectations. At the broader level, the environment influences the formation and evolution of this interaction. Environment factors are market structure and dynamism, internationalisation,

position in the manufacturing channel and social system. Even though interactions are of a dyadic nature, there can be multiple relationships between buyers, suppliers and other firms, which are then aggregated into networks (Lindgreen, et al., 2006). The interactions form the basis for the future direction of the relationship. The dynamics of the interaction are influenced by the perceptions of past actions and intended actions of parties.

One of the important areas where the IMP approach diverges and challenges the other research traditions is the view of limited autonomy of players in a business relationship (Ford & Hakansson, 2006). This limitation to autonomy in decision making implies that relationship marketing cannot be viewed as a management technique for the individual manager to influence a relatively passive customer through the choice of appropriate marketing actions. This may be relevant in many business markets where the number of customers is low and the on-going nature of the interactions clearly defines the nature of the relationship. This also brings to the fore the other major difference with regard to evolution and state of equilibrium in a relationship. The IMP perspective views relationships as being stable with regard to the number of firms that are interacted with, with very little changing of partners, but great dynamics within each relationship played out over time due to interactions. In contrast, other theoretical perspectives view the possibility of changes in the number of firms selected for doing business with as high, with relationships developing and stabilising over a period of time.

The clear grounding of IMP in the business market area and the explicit recognition of the economic gain in relationships should logically have led to studies on profitability of relationships. However, this appears to be a relatively unexplored area by this school of thought. Thus, while the IMP perspective provides important insights into the dynamics of relationships between firms, it provides no relevant frameworks which could be used to examine the research question being examined.

### **3.3 The Appropriate Theoretical Framework for Business Relationships Research**

The preceding section discussed how theoretical frameworks have been used to investigate specific facets of a relationship. However, this specificity becomes a limitation when attempting to research and explain relationship development and evolution in a more comprehensive manner and is illustrated by the following comment:

....although each of these theoretical perspectives has spawned impressive research streams in marketing that are obviously focused on the input and desired output of relationships, marketing researchers have been frustrated in their attempt to use any single theory to explain the evolution of inter-firm relationships in industrial markets from initiation to maintenance. Consequently, scholars have been forced to crisscross paradigms.

Narayandas and Rangan (2004, p. 64)

A similar view point was expressed by Fink et al. (2007) when attempting to investigate the environmental context of both supplier and customer performance gains through relational exchanges. Fink et al. drew on four divergent research streams in the domains of organisation theory, marketing, strategic management and law.

The limitations of a single theoretical framework spurred researchers to adopt a more integrative approach. One of the pioneering attempts in this regard was the study by Cannon and Perreault (1999) that investigated the nature of buyer - seller relationships using a set of six 'relationship connectors' that reflect the manner in which business buyers and sellers interrelate and conduct commercial exchange. The six relationship connectors were: Information exchange, operational linkages, legal bonds, co-operative norms and relationship specific adaptations by the seller or buyer. Since the focus was on

the operational elements of relationships, social aspects of relationships that were not anchored behaviourally (e.g., trust, commitment, long-term orientation) did not come within the domain of relationship connectors.

Cannon and Perreault (1999) also stipulated four antecedents that could influence the relationship connectors - supply market dynamism, availability of alternatives, complexity and importance of supply. The outcomes were customer satisfaction and customer evaluation of supplier. Data was obtained from a cross-section of purchase managers in different industries. Conjoint analysis revealed that the relationship connectors could be used to identify eight different clusters of relationships which could be related to the way businesses interacted. These clusters ranged from a purely transaction oriented cluster to a relationship/partnership-oriented cluster. Using a stepwise determinant analysis, the antecedents were shown to have a clear influence on the relationship connectors. This empirical study, which used multiple constructs based on how companies set up and operate, demonstrated the utility of relationship connectors to clearly distinguish different types of exchange relationships.

Palmatier and other researchers attempted to carry out a systematic investigation of the various facets of business relationships in industrial markets with the aim of updating prior knowledge in the area and addressing some of the gaps in literature. A summary of this research is provided in Table 3-1. In a meta-analysis of business relationships to ascertain if a relational approach works, Palmatier et al. (2006) found that a seller's objective performance was directly linked to relationship investment. Further, relationship marketing efforts were found to be more effective when relationships were more critical to customers and relationships between individuals were more important than relationships between the firms.

**Table 3-1: Research by Palmatier and others on Various Facets of Business Relationships**

Study	Research aim	Methods/ data	Main findings
Palmatier, Dant, Grewal, & Evans (2006b)	Do relationship marketing efforts work? (Given the mixed results in earlier studies). Specifically, which RM strategies are most effective for building customer relationships? What outcomes are most affected by customer relationships? Which moderators are most effective in relationship –outcome linkages? How does the RM strategy – mediator – outcome linkage vary across different mediators?	Meta analytic framework	Relationship investment has a large, direct effect on seller objective performance. Objective performance is influenced most by relationship quality (a composite measure of relationship strength) and least by commitment. RM is more effective when relationships are more critical to customers (e.g., business markets) and when relationships are built with an individual person rather than a selling firm.
Palmatier, Gopalakrishna, & Houston (2006)	Linking customer-specific relationship marketing investments to short-term, customer-specific financial outcomes	Dyadic data on relationships. Commission earned as indicator of financial outcome.	Investments in social relationship marketing pay off handsomely, financial relationship marketing investments do not, and structural relationship marketing investments are economically viable for customers serviced frequently. Conceptualised relationship marketing as involving nested participants (customers, salespeople, selling firms).
Palmatier, Scheer, Houston, Evans, & Gopalakrishna (2007)	Does a firm's relationship marketing truly pay off by enhancing financial outcomes? Specifically, why do buyer relationships with the sales person and the selling firm have different effects and in what circumstances are such differences likely to occur?	Triadic data from matched buyer, salesperson, and sales manager. Financial outcome assessed as sales growth using sales data.	Buyer relationship quality with both salesperson and selling firm positively affect seller financial outcomes, but the effect of relationship quality with the selling firm is enhanced as perceived selling firm consistency increases.

Study	Research aim	Methods/ data	Main findings
Palmatier, Dant, & Grewal (2007)	Compared the relative efficacy of four perspectives for driving exchange performance (1) commitment and trust, (2) dependence, (3) transaction cost economics, and (4) relational norms. Also assessed how causal ordering among key inter-organisational constructs varied in the four perspectives.	Four years of longitudinal data. Financial performance assessed based on rating on sales growth, profit growth and overall profitability.	Parallel and equally important roles of commitment and trust and relationship-specific investments as immediate precursors to and key drivers of exchange performance. In markets with higher levels of uncertainty it may be productive to allocate more relationship marketing efforts and investments to exchanges. Proposed an integrated model based on resources-based view of the firm that integrated the four perspectives.
Palmatier, Scheer, Evans, & Arnold (2008)	1) what factors determine a customer's need for relational governance (relationship orientation); 2) what mediating mechanism captures the negative effects of relationship marketing on performance (exchange inefficiency); and 3) how does a customer's relationship orientation determine the effectiveness of relationship marketing, thus allowing for effective segmentation.	Industrial sales person dyad for a single product across industries.	Trust in the salesperson and exchange inefficiency both mediate the effect of relationship marketing on seller financial outcomes. In addition, customers' relationship orientation moderates the impact of relationship marketing on both trust and exchange inefficiency.
Palmatier (2008)	What other relationship attributes or mechanisms, in addition to relationship quality (trust and/or commitment) can account for relationship marketing's effect on performance?	Dyadic data across 446 business-to-business exchanges for manufacturer representative firms. Customer value was defined as commission earned.	Value generated from inter-firm relationships derives not only from the quality of customer ties (e.g., trust, commitment, norms), as is typically modelled, but also from the number and decision-making capability of inter-firm contacts and the interactions among relational drivers. Moderator analysis of customer characteristics suggests that increasing contact density benefits sellers that have customers with high employee turnover rates, whereas building relationships with

Study	Research aim	Methods/ data	Main findings
			key decisions makers generates the highest returns among customers that are more difficult to access.
Samaha, Palmatier, & Dant (2011)	Understanding how relationships are damaged is a critical component in building and preserving strong distribution channels.	Longitudinal data from a Fortune 500 firm and its channel members.	Perceived unfairness acts as 'relationship poison' by directly damaging relationships, aggravating the negative effects of both conflict and opportunism, and undermining the benefits of using contracts to manage channel relationships. At low levels of perceived unfairness, conflict and opportunism have small or even insignificant effects on channel member outcomes. Using contracts to manage channel relationships represents a double-edged sword that suppresses the negative effects of conflict and opportunism while aggravating the negative effect of unfairness.

To address the issue of different theoretical frameworks providing valid, but different perspectives on business relationships, Palmatier et al. (2008) set up a study to compare the relative efficacy of four theoretical perspectives in driving relationship performance. The perspectives represented by the main constructs were commitment and trust, dependence, transaction cost economics, and relational norms. Palmatier and his colleagues found that commitment and trust were equally important, along with relation specific investments, as key drivers of relationship performance. This prompted the authors to propose an integrated model based on the resources view to explain relationship performance.

Thus, any research that attempts to assess the impact of relational exchange beyond a narrow focus supported by the theoretical frameworks inevitably leads to overlap with other theoretical frameworks due to the need for relevant constructs to adequately represent the situation. Recent research adopts an approach involving constructs drawn from different theoretical frameworks to provide a better representation of business relationships.

### **3.4 Measurement of Relationship Outcomes**

The need to assess customer profitability was discussed in Chapter 2, along with research attempts to investigate some of the non-financial drivers or influencers of customer profitability. It would be logical to expect that with the overwhelming focus on relational approaches in business markets, objective financial measures of profitability would be used to assess the efficacy of relationship marketing as a strategy and to serve as a basis to improve returns from a customer. However, most of the research on relational exchange tends to use perceptual outcomes such as satisfaction, commitment, trust, purchase intention and so on. Even where profitability or another business parameter is the outcome, perceptual scales are used rather than financial measures (e.g., Palmatier, 2007). The few studies that have attempted to include customer



profit based on financial measures have tended to use simple measures such as average gross margins, or commission on sales (Palmatier, 2006, 2008; see Table 3-1). The exceptions, involving a more careful assessment of individual customer costs based on resource usage, have been outlined in Table 2-1 (page 21). Thus there is a very clear need to establish financial outcomes at the customer level as a result of adopting a relational approach.

### **3.5 Conclusions**

Relationship marketing is a common practice in business markets. Various facets of the complex business interaction between sellers and customers have been studied using well established theoretical frameworks. These frameworks have been shown to be relevant for investigating specific aspects of a business relationship. However, when the need arises to investigate a problem that may be the consequence of more than one facet of a business relationship, researchers have needed to borrow constructs from different theoretical frameworks to model the phenomenon. This has prompted researchers to attempt an integrated approach involving relationship connectors or the resource based view.

A notable shortcoming in extant literature is the relative scarcity of research attempting to evaluate relational outcomes using customer profitability as a measure, except in very simple proxy form. Hence, research into business relationships appears to have clear gaps. First, there is a need to examine business relationships with constructs that capture the multiple facets involved in a business interaction. Second, there is need to relate how relational exchanges impact on financial outcomes such as customer profitability that truly reflect usage of a firm's resources, rather than using perceptual measures or simple proxy measures.

## **Chapter 4 Synthesis - Customer Profitability and Business Relationships Literature**

### **4.1 Introduction**

This chapter focuses on developing a synthesis of the literature on customer profitability and relationship marketing presented in Chapters 2 and 3 to propose a theoretical model for investigating the research problem. Theoretical constructs drawn from extant literature form the basis of expected interactions between the constructs in the theoretical model proposed to meet the research objectives. An overview of the methodological approach and research design used to collect data for testing the model is presented.

### **4.2 Background**

A review of customer profitability literature indicated that wide variation in customer profitability is a common phenomenon in business markets, especially when the profits are computed more systematically by accounting for usage of various resources of a firm. While the determinants of profitability from a financial perspective are well established, the non-financial influencers are not well known. As Mulhern (1999) pointed out, to understand what causes or influences the wide variation in customer profitability, it may be necessary to look at other factors such as length of relationship. His pointers for future research included business relationship dimensions such as customer satisfaction and the extent of the match between requirements and product benefits, and the quantity and quality of communication (Mulhern, 1999, Table 4, p. 38). Since most of these non-financial aspects fall in the domain of relationship marketing, one of the basic

premises for investigating the research problem is the assumption that customer profitability variation is linked in some way to the nature of the business relationship with customers.

The research stream in relationship marketing is quite extensive, with multiple theoretical frameworks used to investigate various facets of a business relationship, as discussed in brief in Chapter 3. The two main gaps are that there is very little empirical research to link business relationship constructs with customer profitability and, in the few studies that have attempted to investigate this link, that customer profitability was estimated using simple proxies such as gross margin.

Based on the literature discussed in Chapter 3, it appears that capturing the multiple facets of business relationships requires constructs to be drawn from more than one of the established theoretical frameworks. Thus, the framework adopted by Cannon and Perreault (1999) was the starting point for this research, as relationship connectors are grounded in the way businesses are set up and operated, with a focus on behaviour. Moreover, the constructs have a good theoretical underpinning because their formulation was an attempt at integrating different theoretical frameworks (Cannon & Perreault, 1999). The relevance of the focus on behaviour, rather than intentions, is an emerging view of other researchers investigating the effects of marketing. For example, in the area of research on measuring marketing productivity, Rust et al. (2004) indicate that "... the most fertile area for research on customer impact pertains to how customer behaviour (rather than attitudes or intentions) responds to changes in marketing actions" (p. 84).

The possible shortcomings of using only relationship connectors to represent all facets of a relationship could be the view that they represent a static view of business interaction at a point in time, without considering the dynamics of how relationships evolve over time. This facet need not be considered for the current research as the primary aim is limited to one time period. However, how a business relationship has evolved over time to the current state is

covered because perceptions of the relationship integrate this dimension when any assessment is made of it. The relationship connectors represent the perceptions of people responsible for managing the different components of the relationship and therefore incorporate their views of relationship dynamics.

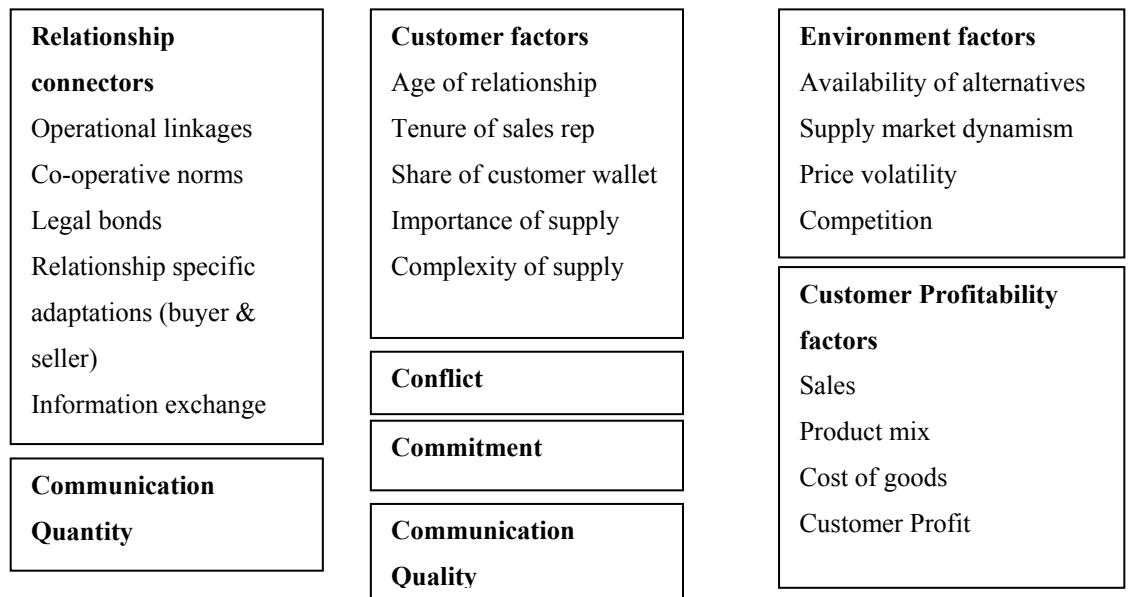
The nature of relationships is also influenced by competitive forces and how customers respond to customer specific factors highlighted by Bowman and Narayandas (2004). Other factors which could characterise the relationship with specific customers include the nature of communications between the parties, such as frequency, communication modes, quality and extensity of communication, and if conflict has occurred in the relationship. Commitment level is the last of the constructs for capturing the nature of a business relationship as it appears to mediate relational outcomes. The nature of relationships thus influences the main outcome, which is customer profitability.

Customer profitability as a construct draws on the general model proposed by Niraj et al. (2001) and has three main components: revenue, product mix and cost of goods. The cost of goods, apart from product costs, includes costs of other resources such as interest on overdue payments, documentation and other logistics related items as detailed in Chapter 5.

### **Constructs in the theoretical model**

The main constructs in the proposed theoretical model linking the nature of a business relationship with a customer and customer profitability are shown in Figure 4-1.

**Figure 4-1: Constructs in Theoretical Model**



The following sections discuss the variables in each of the constructs and the nature of effects reported in literature, which will then serve as the basis for a set of hypotheses regarding the nature of interactions among the constructs in the proposed theoretical model.

### 4.3 Relationship Connectors

Based on the work of Cannon and Perreault (1999), six variables have been used to capture multiple aspects of how businesses interact in their relationships. The variables are operational linkages, legal bonds, co-operative norms, information exchange, relationship specific adaptation by the seller, and relationship specific adaptation by the buyer.

#### 4.3.1 Operational Linkages

Operational linkages capture the degree to which the systems, procedures, and routines of the buying and selling organisations have been linked to facilitate

operations (Cannon & Perreault, 1999). At one extreme, the two organisations may operate independently and at 'arm's length', where there are no inter-firm routines and systems. At the other extreme, inter-coupled systems tend to specify rules implicitly or explicitly for both parties in the relationship.

Previous research cited by Canon and Perreault (1999) to support this construct cover: order/inventory replenishment including just-in-time delivery (Frazier, Spekman, & O'Neal, 1988), cooperative marketing programmes (J. C. Anderson & Narus, 1990), and 'technical bonds', which are interconnected technical or production processes as in the IMP view. These linkages facilitate exchange between parties or reduce transaction costs, and contribute to the creation of dependence and switching costs for one or both parties. In turn, the customer's dependence leads to predictability in demand, enables the vendor to plan better and thereby reduce their cost of transactions significantly, resulting in improved profitability of the customer.

#### **4.3.2 Legal Bonds**

Legal bonds are detailed and binding contractual agreements that specify the obligations and roles of both parties in a relationship (Cannon & Perreault, 1999). Such legal bonds go beyond the basic obligations and protections that regulate commercial exchange to provide a governance mechanism. Benefits of contracts include protection should something go wrong and regulation of the relationship by furnishing a plan for the future (Macneil, 1980). Legal bonds can thus be seen as mechanisms by which both parties hope to reduce uncertainty in the relationship and also to minimise the chances of opportunistic behaviour. The legal bonds may be explicit or general, depending upon nature of the relationship and other dimensions of a relationship, as discussed under interdependence asymmetry. The impetus to provide such mechanisms is likely to occur where both parties have a high stake, as in large volumes, or the relationship involves a complex supply arrangement that cannot be easily substituted by another vendor.

#### **4.3.3 Norms**

Norms reflect expectations that a buyer and seller have about working together to jointly achieve mutual and individual goals (Cannon & Perreault, 1999). However, Cannon and Perreault clarify that it does not imply one party's acquiescence to another's needs but rather that both parties behave in a manner that suggests that they must work together to be successful.

Development of norms reflects trust and moderates governance in commercial exchange. Norms are influenced by social cultural values and play a role in the trust building process (Doney, Cannon, & Mullen, 1998). Norms also play an important part in the market orientation of the firm that emphasises relational approaches and integrates norms into managing customer relationships (Day, 2000). Cannon and Perreault (1999) contend that norms in relational exchanges find support from a broad stream of theoretical and empirical research such as Macneil (1980), expectations of flexibility in response to changing conditions (Heide & John, 1992), and expressions of solidarity where preservation of a relationship is important (Kauffman & Stern, 1988).

Empirical evidence suggests that norms enhance the relational content of a governance structure containing contractual agreements, which in turn enhances performance when transactional uncertainty is high, but not when it is low (Cannon, Achrol, & Gundlach, 2000). Thus the impact of norms in a business relationship is to some extent dependent on environmental uncertainty.

#### **4.3.4 Information Exchange**

Information exchange represents expectations of open sharing of information that may be useful to both parties (Cannon & Perreault, 1999). More open sharing of information is indicated by the willingness of both parties to share important, even proprietary, information. The importance of the concept is

supported by the existence of related constructs across different theories such as TCE, social exchange theory and the IMP approach. In support, Cannon and Perreault (1999) cite the findings that free exchange of confidential information is a characteristic of more relational exchanges, and market failure occurs when information flow is impacted as communication is at the core of channel performance (Williamson, 1985; Mohr & Nevin, 1990). Thus information sharing, which is an essential component in communication, is a prerequisite for building trust (Morgan & Hunt, 1994) and increasing commitment in the relationship (Anderson & Weitz, 1992).

The presence of information exchange points to the possibility of a relational type exchange between parties together with the attendant expectations of behaviour (norms) and benefits. The benefits expectation include higher volume or share of a customer's business, while from the buyer's perspective, it may signal a willingness to negotiate price on the basis of being allowed a fair margin.

#### **4.3.5 Relationship Specific Adaptions (Seller &/or Buyer)**

Relationship specific adaptations refer to changes to process, product, or procedures specific to the special needs or capabilities of an exchange partner. This would include both one-time investments that might be necessary to conclude a particular transaction as well as gradual adaptations that might occur over time. Adaptations contribute to building switching costs (Jackson 1985), reflect an aspect of calculative commitment in business relationships (Anderson & Weitz, 1992), and are part of a trust building process (Hallen, Johansson & Sayed-Mohammed, 1991). Cannon and Perreault (1999) argue that while adaptations are considered in different ways in each of the theoretical perspectives, they have taken the approach proposed by the IMP Group. In this perspective, adaptations are seen as a characteristic of the relationship (Hakansson, 1982). Since adaptations require significant investments, they are more likely to be undertaken by the seller, especially if the customer is large and significant business is expected with its



accompanying benefits. However, such adaptations are likely to be complex in nature and thus have cost implications.

#### **4.3.6 Relationship Connectors - links to Commitment, Communication and Other Constructs**

The variables discussed above are expected to represent the different ways in which parties in business relationships actually behave and manifest degrees of closeness, but exhibit different profiles. This reflects Canon and Perrault's approach to portraying business relationships as multivariate profiles.

When parties are closely linked, as represented by the relationship connectors, one of the indicators of such links will be the large volume of communication that may take place between various people representing both parties. Further, closer links raise expectations with regard to correct and prompt flow of information leading to higher levels of quality in the communication. The close links and communication will thus reinforce the perceptions of both parties in the relationship that business will continue in the future for mutual benefit and will lead to higher levels of commitment to the relationship.

Based on the expected impact of relationship connectors, the following hypothesis is expected to hold:

**H1:** Relationship connectors will have a positive association with commitment.

### **4.4 Communication – Quantity and Quality**

Communication is one of the key components in various streams of relationship research literature. Morgan and Hunt (1994) viewed

communication as a major precursor to trust and for their study used Anderson and Narus' (1990) definition of communication as 'the formal as well as informal sharing of meaningful and timely information between firms' (p. 25). Morgan and Hunt argue that timely communication fosters trust by assisting in resolving disputes and aligning perceptions and expectations. Morgan and Hunt's views are consistent with the 'virtuous cycle' paradigm, where past communication is an antecedent of trust and, in subsequent periods, the accumulation of trust leads to better communication.

Communication can be viewed as a process between firms interacting in a relationship as well as between individuals in the firms. Other dimensions are characteristics of communication in terms of quantity, quality, type of communication and content, and the range of effects of communication on business relationships.

Communications in business relationships occur at the firm and at individual levels in the dyad for different purposes. Purposes of organisational communication are oriented towards task (job efficiency), maintenance (regulatory functions), and innovation (adapting) to face environmental changes (Holden & O'Toole, 2004). The purpose of communication and its content changes when exchanges between parties take on a relational role and communication between individuals in the interacting firms increases. The closer the relationship, the more relational (human) and innovative (involving joint planning and sharing of proprietary information) the message becomes, and the content also differs.

In market structures where interaction between parties is transactional in nature and not relationship oriented, communications would be formal, infrequent and limited to relevant transaction. In contrast, in a relational type exchange, communication would be frequent, both formal and informal, and involve exchange of considerable amounts of information with regard to relationship processes and joint planning. O'Toole and Donaldson (2000) argue that communication quality and patterns can distinguish between

governance structures as reported in other studies (e.g., Heide & John, 1992; Noordeweir et al., 1990). Communication quality can be examined using five dimensions: timeliness, completeness, credibility, accuracy and adequacy (Mohr & Spekman, 1994; Holden & O'Toole, 2004).

The selection of the type of communication and frequency depends on the nature of information to be shared as well as the cost of communication (Cannon & Homburg, 2001). Face-to-face communications allow for more customised communication and interaction to resolve complex and non-standardised problems, while routine problems are best resolved by less-rich modes such as telephone and written communications. However, face-to-face communication is more expensive than the other modes. Frequency is particularly important when there is involvement with the customer's operational activities and where innovations are required, such as product development (Cannon & Homburg, 2001). The choices made for the mode of communication and frequency may be crucial to managing a relationship and have an impact on the cost.

Communication between buyer and seller may involve more than one person from both parties, especially when a buying centre is involved or the parties are medium to large organisations. This dimension to communication has been termed as 'extensity' and contributes to the overall volume of communication that takes place between buyer and seller (Large, 2005). Thus the volume of communication between parties has dimensions of frequency between any two persons as well as the number of persons involved from both parties and can be represented by a construct termed communication quantity (Large, 2005). Communication quantity has been seen to have a positive impact on relationship quality and supplier performance (Large, 2005). This dimension of multiple level contacts between firms in a relational exchange has been extended in recent studies to include persons of influence in the decision making process, as this appears to have a direct effect on the supplier's performance (Palmatier, 2008).

#### **4.4.1 Communication – Nature of Impact on Business Relationships**

In a study grounded from a purchase perspective, communication quantity and quality had a positive impact on relationship quality as well as supplier management (Large, 2005). However, Cannon and Homburg (2001) argue that greater sharing of information does not always lead to better relationships or outcomes, because there could be information overload and there is always selective use of the information provided. Information sharing, especially sharing of confidential information, can be exploited in situations where a relationship is not well established and this can result in erosion of profit margins, but is not the case when there is a clear acceptance of an on-going relationship between the parties (Bowman & Narayandas, 2004). In a similar vein, frequent communication may point to a problem in the relationship which can be a drain on the resource, with some studies showing that when appropriate information is shared, relationships are successful without the need for frequent communication (Large, 2005). However, if relationships are not beneficial, firms may reduce the frequency of communication.

Different modes of communication used in a direct marketing context appears to have a curvilinear impact on outcomes based on sales increase and gross margins (Venkatesan & Kumar, 2004). The existence of a curvilinear effect for communication quantity points to the possibility of an optimal range beyond which the marginal returns are negative (Venkatesan & Kumar, 2004). However, in a relational exchange, frequency of communication, especially when there is openness in interactions appear to be indicative of the quality of relationship and may result in successful outcomes (Large, 2005).

Based on the arguments above, the following hypotheses are proposed for the constructs communication quality and communication quantity:

**H2a:** Communication quality will be positively associated with higher levels of commitment.

**H2b:** Communication quantity will be positively associated with higher levels of commitment.

## 4.5 Commitment

Commitment refers to what some researchers describe as an enduring desire to maintain a valued relationship (Doney & Cannon, 1997; Moorman, Zaltman, & Deshpande, 1992). Commitment is driven by value, and trading partners commit to a long-term relationship only if they believe they will derive some special long-term benefits. Long-term relationships will increase dependence and strengthen a relationship, thus increasing commitment (Ganesan, 1994).

Factors influencing commitment have been widely investigated in a number of contexts. In a channel set up, Anderson (1994) showed the commitment of one party being influenced by perceptions regarding another party's commitment, idiosyncratic investments, contractual terms and other factors such as communication level and relationship history. The critical influence of communication on commitment across different governance levels was investigated by Mohr, Fisher and Nevin (1996). Gundlach, Achrol and Mentzer (1995) investigated the proportionality of commitment in an exchange as one of the inputs to assess development of social norms and long term commitment intentions. They showed that opportunistic behaviour may arise when one party is less committed than the other.

The structure of commitment as a construct has evolved into a multidimensional component from a simple representation of 'intention' at a firm level in the initial stages (e.g., Anderson & Weitz, 1992). The need to view commitment as operating at two levels, the firm and personal level, was incorporated by Dooney and Cannon (1997) to investigate the impact of long term business relationships on commitment and other factors. In a meta-analysis of relationship marketing, Palmatier, Dant, Grewal and Evans (2006b)

found that relationship development efforts were more effective when relationships were built at a personal level rather than at the firm level. The structure of commitment in terms of its components is often assessed as comprising affective and calculative components (Gundlach, et al., 1995). Some researchers have argued that better predictability of behavioural intentions can be achieved when the two dimensions are represented explicitly, implying that the affective and calculative dimensions are independent (Gounaris, 2005). However, Sollner (1999) argued that even the affective component should be viewed as a calculative instrumental input since attitudinal inputs do not develop unintentionally over time.

Sollner (1999) has argued that commitment must be considered to explain the results of close relational exchanges taking into consideration risks and governance mechanisms. Similarly, Gounaris (2005) utilised commitment as an essential link between customer satisfaction and relationship development efforts using two specific inputs, perceived quality of service and customer bonding techniques. Palmatier (2008) used commitment, along with trust and norms, to represent quality of customer ties to explain the value generated from inter-firm relationships. Value generated was based on the commission earned from sales generated.

Thus, it can be seen that commitment is an essential construct that pulls together various dimensions of relational exchange with links to communication, dimensions of closeness in a business relationship and conflict. As reported in other studies, commitment will be a linking factor between the nature of business relationships and customer profitability. Commitment to a relationship may also be linked to the volume of business obtained from a customer measured as sales and the resulting profits, reflecting the calculative dimension to commitment.

The following hypothesis is proposed based on the arguments cited above:

**H3:** Higher profit levels will be positively associated with commitment.

## 4.6 Conflict

One definition of conflict is the following:

*Disagreements, frustrations, and tension between the parties of a working relationship which arise from the incompatibility of goals, aims, ideas, and values and aiming at one party deterring the other from gaining the resources or conducting an activity necessary for its own advancement*

(Leonidu, Palihawadana and Theodosiu, 2006, Table1, p. 150)

Conflict may occur at some point in most business relationships (Purinton, Rosen, & Curran, 2007). When conflict occur researchers recommend adopting a problem-solving strategy, preferably jointly with the partner for resolution (Ganesan, 1993). Reasons for conflict include hold-up potential or opportunistic behaviour when transaction specific investments are made by one party (Jap & Ganesan, 2000), use of harsh words in interactions, and asymmetry in power (Mohr & Spekman, 1994), and communication breakdown due to the use of inappropriate communication styles (Vaaland, 2006). From a purchase function view point, Humphreys, Williams and Goebel (2009) showed that adopting a supplier-oriented perspective helped to mitigate and avoid inter-organisational conflicts. However, recent research raises a note of caution on conflict resolution, as empirical evidence suggests that the reasons for conflict change as a relationship progresses through different phases of evolution and the use of conflict resolution approaches in each of these phases may not leave the desired relational characteristics in the relationship (Claycomb & Frankwick, 2010).

One of the implicit assumptions often made is that conflict affects performance of a business relationship. But empirical evidence suggests the existence of a more complex phenomenon. In a distribution channel context, Duarte and Davies (2003) found that level of conflict and efficiency as an outcome were best represented as a threshold model, where a linear inverse

relationship holds only below the threshold level, even though a linear model provided an adequate overall fit. Earlier theories had suggested that the relationship between conflict and channel performance follows an inverted U-shaped curve, where conflict is most productive at moderate levels and least productive at very low or high levels. In more recent research, perceived unfairness seems to be an additional dimension as it acts as a 'relationship poison' by aggravating the negative effects of both conflict and opportunism and undermines the benefits of contracts in managing channel relationships (Samaha, et al., 2011). However, at low levels of unfairness, conflict and opportunism appear to have minimal effect on relationship outcomes, indicating that the negative impact of conflict and opportunism are contingent on levels of perceived unfairness.

Considering the nature of conflict and the role of communication in mitigating its adverse consequences, the following hypothesis is proposed for the theoretical model:

**H4:** Higher levels of conflict will have an adverse effect on the quality of communication.

## **4.7 Customer Factors**

Customer specific factors may have a significant influence on customer profitability and need to be clearly specified (Bowman & Narayandas, 2004). The main variables selected to represent these factors are importance of supply, tenure of the sales person and share of customer wallet.



#### **4.7.1 Importance of Supply**

A buying firm's perception of the importance of supply on its operations and financial outcomes may influence its willingness to have closer relations with the supplier to secure and ensure smooth supplies. From the seller's point of view, this provides the opportunity to realise satisfactory price levels through reduction in discounting pressure, resulting in better profitability.

#### **4.7.2 Complexity of Needs**

The complexity of requirements of a customer can be viewed from the perspectives of the buyer and seller to assess its relevance and impact. Cannon and Perreault (1999) used this construct for ascertaining the customer's assessment of a supplier's capability to meet complex requirements as compared to other suppliers. Thus, complexity of supply needs could be one of the reasons for a customer to seek out a relational approach with a supplier to reduce uncertainty surrounding the sourcing of strategic materials and as a mechanism for reducing costs. From a seller's perspective, this complexity significantly increases the cost of meeting customer requirements, leading to reduced profit realisation (Niraj et al., 2001).

#### **4.7.3 Sales Person Tenure - Influence on Relationships**

As the primary person in the interaction between seller and customer, the sales person plays an important role in building trust and commitment to a relationship by the buyer. This central role of sales people was confirmed by Boles, Barksdale Jr and Johnson (1996), who concluded that salespeople play a central role in the evolution of quality business relationships. However, regarding the salesperson's contribution to building trust in a relationship, Swan, Bowers and Richardson (1999) concluded that the role of trust in a sales relationship is positive in nature but limited in magnitude.

Doney and Canon (1997) investigated commitment that could exist in a business relationship and proposed that it could exist at two levels, namely, at the firm level and between representatives of the interacting firms. At a personal level, the authors propose that buyers more dependent upon a given representative will be tempted to strengthen the relationship with the individual. One of the benefits of long-term relationships is the expectation of continuity. Continuity represents the number of years of association between trading partners (Goodman & Dion, 2001). Continuity leads to strong relationships as partners gain experience with each other, have an opportunity to learn about each other, adjust to each other's unique needs and develop new ways of generating joint value (Dwyer, Schurr, & Oh, 1987). In a similar vein, as personal continuity increases, personal commitment increases. In a business service context, empirical evidence showed buyers had strong bonds with persons with whom they have been associated longer (Doney & Cannon, 1997).

Thus, there are sufficient grounds to consider the influence of the sales person in the development and maintenance of relationships with customers. They may also play a key role in the communication of the organisation's offerings to its customers and in turn influence the organisation's understanding of customers, their needs and their strategy decisions as well as implementation of those strategies. Hence, other things remaining the same, the sales person's tenure in the organisation and with the account influences their knowledge of customer needs, expectations and behaviour. This in turn helps to maintain price and operating margins and facilitate business growth. Field investigations by Bowman and Narayandas (2004) have shown that tenure of account executive acts as a switching barrier.

#### **4.7.4 Share of Custome Wallet**

Share of customer wallet refers to the share the seller has of the customer's purchases of a particular category. In a banking context, it has been shown that one of the important characteristics of a profitable customer is the seller's

share of the customer wallet (Garland, 2002). In business markets, purchase from multiple vendors is done to ensure supply, encourage competition among vendors to keep prices in check, reduce reliance on a single party and thereby reduce risk (Bowman & Narayandas, 2004). Therefore, gains in share of customer wallet depend upon the seller's performance, availability of alternatives or non-performance by competitors. Empirical evidence has shown that, other things being equal, a bigger share of customer wallet yields greater margins (Bowman & Narayandas, 2004).

The importance of share of wallet has led some researchers to contend that instead of just focusing on volume of business generated by a customer, it is more important to know what share of a customer's business a firm has captured through a relational approach (Du, Kamakura, & Mela, 2007). This information should enable the crafting of appropriate strategies and development of incentives to persuade customers to switch from competitors. In a similar vein, Fink, Edelman and Hatten (2007) argue that the true test of a supplier benefiting from relational approach is an increase in the share of the customer's purchase that translates into increased sales.

Share of customer wallet along with frequency of purchase and quantity purchased were used as inputs in a regression model to guide marketing resource allocation that would maximise long term profits from individual customers (Thomas, Reinartz, & Kumar, 2004). This was, however, developed for a direct marketing environment and no attempt was made to explicitly represent relational exchanges.

Share of wallet, along with customer satisfaction and service quality, was used in a modified chain link and shown to be relevant for two outcome variables, customer retention and customer profitability (Larivière, 2008). The outcomes were based on longitudinal data spanning two years gathered from a financial services company's internal records. High share of wallet was found to be associated with higher levels of profits during the period as compared to customers with a low share of wallet. However Lariviere found that the

longitudinal relationship between share of wallet and profitability was nonlinear, with heterogeneity in profitability across customers significantly higher than the variability of the observed profitability values over time.

Thus, share of wallet can be considered an important characteristic of a customer that may impact on other relationship dimensions such as importance of supply and propensity for a closer relationship, especially in the presence of environmental uncertainty. Closer business relationships will also be manifested in terms of presence of relationship connectors that demonstrate this behaviour.

It is expected that the variables that represent various facets of the customer will demonstrate internal validity and load on the customer characteristic construct in a linear manner. The hypothesised interactions with other constructs are the following:

**H5a:** Customer characteristics will have a positive association with communication quantity.

**H5b:** Customer characteristics will have a positive association with communication quality.

## **4.8 Environment Factors**

Cannon and Perreault (1999) proposed a set of four market and situational antecedents that would influence their relationship connectors. The antecedents were availability of alternatives, supply market dynamism, importance of supply and complexity of needs. For this research, since importance of supply and complexity of needs refer to customer specific situations, they have been included as customer factors. The first two can be

seen as representing the external environment that a customer and the seller operate in and have been included for this purpose.

#### **4.8.1 Availability of Alternatives**

Availability of alternatives refers to the degree to which a buying firm has alternative sources of supply to meet a need (Cannon & Perreault, 1999). When many suppliers compete to sell compatible goods, the market becomes a ready source of information on prices and quality. Fewer suppliers or non-comparable goods may increase control of information flow by the seller and increase uncertainty for the buyer. The availability of alternatives will have a direct impact on price realisation and therefore operating margins.

#### **4.8.2 Supply Market Dynamism**

Supply market dynamism characterises the degree of variability or changes in a customer's supply market. The contributing factors could be short-term or long-term in nature, covering rapidly changing technology, price changes, and fluctuations in product availability (Cannon & Perreault, 1999). To the buying organisation, risks arising out of such conditions could provide the impetus for seeking a closer relationship with the supplier to reduce risk and uncertainty.

From a seller's perspective, supply market dynamism could represent an opportunity to build closer relations with a customer, which may lead to increased revenue through new products or a greater share of the existing business. However, this may be counterbalanced by increased costs to meet specific requirements.

The assessment of the market dynamism is based on the concerned manager's perception and information processing capability as well as knowledge of the customer's requirements, which in turn may be influenced by the length of relationship with the customer as well as the tenure of the manager handling

the customer (Bowman & Narayandas, 2004). Environmental turbulence, a concept similar to market dynamism, has been shown to improve relationship quality with customers when the level of turbulence is moderate to high (Johnson, Sohi, & Grewal, 2004). Since the original objective of the research by Cannon & Perreault (1999) was to classify relationships, this was specified as an antecedent to the relationship connectors. For this research, as the focus is on customer profitability, supply market dynamism has been specified as an environment variable, influencing the price and revenue that contribute to profitability.

#### **4.8.3 Nature of Effects - Environment Construct**

As an aggregate representation of the broad environment this construct is expected to have a significant influence on outcomes. In an empirical study on whether market share influences business profitability, Prescott, Kohli and Venkatraman (1984) found that the association between market share and business profitability was context-specific and that both direct and spurious relationships were observed, with their relative strengths varying across environments. Similarly, Fink, et al. (2007) recommended that environmental contingencies should be considered when evaluating supplier performance from closer relations as they have a major influence on a customer's decision based on the options available

Boulding and Staelin (1993) state that firms strive to increase market share based on the assumption that it can often lead to market power in the form of lower average costs. However, the firm's operating environment greatly moderates the effect of market share on average cost. In particular, Boulding and Staelin found that market share position only leads to lower average costs when the organisational unit operates in a competitive environment that gives it both the motivation and the ability to realise power from its market share position.

In contrast to the theme of increasing market share to the extent possible subject to environmental exigencies, Villanueva, Bhardwaj, Balasubramanian and Chen (2007) have a counter intuitive recommendation for firms operating in competitive environments. They recommend that if profits are to be maximized, then firms should ignore the future and instead maximize period-by-period profits from customers. Intuitively, while a long-term focus yields more loyal customers, it greatly increases short-term price competition to gain and keep customers. Consequently, overall firm profits and customer lifetime value may be lower when firms directly maximize multi-period profits from customers.

Thus, environmental factors have a significant effect on the propensity of customers to respond to a relational approach, the effectiveness of programmes to improve share of wallet and profits from customers. This suggests the following hypotheses:

**H6a:** Environment factors will have an adverse impact on revenue.

**H6b:** Environment factors will have an adverse impact on relationship connectors.

## **4.9 Customer Profitability Factors**

The main variables contributing to customer profitability are sales revenue, product mix, cost of goods and profit from each customer. The determinants of profitability were identified and clearly specified for a business market context by Niraj et al. (2001). Sales revenues cover quantities of the various products/services, unit price, discounts and other allowances. Cost of goods covers manufacturing costs and the costs of supplying the product (logistics related). Other context dependent issues could have an effect on the overall efficiency, and therefore the cost of serving the customer. The revenues and

costs aggregated over defined period of time enable computation of customer profitability during that period.

#### 4.10 Summary of Effects among Constructs

The hypotheses covering the interactions between the proposed business relationship constructs and interactions among financial constructs are summarised in Table 4-1 below and represented diagrammatically in Figure 4.2.

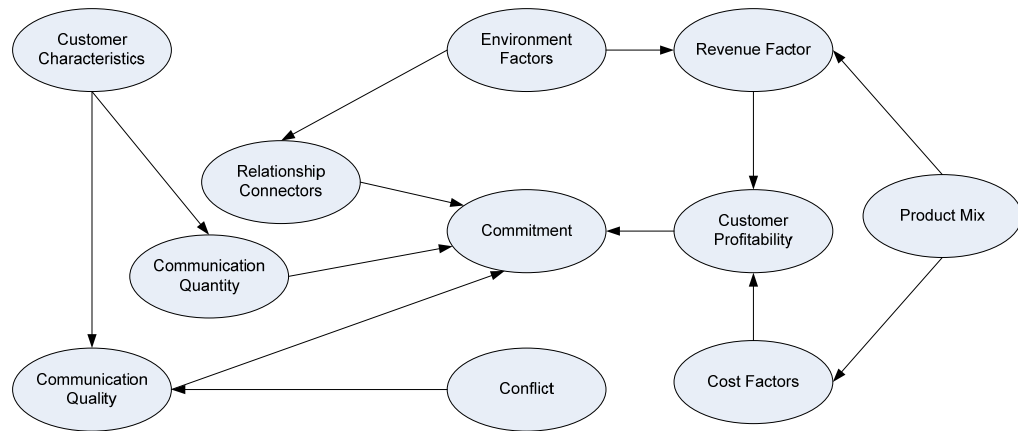
**Table 4-1: Summary- Hypothesised Relationship between Constructs**

Antecedent Construct	Nature of link						
	Relationship connectors	Communication quantity	Communication quality	Commitment	Revenue	Cost factors	Customer Profitability
Customer Characteristics		+	+				
Environment factors	-				-		
Relationship connectors				+			
Communication quantity				+			-
Communication quality				+			
Conflict			-				
Revenue factors							+
Cost factors							+
Product mix					+		+
Customer Profitability				+			

**Note:** + denotes positive association; - denotes negative association.



**Figure 4-2: Proposed Links - Business Relationship and Customer Profitability**



#### 4.11 Identifiability of Theoretical Model

Hess (2001) propounded the view that any theoretical model depicting the relationship between constructs implicitly assumes that such relationships can be represented as a system of linear equations. If a solution is to be arrived at by solving the equations, the model must be identifiable and this condition should be established at the theoretical stage. For a model to be identifiable, it must satisfy rank and order conditions. The order and rank conditions represent the necessary and sufficient conditions for the model to be identified (Kline, 2005).

##### *Order condition*

Order condition refers to a counting rule applied to each endogenous construct in the model (Kline, 2005). The condition specifies that ‘the number of excluded variables for each endogenous variable equals or exceeds the total number of endogenous variables minus 1’ (Kline, 2005, p.240). (Note: In the context of the present discussion, the terms construct and variable are interchangeable). Hess (2001) provided a simplified graphical rule to assess this whereby the number of arrows pointing at each endogenous variable is

counted and if they do not exceed the number of exogenous variables in the model, then the order condition is satisfied. The present model satisfies the order condition as there are four exogenous constructs and all endogenous constructs have fewer than four arrows pointing at them.

#### *Rank condition*

The rank condition is said to be met when, for each equation representing an endogenous construct, the rank of the reduced matrix is greater than or equal to the total number of endogenous constructs minus 1 ( Kline, 2005, p.245). To arrive at the reduced matrix Kline outlined a series of steps starting with the system matrix (Kline, 2005, pp. 244 to 246). The rank of the reduced matrix is then equal to the number of rows in the matrix. The system matrix for the theoretical model and the reduced matrix for each of the constructs is given in Appendix B. As the number of endogenous constructs in the theoretical model is 7, the rank of the reduced matrix should be at least 6. It can be seen from Table B-3 in Appendix B that all the reduced matrices have a value of 6. Hence, the theoretical model satisfies the requirement for the rank condition. As a result, the sufficient condition for model identification is also met.

To summarise, the theoretical model with four exogenous and seven endogenous constructs represents a model that satisfies the necessary and sufficient conditions of identifiability as stipulated in the order and rank conditions.

## **4.12 Methodology Overview**

This research uses the positivist framework to address the research question. The positivist approach was deemed appropriate as the objective was to investigate the extent to which there is a link between business relationship factors and customer profitability variation. The business relationship factors

selected to provide the proposed theoretical basis were drawn from existing literature on business relationships. Further, the constructs used in the theoretical model are based on quantitative studies using deductive reasoning. Thus, the prior formulation of a theory to investigate the research question reflects the ontological perspective best described as a positivist framework (Saunders, Lewis, & Thornhill, 2009). The research design, decisions on methods for data collection and analysis strategy were influenced by this perspective.

The focus of this research was the specific relationship between a seller and a customer. The perspective is from the seller's viewpoint since the research aim was to assess possible links to customer profitability, a measure used to assess the financial benefits to sellers.

#### **4.13 Research Design**

The research aim, based on gaps in the literature, was to address the question: 'Do the nature of business relationships explain the variation in customer profitability in business markets?' The specific research objectives to achieve this aim were the following:

1. What are the factors that determine the nature of business relationships?
2. What are the factors that determine customer profitability?
3. Is variation in customer profitability linked to variation in the nature of business relationships?

One of the guidelines suggested by Yin (2002) and other researchers for deciding on an appropriate research design is to pose the basic questions of *who, what, where, how* and *why* for the proposed research. Yin argues that

‘what’ types of research objectives could be addressed through any of the available research designs such as experiments, surveys, or case studies. But when the primary research objective is in answering questions such as ‘how’ and ‘why’, then a case study may be a more appropriate approach. Yin (2002) provides what he describes as a technical definition of a case study as:

“A case study is an empirical enquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident.”

(Yin, 2002, p. 13)

Yin (2002) further indicates that this definition implies the use of multiple sources of data, covers multiple data collection methods, including surveys, and benefits from prior development of theoretical propositions to guide data collection and analysis. Some of these aspects have influenced the research design for this study, as explained in the following paragraphs.

One of the considerations in deciding between a cross sectional study and a case study was whether the findings were intended to be generalisable over a total population, or whether the aim was to conduct an exploratory study or a confirmatory study (Yin, 2002). In this research, the primary purpose was to develop and test a theory that may provide an explanation for customer profitability variation. Since this link had not been investigated previously, the nature of the study could be viewed as exploratory in nature. The primary objective was to examine the extent to which the proposed theory accounts for variation in customer profitability. Testing theory is appropriate for a case study approach (Yin, 2002).

Another dimension influencing the choice of the research method was the nature of the problem being investigated. Customer profitability is influenced by contextual factors unique to an organisation. Some of the unique factors include the strategy and the resources that are deployed to serve customers,

which result in specific profitability outcomes. These in turn are dependent on the decisions taken by the managers to achieve specific objectives and may have significant variation across firms. These unique sets of factors have prompted previous academic researchers into customer profitability to use one organisation as the focus for their research (Bowman & Narayandas, 2004; Mulhern, 1999; Niraj, et al., 2001; van Raaij, Vernooij, & van Triest, 2003; Van Triest, 2005)

The choice of research approach was also influenced by pragmatic considerations such as access to relevant data. Data access has two aspects, availability of profitability information at the customer level and willingness to share sensitive profitability information. Considering the first aspect, one explanation for the paucity of studies into customer profitability could be the significant barriers to access to this data due to confidentiality considerations. Profitability data are usually closely guarded in an organisation, considered commercially sensitive and usually subjected to restricted access. The second aspect is related to the fact that less than 20% of business organisations compile profitability data at the customer level. One of the reasons for this is that traditional accounting practices influenced by regulatory considerations are anchored in compiling data based on product costs. This approach has resulted in an emphasis on product profitability rather than customer level profitability. Hence getting the co-operation of an organisation compiling customer level profitability data, willing to provide access to the data as well as nature of interactions with their customers, was a strong influence on the selection of an appropriate research method.

## **Summary**

A theoretical framework has been developed based on a synthesis of constructs from relationship marketing literature and factors that determine customer profitability. The nature of business relationship is represented by customer characteristics, environment factors, relationship connectors,

communication quantity, communication quality, conflict and commitment. Customer profitability is represented by revenue factors, product mix, cost of goods and customer profitability. Based on extant literature a set of hypotheses was developed to represent the nature of interactions between the constructs and confirmation of these through an empirical investigation will enable answering the research questions formulated for this study. To test the theoretical framework the research design will adopt a case approach due to the need to link financial data for the customer with an assessment of the nature of business relationship with the specific customer. The specifics of the methodology and findings will be presented in the following chapters.

## **Chapter 5 Computing Customer Profitability**

### **5.1 Introduction**

The theoretical framework suggested in Chapter 4 attempts to link constructs used to measure the nature of business relationships with customers to factors that determine customer profitability. The determinants of customer profitability proposed were sales, gross margins, efficiency factors and complexity factors. The individual components of these constructs will be outlined to provide the link between the theoretical framework and the methodology used to collect relevant data.

This chapter outlines the data structure in the collaborating firm, describes the inputs used for computing customer profitability, the methods used to obtain the data, and data preparation and cleaning undertaken to prepare the data for testing the proposed conceptual model. An outline of the main considerations that arise out of combining two data sets, the survey data of sales personnel and the profitability data for individual customers are discussed.

### **5.2 Components of Customer Profitability**

Sales postulated in the theoretical framework constitute the dollar value accruing to the firm from each customer during a defined time period. The sales dollar value represents the sum of the quantity of each product sold and the unit price charged for the quantity in each transaction. The cost of goods is the product of unit cost and the quantity of the particular product. The gross

margin for each product in each transaction is the difference between the sales value and the cost of goods for that transaction. The other components of cost that are used in profitability calculations are the logistics costs, which include elements such as warehousing, freight and insurance as appropriate. The elements outlined so far represent the normal accounting approach used to arrive at profit. Other elements of cost, which are indirect in nature and not attributed to specific transactions in traditional accounting approaches, are cost of receivables not paid on time, other support costs such as order processing costs, and the complexities of serving customer requirements such as the number of different destinations that each customer requires the goods to be shipped to. Linking the costs of these indirect elements with each customer based on estimated use may provide a more accurate reflection of the profitability of each customer to the firm. Accessing and processing the relevant data to compute profitability of each customer is the primary focus in this chapter.

### **5.3 Customer Profitability – Computation Approaches**

There are different approaches to computing customer profitability and the choice of the approach taken is influenced by the research objective and the practical bounds set by the availability of relevant data from the research participants. This variation in approaches reported in literature is illustrated in Table 5-1.



**Table 5-1: Customer Profitability Models**

<b>Authors</b>	<b>Cost Components in Profitability Model</b>
Mulhern (1999)	Variable cost of product, sales peoples' travel, samples and direct mail
Niraj (2001)	Product cost, replenishment, order processing, logistics and all support costs determined by an activity based costing system
Van Raaij et al. (2003)	Activity based costing used to identify cost pools and relevant cost drivers. Cost pools were: logistics, order processing, technical services, customer services. Indirect costs allocated: sales, marketing, business and product development.
Bowman and Narayandas (2004)	Two broad pools of costs—inputs to individual customer, access to shared services
Van Triest (2005)	Gross margins calculated based on revenue minus product costs. To compute individual customer profitability three categories of costs were deducted from gross margins: exchange costs such as order processing and transport costs, customer specific support costs such as training and servicing, prorata allocation of costs such as overheads which cannot be traceable directly to the customer.

In this research, the participating organisation had a system that tracked transactions by customer and recorded all relevant data. However, there was no activity based costing system in place to track demand on other resources of the organisation such as order processing, technical and customer services. To track some of the additional resources directly attributable to the customer, the cost of overdue receivables and order processing cost were estimated. Thus the model adopted for computing customer profitability had elements of the approach adopted by van Triest (2005) but also included a new component, the cost of overdue outstandings, which had not been covered before in customer profitability calculations. The need to consider this aspect was highlighted in the conceptual paper by Stoelhorst and van Raaij (2004).

## 5.4 Data Model for This Study

The main components of the customer profitability model were the following:

Sales or Gross revenue (GRev), supply chain costs (SCC), cost of goods sold COG, cost of account receivables not paid in time (CAR) and order processing costs (OPC).

Based on these components, the profitability of individual customers (CP) was computed as follows:

$$CP = GRev - SCC - COG - CAR - OPC.$$

The data for the individual components were obtained by aggregating the various aspects recorded in the transaction records.

## 5.5 Customer-wise Sales and Cost Items

A number of revenue or cost elements were aggregated to arrive at the specific revenue and cost components. The detail that underlies the aggregation provides an insight into the variety and complexity of transactions that arise in a business-to-business interaction.

### 5.5.1 Gross Revenue

Gross revenue (GR) was computed as the product of the quantity and price for each individual item that had been negotiated and finalised in a purchase order placed by the customer. There were five main product groups and within each product group each individual product was specified by a unique identifying number. The individual transactions were tracked and summed on a monthly

basis to arrive at the aggregate sales for the financial year. This aggregation process can be represented as follows:

$$GR = \sum_{i,j,k}^{5,n,14} P_{i,j,k} * Q_{i,j,k}$$

where:

P = Price

Q = Quantity in units

i = Product group,

j = Individual product item within each product group

k = Month of the financial year

### **Price Variation**

To simplify computation, various adjustments made to the revenue, such as discounts, were not considered. These adjustments were usually reflected in the price agreed upon with the customer and occurred only occasionally, indicating that they were relatively rare occurrences.

The price agreed upon with a customer may remain constant during the financial year or may change. The nature and extent of this change may be influenced by the nature of business relationship between the seller and the specific customer.

Price variation was tracked by identifying the minimum price paid by the customer for each item at the start of the period. Baseline sales revenue at constant price was computed by multiplying this minimum price by the quantities purchased. The contribution from price increases was computed by multiplying the quantity of the individual item by the difference between the actual price paid and the minimum price. A consequence of this approach is that items which were sold only once did not enter the price change equation.

Most customer profitability calculations reported in marketing literature have taken price to be constant, or have not explicitly captured the effect of price variations. However, price may not be a constant factor, especially if the environment is dynamic, the contractual terms are of short duration, or if the conditions permit periodic negotiations for price. This variation in price during the financial year had to be isolated from the transaction records. The contribution of this aspect to profitability variation is discussed in the data analysis chapter.

### **5.5.2 Supply Chain Costs**

The main components of the supply chain cost were freight and insurance charges incurred in transporting goods to the main point of shipment in the country of production. These were costs not usually paid by the customer and were treated as expenses to be deducted. In some instances, where the sale price included the cost of freight and insurance to the customer, freight and insurance amounts were deducted from the gross sales value.

### **5.5.3 Cost of Goods**

The cost of goods represents the cost of manufacturing a product. The collaborating firm used an activity based costing system to accurately track the cost of manufacturing different products. This was considered necessary by the organisation as the product mix included products made to a standard specification developed by the organisation as well as custom-made ones tailored to individual customers' requirement. However, details of the system used to arrive at the cost of individual products were not available as they were considered proprietary, commercially sensitive and outside the scope of the agreement for this study.

The cost of goods for individual products can be represented as follows:

$$COG = \sum_{i,j,k}^{5,n,14} C_{i,j,k} * Q_{i,j,k}$$

where:

$C$  = Cost of individual per item per unit

$Q$  = Quantity in units

$i$  = Product group

$j$  = Individual product item within each product group

$k$  = Month of the financial year

One of the main benefits claimed for the proprietary cost system was the ability to trace all cost elements accurately and compute the cost of each product. The main benefit is that variation in input costs was reflected immediately in the cost of goods. This was in contrast to standard cost systems that compute internal performance measures based on a fixed cost with changes reflected as variances. However, the ability to immediately track changes in costs provides a mechanism for the organisation to factor changes in input costs into their decision process on prices of finished products with minimal lead time. The magnitudes of changes in cost were computed on the same lines as that indicated for tracking price variation. The extent to which cost increases are offset by price increases would directly impact customer profitability levels.

#### **5.5.4 Cost of Overdue Account Receivables**

In business markets it is normal practice to provide credit terms to customers that permit payment to be made after a mutually agreed time period. When these payments are delayed, additional cost is incurred by the seller because the working capital required to fund the interim period incurs a cost. This cost may be real, by way of short term borrowing, or may represent the opportunity cost of not using the funds for other business activities.

To monitor payments, the organisation under study has a system that tracks the payment status of transactions. The starting point is the date the transaction is deemed to have been completed from the seller's side as stipulated in the commercial terms agreed upon with the customer. In most instances the date that the goods are deemed to have been shipped is taken as the date when the transaction is deemed to be completed from the seller's side. The date that the goods are deemed to have been shipped is based on the date of the transporter's document for the consignment, such as the date of the Bill of Lading which is issued by a shipping company in respect of goods sent by sea. The credit and payment conditions span a wide range and are negotiated with the customer to meet their requirements.

The due date for payment is computed from the date specified in the agreed upon document. The date the payment is due is then recorded against the relevant invoice, details of which are maintained in the accounts receivables book of accounts. When the customer sends a payment for an invoice the amount received and the date of receipt is recorded against the specific invoice.

The reporting system used to track the payment status generates the outstanding payment statement on a monthly basis. The outstanding period is grouped into periods such as 7 days, 8 to 15 days, 16 to 30 days, 30 to 60 days, 60 to 90 days and over 90 days. These statements are provided to the sales people and other relevant frontline personnel, who then follow up on the outstanding amounts to ensure that payments are realised with minimal delay. Though these actions are initiated as soon as payments are due, delays can occur for various reasons including differences regarding transactional terms or order execution that require resolution before realisation of payment.

Calculating the cost of delayed payments involved two components, the average number of days the payment was outstanding and the cost of capital. The cost of capital was determined to be 9% per annum, as this was the rate the organisation used internally to assess the profitability of projects and other

investments. The number of days that a payment was outstanding was taken as the midpoint of each reporting interval, except for the special case discussed subsequently. The interest cost was then computed for each month for each individual customer.

### **Special case of More Than 90 days Outstanding**

The identification of the actual number of days for realising payment for an amount outstanding for more than 90 days involved two steps. All outstanding amounts for this period were first pooled in one database. Then, using the unique document number associated with each outstanding amount, the date function in Excel was used to calculate the number of months the document featured in the outstanding statement. This was then converted into the number of days this amount was outstanding before it was settled, and the interest amount was computed accordingly.

### **Transaction Currency**

The overseas location of many of the customers resulted in different currencies being used for the commercial transactions analysed. To arrive at the US dollar equivalent, which was the currency used for financial data in this analysis, a conversion table was developed to accurately reflect the dynamics of currency fluctuations over the period studied. This table was produced by calculating the mean values of the exchange rate on a monthly basis for the different currencies. This mean rate was then applied to all overdue outstandings not reported in US dollars.

### **Computation Model for Interest on Outstandings**

The computation of the cost of account receivables (CAR) that encapsulates the various steps outlined above can be represented as shown below:

$$CAR = \sum_{i,j,k} (A_{i,j,k} * P_{i,j} * I) E_{j,k}$$

where:

$A$  = Amount outstanding for customer  $i$  for the month  $j$

$E$  = Exchange rate for the month  $j$  for the currency  $k$  and  $l$  the mean rate for the month to convert currency  $k$  to US dollars

$P$  = No. of days outstanding for customer  $i$  in the month  $j$  for the age bracket  $p$ . The midpoint for the six ageing periods was taken for this purpose and the actual number of days for payment outstanding for more than 90 days.

$I$  = Interest rate calculated as per diem based on a rate of 9% per annum

#### 5.5.5 Order Processing Cost

Van Triest (2005) explicitly modelled order processing cost in the cost of transactions when computing customer profitability. However, to provide an accurate assessment of the cost of order processing a well-developed activity based costing system is necessary. In the absence of an activity based costing system an alternate approach is to develop a basis for allocating costs that approximately reflects the actual usage of order processing facility as a resource, an approach adopted by Van Triest (2005).

In the organisation participating in this study, the order processing facility handles all the billing functions, but the cost of this function could not be ascertained. However, part of the cost of this function could be estimated based on the number of invoices raised for each customer. The invoice preparation itself was not a demanding task, as invoices are generated using the computerised order processing system. The associated activity for which extra cost is incurred, is preparing the required set of documents and sending them to the customer (often by courier) to complete the transaction. The cost of this task varies depending on the requirements of the customer for meeting



their local legal, import and commercial requirements. On average, the organisation incurred US\$ 285 per set of documents over the analysis period. The order processing cost incurred for each customer was the product of the number of invoices raised during the financial year and the cost per set of documents.

To summarise, this section has outlined the approach adopted to compute the revenue and various cost components that served as inputs to the profitability of individual customers. This model extends existing knowledge in two main areas. First, it explicitly incorporates an approach to computing the impact of delayed payments on customer profitability. This was done in a global setting where currency fluctuations were taken into account. The second area where a new aspect has been investigated is the impact of the documentation requirements and the cost associated with this activity. The magnitude of the impact of these two aspects will be covered in the data analysis chapters.

## **5.6 Data Acquisition and Screening**

The organisation used its financial systems data base to extract the relevant records for the top 298 customers used in the survey of sales personnel. For each customer, their transaction details for the calendar years 2007 and 2008 were extracted. These data were then subjected to an extensive cleaning process outlined in the next section.

### **5.6.1 Data Screening and Cleaning**

The gross revenue and cost data were examined for the size and nature of products purchased by the customer to assess if their inclusion would be appropriate. Customers whose purchases were for samples or other services were deleted from the list. Customers with a very small turnover were also

excluded. Another criterion for deletion included nil or minimal transactions during the financial year. These actions resulted in pruning of the list to 247 customers.

Receivables data in categories up to 61 to 90 days were clearly referenced to a document and presented minimal issues. Negative values, indicating a reversal or credit note issue, could be summed to arrive at the net outstanding that would be charged interest. However, receivables outstanding for more than 90 days involved several issues that required resolution.

The first major issue was the occurrence of negative values indicating credit notes that had not been settled. One of the reasons advanced for this was that the credit amount may have been retained at the customer's request for adjustment against future supplies. However, a case-by-case examination was deemed necessary for an accurate assessment.

Another issue was the presence of large values both positive and negative, without a document reference and annotated as not assigned. One explanation provided for the credit values was that they may have been deposits made by the customer as a surety and hence retained without a document reference. This was also explained as a system shortcoming to account for deposits. Another possible explanation was that they that were simply administrative errors.

Consideration of these values would have increased the interest charges significantly. However, because of the unexplained nature of these large positive and negative values it was decided to treat them as noise in the data and remove them from the database for computing the interest burden.

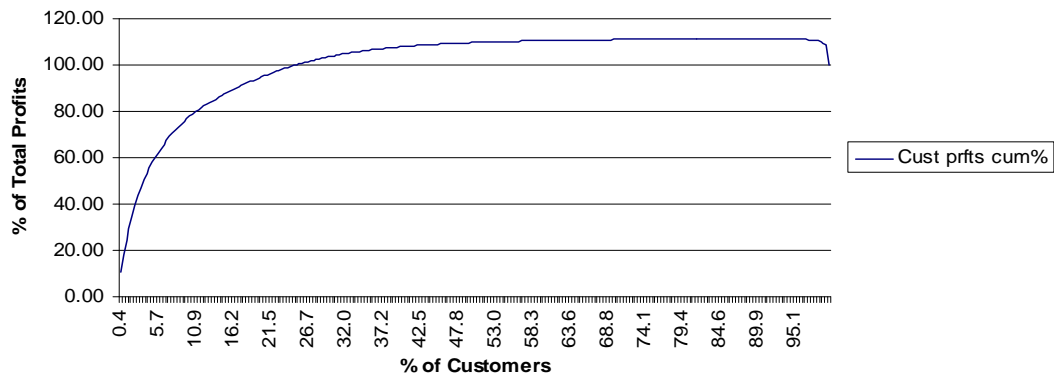
## **5.7 Findings - Customer Profitability**

The main hypothesis underpinning the research question is the presence of a wide variation in customer profitability in business markets. The following sections examine the findings regarding actual variation in customer profitability and the contribution to this variation by parameters outlined in the data model. The findings are evaluated in the context of previous empirical studies and implications for further analysis that is required to answer the main research question.

### **5.7.1 Dispersion of Gross Sales and Customer Profitability**

Following the work of other researchers (Mulhern, 1999; Storbacka, 1997), dispersion is exhibited graphically using Stobachoff curves. This involves ordering the customer profitability values in descending order and then plotting the cumulative contribution in profitability versus the cumulative percentage of customers. Figure 5-1 illustrates the Stobachoff curves for customer profitability. It can be seen that about 25% of customers contributed almost 100% of the profits. The balance of 70% of customers contributed about 10% in additional profits. However, 5% of customers were loss-makers and this was significant enough for the overall profits to be reduced to 100% and can be linked to the presence of one of the large customers that contributed a significant loss.

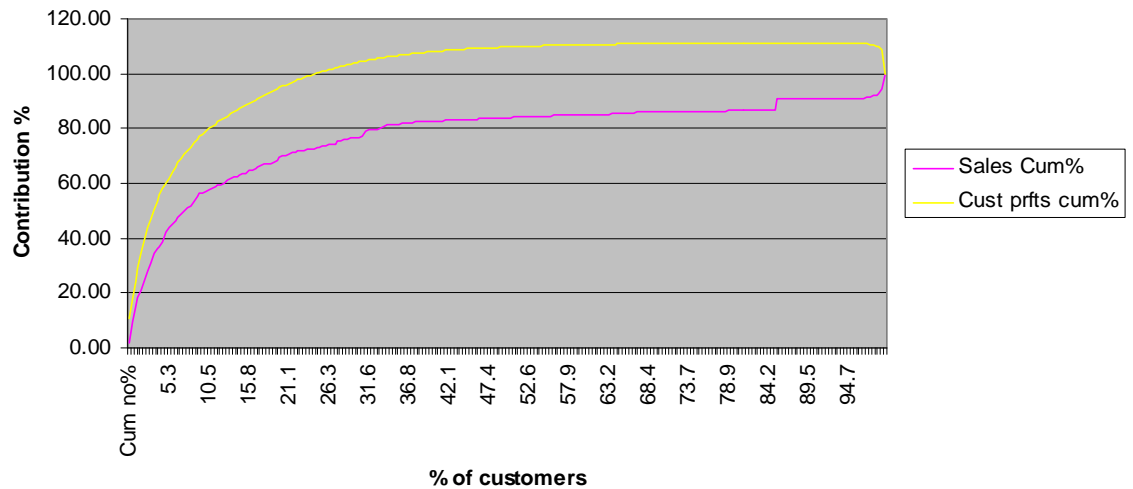
**Figure 5-1: Contribution to Profit by Number of Customers**



This type of distribution is close to the Pareto Principle, or the 80/20 principle, where 80% of profits are contributed by 20% of customers. However, other researchers have reported much higher levels of skew, such as a 225/25 pattern (Kaplan & Datar, 1995) implying a very high level of subsidy to the loss making customers by the profitable ones. In Kaplan and Datar's (1995) study, this extreme skew was brought to light when use of other resources such as customer service was factored into the cost structure using an activity based costing system.

To check if sales levels impact on overall profits, the Stobachoff curve incorporating corresponding sales of the customers is shown in Figure 5-2. In this case, 100% of profits were reached when the sales levels were at only 75% of the total. Another interesting aspect is the fact that the profitability curve rises at a faster rate than the sales curve, indicating that many of the large customers were highly profitable and contributed significantly to overall profits. This is in contrast to previous research which showed that large customers were able to negotiate lower prices in return for larger business volumes and, though their contribution to overall profits may be high, their individual profitability may be lower (Bowman & Narayandas, 2004; Kalwani & Narayandas, 1995; Niraj, et al., 2001). In the current research, the fact that higher prices were realised from large customers seems to imply that there may be other advantages being delivered to customers which may be of value. A deeper analysis of these aspects is provided in the following sections.

**Figure 5-2: Cumulative Contribution to Gross Sales and Customer Profitability**



Another perspective on customer profitability is to view the contribution by the decile groups (see Table 5-2).

**Table 5-2: Customer Decile Contribution to Profit**

Decile	Contribution to Total profits
1	-10.90%
2	0.00%
3	0.20%
4	0.40%
5	0.90%
6	1.80%
7	4.40%
8	9.50%
9	17.50%
10	76.20%

From this table it can be seen that top 20% of customers based on profits (deciles 9 and 10) contribute almost 94% of the firm's profits. The bottom decile group (decile 1) eroded 11% of profits accrued by profitable customers.

The distribution in sales and profitability in this research are placed alongside the findings of previous studies (see Table 5-3) for comparison. The primary difference in this research appears to be higher contribution to overall profits realised from larger customers.

**Table 5-3: Dispersion in Sales and Customer Profitability in other Studies**

<b>Authors</b>	<b>Nature of Dispersion</b>
Mulhern (1999)	20% of customers contributed 65.5% of profits 50% of customers contributed 95.5% of profits
Niraj et al. (2001)	2% of customers contributed 80% of revenues and profits 32% of customers unprofitable
Van Raiij et al. (2003)	Top 20% contributed 93% of sales and 95% of profits Top 1% contributed 50% of sales and 49% of profits
Bowman & Narayandas (2004)	31% of customers were unprofitable
Van Trieste (2005)	Net profit was 16.5% with a std deviation of 18%
This research	Top 25% customers (based on revenue) contribute 75% of sales and 100% of profits. Only 5% of customers were unprofitable, but accounted for erosion of 10% of cumulative profits.

The next section attempts to investigate underlying factors contributing to the observed pattern of profitability.

### **Link between Customer Size and Profitability**

Previous research on customer profitability has highlighted the role of the size of the customer in negotiating lower prices that may then result in lower profitability. Categorising customers by deciles on the basis of gross sales provides an insight into whether customer size based on sales value impacts gross margins and customer profitability (see Table 5-4).

**Table 5-4: Impact of Sales on Gross Margin and Customer Profitability**

<b>Deciles Gross Sales</b>	<b>Gross Margin % Sales</b>			<b>Customer Profitability % Sales</b>		
	<b>Mean</b>	<b>Max</b>	<b>Min</b>	<b>Mean</b>	<b>Max</b>	<b>Min</b>
1	25.5	63.3	-26.9	21.4	64.3	-26.9
2	23.5	59.1	-6.4	22.5	59.0	-7.2
3	22.0	52.2	-38.4	19.9	51.8	-38.7
4	27.8	57.6	-4.5	27.1	55.3	-5.2
5	20.3	9.0	-0.3	18.0	46.0	-0.7
6	23.3	54.9	-1.0	23.1	54.6	-1.1
7	25.3	52.4	-7.5	24.9	52.2	-8.0
8	22.0	51.3	-21.3	21.7	51.1	-21.5
9	18.3	42.8	-16.0	16.8	42.7	-16.1
10	16.0	34.9	-26.8	15.9	34.8	-27.2

The mean value of gross margins was relatively high at the lower deciles and tended to decrease in the top deciles, but the pattern was not uniform. Another interesting feature was the wide range in profitability and the presence of loss-making customers in all the categories.

Reasons for the losses incurred for some of the large customers were discussed with the participating organisation. One customer, with the largest contribution to loss, had a commercial contract that involved index pricing based on a published market index. Sharp fluctuations in this index coupled with other obligations specified in the contract led to the loss. This was corrected in the subsequent year. Since the customer contributed to almost 5% reduction in overall profits, the net reduction in the loss making situation would lead to a major improvement in the overall profits. Overall, the proportion of loss making customers for this organisation appears to be much lower than the levels reported in literature (for example: Bowman & Narayandas, 2004; Niraj et al., 2001).

### 5.7.2 Gross Revenue Components

The total sales for each customer is an aggregate of three components: the mix of the different product groups offered by the organisation, the total quantity of each product item purchased during the financial year and the different price levels at which they were sold. The contribution of each of these elements is analysed in the following sections

#### Contribution of Different Product Groups

The products marketed by the organisation could be broadly categorised into five groups. Product group 1 was the major contributor of revenue to the organisation, with a share of 51%. The contribution of the other product groups is provided in Table 5-5.

**Table 5-5: Contribution by Product Group**

	Product Group1	Product Group2	Product Group3	Product Group4	Product Group5	Grand Total
Share of Gross sales (%)	50.5	15.6	14.2	7.6	11.5	100.0
Gross margin of product group (% of sales)	16.1	10.2	20.8	22.9	20.0	-

The gross margin for the largest group was not the lowest, but was significantly lower than groups 3, 4 and 5. This difference may be due to groups 3, 4 and 5 having product items with greater value addition or customisation.

#### Number of Product Groups Purchased by Customers

Most customers (around 75%) purchased products from one or two product groups only (see Table 5-6). However, some of the largest customers purchased four or five product groups. There were a few products made by the organisation that do not fall under the five broad categories and this accounts for the “0” row in Table 5-6.



**Table 5-6: Frequency of Number of Product Groups Purchased**

<b>Number of Product Groups</b>	<b>Frequency</b>	<b>Contribution %</b>	<b>Cumulative %</b>	<b>Contribution as % of Gross sales</b>
0	7	3.0	3.0	
1	107	45.1	48.1	48.3
2	71	30.0	78.1	29.9
3	32	13.5	91.6	12.8
4	14	5.9	97.5	7.3
5	6	2.5	100.0	1.7
Total	237	100.0		

It is interesting to note that just under half of the organisation's gross sales come from purchases of one product group only. The relationship between purchase volume and the number of product groups purchased can be seen in the decile-based purchase share in Appendix C. The larger variety in the product mix purchased by the customers with large volumes may be an impetus for building closer business relationships. This is corroborated by the sales personnel survey where customers with the largest business volume were rated as having a closer business relationship. Both the organisation and the customers had cemented this close relationship through various relationship building actions, such as adaptations to products and processes to accommodate each other. However, this trend was not uniform, as the purchase pattern indicated that even in the top decile there were customers that purchased only one product group (see Appendix C).

The spread in the share of different groups in total Gross Sales to each customer is summarised in Table 5-7. Based on this it may be reasonable to conclude that a larger proportion of customers buying product group 5 were more likely to be purchasers of only that group.

**Table 5-7: Gross Sales Share (%) Spread by Product Group**

	Mean	Maximum	Standard Deviation
Product Group 1	6.9	98.7	23.5
Product Group 2	17.4	100	38.8
Product Group 3	11.2	100	30.5
Product Group 4	13.0	100	34.4
Product Group 5	27.9	100	44.6

**Contribution of Price Changes**

The individual items in each product group had a unique price that was determined by the product group and extent of customisation carried out to meet specific requirements of the customer. Customisation ranged from extra quality checks to unique tailor-made items that covered composition, packaging, quality checks and other aspects that were agreed upon. This rendered each customised product unique and made comparison of prices difficult. For the group of items that was common across customers, non-availability of net price charged made it difficult to arrive at a common base to enable comparison.

Even though it was not possible to compare price levels set for different customers, price changes for products during the financial year could be assessed. Price changes for a product sold to each customer were tracked using the methodology described in section 5.4.1. The results are shown in Table 5-8

**Table 5-8: Contribution of Price Increase by Customer Deciles**

Deciles Gross Sales	Price Increase as % of Gr. Sales		Price Increase Value	
	Mean	Maximum	Contribution to Total Increase	% of Gr. Sales
1	8.4	26.4	.0	3.9
2	11.1	47.7	.1	4.4
3	4.3	28.3	.1	1.5
4	11.1	41.8	.6	5.9

5	10.4	31.9	.8	4.4
6	9.6	37.6	1.9	5.8
7	14.1	46.2	4.0	6.2
8	4.4	19.8	3.0	2.3
9	3.5	15.6	6.8	2.5
10	10.0	46.9	82.7	7.7

Table 5-8 summarises different perspectives on the price increases realised by the organisation for customer grouping by decile. Apart from the wide range in price increases in the different deciles, the major contribution to overall value increase was realised from the largest customers, with an average price increase of 7.7% of gross sales, contributing to over 80% of all price increases. This may appear to be at variance with prior research in the area as well as the observations in section 5.4 that showed that the mean gross margin percentage was the lowest with this group of customers. One reason for this contradiction could be that favourable market conditions provided an opportunity for correcting depressed prices that may have existed in the previous years due to adverse market conditions. This argument is supported by the fact that even after the substantial price increase the mean profitability levels are still the lowest in decile10 group of customers.

As the price increase spans five product groups, the role of product mix and its contribution to the price increase is examined next. Prices for product groups 1 and 2 appear to have increased the most (see Table 5-9).

**Table 5-9: Contribution (%) to Overall Gain from Price Increase**

<b>Product Group1 %</b>	<b>Product Group2 %</b>	<b>Product Group 3 %</b>	<b>Product Group 4 %</b>	<b>Product Group 5 %</b>	<b>Total %</b>
54.9	12.9	20.6	6.5	5.1	100

Product group 5 had the lowest level of price increase (see Table 5-10). One possible reason for this could be that the price increases supported by the lower deciles were substantial compared to higher decile for this product

group, but due to the relative magnitudes in purchase the overall impact was not great. This explanation is supported by the break down in price increase by the deciles' grouping in revenue provided in Appendix D. It would also appear that market conditions or other factors made it feasible to obtain better increases in the other product groups, leaving product group 5, which had a relatively low level of increase.

**Table 5-10: Contribution of Price Increase by Product Group**

	<b>Product Group1 %</b>	<b>Product Group2 %</b>	<b>Product Group 3 %</b>	<b>Product Group 4 %</b>	<b>Product Group 5 %</b>	<b>Grand Total %</b>
Sales at constant price	65.4	69.5	77.1	78.3	83.9	70.8
Price Increase	21.6	26.0	17.0	12.4	5.8	19.0
Total Gross Sales	100.0	100.0	100.0	100.0	100.0	100.0

### **Sales Quantity**

The second component in the revenue equation is sales quantity. Organisations tend to focus on sales quantity to gain competitive advantage through a higher market share and increased profits as a result of improvement in internal efficiencies when producing larger volumes. The quantity dimension also involves delivering the right quantity at the right time to the place nominated by the customer. These aspects are focus areas of the manufacturing and supply chain operations of an organisation. However, the demand on these resources of the organisation has a significant impact on cost and hence customer profitability if they are accounted for. To facilitate comparison between customer deciles and product group quantity, standard weight units will be shown rather than SKU's (see Appendix G).

Linked to the wide range in the size of customers' purchases from the organisation, there was wide variation in time and place of delivery of the required quantity of products. The time dimension refers to the frequency of

purchases during the financial year. This ranged from once a year to regular monthly deliveries. The place dimension refers to the number of destinations that a customer wants the product sent to. Since large business customers have factories at different locations, the required quantity had to be sent to different destinations as stipulated by the customer.

### **Quantity Variation**

The mean value of quantities purchased by a customer increased for each group according to the size of the customer (see Appendix G). The quantity range for each product group varies in each customer decile category. The implication is that effective back end processes were required to ensure that customers' requirements were met with minimal errors. Niraj et al. (2001) used an activity based costing system to estimate the resource consumption of this activity and estimated the mean costs to be around 2.3% of revenue, but with a wide variation, as the upper limit was almost 85%. The cost of logistics has not been considered in this study but one aspect of this, order processing, is discussed in section 5.7.6.

### **5.7.3 Increase in Cost of Goods Sold**

Price increases improve the profitability on an aggregate basis if cost factors are held constant. Alternatively, where there are increases in the cost of inputs resulting in higher cost of goods sold, price increases can help preserve margins. The change in cost of goods sold was tracked using the same methods indicated for price, and the results are provided in Table 5-11 below. As indicated in the methodology section, only the contributions of the product groups with a change are accounted for in the contribution percentage.

**Table 5-11: Increase in COGS by Product Group**

	<b>Product Group1 %</b>	<b>Product Group2 %</b>	<b>Product Group3 %</b>	<b>Product Group4 %</b>	<b>Product Group 5 %</b>	<b>Grand Total</b>
Baseline COGS	53.3	34.3	63.9	71.1	60.5	52.9
Increase in COGS	11.2	19.3	26.6	18.0	17.8	15.5
Total Cost of Goods Sold	100.0	100.0	100.0	100.0	100.0	100.0

There was a substantial increase in the COGS of all the product groups; this appears to have been mostly due to increases in the cost of inputs to make the product. This would have had a significant adverse impact on profitability if this was not passed on as price increases to the customer.

#### **5.7.4 Net impact of Price and Cost Increases**

The price and cost increases by product group are provided in Table 5-12 for ease of comparison. Overall, the organisation had managed to increase prices at a faster pace than cost increases in the largest product groups in terms of sales. The performance in product group 5 was not as good as in the others and it appears that here the organisation had absorbed the cost increases. As indicated earlier, this may be attributable to unfavourable market conditions or to the fact that most of the customers were already paying the highest possible price.

**Table 5-12: Price and Cost Increases by Product Group**

	<b>Product Group1</b>	<b>Product Group2</b>	<b>Product Group3</b>	<b>Product Group 4</b>	<b>Product Group 5</b>	<b>Grand Total</b>
Price Increase as % of baseline sales	32.9	37.5	22.0	15.9	6.9	26.8
COGS Increase as % of baseline sales	14.0	24.1	22.5	16.0	16.3	17.3

There could be several factors that may have helped the organisation pass on cost increases. These include the nature of contracts, weak competition, lack of alternative suppliers, or custom made products that tie customers to specific suppliers. A combination of these factors may have been at work with the largest customers.

From a customer relationship building perspective, customised products enable a seller to build closer relationships and reduce competitive threats, as it is not easy to find substitutes from other vendors. In cases where this customisation also involves some adaptations by the customer, the relationship bonds may be strong enough to withstand a price increase if it is seen as fair (Cannon & Perreault, 1999). If a price increase is seen as unreasonable, it may lead to conflict and result in degradation in commitment to the relationship (Sollner, 1999). Survey findings of sales personnel indicated that the relationships were seen to be close and arguments or conflicts were minimal. The sales personnel also rated the commitment levels to the business relationship as being high.

One dimension of price that has not been widely investigated in empirical research on relationship marketing is the measurement of the price changes in a defined time period. Price and its effect on purchase decisions have been investigated extensively for FMCG goods and other consumer products. In business markets, price changes, whether from a seller or a customer perspective, have usually been based on perceptions and not on actual measurement (e.g., Fink, et al., 2007). Other dimensions of price, such as its role as a marketing variable or its interaction effects or moderation effects with other variables, have been investigated. Even in these studies, price was measured on a scale or used a reference price point and not the actual price paid by the customer. For example, one of the studies investigated if social and organisational relationship factors could protect an existing supplier from competitive offers involving lower price and a wider range of product offerings in the financial services sector (Wathne, Biong et al. 2001). The conclusion was that business considerations involving price always came

ahead of relationship considerations. Further, personal relationships came second to organisational links, contrary to research focusing on the social aspects of business relationships. Though a price discount level was used in the research, no other objective price change was used.

The role of price in service up-gradation contract renewals was investigated by (Bolton, Lemon et al. 2008). They reported that although previous studies had shown price had no impact on customer retention, in their research price was found to have a contradictory effect. Customers with a long duration of business with a supplier did not opt for an upgrade as they felt that the current level of service was optimal for the price paid. On the other hand, where a customer had a large share of their service budget with one vendor, a decision favourable to upgrade was made. Thus, share of customer wallet and duration of relationship seem to have opposing effects on how price is factored into purchase decision making. Though Bolton et al. (2008) did address the price aspect, actual price paid was not considered.

To summarise, most of the research involving price as a factor has not used objective measures of price changes. The research reported here has tracked actual changes in price in a defined time period. The following chapter reporting on the complete theoretical model investigates possible links between price increases and customer relationship factors.

#### **5.7.5 Cost of Overdue Account Receivables**

In business-to-business markets customers are permitted to make payment after a predetermined period that is agreed upon at the time of finalising a sales order or contract. The credit period extended to the customer is considered as part of the cost of conducting business. Credit may also be used strategically to gain extra share of a customer's purchases or as a defence to counteract competitive moves to cut price. When customers do not pay as per credit terms, well-organised firms have processes to initiate actions to recover



the outstanding amount. However, many organisations do not factor in this cost explicitly when computing the profitability of customers. Some researchers have made a case for factoring in this cost (Day & Fahey 1988; Stoelhorst & van Raaij 2004). In this research, overdue outstandings for each customer were analysed using the methods outlined in section 5.5.4.

On an aggregate basis it was found that the mean value for interest on overdue outstandings was 0.5% of gross sales. However, as not all customers had an overdue outstanding and only a few were responsible for a significant proportion of the outstandings, skew and kurtosis values were very high. In cases where credit amounts due to customers were shown in the outstanding statement, interest on the amount owed was reflected as a negative value and contributed to an increase in customer profitability. These credit values were significant for only four customers. The impact of interest on gross margin for the top ten customers ranked on gross margin reduction due to interest and bottom ten where negative interest was computed is provided in Appendix H.

For a small minority of customers, including interest costs on outstanding amounts resulted in a significant reduction in the gross margins and this would have further eroded the final profit contribution. Overall, even if an arbitrary low value of 0.1% was taken as the lower limit for interest as a per cent of gross sales, only around 28% of customers analysed would have been affected; another 3% would have improved profitability due to interest owed. The balance (69% of customers) paid on time either voluntarily or due to prompt action by the organisation's collection processes.

The collection process on outstandings seems to be well organised in the participating firm. The fact that none of the overdue outstandings became bad debts during the period under scrutiny reflects the conservative approach used in conducting business based on vetting the credit rating of the party. Interviews with the organisation's personnel indicated that payment in advance or other payment options such as letters of credit were used to ensure

that payment was secure in situations where the firm evaluated the commercial risk to be high.

The relevance of the focus on overdue outstandings is the effort organisations have to expend to collect payment. The costs associated with this may be high. Professional journals have highlighted the importance of this as a press note in 2005 estimated that manufacturers in the UK spent an estimated 150,000 hours in following up late payments. Further, the report highlighted the existence of a late payment culture in UK, with the average overdue payment increasing from 57 to 60 days in 2005 ("True cost of late payment").

#### **5.7.6 Order Processing Costs**

The measure used to assess order processing cost was the number of invoices raised for each customer. The number of invoices reflects three underlying dimensions – the number of destinations to which goods were to be shipped, the frequency of shipments during the financial period and the number of product items in each shipment. As the number of product groups has been covered in section 5.6.2, the findings on the other two dimensions are discussed below.

##### **Place Dimension- Number of Destinations**

The number of destinations to which the organisation had to ship the products for each customer is summarised in Appendix E. As expected, the mean number of destinations increases with the size of the customer's purchases from the organisation. The maximum value was 26, which might represent a significant demand on the resources of the organisation.

The large number of destinations to which a product needs to be sent for each customer may be a feature of business markets. Niraj et al. (2001) reported a mean value of 6.3 with a range of 1 to 374. While the range was significantly lower in this current research, most of the locations were scattered worldwide. This has major implications for the criticality of the supply chain and

operations function of the business to ensure that there is regular flow of products as per requirements. This was highlighted in survey responses by the fact that one aspect of information that was shared regularly with the customers in this business relationship is the forecast for requirements.

### Frequency of Delivery to Customers

To assess frequency of delivery, the measurement unit selected was the number of transactions in a month. This is based on the fact that every transaction had a unique invoice and only one product item per invoice. Over the period for which transaction data was available, the number of months when transactions were recorded was categorised into four groups and the number of product items purchased in each month was also counted to provide an idea of the magnitude of the frequency of shipments. An overview is provided in Table 5-13.

**Table 5-13: Transaction Frequency**

Transaction Frequency category*	Number of Customers		Number of product items shipped in the month			Number of destinations for each customer		
	Count	Column N %	Mean	Minimum	Maximum	Mean	Minimum	Maximum
1 to 3	49	20.9	2.04	1	3	1	1	4
4 to 6	36	15.4	4.89	4	6	1	1	3
7 to 10	37	15.8	8.59	7	10	2	1	6
11 to 14	112	47.9	13.21	11	14	4	1	26

\*Note: Transaction frequency category is the count of number of months when transactions were recorded for the customer in the 14 month period.

Almost half the customers analysed had regular monthly shipment requirements, and the number of product items shipped in each month increased with frequency of shipment, pointing to the large volume of transactions with the very large customers. The regular, frequent shipment of goods to meet customer requirements could be of great value to customers and may serve as the basis for a closer business relationship. The clear correlation between a customer's volume of purchase and frequency of shipment can be

seen using decile classification of customers based on gross sales (see Appendix F). A significant proportion of the decile 2 to decile 4 customers had fairly frequent shipment requirements. This would impose an additional burden on the resources of the organisation. If the cost of this resource use was factored into the cost structure, the profit realised from such customers would be less than reported currently in the organisation. An attempt to consider such costs is discussed in a separate section.

The distance of the various delivery places from New Zealand was not analysed because the data was not available. Further, the main impact would have been in freight cost, which would have been factored into the computation of gross margins in the instances where the organisation has to bear the freight.

### **Cost of Order Processing**

The cost of order processing and its impact on customer profitability has been investigated by other researchers using various approaches. Niraj et al. (2001) considered order processing and order fulfilment as related tasks. Order processing was measured as the number of purchase orders placed by customers during a 12-month period. The cost was computed using a cost rate calculated by the number of orders handled divided by the cost of the set of people handling the process. Van Triest (2005) used a similar approach in calculating the cost of administration and processing orders by estimating the number of orders and dividing it by the cost of the associated department and process. The focus on assessing the cost of the processes and arriving at a cost rate in these studies was the consequence of their primary aims, which were to develop an activity based costing model and use it for computing the profitability of an individual customer.

In this research, access to cost of the departments associated with order processing was not available. However, a unique cost item associated with order processing was identified and used as a marker to compute a rough estimate of the cost. The marker selected was the set of documents that had to

be prepared for each shipment to the customer as essential requirements to meet the commercial, legal and other requirements. This set of documents was closely linked to the invoice that was used as the basis for computing the costs as described earlier.

The values of the order processing costs as a percentage of gross sales are provided in Table 5-14. The variation in number of documents was substantial due to the close link between the number of transactions, quantity shipped and number of destinations. The variation in the number of invoices using decile classification of gross sales indicated that the documentation cost as a percentage of sales would also have a wide variation. This argument was supported by the very high skew value of 12.4 and kurtosis of 172.8. The order processing cost as a percentage of gross sales indicated a decreasing trend for the mean values as the costs were spread over a larger base (see Table 5-14). The spread in the range for each of the deciles could be related to the spread in the number of invoices as indicated in Appendix I.

**Table 5-14: Order Processing Cost as a % of Gross Sales**

<b>Gross Sales Deciles</b>	<b>Order processing % Gross Sales</b>		
	<b>Mean</b>	<b>Minimum</b>	<b>Maximum</b>
1	4.0	0.0	49.7
2	0.8	0.0	9.5
3	0.7	0.0	7.8
4	0.7	0.1	4.1
5	0.2	0.0	0.4
6	0.2	0.0	0.6
7	0.2	0.0	1.7
8	0.1	0.0	0.9
9	0.1	0.0	0.5
10	0.1	0.0	0.4

The decrease in costs with increasing sales value could be attributed to the volume effect and was similar to the spread reported by Niraj et al. (2001).

The actual dimensions in quantitative terms were not comparable as a broader definition of service cost was used by these authors and included procurement of replenishment stock, warehousing and logistics cost for the customer. Further, as full cost allocation was attempted, the magnitude of the value was higher.

Van Triest (2005) adopted an approach similar to Niraj et al. (2001), but without procurement and warehousing cost, since the firm investigated was a manufacturing unit. She used exchange cost to reflect these activities and the average value (as % of sales) was 26.4 with a standard deviation of 16.7. The spread by decile was not reported.

Recent research indicates that factoring in duration and intensity of the use of resources in the organisation may be a more accurate way to reflect the cost associated with the complexity of customer requirements (Stout & Bedenis, 2007). Hence this dimension can be added as an element of cost in the model for computing customer profitability.

#### **5.7.7 Correlation among Financial Factors**

The basic assumptions underlying correlation analysis must be satisfied before carrying out the analysis. An examination of the nature of distribution of the financial parameters is necessary for this purpose.

#### **Distribution of Key Financial Parameters**

The main parameters of the financial data are summarised in Table 5-15.

**Table 5-15: Summary of Key Determinants of Customer Profitability**

	Range	Min	Max	Mean	Skewness	Kurtosis
Gross Sales dollars*	36145	1	36145	-	4.2	20.40
Cost of Goods Sold %	97.5	29.4	126.9	72.4	0.1	-0.4
Gross Margin % sales	101.6	-38.4	63.3	22.4	-0.2	0.4
Customer Profitability %	102.9	-38.7	64.3	21.2	-0.2	0.3
Price Increase	47.7	0.00	47.7	4.4	2.7	7.7
Interest %	47.4	-4.0	43.4	0.6	9.1	92.1
Order Processing %	49.7	0.00	49.7	0.7	12.4	172.8

\*Note: Dollar value minimum and maximum shown as ratio

As expected, gross sales span a wide range and the distribution has high levels of skew and kurtosis. In contrast to gross sales, cost of goods, and therefore the gross margin and customer profitability percentages, exhibit a near normal distribution with minimal skew and kurtosis. However, the spread for both variables is more than one hundred points around the mean value.

The high levels of skew and kurtosis for price increases could be due to the selective application of price increase for products as discussed in section 5.7.2.

The wide range in the interest as well as order processing cost are indicative of the volume effect where costs are a higher percentage of sales when the base is small but reduces rapidly as revenue increases.

The presence of high levels of skew and kurtosis required the use of a log transform to meet the requirements of normality in the variables concerned.

### **Correlation among Financial Parameters**

A bi-variate correlation analysis was conducted and Pearson's coefficient computed to determine if the main factors discussed in the earlier sections had correlations as expected. The results are shown in Table 5-16.

All the parameter values except for number of invoices and destinations were taken as a percentage of gross sales. Interest on outstandings has a low but significant correlation with gross sales and number of invoices. The negative sign for this variable indicates a pattern of outstandings becoming overdue for customers who have less frequent transactions with the organisation.



**Table 5-16: Correlations of Selected Financial and Transaction Parameters**

Correlations	Ln Gross sales	Ln Price increase	Cost of Goods	Gross Margin	Ln No. Of Invoices	Ln Order Processing	Ln No. of destinations	Ln Interest on outstandings
Ln Gross sales								
Ln Price increase	-0.12							
Cost of Goods	0.17**	-0.03						
Gross Margin	-0.13*	-0.01	-0.90**					
Ln No. Of Invoices	0.70**	-0.11	0.11	-0.13*				
Ln Order Processing	-0.51**	0.09	0.19**	-0.33**	0.11			
Ln No. of destinations	0.44**	-0.07	-0.07	0.00	0.52**	-0.08		
Ln Interest on outstandings	-0.34**	0.17	-0.13	0.07	-0.28**	0.17	-0.13	
Customer Profitability	-0.08	-0.04	-0.84**	0.95**	-0.14*	-0.41**	0.01	-0.15
**. Correlation is significant at the 0.01 level (2-tailed).								
*. Correlation is significant at the 0.05 level (2-tailed).								

Most of the correlations were as expected, with the exception of price increase; the reasons for this are explained in the following paragraph. Gross sales have low level of correlation with gross margin percent. This may be a reflection of the price increases implemented by the organisation where the biggest contributors were the customers in the top decile (see Section 5.7.2). Gross sales had a significant correlation with number of invoices and number of destinations, for reasons indicated in Section 5.7.6. The moderate level of correlation with interest on outstanding and the negative sign is consistent with reasons provided in section 5.7.5. Gross margins have the appropriate magnitude and direction of effects with cost of goods and customer profitability. Order processing costs have a moderate level of correlation with gross sales and the negative sign is the consequence of the volume effect. Order processing cost also appears to have moderate levels of correlation with customer profitability and the negative sign is indicative of it being a cost resulting in a reduction in profitability.

#### **Correlation of Price Increase with other Financial Parameters**

A separate correlation was run utilising the Log e transform of the actual dollar value of a select list of parameters and the results are provided in Table 5-17. This transformation was necessary due to the large spread in the values as well as high skew and kurtosis in the distribution of the financial value.

**Table 5-17: Bivariate Correlations using Actual Dollar Values**

	<b>Total Gross Sales</b>	<b>Gross Sales- Constant Price</b>	<b>Price Increase</b>	<b>COGS Constant cost</b>	<b>COGS Increase</b>
Total Gross Sales					
Gross Sales- Constant Price	0.75**				
Price Increase	0.64**	0.77**			
COGS Constant cost	0.90**	0.67**	0.51**		
COGS Increase	0.89**	0.64**	0.75**	0.83**	
Gross Margin	0.91**	0.64**	0.58**	0.85**	0.79**

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

The significant correlation between gross sales and gross margin value indicates that the pricing followed by the organisation was oriented toward improving gross margins using a strategy that focused on customers with high sales turnover. Since there was no correlation with gross margin as a percentage of sales as seen in the earlier section, the pricing strategy was probably implemented through a focus on the cost increases faced by the organisation. This explanation is supported by the high correlation of .769 seen between price increase and cost increase. As stated earlier, using cost increase as a basis for price increase is likely to be seen by customers as a fair justification for the increase. Further, other strategies such as short term contracts may have been employed so that price could be reviewed frequently.

### 5.7.8 Limitations

The use of gross sales for revenue could be a source of distortion due to variations in the commercial conditions and the inclusion of elements such as freight and insurance if present.

The data source is assumed to be error free and the various details are assumed to be captured correctly. It is assumed that the distorting effects of errors of omission and commission can be treated as noise that is reduced or minimised through the aggregation process and the use of ratios expressed as a percentage.

The customer profitability model discussed in this section is indicative and does not reflect the true economic worth of the customers to the organisation. This limitation arises due to the focus on past transactions without factoring in future potential or lifetime values as proposed by other researchers.

## **5.8 Summary**

The main assumption underlying this research - that customer profitability in business markets varies widely - is supported by the financial data analysed. The key financial parameters such as gross sales and customer profitability had distributions similar to previous research in business markets. However, this research extends current approaches to computing customer profitability by incorporating actual measures for price changes and cost of overdue account receivables.

The impact of price changes over the period studied were such that on an aggregate basis cost escalations were more than offset by price increases. The contribution of such price increases to overall sales and profitability suggests that price may need to be included as a separate variable when modeling customer profitability. By contrast, interest on overdue outstandings was found to impact on only a small subset of customers and hence may not warrant inclusion as an independent variable for further analysis.

## **Chapter 6 Nature of Business Relationships**

### **6.1 Introduction**

The previous chapter presented the methodology adopted to obtain the data to compute customer profitability and discussed the main descriptive findings. This chapter focuses on the methodology and preliminary findings with regard to the nature of business relationships between customers and the participating firm. It covers the preliminary qualitative research that informed the subsequent quantitative research process involving development of the research instrument, the sampling process and the data collection method, including steps taken to ensure adequate survey response. Preliminary descriptive analysis of the survey data, the reliability of the constructs used and correlations amongst the constructs are discussed to ascertain if the relationship patterns were as expected based on the theoretical model, so that they could be integrated into the final model for testing and estimation using Structural Equation Modelling.

### **6.2 Preliminary Research – Qualitative Investigation**

Before embarking on a planned qualitative investigation, understanding the nature of the firm's operations was considered a necessary pre-requisite. To this end a series of meetings was held with key personnel in the participating organisation to establish the structure, products, systems and practices employed to manage customers.

Once the familiarisation process was completed it was decided to explore in depth the approaches adopted to manage business relationships with

customers, with a view to checking the relevance of the theoretical constructs of business relationships in the proposed theoretical model. Qualitative techniques were considered appropriate as they can facilitate the identification of variables to be investigated or hypotheses to be tested in a subsequent quantitative study (Malhotra, Hall, Shaw, & Oppenheim, 2002). Though a range of qualitative research methods are available, in-depth interviews were used for this investigation. In-depth interviews were considered the method of choice as there was a need to identify and understand key strategies, processes and variations in managing customer relationships and interactions. Moreover, knowledge of the systems and practices were best obtained from knowledgeable sources within the organisation. The suitability of in-depth interviews for this purpose can also be gauged from one descriptor of such interviews as:

Qualitative interviews are conversations in which a researcher gently guides a conversational partner in an extended discussion. ...each conversation is unique, as researchers match their questions to what the interviewee knows and is willing to share.

(Rubin & Rubin 2005, p. 4)

There is a wide variety in the approaches to an interview depending on how broad or narrow the questions are framed to guide the investigation. Another dimension that may contribute to the variety in approach depends on the purpose; whether this is to elicit understanding or meaning about something or to describe and portray specific events or processes (Rubin & Rubin, 2005). These two dimensions influence the conduct of the interview and the framing of questions as open-ended or semi-structured.

In this research, two approaches were used for the various interviews. In the initial interactions with the key contacts, open-ended questions were used because the primary aim was to understand the background of the firm and the structure of operations, systems and processes used to run and manage the

sales functions. After this briefing, interviews with the sales people used a semi-structured approach in which the main discussion points were used as a reference to check that all important aspects were covered (Malhotra, Hall, Shaw & Oppenheim 2006).

Each interview was usually initiated by asking the respondent to provide details covering customer characteristics such as size of the business, range and quantity of products purchased, before moving to the nature of interactions in the course of managing and growing the customer relationship. Once the discussion was under way, probing questions were used to see if there were challenges and how these were managed, or to get opinions or perceptions on different facets of the relationship. In some situations, confirming comments were used to encourage the respondent to describe in more detail aspects of the interactions with a specific customer. The interviews were recorded to ensure reliable transcription for the record and subsequent analysis.

The interviews with sales people were conducted in three phases. After each phase the interviews were transcribed, reviewed and the main themes were noted. Aspects not covered due to time limitations were noted so that these could be taken up early on in the next interview phase. By the end of the second phase, the responses on relationship connectors, environment, and customer characteristics were similar to those in earlier interviews, with no significant new aspects being uncovered except in the area of communications, which could not be covered due to time constraints. In the third phase, no significant or new aspect emerged in any of the areas and hence additional interviews were not conducted. Three interviews with different sales people were conducted in each of the three phases.

## 6.3 Qualitative Research - Main Findings

The interview transcripts were analysed to identify common themes. The findings have been grouped under the main variables proposed in the theoretical model to facilitate assessment of the relevance of the constructs selected.

### 6.3.1 Relationship Connectors

#### *Business Relationships with Customers*

Emphasis on building relationships with customers appears to be a relatively recent strategy adopted by the firm even though business interactions have existed with some customers for many decades. In view of this, some of the facets of business relationships appear to be in various stages of development with different customers.

#### *Operational Linkages*

Only recently have attempts have been made on a trial basis to utilise technology to link up with one or two key customers using EDI. This plan was still in the very early stages and it remains to be seen if this will be pursued as an organisational strategy. One of the possible impediments apart from technology appears to be the willingness of the customers and the participating firm to allocate sufficient resources to initiate this.

#### *Information Exchange*

Content and type of information that is shared appears to vary based on perceived closeness in the relationship. One of the changes taking place with some key customers is a willingness to exchange critical or sensitive information related to costs or IP, or as a basis for building joint projects. Hence, information sharing with a strategic intent to build long term business relationships appear to be selective and possibly in the early stages of development.



Information related to operational matters appears to be the main focus, and processes within the firm appear to function in an integrated manner. For example, buyers are expected to give an annual forecast and a four-month confirmation of quantity. This appears to be a common aspect amongst various customers. This was done for better co-ordination and to ensure production plans are geared up to meet requirements on time.

#### *Legal Agreements for Relationships and Supply*

No specific legal agreements exist to guide relationship development except for one customer. However, there are agreements on quantity and other conditions of supply. These agreements are negotiated annually for some customers whereas others may have supply contracts for shorter periods. Hence, there appears to be wide variation even with regard to agreements. Thus, the presence of legal bonds as a facet for closer relationships appears to be minimal.

#### *Adaptations by the Seller and Customer*

The range of products sold to customers varies from standard products that are almost commodities to products tailor-made for a particular customer. Most processes remain the same. However, for some of the largest customers significant flexibility seems to exist, which demonstrates a willingness to cater to specific requirements. These outcomes are usually agreed upon after protracted negotiations. Adaptations include some attempt at initiating new processes such as EDI for better coordination, as indicated earlier.

#### *Norms*

Norms or expectations of behaviour, in relationships appear to be in the formative stage due to the transition taking place from a history of transaction oriented interactions. As a result mutual trust in relationships was in the formative stages.

### **6.3.2 Communication**

For key customers there was an attempt to coordinate efforts internally, so that all touch points were aligned, and the firm communicated a consistent message. This was being attempted to ensure quality and timeliness in communication. As indicated earlier, in the past there seems to have been a typical transaction type interaction, with the dominant focus on power balance and control. Discussions often gravitated to pricing, and fault finding was a common theme in operational issues. This orientation affected the quality of communication since both parties were wary of yielding negotiating points. The shift in strategic emphasis towards a relational approach appears to have contributed to a change in the mind-set regarding communication between the participating firm and its customers. Hence, more attention was being paid to communication in the business relationships with customers.

There appears to be increasing emphasis on more regular face-to-face contact for getting closer to the customer. Other modes of communication include telephone (cell phones, land lines) and regular email exchanges. Fax and written letters appear to be reserved for important documents. Since most current customers appear to have had interactions with the organisation for a long period of time, other methods of communication, such as mass media and trade fairs, were not considered relevant channels.

### **6.3.3 Conflict in Business Relationships**

From some of the discussions it appeared that past interactions and perceptions had influenced the tenor of discussions and negotiations between the firm and its customers. At times these may have become heated, but ultimately agreeable solutions were reached. However, this resulted in a phase of strained interactions for a period of time.

#### **6.3.4 Customer Characteristics**

The importance of supply could be inferred from the role played by the relevant products. Considering the large number of products supplied to various customers, one can infer that the firm's products play an important role in customers' business operations.

Despite this crucial role, some comments seem to suggest that the participating firm was dependent on the larger customers more than other way around. This might point to possible power imbalances, or the possibility that greater concessions were offered or negotiated away to the largest customers.

#### **6.3.5 Environment Factors**

The participating firm was one of the suppliers to various customers purchasing their products. For few of the largest customers such supplies complemented or supplemented captive production. Such situations created protracted negotiations on pricing and raised issues on sharing proprietary information. Moreover, this was also deemed as indirect competition due to the ease with which supplies could be substituted.

Some respondents indicated that they were aware of the share of their customers' purchases that the participating firm enjoyed, but this was not known for the largest customer. This seems to indicate that there could be information gaps about the firm's share of customers' purchases.

Competition varied between markets, both product group wise and across countries. The level of competence or capability of competitors to offer products and services was also seen to vary substantially.

### **6.3.6 Commitment**

There were mixed reactions to the nature of commitment to business relationships with customers. This was manifested as a co-existence of optimism and cynicism on customer intentions in this regard. However, on an overall basis there was a realistic assessment of the organisation's commitment to a relationship, expressed as a positive outlook balanced against possible risks.

The perception among sales people was that the participating firm had significant sales volume orientation in its relationship with customers. As a result, there was the feeling that there was unequal distribution of benefits, since some customers were able to negotiate higher concessions in price or service levels for increasing their volume of business.

### **6.3.7 Summary – Qualitative Research**

Most of the concepts proposed in the theoretical model appear to be relevant for capturing the nature of the relationship between a supplier and its customers. The variation that exists on these parameters could provide an insight into the variation in the nature of the relationship. The significant differences on some aspects, such as competition, may warrant adaptations in the construct to capture this. While some of the constructs, such as legal bonds and operational linkages, appear to have lesser relevance, these warranted further investigation in the quantitative phase of the study.

## **6.4 Quantitative Research**

Data for quantitative research on the nature of relationships with customers was obtained using a survey instrument. Questions on the nature of

relationships were initially drafted with the same wording as used in the original literature from which the constructs were adapted. The design considerations for a questionnaire, questionnaire development from the theoretical model, sampling process, survey roll out and response are discussed in this section.

#### **6.4.1 Survey Instrument Design Considerations**

The presentation and the wording of a questionnaire are important elements that can determine survey response rate as well as the reliability of the survey instrument. One of the means to improve survey response rate is to establish trust amongst participants (Dillman, Smyth, & Melani, 2009 ). In this research the trust aspect was established through two actions. The questionnaire was forwarded through the key contact in the firm together with prior intimation to the respondent's immediate supervisor. Other aspects to increase the trust component were a clear statement of the survey objectives, highlighting the fact that the researcher had entered into a confidentiality agreement with the firm, and providing contact details should the participants have any concerns.

Survey response rate is also likely to be higher when potential respondents can see benefits accruing from participation (Dillman, et al., 2009 ). In this study, one benefit of participation was created by agreement to provide all participants with a summary of the findings. This was expected to be of interest to participants since their primary task was developing business relationships, and inputs such as survey findings that could increase their effectiveness would be welcomed. Costs of participation in the survey included the time that sales personnel would have to spend on the survey while balancing the demands of their job. To minimise demands on their time, careful attention was given to main elements of the survey instrument design, covering aspects such as language, ease of understanding, layout, ease of completion and convenience of response. Each of these elements was addressed through a rigorous development cycle as indicated in the following paragraphs.

The first draft of the questionnaire was discussed with two respondents in the qualitative research phase, with the primary objective of gauging if the concepts outlined were relevant to the way they approached the management of business relationships with customers. The preliminary reaction was that the concepts were applicable in most cases. Following the preliminary test, the questionnaire was distributed to academic colleagues with a view to gauging comprehension, logical consistency and ease of replying.

The next phase of the testing involved a meeting with the participating firm's representative and a volunteer from the sales team. In this meeting a verbal protocol approach was used to test each question in the draft questionnaire (Malhotra, et al., 2002). The respondents were asked to read each question and verbalise their understanding of what the question meant, and answer the question based on the scales or options provided. The verbal protocol approach was adopted to check the wording of the questionnaire because the studies from which the questions were derived had different contexts and covered a number of perspectives including purchasing. Hence, there was a need to ensure that the wording of questions was relevant to the firm's particular context.

The different cultural background of some potential respondents was another reason to ensure that question wording was tested. This process resulted in changing several words so that they were more easily understood. Some of the questions with a 'don't know' option were modified as the firm's representatives were of the strong opinion that the concerned sales people were expected to be able answer the questions and that 'don't know' was not an acceptable option. The survey instrument was modified based on this meeting and resubmitted to the firm's representative for review. A telephonic review meeting resulted in additional minor changes. The final version of the draft questionnaire was converted to an electronic format as discussed in the next section.

#### **6.4.2 Conversion to an On-line Version**

Advantages of web based surveys include the ability to collect responses round the clock and to get responses from persons who are travelling (Cheyne & Ritter, 2001) In the case of the participating firm, the online mode was decided as the preferred option since the sales people were travelling most of the time but had internet access. Further, all written communication with the main office was through email.

The finalised questionnaire was converted to an online version using the web based survey tool Survey Gizmo. Layout, choice of colour for the panels and use of radio buttons to simplify respondents' task were all incorporated in this phase of questionnaire development. The online version was once again tested with the participating firm's representative and other academics for usability and other quality aspects before finalisation.

#### **6.4.3 Questions in the Survey Instrument**

The constructs in the theoretical framework drawn from literature were the basis for preparing the initial draft of the questionnaire. The variables in the theoretical framework, the corresponding questions in the survey instrument and literature sources are summarised in Table 6-1. A copy of the questionnaire as used in Survey Gizmo can be seen in Appendix J.

**Table 6-1: Theoretical Model Variables and Corresponding Questions in Survey Instrument**

Variable	Question no	Comments
<b>Customer factors</b>		
Duration of business relationship	1,2	Total duration and period of relationship development asked separately based on the qualitative research.
Tenure of sales rep	3	Based on findings of Bowman and Narayandas (2004).
Share of customer wallet	4,5	Share of total purchase and share of product group category purchased to ascertain different facets.
Size of the customer	6	To assess customer size effect on relationships and nature of interactions (Large, 2005; personal communication from Rakesh Niraj, principal author in Niraj et al. 2001).
Importance of supply	18	Cannon and Perreault (1999) postulated these constructs as antecedents to Relationship connectors in business markets. These have been reformulated as a variable in customer characteristics in this research.
Complexity of supply	19	
<b>Relationship connectors</b>		
Operational linkages	7	All scale items taken from Cannon and Perreault, 1999. Minor changes include adding IP to proprietary information in the original to represent the usage appropriate to the participating organisation's context.
Information exchange	8	
Legal bonds	9,10	
Norms	11	
Adaptation by Seller	12	
Adaptation by Buyer	13	
<b>Environment factors</b>		
Competition	14	Cannon and Perreault had included competition as one of the items to evaluate the construct 'Availability of alternatives'. In this research, since the five product groups were deemed to have different end uses and competitive situations, this aspect was



Variable	Question no	Comments
		formulated as a separate variable with one item for each product group.
Availability of alternatives	15	As indicated for 'Competition', this item was modified to accommodate the different product groups and the ease with which the customer could shift to other vendors with minimal change in its processes.
Price volatility	16	Cannon and Perreault had included price fluctuation as an item to evaluate 'Supply market dynamism' as a construct. As in the case of competition and availability of alternatives, price volatility was separated out to reflect market differences in the five product groups offered by the participating firm.
Supply market dynamism	17	Items from original construct without price fluctuation for reasons under price volatility.
<b>Communication</b>		
Quantity	20, 21, 22, 23	Quantity of communication reflects the frequency in a defined time period. The time periods were split into 6 categories and were an adaptation from the formative scales used by Mohr, Fisher and Nevin (1996). This was done for 4 dominant types of communication identified in the qualitative phase of the study. Communication between different functional groups was also included to capture the range of interacting groups and was adapted from the work of Large (2005).
Quality	24, 25	Scales adapted from Mohr and Spekman (1994) and covers both representative level and the organisational level communications.
<b>Conflict</b>	26	Scale items adapted from Mohr and Spekman (1994) in their study on communication behaviour and conflict resolution techniques.
<b>Commitment</b>	27, 28	Scale items adapted from Sollner(1999). The items reflect the affective and calculative dimensions of commitment.

#### 6.4.4 Customer Relationships - Sampling Process

The local sales personnel have prime responsibility for managing business relationships and growing business volumes. Though profit plays a role, there is a dominant focus on sales volume. In order to get a more uniform representation of the business, it was decided to sample equal number of customers per sales person based on sales volume, with the additional criterion that customers should be an end user and not a distributor. This was expected to provide around 300 customer relationships spread across the sales team.

A list of customers was drawn from the database initially (in 2006) and the total came to 253. It was decided that an update would be done before launching the survey in order to get the total up to around 300. It was felt that targeting a larger number of customer relationships per sales person may result in inclusion of smaller customers, who may be important commercially, but would not be the focus of any relationship development.

A revised list obtained in 2008 had 298 customer relationships when extracted from the database using the criteria listed above. However, further scrutiny of the list resulted in the following changes:

Original number	298
Less:	
- removed due minimal transactions (based on financial data)	4
- Sales person position vacant	58
- No business presently with the customer	10
- Supplier or distributor	5
- Duplication due to Account Number change	4
- Change in account allocation	10
Effective base for survey	207

Hence, 207 customer relationships spread over the sales team personnel was the base for the survey on nature of business relationship with the customer.

#### **6.4.5 Survey Rollout and Response Patterns**

The survey roll out started on November 4, 2008, with an individual email to all sales people detailing the accounts selected and the Survey Gizmo site address to access the online questionnaire. The emails were routed to the participating firm's contact for onward transmission, with a copy marked to relevant sales managers for follow up action. The sales managers provided feedback if there were issues with a sales person or customer that might result in a lack of response so that this could be factored into subsequent follow up actions. Responses received as well as feedback on issues with selected sales people or customers were noted in an Excel spread sheet. This was used to provide updates to the participating firm's contact and also provide a basis for additional follow-up with the sales managers at regional offices. Two follow-up emails were sent to ensure adequate response was obtained. The second follow-up was sent out on 21 Nov 2008 and the third follow-up emails were sent in March 2009.

The following number of responses was received from the sales team after each mail-out of the invitation to participate.

	<b>No. of Responses</b>
First email invitation	54
First Reminder	46
Second Reminder	23
Total	123

In addition to the above responses, 4 new appointments of sales people responsible for 10 customer accounts could be traced and they were invited to

participate in the survey on 5 April 2008. This resulted in an additional four responses. Hence total response was 127 and the response rate is as follows:

Total responses            127

Response rate as % of effective list  $(207 + 10) = 127 / 217 = 58.5\%$

The above responses were received from 56% of the sales people included in the list.

Survey Gizmo provides the facility to track responses received daily during the survey period and this is presented graphically in Appendix M. The responses to the reminders were usually immediate and most of them were received over five days with only a few trickling in after that.

The response rate of 58.5% does raise the issue of whether the profile of customer relationships not included was different. Since the only approach to check if this is a problem requires comparison using another parameter that is available for non-respondents, this will be addressed in section 7.6.1 using the data set that includes customer profitability measures.

It is worth mentioning that the list of customers drawn up originally may be almost the complete population of all customers (excluding distributors) who may be the target of the organisation's relationship development approach. Hence, it is possible that non-response bias may not be a significant issue in the context of the present study.

## **6.5 Data Preparation for Analysis**

The responses collected by Survey Gizmo could be downloaded as an Excel file and this was subsequently transferred to SPSS for data cleaning. This

facility for direct transfer eliminated one potential source for error which could have occurred if this stage was done manually from paper based questionnaires.

#### **6.5.1 Data Cleansing Process**

The data cleansing process removed the occasional alpha numeric entries made by respondents. The responses that required percentage data were screened to ensure uniformity in responses. Similarly, the question requiring customer sales value was screened to ensure that all values were converted to USD million from responses that indicated billions or other units of measurement.

Missing data for questions requiring numerical answers such as market share were coded as missing using SPSS default value coded as 99999. There were a few missing responses for the scale items. On examining the values, there was no discernible pattern by case or by variable and in all cases the number of missing responses was significantly lower than 10% recommended as a guideline (Hair, Black, Babin, Anderson, & Tatham, 2005). As recommended by Hair et al. (2005), the mean value substitution approach was used to obtain complete data for further analysis. One of the questions that required a response on the estimated sales turnover of the customer resulted in only a 70% response rate. Hence, sales turnover of the customer intended as a measure of customer size was dropped from further analysis. Similarly, the construct for legal bonds to cover relationship development was dropped from further analysis since only 25% positive responses were indicated.

After the cleansing process, the survey data was screened for degree of skew and kurtosis. As these facets as well as multivariate normality are a requirement for undertaking model estimation using structural equation modelling, details are presented in section 7.4.

## 6.6 Preliminary Analysis of Survey Data

The focus of the preliminary analysis was to ascertain if data generated by the survey instrument could be utilised for testing the proposed theoretical model. Hence, the following sections provide a profile of customers based on duration of the relationship and a profile of communication frequency and response for the key linking construct of commitment. This is followed by an analysis of the response patterns, reliability of the constructs used and bi-variate correlation analysis as a first check on the theorised relationships.

### 6.6.1 Duration of Business Interaction and Relationship Development

Most of the customers for whom a response was received were customers of the participating firm for a fairly long time, with an average of just over 13 years (see Table 6-2). A more detailed analysis of this dimension indicated that only 22% of customers had been doing business for less than six years. However, it appears that attempts to develop business relationships on a more systematic manner are a more recent initiative, with 47% of responses indicating a relationship of six years or less.

**Table 6-2: Duration of Business Interaction**

	<b>Minimum (years)</b>	<b>Maximum (years)</b>	<b>Mean (years)</b>
Duration of Business Transactions with Customer	2	50	13.3
Relationship development period	0	31	8.6
Account Managers tenure with this Customer	0	22	4.2

With regard to the period for which a sales person had handled relations with a particular customer, the mean is approximately four years. However, a more detailed analysis indicated that around 65% of sales staff had been handling

the assigned customers for three years or less. This dimension is similar to the pattern reported by Bowman and Narayandas (2004), where only 50% of business customers reported that the same person was servicing their account for more than two years.

### **6.6.2 Communication**

An important aspect of all business dealings is the various types of communication that takes place between different functional groups in both parties, even if the sales person serves as the primary contact and coordination point. Appendix N provides a summary of the various parties and frequency of contact across different modes.

At the sales person level, the most frequent face-to-face meeting appears to be with purchase personnel, with 50% of respondents indicating a frequency of around once a month or more. Lower frequency of face-to-face meetings occurs with logistics, R&D and senior management on the customer's side, with around 53% indicating a frequency of once every two months to once a quarter. The most frequent non-verbal communication mode was email, with 50% reporting a frequency of more than twice a week.

Contacts between other personnel on the seller's side are more frequent with the customer's purchase and logistics personnel, with an estimated 40% indicating a frequency of once in two months or more. As expected, this frequency in communication is lower than the levels reported for the sales personnel.

The frequency of communication at various levels using various modes supports the contention of Large (2005) that communication quantity is an important dimension of the closeness of the business relationship between two parties.

### 6.6.3 Response Patterns - Nature of Business Relationship

The objective of collecting data on the nature of business relationships is to see if there emerges a clear pattern either in support or against the hypothesized relationships. Hence, any neutral response received on the various facets needs to be checked before embarking on analysis of the data.

The survey used seven-point Likert scales in the data collection process. Responses to all the survey items were assessed to check if there was a clear difference from the mid-point 'Neither Agree nor Disagree' represented by the number 4 in the scale. A t - test was conducted on the items in each scale to see if the mean responses were statistically different from the mid-point (Appendix L). All the items had mean values that were statistically different from the mid-point except for the following (see Table 6-3).

**Table 6-3: Items with Neutral Response**

Measurement Item	Mean	Std Dev.	Relevant scale	Total items in Scale
Our business planning activities are linked with this customer	3.93	1.66	Operational linkages	3
We will include each other in product development meetings	3.98	1.76	Information exchange	4
Customer- Changed financial terms	4.03	1.62	Adaptation by Customer	6
Competition for ProductGrp5	3.85	1.93	Competition	5
The customer can change to other vendors with minimal change in processes for Product group5	4.30	1.90	Availability of Alternatives	5
Complicated logistics, documentation or other import processes	4.00	1.72	Supply Complexity	4
High technical profile	3.94	1.63		
We benefit from this relationship through increased business with other clients	3.83	1.54	Commitment	7



Despite the wide acceptance of the seven-point Likert scale with a neutral anchor point, one of the criticisms levelled against the scale is the possibility of bias where the responses are made to please the interviewer (Garland, 1991). However, the context of the question and more importantly the mode of administration are important considerations. Since the survey was administered online, attempts to provide acceptable responses to please the surveyor may be minimal due to the impersonal nature of the mode. Thus, other possibilities could be either an actual assessment reflecting a neutral stance or a lack of knowledge. Since the other items in the scale are not on the mid-point and the scales demonstrate acceptable levels of internal reliability (see section 6.8), the results in Table 6-3 may reflect an actual mid-point evaluation on these items. Eliminating these items may thus result in inflation in the variables that the items represent.

## **6.7 Commitment to Business Relationship**

In this research, commitment has been postulated as one of the main constructs in a business relationship, serving as a link between the behavioural and cognitive aspects, with actual outcomes measured as customer profitability. Since the customers included in the survey were the target for business relationship development by the participating firm, actual measures on this dimension should reflect higher perceived commitment levels.

The construct, assessed by two questions to reflect the affective and the benefit expectation representing the calculative commitment are shown separately for this section (Geyskens, Steenkamp, Scheer, & Kumar, 1996; Verhoef, Franses, & Hoekstra, 2002).

To obtain a clearer picture on this dimension, Table 6-4 provides the responses for commitment arrived at by aggregating all agree responses and disagree responses into separate categories. Most responses from sales people indicate

that both the firm and the customer were committed to the business relationship. Another important result is the significantly higher agreement that it has taken a lot of time and effort to develop the business relationship. Thus, investment in developing a business relationship was one of the important drivers for on-going commitment and may support Sollner's (1999) contention that even the affective dimensions of commitment should be viewed as instrumental inputs representing a calculative dimension.

**Table 6-4: Commitment to the Relationship**

<b>How much do you agree or disagree that</b>	<b>Agree %</b>	<b>Neither Agree nor Disagree %</b>	<b>Disagree %</b>
It has taken a lot of time and effort to make this relationship an effective one	72.2	19.0	8.7
This customer's overall commitment towards The firm is very high	62.7	24.6	12.7
The firm's overall commitment toward this customer is very high	58.9	21.8	19.4

The commitment to the business relationship is also supported with fairly high agreement on economic benefits and obtaining a fair share of the same. However, help in obtaining other business because of the current relationship was rated significantly lower (see Table 6-5).

**Table 6-5: Benefits Realised from the Business Relationship**

<b>How much do you agree or disagree with the following outcomes for The firm from this relationship?</b>	<b>Agree %</b>	<b>Neither Agree nor Disagree%</b>	<b>Disagree %</b>
Our expectations concerning this relationship have been met	71.4	15.9	12.7
There is a fair distribution of costs and benefits in this relationship	69.8	23.0	7.1
Economic benefits from this relationship are very positive	67.5	23.0	9.5
We benefit from this relationship through increased business with other clients	42.9	30.2	27.0

Overall the sales peoples' perception appears to be that a large number of the customers included in the survey are likely to remain with the participating firm due to the commitment displayed by both parties.

## **6.8 Reliability of Scales in Constructs**

All the scale items were adapted from academic literature with minor adaptations as required by the research context. The scales taken from Cannon and Perreault (1999) were originally used in a cross sectional research design involving purchase professionals. Since the current research involved sales personnel from a single participating firm it was decided to check the internal consistency of the scales used before undertaking further analysis and interpretation of results.

Following the guidelines of Hair et al.( 2005, p. 137) the internal consistency of the items in each variable was checked using the rule of thumb that item to total correlations exceed 0.50 and the inter-item correlations exceed 0.30. In

addition, the reliability coefficient of the entire set of scales was assessed using Cronbach's alpha, with a lower cut off limit of 0.70. Details for the various constructs are provided in Appendix K. A summary of the reliability of the main scales, along with mean values and standard deviations are provided in Table 6-6. For the scale items adapted from Cannon and Perreault (1999), values of Cronbach's alpha were higher than that reported by the authors for all variables except one. The exception was supply complexity, for which Cannon and Perreault reported a value of 0.88 as against 0.83 in this research. However, all the items in the scales had inter-item correlations greater than 0.30 as recommended by Hair et al. (2005). Thus, all the scale items adopted in this research confirm earlier research with regard to internal consistency. Additional checks on the reliability and validity of the variables and constructs are discussed in section 7.5 as part of confirmatory factor analysis.

**Table 6-6: Cronbach Alpha Values for Scales in the Theoretical Model**

<b>Scale</b>	<b>Cronbach's alpha value</b>	<b>Mean</b>	<b>Std. Deviation</b>
Operational Linkages	0.90	2.76	1.03
Information Exchange	0.89	3.43	1.21
Relational Norm	0.89	2.96	0.97
Vendor Adaptation	0.92	3.99	1.23
Customer Adaptation	0.92	3.97	1.19
Supply Complexity	0.83	3.30	1.04
Supply Importance	0.95	2.61	1.12
Communication Quality	0.92	2.03	0.64
Conflict	0.86	3.68	1.03
Commitment	0.84	3.19	0.97
Market dynamism	0.88	3.48	1.35
Price volatility	0.94	2.60	1.81
Competition	0.80	3.35	1.47
Ease of vendor change	0.92	3.65	1.73

## 6.9 Nature of Interactions between Variables

The variables measured using Likert scales were examined to see if correlations between them were as expected based on the theoretical framework discussed in Chapter 4. The variables not based on items using Likert scales were excluded from this preliminary analysis as they required addressing normality and scale issues and will form part of the full model validation and estimation using SEM (See Chapter 7 for details).

Based on the theoretical framework proposed for this research (see section 4.3), a strong business relationship with a customer would imply that the underlying factors representing the relationship, such as relationship connectors, communication quality and customer specific factors, will be strongly correlated. Hence these could be regarded as the main effects in the proposed model. This would also imply that environment factors will have a weaker effect on the relationship and will manifest as lower levels of correlation. Specifically, the following correlations were expected among the main constructs if they are a valid representation of a close business relationship:

1. A positive correlation between commitment and variables representing relationship connectors.
2. A positive correlation between communication quality and commitment to a relationship.
3. A negative correlation between conflict in a business relationship and relationship connectors and communication quality.

The presence of above-mentioned correlations based on theory would represent a preliminary check on the relevance of the theoretical model and provide the basis for further analysis using appropriate confirmatory methods.

The observed correlations exhibit a clear pattern, consistent with the expectations previously outlined (see Table 6-7). Higher levels of correlation

are seen among constructs used for business relationships, whereas the environment constructs demonstrated lower correlations with the other constructs. For example, the environment factors show significant correlations with only two or three business relationship factors and the values are all less than 0.31 ( $p \leq .01$ ).

An important finding is that operational linkages have negative correlations with other constructs, which is contrary to expectations based on theory. However, taking the organisation context into consideration, this finding is understandable because the nature of business and location of customers makes development of operational linkages difficult. This finding also highlights the need to interpret relational constructs taking their context into consideration, especially when the averaging effects of a cross sectional study are not present.

**Table 6-7: Correlation Matrix of Main Relationship Constructs**

Operational Linkages													
Information Exchange	-0.76**												
Relational Norm	-0.59**	0.66**											
Vendor Adaptation	-0.54**	0.60**	0.47**										
Customer Adaptation	-0.48**	0.59**	0.44**	0.73**									
Communication Quality	-0.05	0.05	0.19*	-0.07	-0.10								
Conflict	0.09	0.21*	0.02	0.23**	0.15	-0.38**							
Commitment	-0.48**	0.46**	0.68**	0.45**	0.36**	0.35**	-0.05						
Supply Importance	-0.49**	0.56**	0.67**	0.44**	0.35**	0.26**	0.03	0.68**					
Supply Complexity	-0.41**	0.45**	0.39**	0.52**	0.47**	0.07	0.17	0.40**	0.46**				
Competition	-0.11	0.22*	0.13	0.19*	0.19*	0.17	0.08	0.24**	0.26**	0.26**			
Ease of vendor change	0.27**	-0.13	-0.19*	-0.14	-0.08	-0.02	-0.02	-0.17	-0.04	-0.04	0.40**		
Price volatility	-0.04	0.19*	0.15	0.15	0.1	0.16	0.01	0.24**	0.33**	0.23*	0.61**	0.35**	
Market Dynamism	-0.15	0.25**	0.09	0.17	0.15	0.06	0.13	0.16	0.23**	0.30**	0.34**	0.26**	0.41**

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

## 6.10 Conclusions

The nature of business relationships with customers in the participating firm can be investigated using the scales reported in prior research as indicated in the theoretical model. This conclusion is supported by the preliminary qualitative investigation using in-depth interviews which indicated that the variables and constructs selected from literature were appropriate for capturing the range of business relationships that existed between the participating firm and its customers. A subsequent quantitative investigation incorporating the scales in a survey instrument generated the raw data to be used as input for further analysis. Based on this data all the scale items met the internal consistency requirements, with Cronbach alpha values exceeding 0.80 as well item-to-total contributions of 0.50 or greater. Bi-variate correlation analysis of all the scale items provided initial confirmation of the hypothesised interactions between business relationship factors and supports a more detailed analysis based on the data set. The availability of a complete data set for business relationships with customers provides the basis for integration into a complete model with financial data on customer profitability.

Preliminary analysis also revealed that legal bonds as a variable should be excluded from further analysis as they did not appear to be relevant. Similarly, a large non response to the question on share of customer wallet and customer size indicated that these may need to be dropped from the model in the next stage of analysis.



## **Chapter 7 Theoretical Model Validation**

### **7.1 Introduction**

The previous chapters provided an overview of the data collected to answer the research question. This chapter will first outline the theoretical model presented in Chapter 4 and then describe the analysis strategy appropriate for testing the validity of the theoretical constructs and proposed hypotheses linking the constructs in this model. This will be followed by the data analysis strategy proposed using AMOS18 as the SEM tool, and measures adopted to prepare the data collected for analysis. SEM analysis involves a two-step approach wherein the measurement models using congeneric constructs that are assessed for validity, followed by tests on an integrated structural model to assess the validity of proposed links between the constructs. Equivalent versions of the proposed structural model are evaluated before arriving at the final model. The chapter concludes with the interpretation of results and assessment of the extent to which the proposed hypotheses are supported and their implications for the research questions.

The presentation of SEM analysis results follows the recommendations of McDonald and Ho (2002). As the proposed models are fairly complex, details of the analysis results are provided in appendices and only the main results are included in this chapter.

### **7.2 Theoretical Models**

The theoretical model originally proposed has been updated on the basis of data collected from the organisation and presented in previous chapters. The

models for customer profitability and business relationships are discussed separately as the sources of data are different.

### **Customer Profitability**

The descriptive analysis presented in Chapter 5 outlined the various components of cost and revenue. The relative contribution of the various components was the basis for inclusion or deletion in the updated theoretical model. The main components of the theoretical model are the following (See Table 7-1):

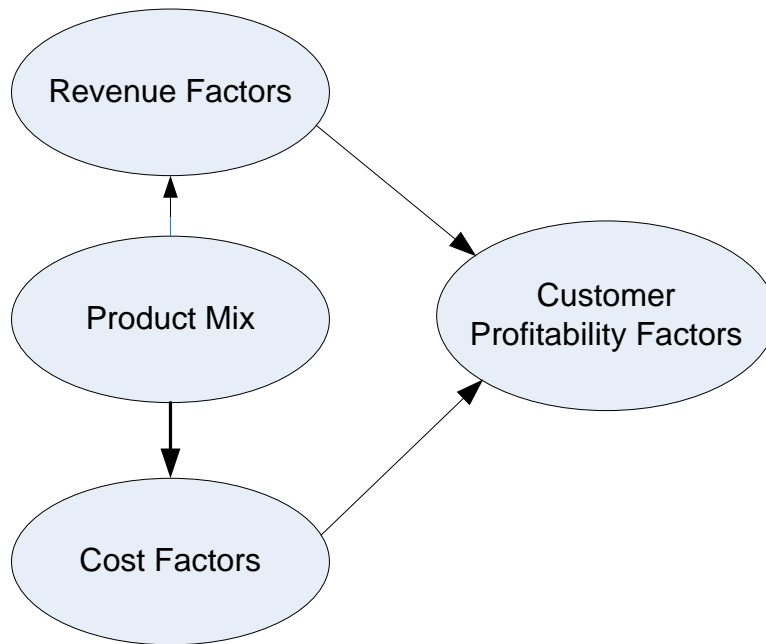
**Table 7-1 : Variables in the Customer Profitability Model**

<b>Components</b>	<b>Description</b>
<b>Revenue factors</b>	
Baseline revenue	Dollar revenue from customer at constant price
Price Increase	Dollar revenue accruing from Price Increase during the financial year
Other recoveries	Other elements such as freight recoveries etc.
<b>Product Mix</b>	
Share of Product group 1	Percentage share of PGrp1 in total revenue
Share of Product group 2	Percentage share of PGrp2 in total revenue
Share of Product group 3	Percentage share of PGrp3 in total revenue
Share of Product group 4	Percentage share of PGrp4 in total revenue
Share of Product group 5	Percentage share of PGrp5 in total revenue
<b>Cost factors</b>	
Cost of goods baseline	Cost of goods computed at constant cost
Cost of goods others	Other costs recovered from customer
Documentation costs	Costs incurred for processing each transaction
Number of destinations	Number of destinations that a customer requires products to be sent to
<b>Customer Profitability Factors</b>	
Customer Profit value	Dollar profit accruing from a customer
Customer Profitability as % of Sales	Profit from customer measured as a % of sales

Accounting methods at the aggregate level follow the formula where revenue minus costs equals the profitability of the customer. In contrast, the proposed theoretical model for a statistical analysis of the relationship is a four factor model where customer profitability variation is accounted for by revenue

factors, product mix and cost factors, as shown in Figure 7-1 below. For the purpose of analysis using SEM it is postulated that the indicators of each of these factors are reflective in nature (Jarvis, Mackenzie, Podsakoff, Mick, & Bearden, 2003).

**Figure 7-1: Customer Profitability Model**



The rationale for depicting customer profitability as a four factor model is based on an extension and modification of earlier research in this area. Niraj et al. (2001) extended the traditional concept of customer profitability using activity based costing to account for costs associated with complexity of transactions such as number of items ordered and order processing cost. These costs were based on activity levels and cost pools and did not draw on traditional book keeping accounting records. This research has similar extensions by including cost of documentation and number of destinations and costs based on indicators of activity. Van Triest (2005) investigated the key financial factors that influence customer profitability and used path analysis for a breakdown of the direct and indirect effects of the relevant factors. This research builds on this approach by modelling the individual financial components as an observed term that can have a measurement error and statistical variation with a view that analysing the levels of covariance

amongst these constructs might provide insight into the research question. Due to the possible links between some of the financial variables, such as price increase and customer profitability, some correlation between the factors and the error terms may be expected when conducting a CFA analysis.

### **Nature of Business Relationship**

Table 7-2 outlines the constructs in the theoretical model, the measurement indicators and the postulated nature of effects of the indicators on the constructs when set up as a model for SEM analysis (Jarvis et al., 2003).

**Table 7-2 : Nature of linkages between Constructs**

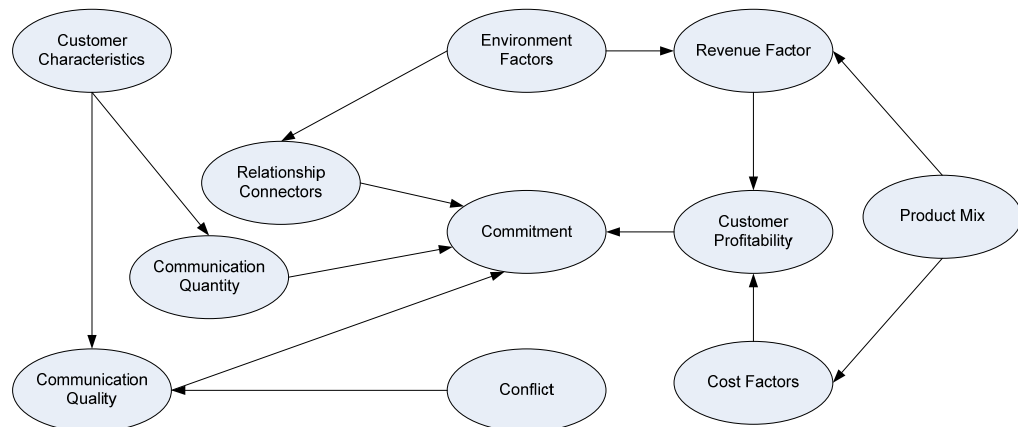
<b>Construct</b>	<b>Items</b>	<b>Postulated Nature of effect</b>
Customer Characteristics	Tenure of sales rep Share of customer wallet Duration of Business Relationship  Importance of Supply Complexity of supply	Reflective Reflective Reflective (Above 3 could be viewed as being formative) Reflective Reflective
Relationship Connectors	Operational linkages Relational norms Information exchange Adaptations by Seller Adaptations by Customer	Reflective Reflective Reflective Reflective Reflective
Communication Quantity	Your Communication Qty Communication Between Others Qty Non-Verbal Communication Qty	Reflective Reflective Reflective
Communication Quality	Quality Your Communication Quality of Communication between others	Reflective Reflective
Conflict	Arguments Heated Argue Frequently Disagree on Goals	Reflective Reflective Reflective
Commitment	Seller's Commitment to business relationship Customer's Commitment to business relationship Time invested to develop business relationship Growth expectations Economic benefits from the relationship Distribution of Costs and benefits Aids Development of other customers	Reflective Reflective Reflective Reflective Reflective Reflective Reflective
Environment Factors	Competition Ease of Vendor Change Price Volatility Comp. Vendor Capability	Reflective Reflective Reflective Reflective

The direction of effects of the indicators on the first order variables was hypothesised to be reflective. Some of the items of constructs such as communications and environment factors could be argued to be formative using the criteria recommended by Jarvis, Mackenzie and Podsakoff (2003). However, considering the context of the research and hypothesised nature of effects, they are all assumed to be reflective.

### Link between Customer Profitability and Nature of Business Relationship

Based on the existing literature it was postulated that business relationship and customer profitability would be linked through the level of commitment in the business relationship. The constructs and the links between them are indicated in Figure 7-2.

**Figure 7-2: Proposed Links - Business Relationship and Customer Profitability**



The hypothesised relationships between the constructs are summarised in Table 7-3. The theoretical basis for the hypotheses in Table 7-3 is provided in Chapter 4.

**Table 7-3: Hypothesised Relationship between Constructs**

<b>Antecedent Construct</b>	<b>Nature of link</b>						
	Relationship connectors	Communication quantity	Communication quality	Commitment	Revenue	Cost factors	Customer Profitability
Customer Characteristics		+	+				
Environment factors	-				-		
Relationship connectors				+			
Communication quantity				+			-
Communication quality				+			
Conflict			-				
Revenue factors							+
Cost factors							+
Product mix					+		+
Customer Profitability				+			

**Note:** + denotes positive association; - denotes negative association.

### 7.3 Data Analysis Strategy

The proposed theoretical model influenced the choice of the appropriate multivariate analysis technique. The choice of an appropriate strategy was linked to the research objective and the theoretical basis for the proposed constructs in the theoretical model (Hair et al., 2005). In this instance, SEM was considered the appropriate method since the proposed model incorporates constructs drawn from different research streams to provide a link between business relationships with customers and customer profitability. In the first instance, it was necessary to determine if the diverse collection of constructs

remained valid in the present study. Further, as the theoretical model to explain customer profitability variation was not reported in the literature prior to commencement of this study, this research had an exploratory dimension. SEM was considered suitable for this dimension as it enabled alternative formulations of the model to check theory based on data obtained.

The analysis process adopted involved a two-step approach: analysis of the measurement model and then the structural model (Byrne, 2001; Hair, et al., 2005; Kline, 2005). Testing the measurement model involved conducting a confirmatory factor analysis to check if all observed indicators loaded onto the first order factors as proposed. The assumption is that the theory is tested with regard to the relationships between the measurement items and latent constructs. If the proposed indicators and constructs confirm the linkages at the first order levels, then the analysis can proceed to test the nature of structural relationships between the constructs.

### **Proposed Modelling Strategy**

Hair et al. (2005) advise that the use of multivariate techniques such as SEM is influenced by the research objectives and is best achieved through selecting one of the three modelling strategies, confirmatory, competing or development. If the approach is not specified beforehand, the analysis may result in incorrect pathways being pursued and incorrect conclusions drawn from the analysis.

A confirmatory modelling approach involves developing and testing one model for fit with the data. If the fit is acceptable, the model is accepted. In the competing models approach, models with different hypothetical structural relationships based on competing theories are tested to ascertain which alternative model provides a better fit. A subset of this approach that is less stringent and is related to the use of SEM as an analytical technique is the equivalent models approach. This capitalises on the existence of at least one other model with the same number of parameters and model fit and can be linked to model complexity. Since the proposed model in this research has a

number constructs, it is expected that there would be equivalent models that would have the same fit to data. The equivalent models are largely data driven and may result in models that, while providing adequate fit, may not be theoretically sound.

The primary research objective was to establish if the nature of business relationships that exist between a seller and its customers can explain the variation seen in customer profitability. A theoretical model was developed utilising or adapting constructs reported in existing literature. However, the nature of the link between business relationships and customer profitability variation measured in financial terms has not been investigated. Hence, the initial analysis was planned as a confirmatory approach to validate the reliability of the relationship between constructs as indicated in the theoretical model. This was followed by an exploratory approach to investigate if alternative theories confirm or disconfirm the link. Thus the modelling strategy adopted was the model development approach (Hair et al., 2005).

### **Sample Size Requirements for SEM**

AMOS 18 software utilises maximum likelihood estimation (MLE) procedures to test a model and compute its parameters. A stable solution can be arrived at with a sample size of 100 to 150 (Hair et al., 2005, p. 741). However, this would apply when the model has five or fewer constructs and each construct has at least three indicators. Since the model proposed has more than five constructs, and therefore parameters to be estimated, the traditional view is that it will require a larger sample size (Hair et al., 2005). Other aspects also need to be considered, such as the number of constructs with fewer than three indicators and modest communalities. While the number of indicators per construct is significantly more than three in most cases, this may mitigate to some extent the fact that number of construct is more than six. Boomsma (2000) has highlighted the link indicating "...a higher number of indicators per factor ratio in the confirmatory factor analysis may compensate for a small N..." The communalities will be known only after completion of a CFA on the constructs. In view of these conditions, it could be argued that the proposed



model may need a larger sample size than 100 to 150 for a stable solution. Bearing in mind that the sample sizes for this research are 126 for the survey data, 235 for customer profitability from the financial data base and 107 for the merged data set (see section 7.6.1) literature on SEM was investigated to ascertain current thinking on the matter.

Herzog and Boomsma (2009) have investigated the issue of sample size and SEM. Their contention is that the model fit indexes used by SEM programs derive from the work of Hu and Bentler (1999) that require a sample size of 200 to achieve robust inferences. However, by using modified estimators based on the work done by other researchers, it is possible to obtain robust estimates even when sample size is as low as 50. Herzog and Boomsma also present simulated data to show that these estimates are relatively independent of sample size in the range of 50 to 200. The significance of their conclusions for the current research is that if the model fit and estimation using AMOS indicate that there could be problems due to sample size limitations, the modified indices of fit could be used to check the fit of the model. A post-hoc analysis of the adequacy of sample size in the final model will be discussed in sec.7.7.

## **7.4 Data Preparation for SEM Analysis**

As there were two data sets for the analysis, survey data for business relationships with the customers and financial data to represent customer profitability, initial data preparation was conducted separately. This approach was adopted as the sample sizes were different and the nature of the data required different treatments for preparation. Further, the full data sets in each case were used to test the respective measurement models in the CFA.

### **Item Representation in the Constructs: Total versus Partial Disaggregation**

One of the essential steps in preparing data for analysis is the decision on how the data items, especially those from a survey, are to be represented as indicators in the latent constructs. The choice is between having each item represented in the model (total disaggregation) or combining them into subsets called parcels for use as indicators in the latent variable (partial disaggregation). Williams et al.'s (2009) view on the total disaggregation approach is that although using each question response as an item is conceptually attractive to represent multiple facets, there are many disadvantages. Previous researchers have highlighted such an approach to be associated with lower reliability and communality as compared to parcels and hence to limit the effectiveness of individual items as indicators. Other issues include the greater likelihood of non-normal distributions, the need for larger sample sizes due to the number of parameters to be estimated and the lower chance of the model fitting well, even if it closely matches the process being studied, because of a large covariance matrix.

On the other hand, the claimed advantages for item parcelling include more intervals between scale points as compared to items, fewer parameters to be estimated, which becomes important when sample size is small, and fewer chances for correlations among uniqueness estimates. Item parcelling may also be preferred to data transforms if non-normality exists (Williams et al., 2009). Disadvantages are problems in interpreting estimated relations when used with multi-dimensional constructs and, more importantly, the potential to hide sources of model misspecification.

In research that involves latent variables that are multi-dimensional with multiple facets, one of the approaches to developing parcels is the 'internal-consistency approach', which involves combining items from each facet to form the parcel. The 'internal-consistency approach' tends to have high internal consistency reliability estimates since the items that load together are fairly highly correlated and this maximises the value of alpha. While it could

be argued that this would result in representing only one component, availability of a reasonable number of these facets enables an adequate number of indicators to capture a multidimensional construct. This was the approach adopted in this research for the constructs used to represent relational connectors and environment factors. The indicator parcels were developed by summing the item scores. Individual items were used for constructs communication quality, communication quantity, conflict, commitment and customer characteristics.

For the financial constructs individual items were used as representing the various components of the relevant constructs without aggregation.

### **Screening for Multivariate Normality**

One of the important requirements for ensuring stable solutions to SEM analysis using MLE is that the underlying data should be multivariate normal, have minimal missing values and should not be ill scaled (Hair et al., 2005; Kline, 2005). As most data have some degree of skew and kurtosis, Kline (2005) recommends that acceptable levels for these would be  $< 3$ . Scaling of the items is also important for getting convergence and Kline recommends that the ratio of the minimum to maximum should not exceed 10. Using these guidelines, the financial data and survey data were screened and processed as outlined below to enable analysis using AMOS.

The recommended approach to ensure that data conforms to multivariate normality is to examine the univariate normal distribution characteristics in the first instance. Associated with this step is the need to check for outliers, skew and kurtosis as often deviations from normality can be traced to the latter two aspects (Hair, et al., 2005; Kline, 2005).

### **Survey Data: Business Relationship with Customer**

The distribution of indicators used to assess the nature of business relationship was checked using the stem leaf and the normal probability plots. Most of the indicators showed curves in the normal probability plots indicating deviation

from normality. The deviations could be due to the presence of skew and kurtosis in the distribution as explained in the next paragraph.

To examine the extent of skew and kurtosis in each of the univariate variables, skew and kurtosis statistic value (z) were calculated using the following formulae (Hair, et al., 2005)

$$z_{skewness} = \frac{skewness}{\sqrt{\frac{6}{N}}}$$

$$z_{kurtosis} = \frac{kurtosis}{\sqrt{\frac{24}{N}}}$$

The z skew and kurtosis test values are indicated in Appendix O. It can be seen that all the variables have some degree of kurtosis and skew at the .01 or .05 level of significance. The presence of skew and kurtosis in all the variables was also indicated by the Shapiro-Wilks test and the Kolmogorov-Smirnov test with the Lilliefours correction provided in SPSS 18.

Box plots of all the variables indicated the presence of outliers in the case of two variables. As these related to the items using the seven- point Likert scale, these values were changed to the ends of the distribution.

### **Corrections for non-Normality**

The normal recommendation for non-normality is to correct for deviations from normality at the univariate level as a first step as this may reduce the chances of multivariate normality. With this data set the main concern was to examine ways to correct the skew and kurtosis present. Though heuristics exist for various types of transformations, depending on the direction of the skew and positive or negative kurtosis, researchers often try various transformations and adopt one that passes the normality test (Hair, et al., 2005). However, transformations may distort the interpretation of results.

Another perspective on handling deviations from normality is an examination of the severity of the skewness and kurtosis based on the respective indices. One guideline indicated by Kline (2005) is that absolute skew values of 3 or more indicate severe skew. However, for kurtosis there appears to be even fewer guidelines. A conservative view propounded by Kline is that kurtosis index values greater than 10 may indicate a problem, while values greater than 20 may indicate a more serious problem.

Using the guidelines proposed by Kline (2005), an examination of the kurtosis indices shows that the maximum value is 2.82. Hence, while kurtosis is present, it may not be a problem as it is much lower than 10. The maximum value for skew is 1.86 indicating the presence of skew but is less than 3 recommended as a guideline, indicating that it is not severe in nature. Hence no actions were required to correct for skew or kurtosis.

### **Screening of Financial Data**

Most of the indicators in the financial data set exhibited severe skew and kurtosis. Transformations and scaling approaches were adopted to normalise and prepare the data for analysis as required for SEM (see Table 7-4).

**Table 7-4: Transformations for Financial Data**

<b>Components</b>	<b>Treatment for normality and scale</b>
<b>Revenue factors</b>	
-Baseline revenue	Ln transformation then divided by 10
-Price Increase	Ln transformation then divided by 10
- Other recoveries	Ln transformation then divided by 10
<b>Product Mix</b>	
- Share of Product group 1	No change
- Share of Product group 2	No change
- Share of Product group 3	No change
- Share of Product group 4	No change
- Share of Product group 5	No change

Components	Treatment for normality and scale
<b>Cost factors</b>	
Cost of goods baseline	Ln transformation then divided by 10
Cost of goods others	Ln transformation then divided by 10
Documentation costs	Ln transformation
Number of destinations	No transformation
<b>Customer Profitability Factors</b>	
Customer Profit value	Ln transformation then divided by 10
Customer Profitability as % of Sales	Ln transformation then divided by 5

### Missing Data

Identification and taking appropriate actions for missing data was an important step as complete data sets are required to enable AMOS 18 to generate the modification indices, essential if exploratory analysis for improving model fit is to be undertaken (Byrne, 2010; Garson, 2011).

The survey data had very few items missing for the questions that required responses on the seven-point Likert scale. A few response items had fewer than 10 missing responses and these appeared to be at random. The missing responses were replaced with mean values. The question on customer size had around 30% missing response and hence was not considered for analysis.

There were no missing items in the financial data set.

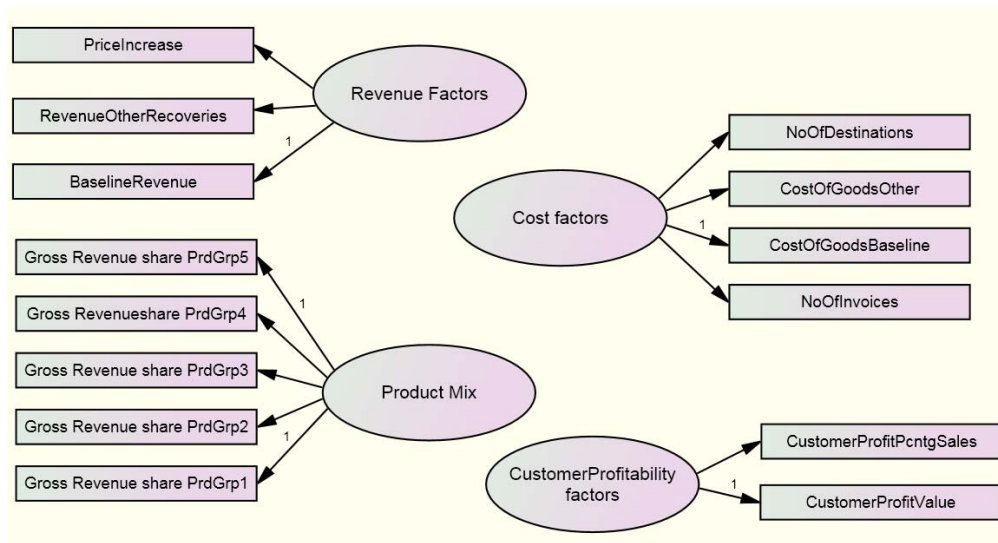
## **7.5 Measurement Models' Validation**

The first step in the two step analysis process with SEM involved testing the measurement models using Confirmatory Factor Analysis (CFA) to confirm that observed variables or indicators load onto the respective factors as indicated by theory (Hair et al. 2005). One-factor congeneric models were estimated for each of the constructs using survey data to assess their measurement properties. The measurement models were then estimated before attempting to assess the structural models. There were two measurement models, one for constructs relating to customer profitability and the other on the nature of business relationship with individual customers. CFA for the two models was done separately. This approach was used since the constructs on business relationships and those on customer profitability draw on two different data sets. Further, the data types for the two main areas were different. The business relationship constructs draw on perceptions of the sales people measured using a seven-point Likert scale. Customer profitability data, on the other hand, drew on the accounting data that reflected the actual business transactions that took place during a financial year. Another factor influencing this decision was the reduction in sample size that was expected when the survey and the financial data were merged. Testing the constructs for measurement validity on a larger sample size would establish the reference points to check if problems existed as a result of the reduction in sample size.

### **7.5.1 Customer Profitability**

The main constructs in the measurement model can be seen in Figure 7-3.

**Figure 7-3: Constructs and Indicators in the Customer Profitability Model**



Note: Measurement errors for variables are not shown in the diagram

### Measurement properties of constructs

The four constructs proposed to reflect the underlying commonality of the financial parameters needs to be assessed with regard to their measurement properties. Hence, each of the constructs was subjected to a confirmatory factor analysis to check their feasibility to be represented as congeneric models. In addition to  $\chi^2$  significance, other model fit parameters such as RMSEA and CFI values were used to assess model fit.

#### Revenue

Running a CFA with three indicators resulted in a poor fitting model ( $\chi^2 = 15.6$  with  $p = 0.00$ , RMSEA = 0.25 and CFI = 0.976). Examination of the loadings showed that the 'RevenueOtherRecoveries' had a low value of -0.09. Hence this was deleted.

#### Product Mix

All the indicators in this construct had non- significant low loading on the construct resulting in a poor fitting model ( $\chi^2 = 397$  with  $p = 0.00$ , RMSEA = 0.532 and CI = 0.05). This clearly indicated that the hypothesised reflective construct for the indicators was inappropriate and probably needs to be



considered as a formative construct. Hence, Product Mix was dropped from the model.

#### *Cost factors*


The indicators in this construct had statistically significant loading on the construct, but the model demonstrated a poor fit ( $\chi^2 = 21.6$  with  $p = 0.00$ , RMSEA = 0.21 and CFI = 0.884). Examination of the modification indices showed that one of the contributors to the poor fit was the possible covariance in the error terms of 'CostofGoodsBaseline' and 'CostofGoodsOther'. Freeing this parameter to be estimated resulted in a near perfect fit of the model.

#### **Customer Profitability Measurement Model Refinement and Validation**

A first run of the Confirmatory Analysis indicated that the initial measurement model hypothesised for the data had a poor fit. As a result, further analysis was undertaken in an exploratory mode as recommended by other researchers (Garson, 2011; Hair et al. 2005; Kline, 2005). In the exploratory mode additional paths in the model were freed using the modification index as the initial starting point, followed by theoretical relevance (Kline 2005; Byrne 2010). A stepwise approach was undertaken to ensure that the model fitting process did not result in Heywood cases (Byrne, 2010). Further, the paths freed took into consideration expected changes in parameter estimates in addition to the value of the Modification Index (Byrne, 2010).

In the first instance, the analysis focused on nested models to arrive at one that fitted the data best. The stages in the exploratory refinement process are summarised in Table 7-5.

**Table 7-5: Overview- Customer Profitability Measurement Model Modification**

Model no Description	 Val (df)		ECVI	RMSEA		Comments
	Val (df)	<i>p</i>		Val	PClose	
<b>CP1.</b> Three construct baseline model	143 (19)	0.00	0.77	0.17	0.00	Minimisation achieved. Poor fit with data
<b>CP2.</b> Model CP1 with additional paths	60.7 (16)	0.00	0.438	0.11	0.00	Improvement in fit, but still below acceptable limits. Cross loading point to problems with discriminant validity
<b>CP3.</b> Model CP2 modified by combining two constructs- cost factors and customer profit variation	129.3 (19)	0.00	0.71	0.16	0.00	Poor fit with the data. Points to the need to explore ways to improve model fit
<b>CP4.</b> Arrived at by pruning indicators with low loading on constructs	12.9 (7)	0.07	0.178	0.06	0.31	A parsimonious model with good fit to the data and constructs with high reliability and discriminant validity

The exploratory phase commenced with Model CP2 in Table 7-5. Though the modification exercise was identified based on statistical considerations, paths were freed to be estimated only if this made sense on theoretical grounds. This was done to avoid the dangers of model building being a pure statistical exercise in model fitting to capitalise on chance in the data set (Kline, 2005). However, analysis of modification indices pointed to the need to estimate the covariances between error terms of adjoining constructs which indicated that there may be issues with the discriminant validity of constructs.

Model CP3 was arrived at after merging indicators of the constructs for customer profitability and cost factors to improve discriminant validity. This resulted in a model that had poor fit to the data. This pointed to the need to

examine the indicators in the model with a view to pruning ones with low loading and also to examine freeing additional pathways to improve model fit.

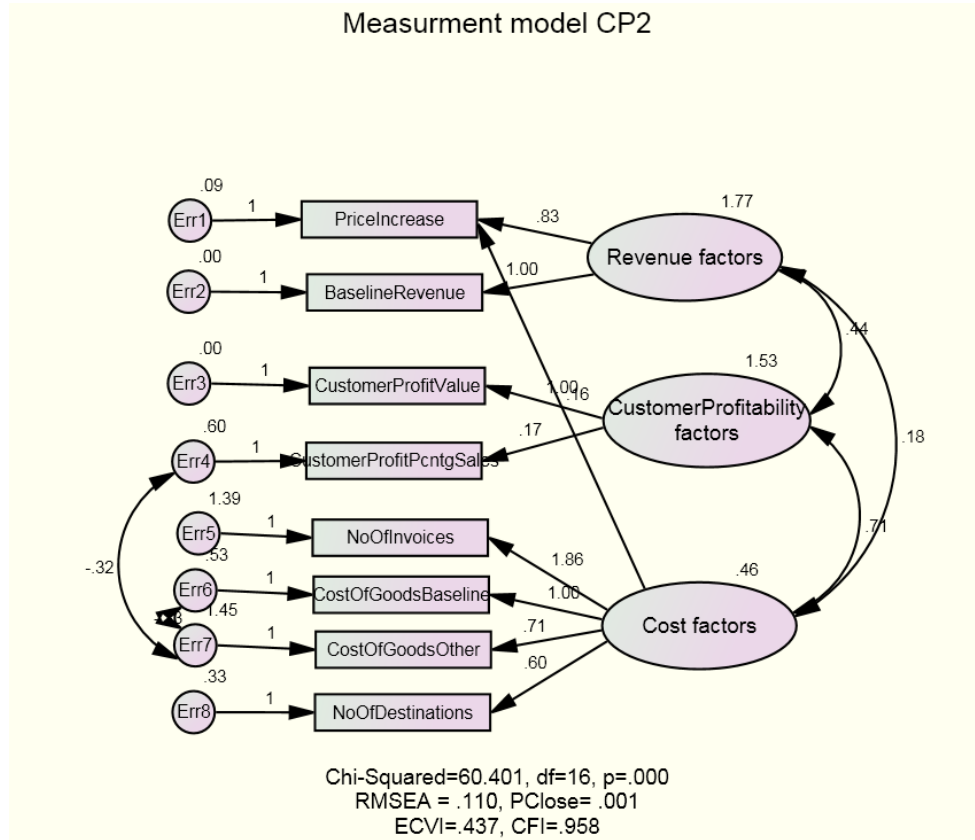
ModelCP4 was the final parsimonious model arrived at a result of changes. It exhibited excellent fit to the data and was used to represent the financial factors in the final structural model estimation.

The details of the analysis and steps taken to arrive at the final model are discussed in the following section.

### **Customer Profitability measurement model validation**

The baseline three factor measurement model (CP1) indicated a poor fit (see Table 7.4). In order to improve fit, examination of the modification indices provided by AMOS18 resulted in freeing additional paths in a stepwise manner. The paths were: PriceIncrease loading on Cost factors construct, covariance between error terms Err6 and Err7 and Err4 and Err7. The model resulting from these changes is shown in Figure 7-4. Even though there was an improvement compared to model CP1, RMSEA = 0.11 indicated an unsatisfactory fit. Further, to improve fit, the modification indices pointed towards the possibility of including covariances between error terms across constructs as well as cross loading of indicators. Hair et (2005, p. 782) caution against including such pathways in improving the fit model as it invariably results in lower construct reliability as well as lower discriminant validity. Before proceeding with further exploratory changes to the model to improve fit, it was deemed necessary to investigate the reliability and discriminant validity of the constructs in model CP2 to identify issues and address them.

**Figure 7-4: Customer Profitability Model CP2**



### Reliability and Validity of Constructs- Model CP2

Model CP2 was analysed for the reliability and validity of the constructs as proposed in the theoretical model. To assess these facets the Average Variance Extracted (AVE) and Construct Reliability (CR) were computed using the formulae given below (Fornell & Larcker, 1981; Hair et al., 2005, p. 777).

$$\text{Average Variance Extracted } AVE = \frac{\sum_{i=1}^n \lambda_i^2}{\sum_{i=1}^n \lambda_i^2 + \sum_{i=1}^n \text{Var}(\varepsilon_i)}$$

where:

$\lambda$  represents standardised factor loadings

$i$  the number of items in the construct and

$\text{Var}(\varepsilon)$  the variance of the error term for the item

$$\text{Construct Reliability } CR = \frac{\left( \sum_{i=1}^n \lambda_i \right)^2}{\left( \sum_{i=1}^n \lambda_i \right)^2 + \left( \sum_{i=1}^n \delta_i \right)}$$

where

$\lambda_i$  = individual standardised factor loadings for each construct

$\delta_i$  = error variance terms

The justification for using the above formula for assessing construct reliability rather than the commonly used Cronbach's alpha is the possibility that the latter may understate reliability in many instances (Hair et al., 2005).

### **Convergent Validity of Constructs Model CP2**

The measurement model was assessed for convergent validity to estimate the extent to which the selected indicators converge or share a high proportion of variance in common with a specific construct (Hair et al., 2005). This assessment takes into consideration factor loadings to the specified construct, average variance extracted (AVE) by the construct and construct reliability (CR). The guidelines for assessing validity are: factor loadings > 0.5 and ideally > 0.7, AVE > 0.5 and CR > 0.7 represents good reliability. However, CR values between 0.6 and 0.7 are deemed acceptable levels of construct reliability.

Of nine variables in the model, factor loadings were above the specific limit for seven variables. Loadings were well below the limit for other COGS and customer profitability as % of sales. The possible reasons for this could be noise in the data as a result of the process used to compute these values (see Chapter 6). While it can be argued that these factors should be dropped to improve the parsimony of the model, both factors make an important contribution from substantive considerations. Profitability as a proportion of sales was considered an important dimension on which customer profitability varies and was deemed necessary in the model to capture this variation. If this

factor was deleted, only the magnitude of profit will be represented, limiting this construct to just one dimension.

### **Discriminant Validity**

There has been some debate about how the discriminant validity should be computed to ensure that values do not lead to wrong conclusions. Farrell (2010) makes the case that factor loadings used for the computation should utilise the estimates obtained from an SEM program, rather than from general statistical packages such as SPSS, as this takes into consideration measurement errors. This approach is recommended as it is claimed to provide a more stringent evaluation of the statistic. Accordingly, AVE and construct reliability were computed using standardised estimates and the corresponding error term value from AMOS18 output.

Fornell and Larcker (1981) proposed a method to establish discriminant validity of constructs in a measurement model. To assess discriminant validity of two or more constructs the AVE of each construct should be more than the shared variance with other constructs. If this condition holds, then discriminant validity is supported. Table 7-6 provides the relevant values for Model CP2.

**Table 7-6: AVE and Shared Variances of Model 4**

	<b>1</b>	<b>2</b>	<b>3</b>
1.Revenue	<b>0.95</b>	0.005	0.005
2.Customer Profitability	0.071	<b>0.64</b>	0.475
3.Cost factors	0.038	0.689	<b>0.28</b>

Note: Values on the diagonal are AVE, values, below the diagonal are correlations, and values above the diagonal are the variances between the constructs.

Using the criteria proposed by Fornell and Larcker (1981) it can be seen that the constructs revenue factors and customer profitability variation pass the discriminant validity test as the AVE in the both the cases is more than the shared variances with other two constructs. However, in the case of cost

factors the AVE is less than the shared variance with customer profitability indicating insufficient discriminant validity for this construct. Possible reasons for this would be the cross loading of two indicators from the revenue construct and the existence of a high degree of correlation with the customer profitability variation construct.

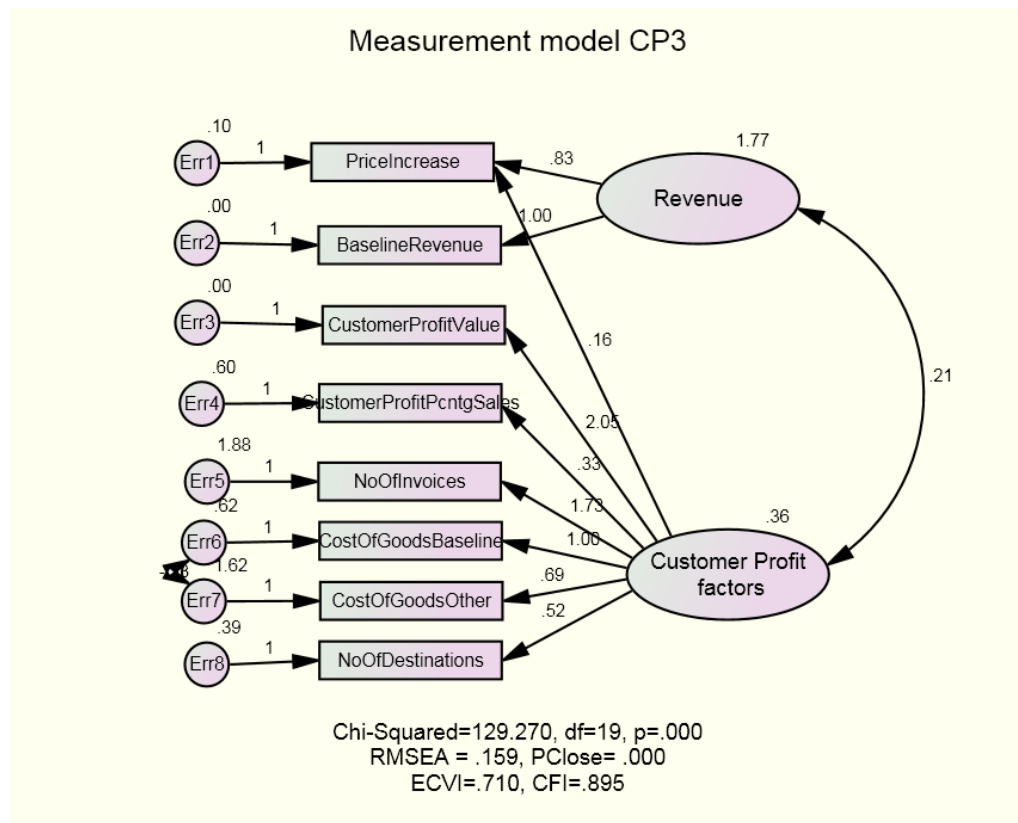
To tackle issues of insufficient discriminant validity in a measurement model Farrell (2010) makes three broad suggestions.

1. Introduce a common method factor to reduce variance inflation and reduce shared variance estimates between latent constructs and observed variables.
2. Conduct an EFA (or use modification indices from CFA) to check if cross loading of items is a possible cause. If items load on more than one factor, elimination of the offending variable may help. However, there may be a trade-off between number of scale items for face validity and measurement scales that perform well and discriminate when adopting this approach.
3. If discriminant validity still persists, then there may be no option but to combine the constructs.

Examining Model CP2 it can be seen that one indicator has cross loading. This was freed to be estimated as it contributed to better model fit. It can also be justified on the grounds that price increases were linked closely to offset cost increases (see sec 5. for details). Similarly, covariance among the error terms occurs due to the close link between the cost components which were derived from aggregate data.

In model CP3 the latent constructs cost factors and customer profitability was combined into one and relabelled as customer profitability factors. The graphical representation of this model and the revised parameter estimates are shown in Figure 7-5.

**Figure 7-5: Model CP3- Two Factor Model for Customer Profitability**



**Table 7-7: Model CP3- AVE and Construct Reliability Estimates**

Constructs	AVE	Shared Variance	Construct reliability
Revenue	0.95	0.07	0.98
Customer Profit factors	0.29		0.52

From a model fit perspective, the RMSEA value of 0.16 represents a poor level of level fit. Other fit criteria such as CFI =.895 also indicate that it is short of an acceptable fit level.

Model CP3 demonstrated good convergent validity for the revenue variation construct, but continues to have a poor validity for the merged construct as the AVE is only 0.29, some of the indicator loadings are less than 0.5 and construct reliability is poor, with the value of 0.52. As indicated earlier, these indicators were retained initially for substantive reasons because they enabled a more complete modelling of the factors that contribute to customer

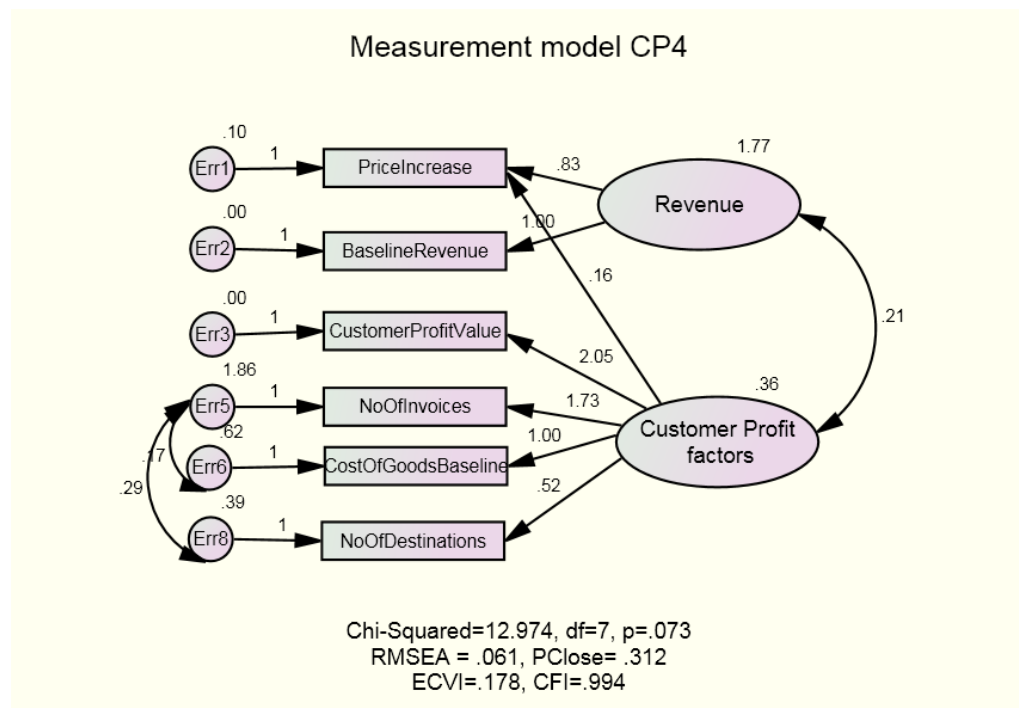


profitability. However, as the primary focus had shifted to establishing discriminant validity for the constructs, the following indicators were deleted.

Customer Profitability % of Sales	0.25
Cost of Goods Other	0.31

The item no. of destinations, with a loading of 0.45, was judged to be just within the acceptable levels and was retained. Model CP4 is the revised model with above two parameters dropped. The revised model CP4 along with main model fit statistics is given in Figure 7-6., AVE and construct reliability estimates are shown in Table 7-8.

**Figure 7-6: Model CP4- Pruned Two Factor Customer Profitability Model**



**Table 7-8: Model 7- AVE and Construct Reliability Estimates**

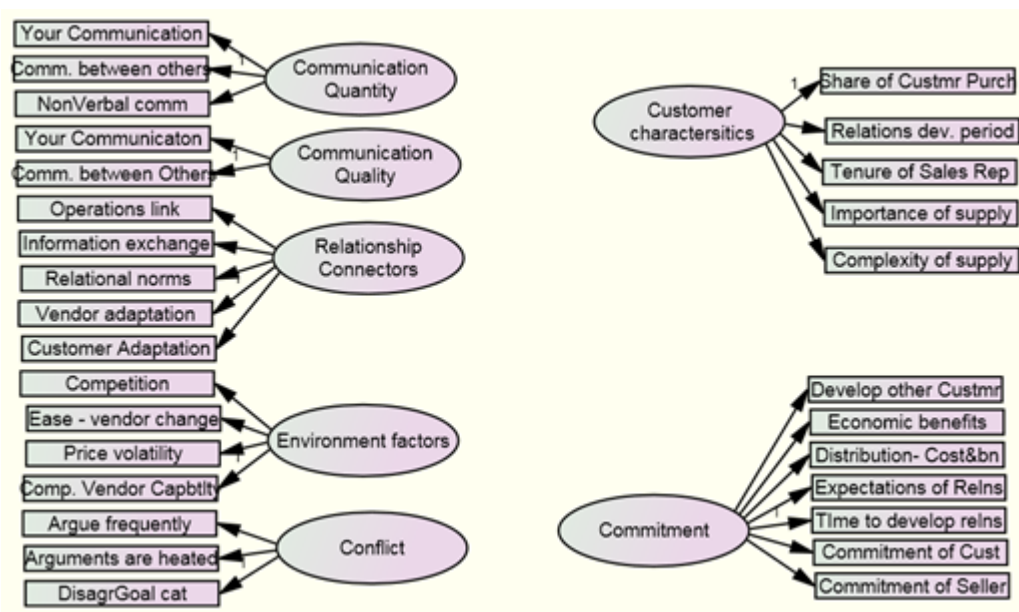
Constructs	AVE	Shared Variance	Construct reliability
Revenue	0.95	0.073	0.98
Customer Profit factors	0.40		0.71

The pruned model CP4 showed better fit to the data as exemplified by  $\chi^2 = 13$ , which was non-significant at 7% level ( $p = 0.07$ ). Other fit parameters also indicated a good fit. The requirements for convergent and discriminant validity were also met (Table 7-8). Thus Model CP4 represented a well-fitting parsimonious measurement model representing the variables for assessing customer profitability.

### 7.5.2 Nature of Relationships with Customers

The main constructs of the theoretical model used to investigate nature business relationships with a customer are depicted in Figure 7-7. This was configured as a measurement model and a CFA was run using AMOS18.

**Figure 7-7: Main Constructs**



Note: Error terms and covariances are not shown to conserve space

As in the case of the approach taken for the financial constructs, the unidimensionality of the constructs used for measuring business relationships was examined by conducting a CFA for individual constructs separately.

### *Customer Characteristics*

A CFA of the construct did not result in a minimisation being achieved. Examining the factor loadings it was seen that three indicators of customer characteristics namely share of customer purchase, relationship development period and tenure of sales rep, had no relationship with the construct due to the nature of the measurement items. Hence, following the recommendation of Jarvis et al. (2003), these should have been represented as formative indicators where the items determine the construct, in contrast to the traditional approach of using items as reflective measures of a latent construct.

Incorporating a formative set of measures in the modelling process would have complicated the analysis in many ways. In the first instance, formative measures would not form part of the measurement model as this would lead to model identification issues and such measures are usually considered as part of the structural model only. Further, to establish identification in the structural model, the formative construct must be specified as a cause of two additional constructs with reflective measures, or should have two reflective measures of its own (Williams et al., 2009). However, there appears to be debate about this approach as it implies that the substantive nature of the formative construct may get altered in the process of developing an approach that may provide a solution to be able use SEM analysis in a mixed model (Treiblmaier, Bentler, & Mair, 2011).

Thus, as a way to simplify the analysis and keep formative indicators for future research, these three items and customer characteristics latent construct were dropped from the model. However, importance of supply and complexity of supply were scale items which could be utilised and hence were shifted to the relationship connectors construct. The justification for this approach was that customers would be more willing to enter into long-term relationships and set up structures to support this where the supplier's products were crucial to their operations or the nature of supply was complex.

### *Relationship Connectors*

This construct with seven indicators indicated a poor fit ( $\chi^2 = 63.8$ ,  $df = 14$ ,  $p = 0.00$ ; RMSEA = 0.17; CFI = 0.9). An examination of the loading values indicated that three indicators had values less than 0.7; they were complexity of supply, importance of supply and adaptation by customer. On the other hand operations link had a negative value. As indicated in (Chapter 6, page 138) it appears that the participating firm had no close operating links with customers due to physical distances. Hence, this indicator as well as customer adaptation was deleted in a stepwise manner to improve fit as well as ensuring that discriminant validity and reliability are maintained. Removal of these indicators resulted in a substantial improvement in the fit of the model, but still poor based on RMSEA ( $\chi^2 = 15.1$ ,  $df = 5$ ,  $p = 0.01$ ; RMSEA = 0.13; CFI = 0.96). Good discriminant validity and reliability was noted for the model with AVE = 0.63 and construct reliability = 0.85. The exploratory improvement was stopped at this stage even though overall fit could be considered poor. Additional improvements in the model fitting process could have resulted in a near perfect fitting model, but the trade off would have been poor discriminant validity and reliability measures for the construct.

### *Commitment*

The initial formulation of the construct with seven indicators showed a poor fit ( $\chi^2 = 82.5$ ,  $df = 14$ ,  $p = 0.00$ ; RMSEA = 0.20; CFI = 0.81). An examination of the loadings as well as the modification indices pointed to the need to remove three indicators – other client development, relationship expectations and distribution of costs and benefits. After this change the construct exhibited good measurement properties ( $\chi^2 = 2.73$ ,  $df = 2$ ,  $p = 0.26$ ; RMSEA = 0.05; CFI = 0.997; AVE = 0.73 and reliability = 0.75).

### *Environment factors*

A CFA of this construct with four indicators showed excellent fit ( $\chi^2 = 1.4$ ,  $df = 2$ ,  $p = 0.49$ ; RMSEA = 0.00; CFI = 1.0). Hence, no changes were necessary.

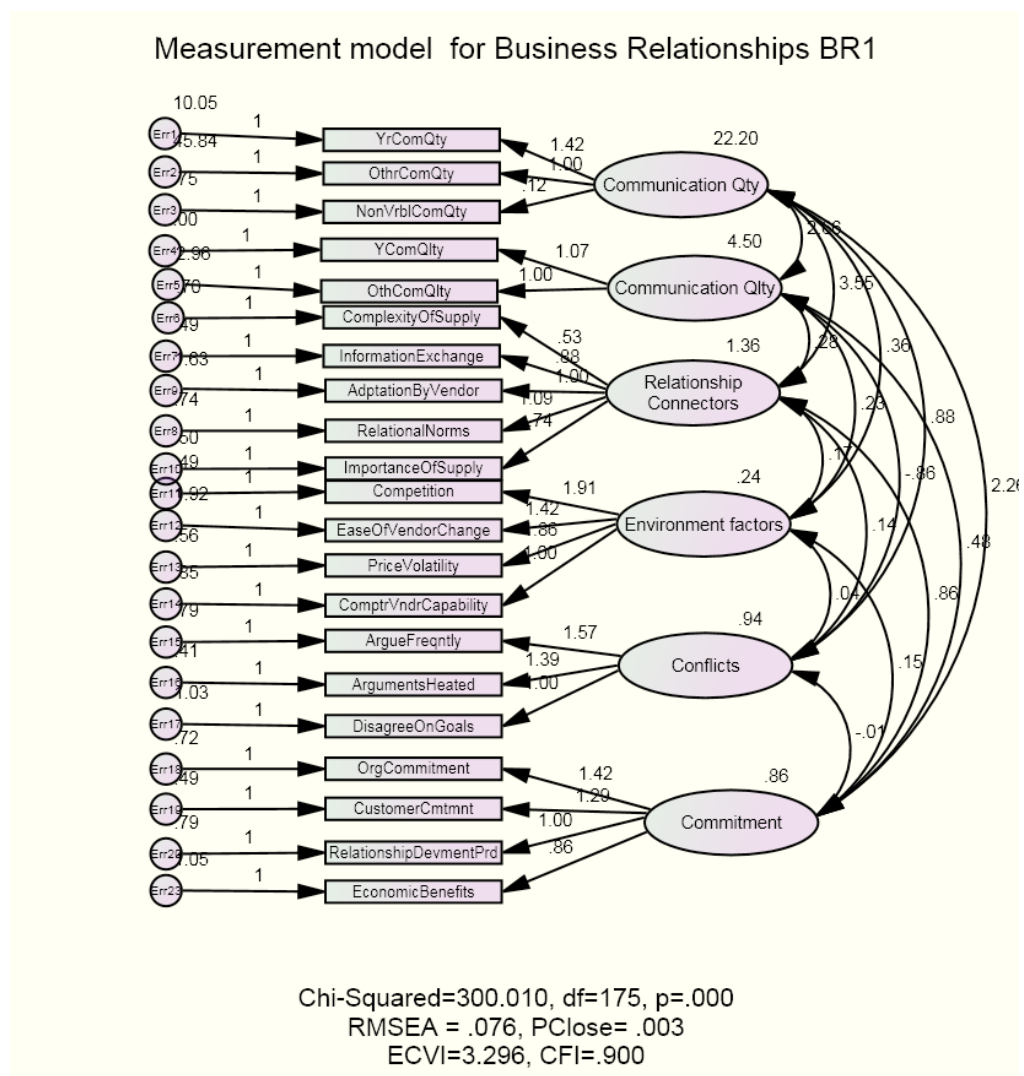
### Other constructs for business relationships

The constructs communication quality, communication quantity and conflict had only three indicators each or less and the loadings were above the recommended levels. Hence no changes were necessary.

### Measurement model for business relationships

The constructs updated as indicated in the previous section were incorporated in a measurement model and a CFA was conducted. Results of the initial confirmatory factor analysis and subsequent exploratory model development are shown in Figure 7-8.

**Figure 7-8: Measurement model for business relationships**



The baseline model had a satisfactory level of fit with the data.

The parameter estimates, AVE and construct reliability for Model BR1 are provided in Table 7-9 below. Model BR1 exhibited borderline acceptable levels on various fit indices. Before progressing to exploratory phase for improving model the constructs used in the model were assessed for reliability and validity.

**Table 7-9: Model BR1- Parameter Estimates, AVE and Construct Reliability**

Variable	dir	Construct	Estimate	Variance Extracted	Construct Reliability
RelationshipDevmentPrd	<---	Commitment	0.72	0.75	0.91
CustomerCmtmnt	<---	Commitment	0.86		
OrgCommitment	<---	Commitment	0.84		
EconomicBenefits	<---	Commitment	0.61		
OthComQty	<---	Communication Qty	0.78	0.93	0.93
YComQty	<---	Communication Qty	1.00		
OthrComQty	<---	Communication Qty	0.57	0.49	0.81
YrComQty	<---	Communication Qty	0.90		
NonVrblComQty	<---	Communication Qty	0.56		
DisagreeOnGoals	<---	Conflicts	0.69	0.66	0.89
ArgumentsHeated	<---	Conflicts	0.90		
ArgueFrequentlly	<---	Conflicts	0.86		
ComptrVndrCapability	<---	Environment factors	0.47	0.77	0.89
PriceVolatility	<---	Environment factors	0.77		
EaseOfVendorChange	<---	Environment factors	0.45		
Competition	<---	Environment factors	0.80		
AdptationByVendor	<---	Relationship_Connectors	0.67	0.63	0.86
RelationalNorms	<---	Relationship_Connectors	0.83		
InformationExchange	<---	Relationship_Connectors	0.83		
ComplexityOfSupply	<---	Relationship_Connectors	0.59		
ImportanceOfSupply	<---	Relationship_Connectors	0.78		

### Validity and Reliability of Constructs

The indicators in Model BR1 demonstrated good convergent validity as most of the factor loadings were more than 0.5. Only two indicator items, ease of vendor change and competitive vendor capability, were slightly lower than the

recommended limit. Considering the marginally lower value than the recommended criterion, it was felt that these items could be retained for further analysis. All constructs had  $AVE > 0.5$  and construct reliability values  $> 0.7$ .

Since all the indicator items have been investigated in prior research, face validity has been well examined. Further, the qualitative phase of this research and subsequent discussions with the executives established the relevance of these items for capturing the nature of business interactions between the firm under study and its customers.

The patterns of correlations between the constructs were as expected based on theoretical considerations. For example, conflict shows a negative correlation with communication quality. Overall, nomological validity was supported.

#### **Business Relationships Model BR1- Discriminant Validity**

Table 7-10 provides AVE and shared variances between constructs. It can be seen that almost all values of AVE are significantly higher than the corresponding shared variances with other constructs. Hence, discriminant validity is supported for all the constructs.

**Table 7-10: Model BR1- AVE and Shared Variances**

	<b>Communication Quality</b>	<b>Communication Qty</b>	<b>Conflict</b>	<b>Relationship Connectors</b>	<b>Commitment</b>	<b>Environment factors</b>
Communication Quality	<b>0.93</b>	0.07	0.18	0.01	0.06	0.00
Communication Qty	0.26	<b>0.49</b>	0.02	0.33	0.21	0.02
Conflict	-0.42	0.15	<b>0.66</b>	0.02	0.00	0.01
Relationship Connectors	0.11	0.58	0.13	<b>0.63</b>	0.64	0.09
Commitment	0.25	0.46	0.01	0.80	<b>0.75</b>	0.11
Environment factors	0.22	0.13	0.08	0.31	0.34	<b>0.77</b>

**Note:** Correlations are below the diagonal, squared correlations (shared variances) are above the diagonal and AVE estimates on the diagonal.



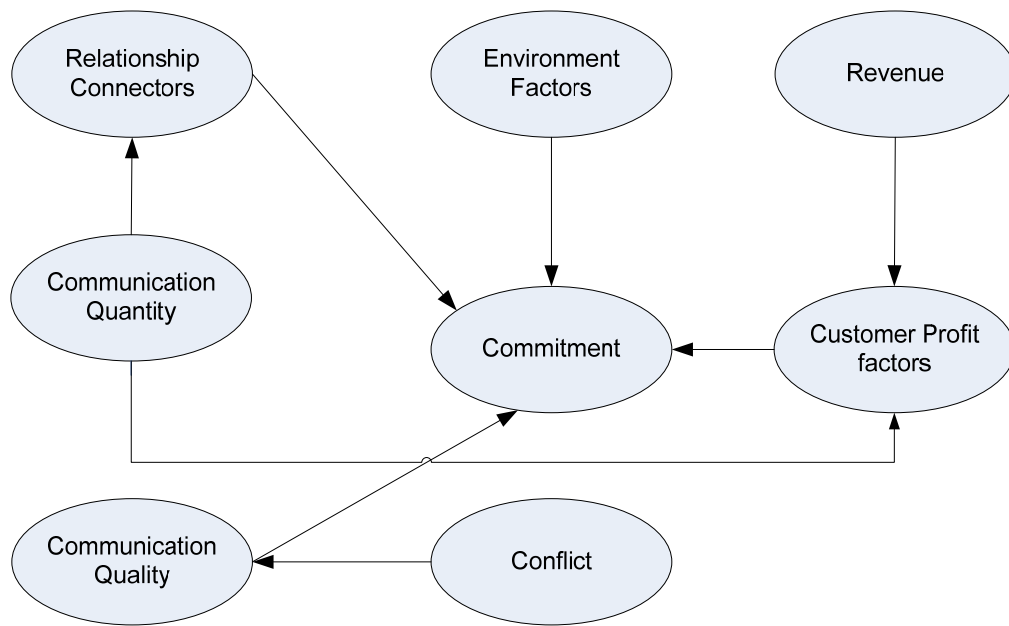
### **7.5.3 Summary of Measurement Models Validation**

The initial measurement model for customer profitability had four latent constructs and fourteen indicator items. One-factor congeneric models were estimated individually for each of the constructs to assess unidimensionality. This process resulted in the removal of product mix as a construct. Revenue and cost factor constructs also required an indicator to be dropped to improve model fit. The three constructs of revenues, customer profitability and cost factors were then evaluated together as a measurement model. CFA on the measurement model indicated a poor fit. Analysis then entered the exploratory phase where items or constructs were deleted or additional paths freed so that a better fit was obtained, while also meeting the requirements of convergent and discriminant validity. The final parsimonious representation had two latent constructs, revenue and customer profitability factors, and six indicators. The model fitted the data well as measured by various fit indices.

The baseline measurement model for the nature of business relationships with customers had seven latent constructs and 29 items. As in the case of financial factors, one-factor congeneric models were used to assess unidimensionality of the constructs individually. This resulted in elimination of customer characteristics as a construct, as well removal of indicators in some of the constructs such as relationship connectors and commitment. CFA analysis of the measurement model with improved constructs indicated that the re-specified model had moderate fit with the data, but all constructs clearly demonstrated convergent and discriminant validity.

The deletion of some of the constructs from the measurement model necessitated modification to the original theoretical model. The updated theoretical model which formed the basis for analysing the structural relationships in the next phase is outlined in Figure 7-9.

**Figure 7-9: Updated Theoretical Model**



The updated theoretical model has two constructs fewer than the original model; they are: product mix from the profitability measurement model and customer characteristics from the business relationship measurement model. Further, the main impact of environment factors was posited to be on relationship connectors, with the result that the potential impact on revenue was deleted. This was done to ensure that the updated model met the order condition, as otherwise there would have been more paths directed at commitment than the number of exogenous constructs. With deletion of some of the constructs the hypotheses on the nature of links were updated as shown in Table 7-11.

**Table 7-11: Updated Hypotheses of Links between Constructs**

<b>Antecedent Construct</b>	<b>Nature of Link</b>					
	<b>Relationship connectors</b>	<b>Communication quality</b>	<b>Conflict</b>	<b>Commitment</b>	<b>Revenue factors</b>	<b>Customer Profitability factors</b>
Environment factors				-		
Relationship connectors				+		
Communication quantity	+					-
Communication quality				+		
Conflict		-				
Revenue						+
Customer Profitability factors				-		

Note: + denotes positive association; - denotes negative association

## 7.6 Estimation of Structural Relationships

Estimating the structural paths in the full model required the two finalised measurement models to be linked as shown in the theoretical model. Another essential preparatory task was merging the two data sets into one for use as data input for the structural model analysis

### 7.6.1 Assessing the Impact of Merging Two Data Sets

The merging of the two data sets was completed based on a unique customer identification number. Due to survey non-response, data on nature of business

relationships were available for only 126 customers. When the financial data and survey data were merged there was a further loss due to errors in the master data set and deletion of customers from the financial data set due to incorrect classification as a major customer (see Chapter 6). The final data set that formed the basis for estimating the structural model was based on 109 customers. This reduction in number of responses could have impacted on the fit of the original measurement models as it was especially large for the customer profitability data. To assess if sample size reduction adversely affected model fit indices, the measurement models were estimated again on the merged data set and a selected set of fit indices was chosen.

The model fit parameters chosen were: RMSEA, CFI and SRMR (Standardised Root Mean Residual). SRMR provides the average difference between the predicted and observed variances and covariances in a model based on standardised residuals. Values less than 0.05 represent a good fit of the model. Table 7-12 below provides the results of this analysis.

**Table 7-12: Measurement Model Fit Indices with Reduced Sample Size**

Models	RMSEA		CFI	SRMR
	Val	PClose		
<i>Customer Profitability models</i>				
Full sample set	0.06	0.31	0.99	0.03
Reduced sample set	0.06	0.33	0.99	0.03
<i>Business relationships with customers</i>				
Full sample set	0.08	0.00	0.90	0.10
Reduced sample set	0.08	0.00	0.90	0.10

In the case of the customer profitability model, the main fit indices were almost the same as previously estimated, indicating that the patterns of the data were similar to the complete data set. The business relationship measurement model also exhibited a similar pattern for the main fit indices. The SRMR, which is a measure of the residuals, was on the borderline acceptable level of 0.10, indicating that there was no major increase in the

residuals due to a smaller sample size. This consideration was factored in when evaluating the results of further analysis.

To summarise, both measurement models tested in the earlier sections retained adequate fit with the reduced sample size. Hence, the full structural model can be estimated using the constructs from the measurement models.

## 7.6.2 Structural Model Estimation

The structural model was estimated using the merged data base; the parameter estimates for the structural relationships are provided in Table 7-13.

**Table 7-13: Structural Model Parameter Estimates**

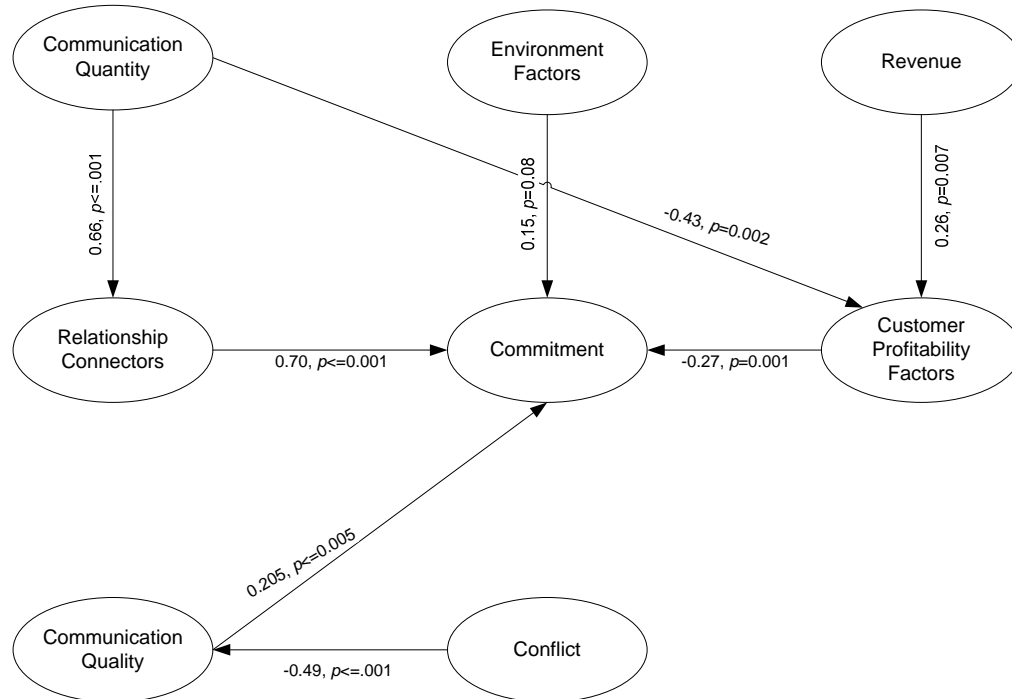
Construct		Construct	Estimate	S.E.	C.R.	P
Commitment	<---	Communication Qlty	0.46	0.16	2.84	0.005
Relationship Connectors	<---	Communication Qty	0.92	0.23	4.02	***
Customer Profit_ factors	<---	Communication Qty	-0.24	0.08	-3.14	0.002
Communication Qlty	<---	ConflictLatent	-0.58	0.16	-3.66	***
Commitment	<---	Customer Profit_ factors	-0.52	0.16	-3.18	0.001
Commitment	<---	Environment factors	0.28	0.16	1.75	0.08
Commitment	<---	Relationship Connectors	0.55	0.10	5.67	***
Customer Profit_ factors	<---	Revenue	0.09	0.04	2.68	0.007

The structural model had a significant Chi-squared value:  $\chi^2 = 485$ ,  $df = 316$ ,  $p = 0.000$ . However, other model fit indices indicated a satisfactory fit level (RMSEA = 0.07 (Pclose = 0.005), CFI = 0.885, SRMR = 0.116).

The RMSEA value indicated that overall the model had acceptable level of fit. However, CFI value was slightly less than the recommended minimum of 0.90. The standardised residual was just above the cut-off level of 0.10, indicating that there may be significant residuals in some elements of the covariance matrix. Nevertheless, considering the large number of constructs and the relatively small sample size, this finding was not unexpected. The

model is shown in Figure 7-10. (The complete model with all the error terms, covariances and indicator loadings is provided in Appendix P.)

**Figure 7-10: Structural Model with Standardised Parameter Estimates**



### Evaluation of Hypotheses

The updated set of hypotheses (refer Table 7-11) was evaluated with the structural estimates (Figure 7-10) and the results are provided in Table 7-14. All paths were significant, though some of the loadings were weak, as in the case of environment factors and communication quality. When evaluating the loading of the financial constructs, it must be borne in mind that they represent many items that have been transformed using a natural log base as well as rescaling (refer Table 7-4). Hence, the relationship based on actual values will not be linear, but an inverse of the log function.

**Table 7-14: Evaluation of Hypotheses based on Trimmed Structural**

<b>Antecedent Construct</b>	<b>Nature of Link</b>					
	<b>Relationship connectors</b>	<b>Communication quality</b>	<b>Conflict</b>	<b>Commitment</b>	<b>Revenue factors</b>	<b>Customer Profitability factors</b>
Environment factors				NS		
Relationship connectors				S		
Communication quantity	S					S
Communication quality				S		
Conflict		S				
Revenue						S
Customer Profitability factors				S		

**Note:** S - hypothesis supported

NS -Hypothesis not supported

### 7.6.3 Equivalent Models

Kline (2005) recommends that after the final structural model has been selected equivalent models should be considered as they yield the same predicted correlations or covariances but with a different configuration of paths among the same constructs or observed variables. This exercise is expected to be accompanied by an explanation as to why the final model should be preferred over mathematically identical ones. Equivalent models can be generated from identified models using the Lee-Herschberger replacing rules (Kline, 2005, p. 153) as outlined below:

1. Within a block of variables at the beginning of the model with unidirectional relations to subsequent variables, direct effects, correlated disturbances and equality constrained reciprocal effects are interchangeable. If two variables are exogenous, then an unanalysed association may also be substituted.
2. At subsequent places in the model where two endogenous variables have the same causes and their relations are unidirectional, all of the following may be substituted for one another represented symbolically as:  $Y2 \rightarrow Y1$ ,  $Y1 \rightarrow Y2$ ,  $D1 \text{ U } D2$  and  $Y1 \rightleftarrows Y2$ . (Note: U denotes covariance between D which represents disturbances or error terms of the variables.)

A large number of constructs in the final model can result in a large number of equivalent models to be considered. A more manageable approach is to examine a small subset of equivalent models by changing the main paths between endogenous constructs as per the Lee-Herschberger replacement rules, estimate the models and evaluate the resulting changes. Further, only the structural paths are examined and not the disturbances in the error terms. The approach adopted for this analysis was to select a few structural paths that had significant path estimates and examine the impact on the regression estimates of modifying the direction of the paths as well as on the overall model fit. The following three structural paths were selected using this criterion.

Relationship Connectors	←	Commitment
Communication Quality	←	Commitment
Commitment	←	Customer Profit factors

The selected structural paths in the original model were modified one at a time and the model parameter re-estimated. Selected model fit statistics were also examined to assess if the model was stable with the change. Appendix Q outlines the re-estimated values with the changes made. The objective of



undertaking this stepwise approach was to see if any of the changes resulted in improved fit parameters. If they did, the changes that do improve can form the basis for building a new equivalent model and its parameters compared to the original model.

The equivalent models with reciprocal paths were not pursued as they were likely to result in model identification issues and should have considered explicitly at the theoretical model stage (Hess, 2001). Moreover, there are limitations to AMOS18 that result in the reciprocal paths being constrained to being equal. Such an analytic constraint is unlikely to shed light on the possibility of reciprocal effects.

Appendix Q summarises the main regression estimates and model fit for the equivalent models. The alternate models with reversed paths for customer profitability and communication quality with commitment resulted in a degradation of the parameter estimates as well as slight reduction in the fit statistics for the model. Only the alternative model with reversed pathway for relationship connectors and commitment resulted in an improvement of the path estimate as well as the loading of customer profitability on commitment. This, however, resulted in an increase in the Chi-square value as well as a slight degradation in the model fit. The main implication of this model is that commitment levels are indicative of closeness with customers as measured by the relationship connectors construct. This is in contrast to the theoretical model and other reported research that views relationship connectors as antecedents to the outcome of a business relationship. Hence pursuing this alternate model would require a significant change to the theoretical model based on appropriate work in order to correctly interpret this finding.

Based on the discussion in the preceding paragraphs, the original model was selected for interpreting the results of the analysis. However, the implication of the alternate model was borne mind during discussion of results and avenues for future research.

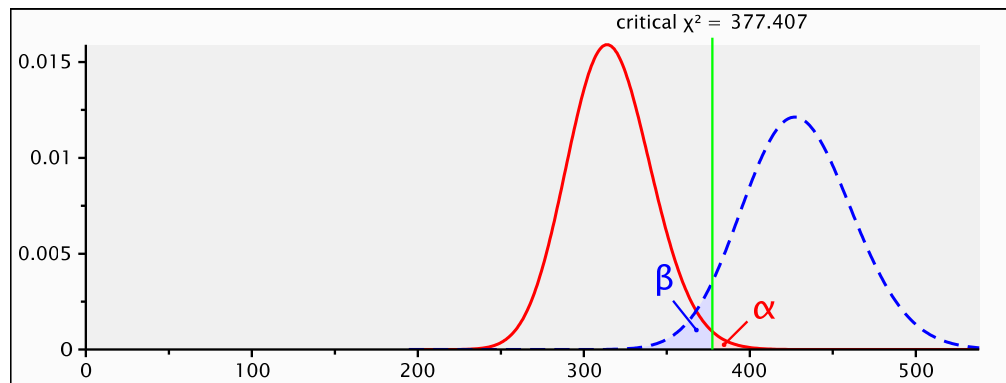
## 7.7 Power Analysis - Post Hoc

One of the technical issues raised earlier was the reduction in sample size due to various reasons beyond the control of the research process (see sec 7.6.1). Various approaches are available to plan the required sample size to achieve a certain power level at the research design phase (Patrick, 2008). However, this often requires reassessment based on actual data. The relevance of power analysis assumes importance as the Chi-squared test statistic and fit indices may be sensitive to sample size. Small sample sizes may result in non-rejection of the null hypothesis, which is that the model under consideration is not representative of the population.

Schumacker and Lomax (2004) suggested that the Hoelter N statistic represents a parameter for checking if sample size is sufficient to estimate a model and determine its statistics. For the final model in this research, the Hoelter N for the 0.01 level of significance was 85. As the Hoelter N was lower than the actual sample size of 109 it is reasonable to conclude that the model fit estimates are stable and not compromised by sample size.

Another perspective regarding the adequacy of the sample size is to estimate the power of the final model. GPower3.1 was utilised for this purpose. The inputs required to perform a post-hoc analysis were the non-centrality parameter value and the degrees of freedom. Since AMOS provides the Lo90 and Hi90 values for the non-centrality parameter (NCP), the Lo90 value was used to arrive at a conservative estimate, which is shown in Figure 7-11.

**Figure 7-11:  $\alpha$  and  $\beta$  Error Probability Distribution**



**$\chi^2$  tests - • Generic  $\chi^2$  test**

**Analysis:** Post hoc: Compute power

**Input:** Noncentrality parameter  $\lambda$  = 113.5

$\alpha$  err prob = 0.01

Df = 316

**Output:** Critical  $\chi^2$  = 377.4068

$\beta$  err prob = 0.0524381

Power (1- $\beta$  err prob) = 0.9475619

Since the power achieved by the model is well above the normally accepted criterion of  $>0.80$ , sample size does not appear to be an issue.

To summarise, the sample size for the current research appears to be more than adequate, since the sample size of 109 for the final model was more than the required Hoelter N (0.01) value of 85, and the non-centrality parameter based power of 0.95 was well above the recommended norm of  $>0.80$ .

## 7.8 Conclusions

This chapter outlined the analytical process followed to evaluate the original measurement model developed for customer profitability and the nature of business relationships with customers. The analytical tool was structural equation modelling (SEM) using the software AMOS18. To meet the

requirements of SEM, data used for the analysis was extensively screened for non-normality, and corrective actions were undertaken where necessary.

The customer profitability measurement model underwent significant refinement in a stepwise manner and resulted in a parsimonious representation of the key constructs in a model which exhibited good fit with the data. The measurement model for business relationships also underwent refinement after initial CFA and resulted in a model with satisfactory fit indices. The final measurement models had constructs that met requirements of reliability and validity.

The structural model was developed from the updated measurement models, and the estimated model was found to have a reasonable fit. Some of the pathways that were not statistically significant were trimmed to arrive at a parsimonious representation without any significant reduction in the level of fit. Equivalent models were generated and evaluated before settling on the final model; based on substantive considerations this was the estimated model. The proposed hypotheses remaining were evaluated based on the statistical significance of the associated path estimates.

The implications of the findings from the model, applications and other dimensions of this chapter are discussed in Chapter 8.

## Chapter 8 Conclusions

### 8.1 Introduction

In this chapter the main findings of Chapters 5 to 7 are discussed in relation to the research questions and how the findings contribute to the body of knowledge about business relationships with customers and customer profitability. Implications of this study for practitioners in the area of business-to-business marketing are also reviewed. This is followed by a discussion of the limitations of this study and suggestions for future research.

### 8.2 Overview of Research Findings

The main research question that this study set out to address was the following:

*Is the nature of the business relationships with customers linked to variation in customer profitability seen in business markets?*

One of the main hypotheses for this research was that the nature of a business relationship with a customer was closely linked to profitability. In order to test this primary postulate, specific questions were:

*What are the financial factors that contribute to variation in customer profitability?*

*What are the factors that determine the nature of a business relationship with a customer?*

*Does variation in business relationships affect the financial factors?*

To represent the nature of business relationships, theoretical constructs drawn from multiple theories of business relationships were utilised as a framework for a more comprehensive representation of underlying complexity. A customer profitability framework was developed from the basic financial equation represented as revenues less relevant costs. The indicators for various facets of the business relationship, such as communication, relationship connectors and environment factors, and their aggregation under latent constructs in the model, were based on extant theories. A set of hypotheses was developed to account for interactions between the constructs representing business relationships and customer profitability.

A case study research design was adopted to obtain empirical data to compute customer profitability and assess the nature of the business relationship between a supplier and its customers. Structural Equation Modelling (SEM) was used to test validity and reliability of the latent constructs as well as interactions between the constructs. The theoretical model, with some changes, was found to be a valid representation of the data. The interactions between the constructs and the hypotheses that were supported (or not supported) are summarised below.

### **Financial Factors that Contribute to Customer Profitability**

The initial model to represent customer profitability variation had three latent constructs – revenue, cost and customer profitability. To meet the requirements of validity and reliability, the final model had only two constructs, revenue and customer profitability factors. The nature of interactions between constructs was as follows.

The only effect of revenue was on customer profitability factors (standardised loading = 0.26,  $p = 0.007$ ). Customer profitability factors reflect the interaction between the actual profitability outcome and elements of cost such as cost of goods, documentation cost and number of destinations. Hence, the nature of the construct could be viewed as being an indicator of the variation in profitability of the customer resulting from greater demand on the resources

of the organisation as compared to the profit value based on products sold. Based on these findings the following hypothesis was supported:

Revenue factors will be positively associated with customer profitability variation.

The revenue construct has an almost equal contribution from two indicators, baseline sales at constant price and price increases, with a standardised loading of .98. In the context of this research, it would appear that increases in price have contributed more to profitability than increases in sales volume at constant prices.

### **Factors that Determine Nature of the Relationship with Customers**

The set of six latent constructs used in the final model to represent the behavioural and cognitive dimensions in a business relationship were environment factors, relationship connectors, communication quantity, communication quality, conflict and commitment. These factors demonstrated high levels of reliability and discriminant validity. The exogenous constructs were environment factors, communication quantity and conflict. Amongst the exogenous constructs, environment factors had a relatively weak impact on commitment (standardised loading = 0.15). By contrast, communication quantity had a strong influence on relationship connectors (standardised loading = 0.66) and conflict had a moderate, but negative impact on communication quality (standardised loading = -0.49).

Thus, it would seem that communication quantity represents an independent construct that reflects the participation firm's decisions on the level of engagement with customers. This level may have been influenced by customer characteristics such as tenure. However, since customer characteristics were excluded from the final model (see section 7.5.2), communication quantity appears as an exogenous construct. A similar argument may hold for conflict as an exogenous construct.

Amongst the endogenous constructs, the main outcome that represented the nature of business relationship was commitment. Only relationship connectors, communication quality and environment factors had a direct influence on commitment.

The nature of the effects between the constructs outlined above supports the following hypotheses:

1. Closer links with a customer through relationship connectors will be associated with higher levels of commitment.
2. Higher levels of communication occur when relationship connectors bind the parties in a closer business relationship.
3. The quality of communication in a business relationship will be closely associated with the level of commitment.
4. The presence of conflict in a relationship adversely affects the quality of communication.
5. Higher levels of environmental uncertainty promote higher levels of commitment to a business relationship.
6. Communication quantity will be adversely affected when customer profitability is lower than expected.

#### **Nature of link - Business Relationship and Customer Profitability**

The main link between the nature of business relationships and financial factors was between commitment and customer profitability factors (standardised loading = -0.27). The inverse relationship indicates that commitment levels in the business relationship tend to decrease when customer profitability factors are higher. Considering the components of the customer profitability variation construct, this would imply that additional demands on the resources of the organisation that reduce profits realised from the customer may impact on the organisation's commitment levels.



It must be pointed out that the reverse pathway between customer profitability factors and commitment also fits the data (see section 7.6.3). However, this model was not considered on substantive grounds based on the interpretation of the link between the constructs as well as the lower magnitude of the loading (see Appendix Q). The plausible explanation if the reverse pathway is accepted is that the business relationship facets could be managed in a manner that high levels of commitment manifested in the relationship lead to lower customer profitability variation. This is also associated with a reversal in the sign of the parameter on the loading between environment factors and commitment, indicating that environment factors favour the seller and result in higher levels of commitment in the business relationship.

The other link between financial factors and business relationship factors was the influence of communication quantity on customer profitability factors (loading = -0.233,  $p \leq 0.003$ ). This result seems to indicate that the participating firm may reduce the level of interaction through various communication channels when demands of the customer erode profitability levels.

Based on the results discussed in the preceding paragraphs the following hypotheses were supported:

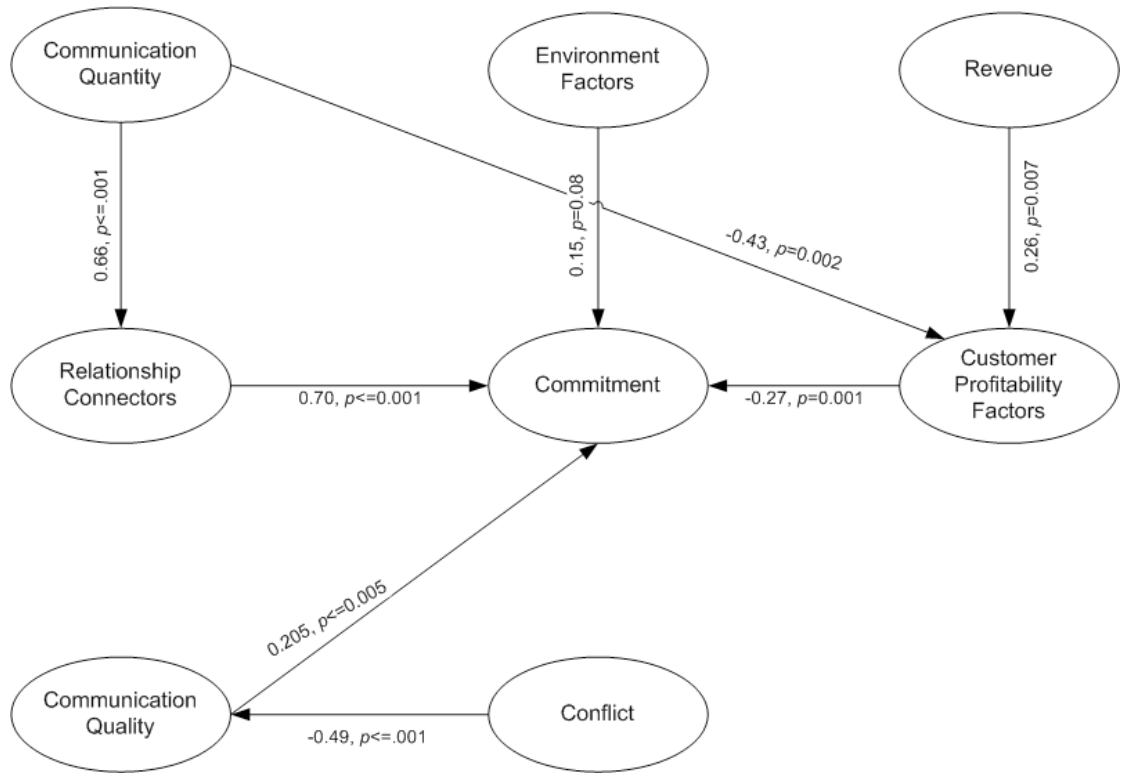
1. Communication quantity will be adversely affected when customer profitability is lower than expected.
2. Commitment levels in a business relationship will be adversely affected when customer profitability variation is higher.

## **Summary**

The theoretical model, using constructs based on previous research, supports most of the theory-based hypotheses. All the constructs in the model demonstrated high levels of reliability and validity and were found to represent

well the business relationship, with minimal overlap. The final model with its structural path estimates is shown in Figure 8-1 below as a reference to the discussion and conclusions section that follows.

**Figure 8-1: Structural model with standardised parameter estimates**



### 8.3 Discussion and Conclusions - Findings on Customer Profitability

Distribution of customer revenue and customer profitability follows the Stobachoff curve reported in other studies in business markets, where a few large customers contribute a large proportion of a supplier's revenue and profits (Mulhern, 1999; Niraj, et al., 2001; van Raaij, et al., 2003). The concentration of revenue from a few customers poses a risk to the supplier because defection of even one customer, or a reduction in purchases by one large customer, can result in significant reduction in revenues and profits. This risk is compounded when investment decisions on customer development and

maintenance are guided by a focus on nurturing the high revenue contribution customers to retain or possibly grow the business. To avoid being held hostage to the phenomenon of large customers having a stranglehold on suppliers and to reduce vulnerability, some recent research suggests that a clear strategy needs to be in place to spread this risk (Piercy & Lanae, 2006).

Previous studies in business markets have reported that large customers, because of their purchasing power, often engage in price gouging behaviour (Kalwani & Narayandas, 1995). One of the important findings in this study was the price increases the firm was able to realise during the study period and their contribution to its revenue and profits. The price increases realised appear to have more than offset cost increases. In many instances the increases realised were from large customers. This is in sharp contrast to behaviour reported in the literature, where large customers have been able to realise a price reduction resulting in lower levels of profitability or even outright loss to their supplier.

There may be several possible reasons for the firm's ability to realise price increases during the period of this study. One could be product shortages resulting in a munificent environment, which allowed the supplier to increase its prices (Morgan, Slotegraaf, & Vorhies, 2009). A second possibility could be increases in the prices of raw materials, which were passed on to the customer with their acceptance that this was a fair demand. A third reason could be that this period witnessed a correction whereby depressed prices in previous years were corrected as a result of a positive market environment. Whatever the reasons for the price increases, acceptance of them may be a reflection of the good relationship between the firm and its customers and its provision of other relevant forms of value such as assured timely supply and required quality. Aspects of these sources of value are discussed in later sections.

It could be argued that price increases may increase the chances of conflict with customers or result in defections because of competitive pressure. In this

study, frequent arguments (an indicator for the conflict construct) showed a very weak correlation with price increases (Pearson  $r = -0.199$ ,  $p \leq 0.01$ ), indicating that there may be reasons other than price for the conflict. Regarding the possibility of defection due to price differentials vis a vis competition, recent game theoretic studies indicate that this may not be a large risk. Short-term focused price increases do not adversely impact even strategic customers in markets that can be characterised by asymmetric equilibrium, where customers remain loyal even in the presence of price or value differentiated offerings in the market place (Singh, Jain, & Krishnan, 2008).

Another facet of business-to-business relationships is that large customers often require product shipments to multiple destinations, which adds to the complexity of the operation, planning cycle and management of the supply chain (Niraj et al., 2001). In this research, the number of destinations for each customer ranged from one to 22. The number of destinations had a moderate impact on customer profitability factors, with a loading of around 0.45. This extends the work of Niraj et al. (2001) by examining the spread of destinations across geographic boundaries, whereas Niraj et al.'s research was focused only on the USA.

Helgesen (2007) found that order execution costs for customers located in different geographic regions were on average 7% of sales. In this study, a specific cost estimate associated with the number of destinations could not be computed for want of data. However, the number of destinations was closely related to the size of the customer, with the top decile of customers (based on revenue) having a mean of six destinations each. The added complexity to the supply chain due to the number of destinations as well as meeting variations in customer demand may be a way in which the participating firm adds value. This aspect of value addition may have helped it in gaining price increases from the largest customers to offset cost increases and ensure profitability at the customer level.

One aspect of the cost of serving the complex needs of customers is the documentation costs associated with each transaction to meet commercial and legal requirements. In this study, a cost associated with this activity was computed and the mean value ranged from 4% of gross sales for the lowest decile customers to 0.1% for the top decile. Since documentation represents only one small facet of the cost of serving customers, these values are much smaller than the 26.4% of sales reported by Van Triest (2005) based on a detailed activity based costing of the whole supply function. If the full costs of this service could be estimated, it may add significantly to the total cost since almost half the customers included in this study had mean values of 13 product items shipped to four destinations each month (details in Table 5-12).

Interest charges were explicitly estimated and incorporated as a cost element in computing customer profitability, as suggested by van Raij (2003). Credit is often used as a strategic component to build business relationships, to obtain a larger share of a customer's business or as a bargaining chip, depending on the situation (Summers & Wilson, 2003). However, one of the issues associated with credit is the tendency for payments to be delayed beyond the credit period, resulting in use of a firm's resources through additional interest and the cost of recovering overdue amounts (Howell & Soucy, 1990). In this study, only a few customers had significant outstanding amounts that resulted in a reduction in customer profitability, indicating that the internal processes for order acceptance and execution were tightly monitored for payment status.

To summarise, customer profitability variations seen in this study are similar to those reported in other empirical studies. One of the significant contributors to profitability appears to be price increases realised from large customers. Since these did not result in a significant conflict, customers may have accepted them as being fair to cover cost increases and the firm may have offered significant value by other means. One of the components of this value offering may be the management of supply requirements in terms of the number of destinations to which products are to be shipped and the associated complexity arising from this. These facets also point to the possibility of the

firm having developed close relationships with customers, resulting in them accommodating the price increases, and other changes due to the commitment to the business relationship from both parties.

#### **8.4 Discussion and Conclusions - Findings on Nature of Business Relationships**

The constructs selected from existing theoretical frameworks to represent business relationships with a customer demonstrated a high level of validity and reliability. The justification provided in Chapter 4 for drawing on multiple frameworks to capture the multifaceted nature of business relationships is largely supported. Further, most of the hypotheses on the nature of the fit between constructs were supported. Specific effects between constructs are outlined below.

Communication quantity emerged as an exogenous construct with a significant loading on relationship connectors, implying that one of the indicators of the presence of relationship connectors will be more frequent communication. It also emerged that communication quantity is closely linked to customer profitability factors. The negative value of the correlation coefficient indicates that the amount of communication with customers is reduced as customer profitability factors increase (Pearson  $r = -0.418$ ,  $p < 0.01$ ). It is worth mentioning once again that the customer profitability factors construct in this research captures the extent to which profitability is affected by demand on other resources. The negative correlation appears to be logical since efforts are likely to be mounted by the supplier to ensure that cost escalations due to inadequate pricing structures resulting out of demand on other resources are addressed when customer profitability is adversely affected. Quantity of communication is an indicator of these efforts in business-to-business markets.

However, though this model assumes linearity in the relationship between communication quantity and profitability factors, the actual relationship is likely to be non-linear. For example, quantity of communication was investigated by Kumar (2003) who found that customer development efforts in a direct-marketing set up had an inverted U shape, where greater quantity of communication beyond an optimal point resulted in reduced returns.

Communication quality in a business relationship can be viewed as one of the behaviours influenced by the perceptions of the state of the relationship with a customer. These perceptions could be the result of the sense-making process through which managers reconstruct the social reality of the business relationship and assess where they stand (Olkkonen, Tikkanen, & Alajoutsijarvi, 2000). Evolution of a business relationship as an outcome of on-going interactions, episodes and their effects on sense-making regarding the nature of a business relationship is one of the key themes in the IMP approach to business relationships (Ford & Redwood, 2005). Episodes such as conflict are bound to adversely impact on assessment of the business relationship and the level of commitment. Hence, communication quality as a behavioural outcome can be an indicator of the level of commitment in a business relationship.

This study confirms that the presence of conflict has a significant adverse impact on communication quality, which may then affect commitment. However, conflict does not have a direct impact on commitment. To ascertain if customer characteristics such as size influence communication quality a bivariate correlation test was conducted. The results indicated that size of the customer's organisation (based on revenue) had no correlation with communication quality. This would imply that the participating firm strived to maintain the same level of communication with all customers and this practice would be adversely impacted only when a conflict arises.

Environment factors would be expected to have an influence on the closeness of relationships. The four main indicators in the environment factors construct

were price volatility, competitors' capability, ease of changing the vendor and level of competition in the market. Competition and price volatility had the largest influence on this construct, with loadings of 0.80 and 0.77, respectively. The nature of these two indicators is such that to some extent their impact could offset each other. For instance, when there is a higher level of price volatility due to an upward trend, then intensity of competition is likely to be reduced; the opposite may occur when there is a downward trend in prices. The combination of these two countervailing forces may determine the level of impact on other constructs.

The fact that significant price increases were realized by the supplier during the analysis period supports the contention that there could have been a significant upward trend in prices as exemplified by price volatility. While this may be true at the aggregate level, the level of competition and price volatility varies across the different product groups, with less deviation occurring in the higher value-added products (see Table 5-10). The statistically significant impact of environment factors seems to be relatively weak on the level of commitment (standardised loading = 0.15), and possibly reflects the lower level of impact from competition and price volatility due to closeness in the business relationship.

The environment factors modelled in this study are slightly different to the formulation of these factors by Cannon and Perreault (1999). Cannon and Perreault modelled the environment factors as antecedents to relational connectors to classify the nature of business relationships into eight relationship categories spanning transaction-oriented to close-relational. Considering the level of impact of environmental factors on commitment it is likely that these factors play a relatively minor role compared to the impact of other relationship factors.

Conflict can occur at some point in most business relationships (Purinton, et al., 2007) and may be characterized by domination attempts of one party over the other and the use of harsh words (Mohr & Spekman, 1994). In this study,



heated arguments and frequent arguments, used as indicators for conflict, had loadings of 0.90 and 0.86, respectively, indicating that these were the main factors compared to the other indicator, disagreement over goals. The negative impact of the presence of conflict is supported by the fact that it has an adverse impact on communication quality with indirect effects on commitment. Mohr and Spekman (1994) empirically demonstrated that the presence of conflict could be viewed as a characteristic of unsuccessful business partnerships that resulted in reduced profitability and lower customer satisfaction. The present study confirms this overall impact, though the pathway is different due to the different specification of the business relationship model.

Commitment in business relationships has been investigated in a number of studies and is often represented as comprising two main components, affective and calculative (Gundlach, et al., 1995). Commitment as a key component in a business relationship was refined further conceptually as resulting out of the balance between attitudinal and instrumental inputs into the relationship and outputs comprising relationship performance and relationship justice (Sollner, 1999). Sollner (1999) argued that even attitudinal inputs do not evolve over time as a result of interaction and norms but encapsulate a calculative investment.

*“...it is emphasised that attitudinal inputs do not develop unintentionally. Attitudinal inputs should also been seen as purposeful institutions that may be consciously developed or selected in order to contribute to the success of the relationship. Attitudinal inputs represent an “amount at stake” just like instrumental inputs.”*

(Sollner, 1999, p. 222)

Affective commitment as an act of calculative investment is in contrast to views of researchers grounded in social exchange theory who consider affective commitment as being positive while calculative commitment is seen as being negative. However, empirical studies with clear separation of the affective and calculative component of commitment provide better

predictability for behavioural intentions (Gounaris, 2005). Further, most suppliers organise their efforts to increase the commitment of customers (Leek, Turnbull, & Naude, 2004). In this study, the structural model paths between constructs appear to reflect this approach. Thus, all the relationship constructs that reflect cognitive and behavioural aspects as well as customer profitability reflect a calculative commitment on the part of the firm when developing closer relationships with its customers.

Extant research on commitment in business relationships tends to focus on perceptual outcomes such as trust, satisfaction, loyalty or perceived profit levels, but finance-based outcomes such as profitability have not been widely investigated. One attempt to bridge this gap was the theoretical model developed by Ulaga and Egger (2006) which propounded the hypothesis that the value of a business relationship may be an antecedent to the levels of commitment, satisfaction and trust. The current study provides empirical evidence for this hypothesis and confirms customer profitability (which could be viewed as the value of a relationship) as the antecedent influencing the level of commitment in a relationship.

As indicated earlier in this section, the level of commitment to a business relationship appears to be only slightly affected by environmental factors as measured by levels of competition, price volatility and ease with which the supplier can change vendors. However, larger customers may be more likely to leverage these factors to their advantage. Bivariate correlation of perceived organisation commitment indicated moderate levels of negative correlation with the revenue generated from the customer (Pearson  $r = -0.464$ ,  $p < 0.01$ ). This indicates that the perceived commitment in the firm decreased as the value of the business with a customer increased and reflects the possible risk of exploitation through additional demands on the resources of the company. Thus, while the firm was able to realise price increases, the commitment perception appears to reflect an assessment of this risk and confirms the extant literature on the risk of exploitation. However, in the structural model revenue has no direct impact on commitment and influences only customer

profitability factors. Overall, the commitment construct appears to confirm the view expressed by Sollner (1999) that even the affective dimensions of commitment reflect a calculative investment in a business relationship.

#### **Equivalent model - path from commitment to relational connectors**

While the discussions in the earlier paragraphs are based on the original theoretical model, an investigation of alternate models points to an alternate role for commitment in business relationships. When the link between commitment and relationship connectors was reversed, the loading for the customer profitability to commitment path showed a significant increase (standardised loading = 0.414; up from -0.27) as well as a change in sign, but the loading of commitment on relationship connectors decreased in value. The main implication of this finding is that relationship connectors can also be viewed as an outcome of relationship building efforts, where commitment to a business relationship impacts on efforts to make an investment in relationship connectors.

While this explanation appears logically correct, this alternate model was not preferred over the original model for the following reasons. First, the relationship connectors and other theoretical constructs were based on prior research that identified these constructs as predictors of outcomes of a business relationship. Reversing the logic would require a re-examination of the indicators of the various constructs as well as developing an appropriate theoretical model that justified relationship connectors as an outcome. Nevertheless this model could be the basis for future research based on an appropriate model.

## **8.5 Contribution to Academic Research**

### **Linking Relationship Marketing and Financial Measures**

The need to link relationship marketing efforts to hard financial outcomes, rather than soft outcomes like satisfaction or trust, was articulated by Cannon

and Homburg (2001) when researching whether customers benefit from cost savings through closer relationships with suppliers. From a supplier's perspective, Bowman and Narayandas (2004) discussed the need for linking relationship marketing efforts with results measured as customer specific profitability, but their research used a service-profit-chain link model rather than constructs from the relationship marketing stream.

Other researchers attempted to build this link following the identification of customer profitability as an important facet of marketing metrics, but focused more on customer lifetime value based on gross margins at the customer level (Kumar, Venkatesan, & Beckmann, 2009; Kumar, Venkatesan, Bohling, & Beckmann, 2008). Triest, Bun, Raaij, and Vernooij (2009), for example, investigated the impact of customer specific investments and their relationship to profitability. However, as noted by Triest et al. (2009), there is a slight skew in research linking marketing activities and customer profitability towards direct marketing and the financial services industry (for example, Reinartz and Kumar, 2000, 2003) and there are very few empirical studies investigating this link in business markets.

Thus, while these empirical studies advance understanding of customer profitability and its link to specific marketing activities, no empirical study has attempted to investigate the nature of ongoing business relationships and their link with varying customer profitability levels in business markets. This current study fills this gap and progresses knowledge on specific areas as indicated in the following sections.

### **Representing Complexity in Business Relationships**

Mainstream research into relationship marketing is normally grounded in one particular framework such as transaction costs or social exchange theory. This has tended to limit the outcomes to cognitive measures such as satisfaction, trust, commitment, or purchase intention, or to efficiency gains through governance structures for the business relationship. This provides a limited perspective of a complex set of interactions.

Cannon and Perreault (1999) argued that since many of the theories in relationship marketing have been found to be relevant it would make sense to attempt some integration and to conceptualise business relations as multivariate profiles comprising different ways in which they interact. In a similar vein, Fink, Edelman and Hatten (2007) used constructs from four different frameworks to investigate suppliers' performance improvement from developing closer relationships with customers. Further, Fink, Edelman and Hatten (2007) found that many of the studies in this area employed diverse operational definitions of key variables. The current study contributes to a more complete portrayal of the complexity of business relationships using constructs such as environment factors and relationship connectors from Cannon and Perreault (1999), communication quantity and quality from Cannon and Homburg (2001) and Mohr and Spekman (1994), and conflict and commitment from Sollner (1999). As these constructs were operationalised using the cited research this study contributes to consistency in operationalisation and addresses the issue of lack of consistency in prior research as cited by Fink, Edelman and Hatten (2007).

### **Commitment – a Calculative Investment linked to Custome Profitability**

Starting with the seminal work of Morgan and Hunt (1994), commitment has been one of the key constructs used to investigate various facets of a relationship, serving as a link to outcomes such as trust and purchase intention. Continuing research over the years has expanded understanding of this construct to include attitudinal and instrumental components (Sollner, 1999; Gounaris, 2005) and value-based, affective, locked-in, obligation, and behavioural dimensions (Sharma, Young, & Wilkinson, 2006).

Further, the role of commitment has also evolved from being an antecedent to cognitive outcomes such as trust (Morgan & Hunt, 1994) to an outcome based on a calculative affective investment (Sollner, 1999). However, this act of calculative commitment is based on other perceptual (or soft) measures and not on objective (or hard) financial measures as recommended by Cannon and Homburg (2001). This current research overcomes this shortcoming by

establishing a clear link between commitment as a calculative investment and other relationship marketing efforts as reflected in constructs used to model the nature of a business relationship. It also provides the first empirical evidence linking a financial measure to the value of a 'valued relationship' as stated in the definition of commitment: "Commitment to the relationship is defined as an enduring desire to maintain a valued relationship" (Moorman, Zaltman & Deshpande, 1992, p. 316; cited in Morgan & Hunt, 1994, p. 23).

In another stream of research focusing on profitability, the satisfaction-loyalty-profitability chain (Reichheld & Teal, 1996) used in several earlier studies has been modified due to the inadequacy of satisfaction as a primary strategy to retain customers and doubts about the loyalty-profitability link (Reinartz & Kumar, 2000, 2003). Instead of adopting a common strategy of satisfying all customers, an emerging trend appears to be a more selective approach to allocating marketing resources to customers or segments based on expected return. This differentiated strategy to building relationships and satisfying customer needs that can contribute to building loyalty is an attempt to address the shortcomings in the earlier approach (for example, see Kumar and Peterson, 2005).

This change in outlook is best summarised in the recommendation to reverse the logic of profitability through relationship marketing whereby crafting a customer relationship strategy should start with customer profitability and different customers should be rewarded and satisfied differently (Kumar, Pozza, Petersen, & Shah, 2009). Despite this clear change in thinking with regard to the crucial role of customer profitability, the main limitations of Kumar et al.'s research are that it was not conducted in a business-to-business environment and relationship marketing development was limited to innovations in products and service. The current research contributes to this emerging perspective by clearly illustrating the role of customer profitability as an important influence on commitment to a relationship, which in turn influences the level of effort a firm may invest in building and maintaining a business-to-business relationship.

### **Customer Profitability Model - Latent Constructs to Represent Financial Measures**

One major difference in this research compared to earlier research into customer profitability is the representation of the main components of profitability as latent factors instead of actual values. Financial data is often represented in profitability calculations as objective measures, without errors. This may be valid at the highest level of aggregation into main elements such as revenue, total cost and profits subject to the assumption of accounting records being true. However, errors may creep in when attempting to represent the finer elements of the aggregate components that may involve recasting accounting data to get a more meaningful representation.

One possible source of this error would be incorrect classification when developing higher level management information systems based on transaction data. Such errors may go undetected in large data bases. Representation of the key components of profitability as indicators of latent constructs in a statistical model allows for the possibility of such error and accounts for it in a systematic way. This approach also provides the means for exploring the data from multiple angles and accounting for variation using statistical tests. Some of the finer elements that contribute to a better representation of customer profitability and account for its variation are discussed in the following sections.

#### **Customer Profitability Component – Price Increases**

Price levels charged for a product influence revenue growth and profitability. The relevance of revenue and margin growth based on customer relations management and brand management to achieve firms' profit growth objectives has been empirically investigated in consumer products (Morgan et al., 2009). The services industry has also recognised the need for revenue management based on appropriate pricing of transactions as a means to optimise profits and utilise service capacity efficiently (von Martens & Hilbert, 2011). The importance of price setting, approaches to setting prices and the consequent contribution to overall profits have been the focus of various articles

(Lieberman, 2010; Marn & Rosiello, 1992; Sahay, 2007; Shapiro, et al., 1987). However, price changes at the customer level and the consequent contribution to customer profitability in business markets has not been investigated so far. This current study contributes to knowledge on the contribution of price increases to customer profitability in business markets.

### **Customer Profitability – Other Factors**

This research also clearly establishes the need to represent the number of supply destinations as a factor, or cost element. Incorporating the number of destinations for a customer contributes a new perspective to the work by Niraj et al. (2001). Another new dimension empirically investigated in customer profitability calculations is the impact of interest due on overdue payments. This dimension could be significant for some customers with a poor payment history or in firms that lack rigorous processes to check payment status. Investigation of this aspect empirically addresses the suggestion of van Raiij (2005) to consider this important element of a firm's resources in customer profitability calculations.

## **8.6 Contribution to Managerial Practice**

Integrating financial outcomes such as customer profitability into relationship marketing strategy can improve managerial decision-making in business-to-business markets by addressing a gap in managerial practice as indicated by the following comment:

*' executives of the firm need to systematically manage the ties between marketing and finance rather than assuming that product market results translate directly into financial results '*

(Kumar & Petersen, 2005, p. 505)



Incorporating financial outcomes into managerial decision making may also contribute to correcting the current situation where there appears to be little or no connection between marketing and finance departments within a firm when developing a marketing strategy (Zinkhan & Verbrugge, 2000). Integrating customer profitability into relationship marketing efforts could help executives improve on traditional approaches to developing a portfolio of customers (Campbell & Cunningham, 1983) by deploying distinct marketing tactics according to the profitability of individual customers or customer segments (Kumar & Petersen, 2005; Shapiro, et al., 1987).

Considering customer profitability would also help in the more strategic dimension of resource allocation between customer acquisition and retention efforts (Reinartz, Thomas, & Kumar, 2005). A clear understanding of the role of various customers based on their profitability can provide the basis for informed decisions on customers that can be retained despite low profitability due to other intangible benefits from business relationships, such as referrals, learning through co-development efforts and overhead absorption by large customers (van Raij, 2005). Further, determining resource availability based on customer profitability will help fine-tune communication tactics during different phases of a relationship (Reinartz, et al., 2005).

This research also provides pointers to computing customer profitability even in the absence of activity-based costing through activity proxies (Kaplan & Anderson, 2004). One of the possible impediments to organisations attempting to evaluate customer profitability could be the considerable effort to set up an activity-based costing system. In the absence of this, it is possible to estimate customer use of resources, such as interest on overdue outstanding payments, using outstanding statements that are commonly generated in each firm. Documentation cost can be estimated based on the number of invoices raised for each customer. On the revenue side the impact of price changes can be computed by fixing a price at the start of each annual period at the level of the initial transaction and tracking the changes for the subsequent periods using invoices or other transaction data as the source. This process can be easily set

up in an Excel spread sheet. Developing simple methods to compute customer profitability could help overcome the low use of customer profitability data reported in empirical research and provide a factual basis for ending customer relationships that will not, or are unlikely to, turn a profit (Helm, Rolfes, & Günter, 2006).

## **8.7 Limitations of Current Research**

This study has several limitations that need to be borne in mind when interpreting the results. First, the research used a case study approach to obtain data for testing the model using SEM. The high levels of validity and reliability of the constructs drawn from literature point to the generalisability of the constructs used in the study. However, the specific relationships between constructs must be viewed as indicative as they are data dependent. Another potential shortcoming is the sample size, which was below the recommended level for an SEM model with eight latent constructs (Hair et al., 2005, pp. 741 and 753). Though the estimates obtained were stable and statistically significant and post-hoc power analysis showed that the sample size was adequate, this caveat needs to be borne in mind.

The third limitation is the exclusion from the model developed of some important dimensions, such as customer characteristics and legal bonds, both of which have been reported to play an important role in business relationships. Customer characteristics cover aspects such as share of customer wallet, tenure of the sales representative and age of the relationship. Share of the customer wallet in particular has been reported to have a key influence on profitability in some earlier studies (Larivière, 2008; Lawrence, Diewert, & Fox, 2006). Inclusion of these characteristics might require a different approach to model specification and may result in different pathways between constructs.

The fourth limitation of the study pertains to the interpretation of the results from the model. Interpretational issues arise from the data transformations and model re-specification undertaken in the exploratory phase of the research. Most of the financial data used in computing customer profitability required log transformation to meet normality requirements imposed by SEM (see section 5.2). Though the SEM techniques are supposed to be scale invariant, significant transformation makes it difficult to interpret the magnitude of the relationship between constructs. This is an issue since scales used in the relationship constructs are linear in nature, whereas the customer profitability factors follow a logarithmic scale due to transformation. The other issue that complicates interpretation is some degree of cross loading of indicators across constructs resulting from additional paths being freed to arrive at a better fitting model.

A final limitation is the complexity of the SEM model with eight latent constructs. While the desire to have a good representation of the multiple dimensions inherent in business-to-business relationships requires these, to some extent it conflicts with the requirement to have a parsimonious representation. However, the constructs used to model business relationships with customer customers do pass the stringent requirements of reliability and validity.

## **8.8 Suggestions for Future Research**

To improve the generalisability of the model used in the present study, future research could adopt a cross-sectional approach to capture data from a range of businesses. If the current model fits the new data and can stand scrutiny for reliability and validity, then confidence in its generalisability would be increased.

The present study could also be expanded to include dyadic measurements whereby customers' perspective on commitment, conflict, communication behaviour and satisfaction could be incorporated in a more general model. Such a study would more accurately reflect perception gaps between the parties involved and how these are linked to variations in customer profitability. Another possible improvement to the current research design is to adopt a longitudinal study where variations in the parameters of the model could be assessed to check if they are time invariant.

The reverse pathway of commitment to relationship connectors based on equivalent models opens up other research possibilities, especially the perspective of relationship connectors as an investment that arises out of commitment to a relationship, which in turn is influenced by the level of customer profitability. Such research would further the systematic integration of financial measures into decisions regarding development of business relationships with specific customers.

Other areas for future research would involve refinements to the SEM model developed in this study. The first improvement would be incorporation of customer characteristics as formative constructs and the re-estimation of the model. This would capture the important dimension of how customer characteristics impact on other business relationship constructs, commitment and customer profitability. The second improvement that could be attempted would be to use a different analytical approach, such as partial least squares, so that the more rigorous demands of data normality for maximum likelihood approach are not imposed. This approach may provide the opportunity to explore possible feedback paths as well as non-linear relationships amongst the constructs, especially between communication behaviour, commitment and customer profitability factors.

## References

- Anderson, E. W., Fornell, C., & Mazvancheryl, S. K. (2004). Customer Satisfaction and Shareholder Value. *Journal of Marketing*, 68(4), 172-185.
- Anderson, J. C., & Narus, J. A. (1990). "Value-based segmentation, targeting and positioning".
- Ang, L., & Taylor, B. (2005). Managing customer profitability using portfolio matrices. *Journal of Database Marketing & Customer Strategy Management*, 12( 4), 298-304.
- Bechwati, N. N., & Eshghi, A. (2005). Customer Lifetime Value Analysis: Challenges and Words of Caution. *Marketing Management Journal*, 15(2), 87-97.
- Berger, P. D., & Nasr, N. I. (1998). Customer lifetime value: Marketing models and applications. *Journal of Interactive Marketing*, 12(1), 17-30.
- Berger, P. D., Weinberg, B., & Hanna, R. C. (2003). Customer lifetime value determination and strategic implications for a cruise-ship company. *Journal of Database Marketing & Customer Strategy Management*, 11(1), 40-52.
- Blattberg, R. C., & Deighton, J. (1996). Manage Marketing by the Customer Equity Test. *Harvard Business Review*, 74(4), 136- 144.
- Bolton, R. N. (2004). Linking Marketing to Financial Performance and Firm Value., *Journal of Marketing* (Vol. 68, pp. 73-75): American Marketing Association.
- Boomsma, A. (2000). Reporting Analyses of Covariance Structures. *Structural Equation Modeling: A Multidisciplinary Journal*, 7(3), 461-483.
- Boulding, W., & Staelin, R. (1993). A Look on the Cost Side: Market Share and the Competitive Environment. *Marketing Science*, 12(2), 144 - 166.
- Bowman, D., & Narayandas, D. (2004). Linking Customer Management Effort to Customer Profitability in Business Markets., *Journal of Marketing Research (JMR)* (Vol. 41, pp. 433-447): American Marketing Association.
- Breffni, N., Noone, B., Peter, G., & Griffin, P. (1997). Enhancing yield management with customer profitability analysis. [Article]. *International Journal of Contemporary Hospitality Management*, 9(2), 75.
- Byrne, B. M. (2001). *Structural equatione modelling with AMOS*. Mahwah, New Jersey: Lawrence Earlbaum Associates Inc.
- Byrne, B. M. (2010). *Structural equatione modelling with AMOS*. New York, NY10016: Routledge.
- Campbell, N. C. G., & Cunningham, M. T. (1983). Customer Analysis for Strategy Development in Industrial Markets. *Strategic Management Journal*, 4(4), 369 - 380.

- Cannon, J. P., Achrol, R. S., & Gundlach, G. T. (2000). Contracts, Norms, and Plural Form Governance. *Journal of the Academy of Marketing Science*, 28(2), 180 - 194.
- Cannon, J. P., & Homburg, C. (2001). Buyer-Supplier Relationships and Customer Firm Costs. *Journal of Marketing*, 65(1), 29 - 43.
- Cannon, J. P., & Perreault, J. W. D. (1999). Buyer-Seller Relationships in Business Markets. *Journal of Marketing Research (JMR)*, 36(4), 439 - 460.
- Cardinaels, E., Roodhooft, F., & Warlop, L. (2004). Customer Profitability Analysis Reports for Resource Allocation: The Role of Complex Marketing Environments. *Abacus*, 40(2), 238 - 258.
- Cheyne, T. L., & Ritter, F. E. (2001). Targeting Audiences on the Internet. *Communications of the ACM*, 44(4), 94-98.
- Chiquan Guo, & Jiraporn, P. (2005). Customer satisfaction, net income and total assets: An exploratory study. *Journal of Targeting, Measurement & Analysis for Marketing*, 13(4), 346-353.
- Claycomb, C., & Frankwick, G. L. (2010). Buyers' perspectives of buyer-seller relationship development. *Industrial Marketing Management*, 39(2), 252-263.
- Cooper, R., & Kaplan, R. S. (1988). Measure Costs Right: Make the Right Decision. *Harvard Business Review*, 66(5), 96-103.
- Cooper, R., & Kaplan, R. S. (1991). Profit Priorities from Activity-Based Costing. *Harvard Business Review*, 69(3), 130 - 135.
- Cooper, R., & Kaplan, R. S. (1992). Activity-Based Systems: Measuring the Costs of Resource Usage. *Accounting Horizons*, 6(3), 1-13.
- Coviello, N. E., Brodie, R. J., Danaher, P. J., & Johnston, W. J. (2002). How Firms Relate to Their Markets: An Empirical Examination of Contemporary Marketing Practices. *Journal of Marketing*, 66(3), 33 - 46.
- Day, G. S. (2000). Managing Market Relationships. *Journal of the Academy of Marketing Science*, 28(1), 24-30.
- Day, G. S., & Fahey, L. (1988). Valuing Market Strategies. *Journal of Marketing*, 52(3), 45- 57.
- Dillman, D. A., Smyth, J. D., & Melani, C. L. (2009 ). *Internet, mail, and mixed-mode surveys : the tailored design method* Hoboken, N.J. : Wiley & Sons.
- Doney, P. M., & Cannon, J. P. (1997). An examination of the nature of trust in buyer-seller relationships. *Journal of Marketing*, 61(2), 35 - 51.
- Doney, P. M., Cannon, J. P., & Mullen, M. R. (1998). Understanding the Influence of National Culture on the Development of Trust. *Academy of Management Review*, 23(3), 601 - 620.
- Dowling, G. R., & Uncles, M. (1997). Do Customer Loyalty Programs Really Work? *Sloan Management Review*, 38(4), 71 - 82.
- Doyle, P. (2000). Value-based marketing. *Journal of Strategic Marketing*, 8(4), 299 - 311.
- Du, R. Y., Kamakura, W. A., & Mela, C. F. (2007). Size and Share of Customer Wallet. *Journal of Marketing*, 71(2), 94-113.

- Duarte, M., & Davies, G. (2003). Testing the conflict--performance assumption in business-to-business relationships. *Industrial Marketing Management*, 32(2), 91-99.
- Dubinsky, A. J., & Ingram, T. N. (1984). A Portfolio Approach to Account Profitability., *Industrial Marketing Management* (Vol. 13, pp. 33-41).
- Duen-Ren Liu, & Ya-Yueh, S. (2005). Hybrid approaches to product recommendation based on customer lifetime value and purchase preferences. *Journal of Systems & Software*, 77(2), 181-191.
- Dwyer, F. R., Schurr, P. H., & Oh, S. (1987). Developing Buyer-Seller Relationships. *Journal of Marketing*, 51(2).
- Eng, T.-Y. (2004). Does customer portfolio analysis relate to customer performance? An empirical analysis of alternative strategic perspective. *Journal of Business & Industrial Marketing*, 19(1), 49 - 67.
- Fader, P. S., Hardie, B. G. S., & Ka Lok Lee. (2005). RFM and CLV: Using Iso-Value Curves for Customer Base Analysis. *Journal of Marketing Research (JMR)*, 42(4), 415-430.
- Farrell, A. M. (2010). Insufficient discriminant validity: A comment on Bove, Pervan, Beatty, and Shiu (2009). *Journal of Business Research*, 63(3), 324-327.
- Farris, P. (2010). *Marketing metrics : the definitive guide to measuring marketing performance* (2nd ed.). Upper Saddle River, N.J. : FT Press,.
- Fink, R. C., Edelman, L. F., & Hatten, K. J. (2007). Supplier performance improvements in relational exchanges. *Journal of Business & Industrial Marketing*, 22(1), 29-40.
- Ford, D., & Redwood, M. (2005). Making sense of network dynamics through network pictures: A longitudinal case study. *Industrial Marketing Management*, 34(7), 648-657.
- Fornell, C., & Larcker, D. F. (1981). Structural Equation Models With Unobservable Variables and Measurement Error: Algebra and Statistics. *Journal of Marketing Research (JMR)*, 18(3), 382-388.
- Foster, G., & Gupta, M. (1994). Marketing, cost management and management accounting. *Journal of Management Accounting Research*, 6, 43 - 77.
- Frazier, G. L., Spekman, R. E., & O'Neal, C. R. (1988). Just-In-Time Exchange Relationships in Industrial Markets. *Journal of Marketing*, 52(4), 52 - 67.
- Ganesan, S. (1993). Negotiation strategies and the nature of channel relationships. *Journal of Marketing Research (JMR)*, 30(2), 183 - 203.
- Garland, R. (1991). The mid-point on a rating scale: Is it desirable? *Marketing Bulletin*, 2, 66.
- Garland, R. (2002). Non-financial drivers of customer profitability in personal retail banking. *Journal of Targeting, Measurement & Analysis for Marketing*, 10(3), 233 - 248.
- Garland, R. (2004). Share of wallet's role in customer profitability. *Journal of Financial Services Marketing*, 8(3), 259 - 268.

- Garson, D. G. (2011). Structural Equation Modeling. from <http://faculty.chass.ncsu.edu/garson/PA765/structur.htm>
- Geyskens, I., Steenkamp, J.-B. E. M., Scheer, L. K., & Kumar, N. (1996). The effects of trust and interdependence on relationship commitment: A trans-Atlantic study. *International Journal of Research in Marketing*, 13(4), 303-317.
- Gladys, N., Baesens, B., & Croux, C. (2009). A modified Pareto/NBD approach for predicting customer lifetime value. *Expert Systems with Applications*, 36(2), 2062-2071.
- Gounaris, S. P. (2005). Trust and commitment influences on customer retention: insights from business-to-business services. *Journal of Business Research*, 58(2), 126-140.
- Gundlach, G. T., Achrol, R. S., & Mentzer, J. T. (1995). The structure of commitment in exchange. *Journal of Marketing*, 59(1), 78.
- Guo, C., Kumar, A., & Jiraporn, P. (2004). Customer satisfaction and profitability: is there a lagged effect? *Journal of Strategic Marketing*, 12(3), 129-144.
- Gupta, S., Lehmann, D. R., & Stuart, J. A. (2004). Valuing Customers. *Journal of Marketing Research (JMR)*, 41(1), 7 - 18.
- Gupta, S., & Zeithaml, V. (2006). Customer Metrics and Their Impact on Financial Performance. *Marketing Science*, 25(6), 718-739.
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2005). *Multivariate data analysis* (6th ed.). Upper Saddle River, N.J. : Pearson Prentice Hall.
- Helgesen, Ø. (2007). Customer accounting and customer profitability analysis for the order handling industry-A managerial accounting approach. *Industrial Marketing Management*, 36(6), 757-769.
- Helm, S., Rolfes, L., & Günter, B. (2006). Suppliers' willingness to end unprofitable customer relationships. *European Journal of Marketing*, 40(3/4), 366-383.
- Herzog, W., & Boomsma, A. (2009). Small-Sample Robust Estimators of Noncentrality-Based and Incremental Model Fit. *Structural Equation Modeling: A Multidisciplinary Journal*, 16(1), 1-27.
- Heskett, J. L., Jones, T. O., Loveman, G. W., Sasser Jr, W. E., & Schlesinger, L. A. (1994). Putting the Service-Profit Chain to Work. *Harvard Business Review*, 72(2), 164-170.
- Hess, J. D. (2001). Unidentifiable Relationships in Conceptual Marketing Models. *SSRN eLibrary*.
- Hogan, J. E., Lehmann, D. R., Merino, M., Srivastava, R. K., Thomas, J. S., & Verhoaf, P. C. (2002). Linking Customer Assets to Financial Performance. *Journal of Service Research*, 5(1), 26.
- Howell, R. A., & Soucy, S. R. (1990). CUSTOMER PROFITABILITY As Critical as Product Profitability. *Management Review*, 79(10), 43.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1-55.



- Hughes, S. B., & Paulson Gjerde, K. A. (2003a). Do Different Cost Systems Make a Difference? *Management Accounting Quarterly*, 5(1), 22 - 30.
- Hughes, S. B., & Paulson Gjerde, K. A. (2003b). Do Different Cost Systems Make a Difference? *Management Accounting Quarterly*, 5(Issue 1), 22.
- Humphreys, M. A., Williams, M. R., & Goebel, D. J. (2009). The mediating effect of supplier oriented purchasing on conflict in inter-firm relationships. *Journal of Business & Industrial Marketing*, 24(3/4), 198-206.
- Jacobs, F. A., Johnston, W., & Kotchetova, N. (2001). Customer Profitability. *Industrial Marketing Management*, 30(4), 353 - 363.
- Jain, D., & Singh, S. S. (2002). Customer Lifetime Value Research in Marketing: A Review and Future Directions. *Journal of Interactive Marketing*, 16(2), 34.
- Jap, S. D., & Ganesan, S. (2000). Control Mechanisms and the Relationship Life Cycle: Implications for Safeguarding Specific Investments and Developing Commitment. *Journal of Marketing Research (JMR)*, 37(2), 227 - 245.
- Jarvis, C. B., Mackenzie, S. B., Podsakoff, P. M., Mick, D. G., & Bearden, W. O. (2003). A Critical Review of Construct Indicators and Measurement Model Misspecification in Marketing and Consumer Research. *Journal of Consumer Research*, 30(2), 199-218.
- Johnson, J. L., Sohi, R. S., & Grewal, R. (2004). The Role of Relational Knowledge Stores in Interfirm Partnering. *Journal of Marketing*, 68(3), 21-36.
- Kalwani, M. U., & Narayandas, N. (1995). Long-term manufacturer-supplier relationships: Do they pay off for supplier firms? *Journal of Marketing*, 59(1), 1 - 16.
- Kaplan, R. S., & Anderson, S. R. (2004). Time-Driven Activity-Based Costing. *Harvard Business Review*, 82(11), 131-138.
- Kaplan, R. S., & Datar, S. (1995). Co-operative Bank. *Harvard Business School Cases*.
- Kimbrough, M. D., McAlister, L., Mizik, N., Jacobson, R., Garmaise, M. J., Srinivasan, S., et al. (2009). Commentaries and Rejoinder to "Marketing and Firm Value: Metrics, Methods, Findings, and Future Directions". *Journal of Marketing Research (JMR)*, 46(3), 313-329.
- Kline, R. B. (2005). *Principles and practice of structural equation modelling* (2nd ed.). New York: The Guilford Press.
- Knowles, J., & Ambler, T. (2009). Orientation and Marketig Metrics. In P. Maclaran, M. Saren, B. Stern & M. Tadajewski (Eds.), *The SAGE handbook of marketing theory* (pp. 379 - 396). Los Angeles, [Calif.] ; London : SAGE.
- Koen, P., Tim, A., Clark, B. H., LaPointe, P., Reibstein, D., Skiera, B., et al. (2009). Dashboards as a Service: Why, What, How, and What Research Is Needed? *Journal of Service Research*, 12(2), 175-189.
- Kumar, V., & Petersen, J. A. (2005). Using a Customer-Level Marketing Strategy to Enhance Firm Performance: A Review of Theoretical and

- Empirical Evidence. *Journal of the Academy of Marketing Science*, 33(4), 504-519.
- Kumar, V., Pozza, I. D., Petersen, J. A., & Shah, D. (2009). Reversing the Logic: The Path to Profitability through Relationship Marketing. *Journal of Interactive Marketing (Mergent, Inc.)*, 23(2), 147-156.
- Kumar, V., & Shah, D. (2009). Expanding the Role of Marketing: From Customer Equity to Market Capitalization. *Journal of Marketing*, 73(6), 119-136.
- Kumar, V., Venkatesan, R., & Beckmann, D. (2009). Implementing Profitability through a Customer Lifetime Value Management Framework. *GfK-Marketing Intelligence Review*, 1(2), 32-43.
- Kumar, V., Venkatesan, R., Bohling, T., & Beckmann, D. (2008). Practice Prize Report--The Power of CLV: Managing Customer Lifetime Value at IBM. *MARKETING SCIENCE*, 27(4), 585-599.
- Kumar, V., Venkatesan, R., & Reinartz, W. (2008). Performance Implications of Adopting a Customer-Focused Sales Campaign. *Journal of Marketing*, 72(5), 50-68.
- Kwon, R. (2002). How To Make Activities Measure Up. *Baseline*.
- Large, R. O. (2005). External communication behaviour of purchasers—effects on supplier management performance. *Journal of Purchasing & Supply Management*, 11(1), 28-41.
- Larivière, B. (2008). Linking Perceptual and Behavioral Customer Metrics to Multiperiod Customer Profitability. *Journal of Service Research*, 11(1), 3-21.
- Lawrence, D., Diewert, W. E., & Fox, K. J. (2006). The contributions of productivity, price changes and firm size to profitability. *Journal of Productivity Analysis*, 26(1), 1-13.
- Lawson, R. A., Hatch, T., Desroches, D., & Stratton, W. O. (2010). Who can win with a cost and profitability system? *Journal of Corporate Accounting & Finance (Wiley)*, 21(3), 53-60.
- Leek, S., Turnbull, P. W., & Naude, P. (2004). A comparison of manufacturers and financial services suppliers' and buyers' use of relationship management methods. *Industrial Marketing Management*, 33(3), 241-249.
- Leonidou, L. C., Paliawadana, D., & Theodosiou, M. (2006). An integrated model of the behavioural dimensions of industrial buyer-seller relationships. *European Journal of Marketing*, 40(1/2), 145-173.
- Libai, B., Narayandas, D., & Humby, C. (2002). Toward an Individual Customer Profitability Model: A Segment-Based Approach. *Journal of Service Research*, 5(1), 69 - 77.
- Lieberman, W. (2010). The 1% windfall: How successful companies use price to profit and grow. *Journal of Revenue & Pricing Management*, 9(4), 379-381.
- Lindgreen, A., Palmer, R., Vanhamme, J., & Wouters, J. (2006). A relationship-management assessment tool: Questioning, identifying, and prioritizing critical aspects of customer relationships. *Industrial Marketing Management*, 35(1), 57-71.

- Maclaran, P., Saren, M., Stern, B., & Tadajewski, M. (Eds.). (2009). *The SAGE handbook of marketing theor.* Los Angeles, [Calif.] ; London : SAGE.
- Malhotra, N., Hall, J., Shaw, M., & Oppenheim, P. (2002). *Marketing research : an applied orientation* (2nd ed.). Frenchs Forrest NSW 2086: Pearson Education Australia.
- Marn, M. V., & Rosiello, R. L. (1992). Managing Price, Gaining Profit. *Harvard Business Review*, 70(5), 84-94.
- Marshall, J. (2002). More Complex, More Robust. *Financial Executive*, 18(1), 44 - 45.
- Maynard, R. (2008). Lean Accounting. *Financial Management*, 44-46.
- McDonald, R. P., & Ho, M.-H. R. (2002). Principles and practice in reporting structural equation analyses. *Psychological Methods*, 7(1), 64-82.
- McGovern, G. J., Court, D., Quelch, J. A., & Crawford, B. (2004). Bringing Customers into the Boardroom. *Harvard Business Review*, 82(11), 70-80.
- McManus, L., & Guilding, C. (2008). Exploring the potential of customer accounting: a synthesis of the accounting and marketing literatures. *Journal of Marketing Management*, 24(7/8), 771-795.
- Michael, R. (2005). The Challenges and Benefits of Activity Based Costing: An Overview. *The Australian Journal of Business and Informatics*, 1(1), 35 - 43.
- Miller, J. A. (2008). Customer profitability. *Journal of Corporate Accounting & Finance* (Wiley), 19(4), 63-68.
- Mohr, J. J., Fisher, R. J., & Nevin, J. R. (1996). Collaborative communication in interfirm relationships: Moderating effects of integration and. *Journal of Marketing*, 60(3), 103 - 115.
- Mohr, J. J., & Spekman, R. (1994). Characteristics of Partnership Success: Partnership Attributes, Communication Behavior, and Conflict Resolution Techniques. *Strategic Management Journal*, 15(2), 135 - 152.
- Moorman, C., Zaltman, G., & Deshpande, R. (1992). Relationships Between Providers and Users of Market Research: The Dynamics of Trust Within and Between Organizations. *Journal of Marketing Research* (JMR), 29(3), 314-328.
- Morgan, N. A., Slotegraaf, R. J., & Vorhies, D. W. (2009). Linking marketing capabilities with profit growth. *International Journal of Research in Marketing*, 26(4), 284-293.
- Morgan, R. M., & Hunt, S. D. (1994). The Commitment-Trust Theory of Relationship Marketing. *Journal of Marketing*, 58(3), 20 - 38.
- Mulhern, F. J. (1999). Customer profitability analysis: Measurement, concentration, and research directions. *Journal of Interactive Marketing*, 13(1), 25 - 40.
- Niraj, R., Foster, G., Gupta, M. R., & Narasimhan, C. (2008). Understanding customer level profitability implications of satisfaction programs.. *Journal of Business & Industrial Marketing*, 23(7/8), 454-463.
- Niraj, R., Gupta, M., & Narasimhan, C. (2001). Customer Profitability in a Supply Chain. *Journal of Marketing*, 65(3), 1 - 17.

- O'Toole, T., & Donaldson, B. (2000). Relationship Governance Structures and Performance. *Journal of Marketing Management*, 16(4), 327 - 341.
- Olkkonen, R., Tikkanen, H., & Alajoutsijarvi, K. (2000). The role of communication in business relationships and networks. *Management Decision*, 38(5/6), 403 - 409.
- Palmatier, R. W. (2008). Interfirm Relational Drivers of Customer Value. *Journal of Marketing*, 72(4), 76-89.
- Palmatier, R. W., Dant, R. P., & Grewal, D. (2007). A Comparative Longitudinal Analysis of Theoretical Perspectives of Interorganizational Relationship Performance. *Journal of Marketing*, 71(4), 172-194.
- Palmatier, R. W., Dant, R. P., Grewal, D., & Evans, K. R. (2006a). Factors Influencing the Effectiveness of Relationship Marketing: A Meta-Analysis. *Journal of Marketing*, 70(Issue 4), 136-153.
- Palmatier, R. W., Dant, R. P., Grewal, D., & Evans, K. R. (2006b). Factors Influencing the Effectiveness of Relationship Marketing: A Meta-Analysis. *Journal of Marketing*, 70(4), 136-153.
- Palmatier, R. W., Gopalakrishna, S., & Houston, M. B. (2006). Returns on Business-to-Business Relationship Marketing Investments: Strategies for Leveraging Profits. *Marketing Science*, 25(5), 477-493.
- Palmatier, R. W., Scheer, L. K., Evans, K. R., & Arnold, T. J. (2008). Achieving relationship marketing effectiveness in business-to-business exchanges. *Journal of the Academy of Marketing Science*, 36(2), 174-190.
- Palmatier, R. W., Scheer, L. K., Houston, M. B., Evans, K. R., & Gopalakrishna, S. (2007). Use of relationship marketing programs in building customer-salesperson and customer-firm relationships: Differential influences on financial outcomes. *International Journal of Research in Marketing*, 24(3), 210-223.
- Patrick, D. (2008). *Determining sample size*: Oxford University Press.
- Pauwels, K., Silva-Risso, J., Srinivasan, S., & Hanssens, D. M. (2004). New Products, Sales Promotions, and Firm Value: The Case of the Automobile Industry. *Journal of Marketing*, 68(4), 142-156.
- Payant, W. R. (2004). The Challenges and Opportunities of Customer Profitability Analysis. *Journal of Bank Cost & Management Accounting*, 16(3), 41-47.
- Payne, A., & Holt, S. (2001). Diagnosing Customer Value: Integrating the Value Process and Relationship Marketing. *British Journal of Management*, 12(2), 159 - 182.
- Pfeifer, P. E., & Bang, H. (2005). Non-parametric estimation of mean customer lifetime value. *Journal of Interactive Marketing*, 19( 4), 48-66.
- Pfeifer, P. E., Haskins, M. E., & Conroy, R. M. (2005). Customer Lifetime Value, Customer Profitability, and the Treatment of Acquisition Spending. *Journal of Managerial Issues*, 17(1), 11-25.
- Piercy, N. F., & Lanae, N. (2006). The hidden risks in strategic account management strategy. *Journal of Business Strategy*, 27(2), 18-26.

- Prescott, J. E., Kohli, A. K., & Venkatraman, N. (1984). Is The Relationship Between Market Share and Business Profitability Spurious?: an Empirical Assessment. *Academy of Management Proceedings*.
- Purinton, E. F., Rosen, D. E., & Curran, J. M. (2007). Marketing Relationship Management: Antecedents to Survival and Dissolution. *Journal of Business-to-Business Marketing*, 14(2), 75-103.
- Rappaport, A. (1998). *Creating shareholder value : a guide for managers and investors*. New York: Free Press.
- Reichheld, F. F., & Teal, T. (1996). *The loyalty effect : the hidden force behind growth, profits, and lasting value*. Boston, Mass.: Harvard Business School Press.
- Reinartz, W. J., & Kumar, V. (2000). On the Profitability of Long-Life Customers in a Noncontractual Setting: An Empirical Investigation and Implications for Marketing. *Journal of Marketing*, 64(4), 17 - 35.
- Reinartz, W. J., & Kumar, V. (2002). The Mismanagement of Customer Loyalty. *Harvard Business Review*, 80(7), 86 - 94.
- Reinartz, W. J., & Kumar, V. (2003). The Impact of Customer Relationship Characteristics on Profitable Lifetime Duration. *Journal of Marketing*, 67(1), 77 - 99.
- Reinartz, W. J., Thomas, J. S., & Kumar, V. (2005). Balancing Acquisition and Retention Resources to Maximize Customer Profitability. *Journal of Marketing*, 69(1), 63-79.
- Rubin, H. J., & Rubin, I. S. (2005). *Qualitative interviewing : the art of hearing data* (2nd ed.). Thousand Oaks, Calif: Sage Publications.
- Rust, R. T., Ambler, T., Carpenter, G. S., Kumar, V., & Srivastava, R. K. (2004). Measuring Marketing Productivity: Current Knowledge and Future Directions. *Journal of Marketing*, 68(4), 76-89.
- Ryals, L. (2002). Measuring risk and returns in the customer portfolio. *Journal of Database Marketing*, 9(3), 219 - 227.
- Sahay, A. (2007). How to Reap Higher Profits With Dynamic Pricing. *MIT Sloan Management Review*, 48(4), 53-60.
- Samaha, S. A., Palmatier, R. W., & Dant, R. P. (2011). Poisoning Relationships: Perceived Unfairness in Channels of Distribution. *Journal of Marketing*, 75(3), 99-117.
- Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students* (5th ed.). Harlow, England: Pearson Education Limited.
- Schumacker, R. E., & Lomax, R. G. (2004). *A beginner's guide to structural equation modeling* (2nd ed.). Mahwah, N.J.: Lawrence Erlbaum
- Seppanen, M., & Lyly-Yrjanainen, J. (2002). *Vague Boundaries of Product and Customer Costs*. Paper presented at the Transactions of AACE International.
- Shapiro, B. P., Rangan, V. K., Moriarty, R. T., & Ross, E. B. (1987). Manage customers for profits (not just sales). *Harvard Business Review*, 65(5), 101 - 108.
- Sharma, N., Young, L., & Wilkinson, I. (2006). The Commitment Mix: Dimensions of Commitment in International Trading Relationships in India. *Journal of International Marketing*, 14(3), 64-91.

- Sherratt, M. (2003). Aligning Costs with Revenues. *Financial Executive*, 19(7 - 9), 59.
- Sheth, J. N., & Sisodia, R. S. (1995). Feeling the Heat. (cover story). *Marketing Management*, 4(2), 8-23.
- Singh, S. S., Jain, D. C., & Krishnan, T. V. (2008). Customer Loyalty Programs: Are They Profitable? [Article]. *Management Science*, 54(6), 1205-1211.
- Smith, M., & Dikolli, S. (1995). Customer profitability analysis:: an activity-based costing approach. *Managerial Auditing Journal*, Vol. 10(7), 3 - 7.
- Sollner, A. (1999). Asymmetrical Commitment in Business Relationships. *Journal of Business Research*, 46(3), 219-233.
- Srinivasan, S., & Hanssens, D. M. (2009). Marketing and Firm Value: Metrics, Methods, Findings, and Future Directions. *Journal of Marketing Research (JMR)*, 46(3), 293-312.
- Srivastava, R. K., Shervani, T. A., & Fahey, L. (1998). Market-based assets and shareholder value: A framework for. *Journal of Marketing*, 62(1), 2 - 18.
- Stoelhorst, J. W., & van Raaij, E. M. (2004). On explaining performance differentials: Marketing and the managerial theory of the firm. *Journal of Business Research*, 57(5), 16.
- Storbacka, K. (1997). Segmentation Based on Customer Profitability--Retrospective Analysis of Retail Bank Customer Bases. *Journal of Marketing Management*, 13(5), 479 - 492.
- Stout, D. E., & Bedenis, G. P. (2007). Cost-System Redesign at a Medium-Sized Company: Getting the Right Numbers to Drive Improvements in Business Performance. *Management Accounting Quarterly*, 8(4), 9-19.
- Tarasi, C. O., Bolton, R. N., Hutt, M. D., & Walker, B. A. (2011). Balancing Risk and Return in a Customer Portfolio. *Journal of Marketing*, 75(3), 1-17.
- Thomas, J. S., Reinartz, W., & Kumar, V. (2004). Getting the Most out of All your Customers. (Cover story). *Harvard Business Review*, 82(7/8), 116-123.
- Treiblmaier, H., Bentler, P. M., & Mair, P. (2011). Formative Constructs Implemented via Common Factors. *Structural Equation Modeling*, 18(1), 1-17.
- Triest, S., Bun, M., Raaij, E., & Vernooij, M. (2009). The impact of customer-specific marketing expenses on customer retention and customer profitability. *Marketing Letters*, 20(2), 125-138.
- Anonymous., True cost of late payment. (27 May 2005). *Cabinet Maker*.
- Ulaga, W., & Eggert, A. (2006). Value-Based Differentiation in Business Relationships: Gaining and Sustaining Key Supplier Status. *Journal of Marketing*, 70(1), 119-136.
- Vaaland, T. I. (2006). When Conflict Communication Threatens the Business Relationship: Lessons from the "Balder" Story. *Journal of Business-to-Business Marketing*, 13(2), 3-27.

- van Raaij, E. M., Vernooij, M. J. A., & van Triest, S. (2003). The implementation of customer profitability analysis: A case study. *Industrial Marketing Management*, 32(7), 573 - 584.
- Van Triest, S. (2005). Customer size and customer profitability in non-contractual relationships. *Journal of Business & Industrial Marketing*, 20(3), 148-155.
- Venkatesan, R., & Kumar, V. (2004). A Customer Lifetime Value Framework for Customer Selection and Resource Allocation Strategy. *Journal of Marketing*, 68(4), 106-125.
- Venkatesan, R., Kumar, V., & Bohling, T. (2007). Optimal Customer Relationship Management Using Bayesian Decision Theory: An Application for Customer Selection. *Journal of Marketing Research (JMR)*, 44(4), 579-594.
- Verhoef, P. C., Franses, P. H., & Hoekstra, J. C. (2002). The Effect of Relational Constructs on Customer Referrals and Number of Services Purchased From a Multiservice Provider: Does Age of Relationship Matter? *Journal of the Academy of Marketing Science*, 30(3), 202-216.
- Verhoef, P. C., & Leeflang, P. S. H. (2009). Understanding the Marketing Department's Influence Within the Firm. *Journal of Marketing*, 73(2), 14-37.
- Verhoef, P. C., & Leeflang, P. S. H. (2010). Getting marketing back into the boardroom: The influence of the marketing department in companies today *GfK-Marketing Intelligence Review*, 2(1), 34-41.
- Villanueva, J., Bhardwaj, P., Balasubramanian, S., & Chen, Y. (2007). Customer relationship management in competitive environments: The positive implications of a short-term focus. *Quantitative Marketing & Economics*, 5(2), 99-129.
- von Martens, T., & Hilbert, A. (2011). Customer-value-based revenue management. *Journal of Revenue & Pricing Management*, 10(1), 87-98.
- Williams, L. J., Vandenberg, R. J., & Edwards, J. R. (2009). 12 Structural Equation Modeling in Management Research: A Guide for Improved Analysis. *Academy of Management Annals*, 3(1), 543-604.
- Ya-Yeuh Shih, & Chung-Yuan, L. (2003). A method for customer lifetime value ranking -- Combining the analytic hierarchy process and clustering analysis. *Journal of Database Marketing & Customer Strategy Management*, 11(2), 159-172.
- Yin, R. K. (2002). *Case study research : design and methods* Thousand Oaks, Calif: Sage Publications.
- Yorke, D., & Droussiotis, G. (1994). The use of customer portfolio theory. *Journal of Business & Industrial Marketing*, 9(3), 6 - 18.
- Zeithaml, V. A. (2000). Service Quality, Profitability, and the Economic Worth of Customers: What We Know and What We Need to Learn. *Journal of the Academy of Marketing Science*, 28(1), 67-85.
- Zhang, L., & Smith, M. (2006). Customer profitability analysis. (Cover story). *Financial Management (Caspian Publishing)*, p30-31.

Zinkhan, G. M., & Verbrugge, J. A. (2000). The Marketing/Finance Interface: Two Divergent and Complementary Views of the Firm. *Journal of Business Research*, 50(2), 143-148.



## Appendix A Main Effects Reported for Selected Variables

**Table A-1: Main Effects Reported for Selected Variables**

Independent variable	Dependent Variable	Nature of effect on dependent variable	Context	Comments	Study
Communication Type (rich or standard modes)	Contribution margin	Significant lagged effect	Business markets; vendor of computer hardware and software	Customer size and industry context also explain variation in contribution margin	Venkatesan and Kumar (2004)
Communication Quantity	Relationship	U shaped effect; too much being detrimental	As above		Venkatesan and Kumar (2004)
	(i)Supplier performance	Significant effect on both	Purchase executives in a cross sectional study		Large, R. (2005)
	(ii) Relationship quality	U shaped effect			
	Overall performance	More bi-directional communication associated with greater purchase frequency	Dealers in a channel	Performance, including profitability, based on sales person perceptions and not hard data	Hibbard et al. (2001)
- direction	Purchase frequency			The authors report that contact strategy affects both purchase frequency and contribution margin	Venkatesan and Kumar (2004)
Flexibility	Costs to	Decreased cost to	Business market;	Increases cost to vendor	Cannon and

Independent variable	Dependent Variable	Nature of effect on dependent variable	Context	Comments	Study
	customer	customer	purchase executives' view point		Homburg (2001)
Share of customer wallet	Gross margin	Increased with greater share, but decreasing returns	Business markets; vendor of motor casings	May impact resource allocation decisions; influence interdependence asymmetry	Bowman & Narayandas (2004)
Customer size	Customer profitability	Positive ( $p < .01$ )	As above	May play a role in observed 'size effect'	Bowman & Narayandas (2004)
	Contribution margin	Explain variation	As above	Along with industry category explains the observed variation	Venkatesan and Kumar (2004)
Supply alternative	Customer profitability margin	Negative ( $p < .01$ )	As above		Bowman & Narayandas (2004)
Sharing information on costs	Cost	-Negative, but not significant - No impact where there is close relationship	As above	Critical component of information exchange; influences nature of relationship	Bowman & Narayandas (2004)
Tenure of sales person	Operating margin	Positive ( $p < .01$ )	As above		Bowman & Narayandas (2004)

## Appendix B      Rank condition of endogenous constructs

To simplify representation of the constructs in a matrix format the abbreviations proposed to be used are shown in Table B-1

**Table B-1: Abbreviations for constructs**

Construct	Abbreviation
<i>Exogenous</i>	
Customer Characteristics	$X_1$
Environment factors	$X_2$
Conflict	$X_3$
Product Mix	$X_4$
<i>Endogenous</i>	
Relationship connectors	$Y_1$
Communication Quantity	$Y_2$
Communication Quality	$Y_3$
Commitment	$Y_4$
Revenue	$Y_5$
Cost Factors	$Y_6$
Customer Profitability	$Y_7$

The System Matrix representation of the theoretical model (Figure 4-2) is shown in Table B-2.

**Table B-2: System matrix for the theoretical model**

	$X_1$	$X_2$	$X_3$	$X_4$	$Y_1$	$Y_2$	$Y_3$	$Y_4$	$Y_5$	$Y_6$	$Y_7$
$Y_1$	0	1	0	0	1	0	0	0	0	0	0
$Y_2$	1	0	0	0	0	1	0	0	0	0	0
$Y_3$	1	0	1	0	0	0	1	0	0	0	0
$Y_4$	0	0	0	0	1	1	1	1	0	0	1
$Y_5$	0	1	0	1	0	0	0	0	1	0	0
$Y_6$	0	0	0	1	0	0	0	0	0	1	0
$Y_7$	0	0	0	0	0	0	0	1	1	1	0

The system matrix value in each cell represents nature of the impact. A value of 1 indicates that the specific construct has an effect.

The reduced form matrix was arrived at as described in section 4.11 for each of the endogenous constructs. A summary of the reduced form matrix and its rank are given in Table B-3

**Table B-3: Reduced form matrix for constructs**

Construct	Reduced form matrix	Matrix Rank
$Y_1$	$\begin{bmatrix} 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 1 & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 1 & 1 & 0 & 0 & 1 \\ 0 & 0 & 1 & 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 0 \end{bmatrix}$	6
$Y_2$	$\begin{bmatrix} 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 1 & 1 & 0 & 0 & 1 \\ 1 & 0 & 1 & 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & 1 & 1 & 0 \end{bmatrix}$	6

Construct	Reduced form matrix	Matrix Rank
$Y_3$	$\begin{bmatrix} 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 1 & 1 & 1 & 0 & 0 & 1 \\ 1 & 1 & 0 & 0 & 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 & 1 & 1 & 0 \end{bmatrix}$	6
$Y_4$	$\begin{bmatrix} 0 & 1 & 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 0 & 0 \\ 1 & 0 & 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 0 & 1 & 1 \end{bmatrix}$	6
$Y_5$	$\begin{bmatrix} 0 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \\ 1 & 1 & 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 1 & 1 & 1 & 0 & 1 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 1 & 1 & 0 \end{bmatrix}$	6
$Y_6$	$\begin{bmatrix} 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \\ 1 & 0 & 1 & 0 & 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 1 & 1 & 1 & 0 & 1 \\ 0 & 1 & 0 & 0 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 & 1 & 1 & 0 \end{bmatrix}$	6
$Y_7$	$\begin{bmatrix} 0 & 1 & 0 & 0 & 1 & 0 & 0 & 0 \\ 1 & 0 & 0 & 0 & 0 & 1 & 0 & 0 \\ 1 & 0 & 1 & 0 & 0 & 0 & 1 & 0 \\ 0 & 0 & 0 & 0 & 1 & 1 & 1 & 1 \\ 0 & 1 & 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 1 & 0 & 0 & 0 & 0 \end{bmatrix}$	6

## Appendix C    Number of Product Groups Purchased by Customers

**Table C-1: Number of Product Groups Purchased by Customers**

Decile category	Number of Product Groups Purchased					
	0	1	2	3	4	5
	Row N	Row N	Row N	Row N	Row N	Row N
1	21.7	69.6	8.7	0.0	0.0	0.0
2	8.3	70.8	12.5	8.3	0.0	0.0
3	0.0	58.3	25.0	16.7	0.0	0.0
4	0.0	50.0	41.7	4.2	4.2	0.0
5	0.0	43.5	39.1	17.4	0.0	0.0
6	0.0	54.2	25.0	20.8	0.0	0.0
7	0.0	20.8	58.3	16.7	4.2	0.0
8	0.0	41.7	33.3	16.7	0.0	8.3
9	0.0	29.2	25.0	16.7	16.7	12.5
10	0.0	13.0	30.4	17.4	34.8	4.3

## Appendix D Contribution of Price Increase

**Table D-1: Price Increase by Product Group in each Decile**

Decile	Product Group 1	Product Group 2	Product Group 3	Product Group 4	Product Group 5	Total
1	0.3	15.0	.	61.3	23.4	100
2	13.1	1.4	8.8	.	76.7	100
3	41.5	4.4	25.4	21.7	7.0	100
4	.	31.5	4.8	56.0	7.6	100
5	14.1	18.9	25.9	11.1	30.1	100
6	19.1	16.3	9.6	0.6	54.4	100
7	9.4	54.7	19.4	8.1	8.4	100
8	22.9	38.3	21.2	11.0	6.5	100
9	47.1	36.5	4.3	7.8	4.2	100
10	67.0	13.1	15.2	3.0	1.7	100

**Table D-2: Contribution by Customer Decile to Price Increase in each Product Group**

Decile	Product Group 1	Product Group 2	Product Group 3	Product Group 4	Product Group 5
1	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.9
3	0.2	0.0	0.4	0.9	0.4
4	0.0	0.6	0.1	4.3	0.8
5	0.1	0.4	0.9	1.0	3.7
6	0.4	1.0	0.9	0.2	19.4
7	0.4	6.9	4.1	4.4	6.4
8	1.5	6.8	6.4	8.5	7.0
9	21.1	44.0	8.7	40.7	30.6
10	76.3	40.3	78.3	40.0	30.6
Total	100	100	100	100	100

## Appendix E      Destinations per Customer

**Table E-1: Destinations per Customer**

Decile	Number of destinations per customer		
	Mean	Minimum	Maximum
1	1	1	3
2	1	1	2
3	1	1	2
4	2	1	8
5	2	1	4
6	2	1	5
7	2	1	6
8	2	1	10
9	5	1	25
10	6	1	26



## Appendix F      Transaction Frequency Category

**Table F-1: Transaction Frequency Category**

Gross sales Deciles	1 to 3	4 to 6	7 to 10	11 to 14
	Row N %	Row N %	Row N %	Row N %
1	90.0	5.0	5.0	0.0
2	58.3	16.7	8.3	16.7
3	29.2	41.7	8.3	20.8
4	12.5	33.3	12.5	41.7
5	13.0	13.0	47.8	26.1
6	8.3	25.0	25.0	41.7
7	8.3	12.5	16.7	62.5
8	0.0	4.2	16.7	79.2
9	0.0	0.0	16.7	83.3
10	0.0	0.0	0.0	100.0

\*Note: See Table 5-13 for basis of categorisation of transaction frequency

## Appendix G Shipment Size by Customer Decile

Table G-1: Shipment Size by Customer Decile

Product Group Number														
1.00			2.00			3.00			4.00			5.00		
Standard Weight			Standard Weight			Standard Weight			Standard Weight			Standard Weight		
Mean	Minimum	Maximum	Mean	Minimum	Maximum	Mean	Minimum	Maximum	Mean	Minimum	Maximum	Mean	Minimum	Maximum
2	1	4	2	1	3	11	2	17	3	1	14	16	1	120
12	1	72	15	10	18	17	1	34	41	35	53	8	1	54
12	1	64	7	1	43	26	1	98	5	1	100	12	1	38
36	1	339	8	1	26	30	1	294	12	1	90	21	1	79
60	2	340	17	2	56	52	2	300	23	1	60	64	1	300
70	2	400	13	1	50	68	4	202	62	1	306	48	1	906
161	1	1031	29	1	201	43	1	437	48	1	461	32	1	373
113	1	1100	33	1	328	119	1	805	31	1	192	47	1	624
227	1	1728	33	1	194	128	1	1800	66	1	554	105	1	1845
299	1	8237	93	1	1368	236	1	3527	114	1	833	152	1	2895

## Appendix H      Impact of Interest

**Table H-1: Interest on Outstanding - Top 10 Customers**

<b>Sr No</b>	<b>Gross Margin%</b>	<b>Gross Margin % after Interest</b>	<b>Difference</b>
1	31.03	20.73	10.30
2	2.06	-7.26	9.33
3	11.87	5.91	5.95
4	46.15	42.14	4.01
5	17.10	14.16	2.95
6	28.21	25.63	2.58
7	47.07	44.53	2.54
8	25.73	23.74	1.99
9	30.73	28.82	1.90
10	21.11	19.61	1.50

**Table H-2: Interest on Overdue Credit - Top 10 Customers**

<b>Sr No</b>	<b>Gross Margin%</b>	<b>Gross Margin % after Interest</b>	<b>Difference</b>
1	27.20	29.38	-2.18
2	10.09	11.25	-1.16
3	23.03	23.85	-0.82
4	8.00	8.49	-0.49
5	24.87	25.27	-0.40
6	10.10	10.42	-0.33
7	-40.35	-40.24	-0.11
8	6.10	6.20	-0.10
9	11.75	11.84	-0.08
10	15.83	15.89	-0.06

## Appendix I      Number of Invoices by Customer Decile

**Table I-1: Number of Invoices by Customer Decile**

Gross sales Decile	Number of invoices		
	Mean	Minimum	Maximum
1	7	1	31
2	11	1	120
3	19	2	169
4	34	2	219
5	17	4	34
6	25	6	108
7	77	1	701
8	89	1	537
9	141	20	485
10	485	2	4047

## Appendix J Questionnaire

Note: Name of the participating firm has been removed to maintain confidentiality



This questionnaire is designed to gather data on the nature of relationships with your main customers. The data will be used to assess if there is any pattern in the relationships with individual customers and, if so, how it impacts outcomes such as financial contribution.

I have signed a confidentiality agreement with ----- which clearly specifies that all information collected will be confidential and any publications coming out of this study will be seen by authorised ----- personnel before submission. No information that may allow an individual respondent to be identified will be published or made available to -----

The following paragraphs about this research are inserted as required by the University.

This project has been evaluated by peer review and judged to be low risk. Consequently, it has not been reviewed by one of the University's Human Ethics Committees. The researcher named below is responsible for the ethical conduct of this research.

If you have any concerns about the conduct of this research that you wish to raise with someone other than the researcher, please contact Professor Sylvia Rumball, Assistant to the Vice- Chancellor (Research Ethics), telephone 06 350 5249, email [humanethics@massey.ac.nz](mailto:humanethics@massey.ac.nz)

Ravi Balasubramanian

Massey University

The following questions concern the customer indicated below:

Name:

SAP code (sold to party):

**Section A: Background information**

1. How long has ----- conducted business with this firm?

2. For how many years has a systematic attempt been made to develop a close business relationship with this customer?

3. How many years have you been responsible for this customer?

4. What percentage (approximately) of total purchases by the customer do -----related products constitute?

5. What share (%) of this customer's ----- purchases does ----- have?

**(Please indicate 0 against any of the items not purchased by the customer)**

Product Group A

Product Group B

Product Group C

Product Group D

Product Group E

6. How big is this organisation in terms of annual sales to their customers (in million US\$)?

**Section B: Structure and Nature of Interactions**

The questions in this section relate to the structure and dynamics of business interactions between ----- and this customer.

For the following questions please indicate your level of agreement or disagreement using the following seven point scale

1-----2-----3-----4-----5-----6-----7

Strongly Agree      Moderately Agree      Slightly Agree      Neither Agree nor Disagree      Slightly Disagree      Moderately Disagree      Strongly Disagree

7. How much do you agree or disagree with the following statements about the linkage between ----- and this customer?

	Strongly Agree 1	2	3	4	5	6	Strongly Disagree 7
Our business planning activities are linked with this customer (examples: strategic planning, marketing programs, new product/ market development etc.).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
This customer's systems are essential to our operations (examples: EDI, order and replenishment system, vendor managed inventory, Just-in-time inventory etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Our operations are closely linked with (examples: production processes, logistics)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. How much do you agree or disagree that in this relationship it is expected that...

	Strongly Agree 1	2	3	4	5	6	Strongly Disagree 7
Proprietary information ( I.P.) will be shared with each other	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
We will both share relevant cost information	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
We will include each other in product development meetings	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
We will share supply and demand forecasts	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

9. Does ----- have a legal agreement with this firm for an on-going business relationship or for the supply of products?

☒ Yes GO TO Q10

☒ No GO TO Q11

10. Considering the nature of legal agreements with this customer, how much do you agree or disagree that .....

	Strongly Agree 1	2	3	4	5	6	Strongly Disagree 7
We have detailed contractual agreements for supply of products and services	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>



	Strongly Agree 1	2	3	4	5	6	Strongly Disagree 7
We have formal agreements that detail the obligation of both parties in building this relationship	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

11. How much do you agree or disagree that in this relationship it is expected that...

	Strongly Agree	1	2	3	4	4	6	Strongly Disagree
No matter who is at fault, problems are joint responsibilities	<input checked="" type="radio"/>		<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Both sides are concerned about the other's profitability	<input checked="" type="radio"/>		<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
One party will not take advantage of a strong bargaining position	<input checked="" type="radio"/>		<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Both sides are willing to make cooperative changes	<input checked="" type="radio"/>		<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
We must work together to be successful	<input checked="" type="radio"/>		<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
We make adjustments to help each other out when faced with special problems or circumstances	<input checked="" type="radio"/>		<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
We set aside contractual terms in order to work through difficult situations	<input checked="" type="radio"/>		<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>

12. How much do you agree or disagree that to meet this customer's needs ----

-----

	Strongly Agree 1	2	3	4	5	6	Strongly Disagree 7
Has changed product features (example: specifications, packaging etc.)	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Has changed personnel to deal with the customer	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Has changed inventory holding or distribution processes	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Has invested in capital equipment or new manufacturing or business processes	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Has changed production planning or scheduling processes	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Has agreed to change financial or contractual terms and conditions	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>

13. How much do you agree or disagree that to meet -----' requirements  
this customer---

	Strongly Agree 1	2	3	4	5	6	Strongly Disagree 7
Has changed their product features (example: specifications, packaging etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has changed personnel to deal with us	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has changed inventory holding, material handling or storage processes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has changed procurement processes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has invested in capital equipment or new manufacturing or business processes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has agreed to change financial or contractual terms and conditions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Section C: Market Environment

The questions in this section assess the market conditions that may influence the customer's purchase decision.

14. This market is very competitive for-----  
(Please give responses only to product categories that this customer purchases from the market)

	Strongly Agree 1	2	3	4	5	6	Strongly Disagree 7
Product Group A	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Product Group B	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Product Group C	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Product Group D	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Product Group E	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15. The customer can shift to other vendors with minimal change in processes for-----

	Strongly Agree 1	2	3	4	5	6	Strongly Disagree 7
Product Group A	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Product Group B	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Product Group C	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Product Group D	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Product Group E	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>

16. In the market where this customer is located, there were large fluctuations in average market price level over the last 12 months for---

	Strongly Agree 1	2	3	4	5	6	Strongly Disagree 7
Product Group A	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Product Group B	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Product Group C	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Product Group D	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Product Group E	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>

17. In the market where this customer is located there is wide variation in—

	Strongly Agree 1	2	3	4	5	6	Strongly Disagree 7
Product features and specifications offered by different vendors	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vendor support services	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Technology used by supplier	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Product availability (for the main categories purchased by customer)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

#### Section D: -----'s contribution to the Customer's business

The questions in this section relate to the importance of -----'s products to this customer's business

18. Compared to other purchases made by this customer, how much do you agree or disagree that -----'s products are ----

	Strongly Agree 1	2	3	4	5	6	Strongly Disagree 7
Very important towards meeting their strategic growth objectives	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Essential to meet their own customers' needs	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accorded top priority in procurement decisions	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Strongly Agree 1	2	3	4	5	6	Strongly Disagree 7
A significant proportion of total purchase value	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

19. Compared to other purchases made by the customer, how much do you agree or disagree that -----'s products have-----

	Strongly Agree 1	2	3	4	5	6	Strongly Disagree 7
Complex requirements for storage, handling, or use in production	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Complicated logistics, documentation or other market access processes	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
High technical profile	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Product functions or benefits that are difficult to understand	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



## Section E: Nature of Communications with the Customer

The questions in this section relate to the frequency and modes of communication that take place between people in ----- and this customer

20. Frequency of **face-to-face** communication **you** have with.....

	Once a day or more	1- 4 times a week	1- 3 times a month	4 – 10 times a year	2 – 5 times a year	Once a year or less
Customer's purchase personnel	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Customer's logistics personnel	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Customer's R & D and other functions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Customer's senior management	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

21. Frequency of **telephone** communication **you** have with...

	Once a day or more	1- 4 times a week	1- 3 times a month	4 – 10 times a year	2 – 5 times a year	Once a year or less
Customer's purchase personnel	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Customer's logistics personnel	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Customer's R & D and other functions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Customer's senior management	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

22. Frequency of **face-to-face** communication between **other personnel** in ----  
----- with.....

	Once a day or more	1- 4 times a week	1- 3 times a month	4 – 10 times a year	2 – 5 times a year	Once a year or less
Customer's purchase personnel	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Customer's logistics personnel	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Customer's R & D and other functions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Customer's senior management	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

23. Frequency of **telephone** communication between **other personnel** in -----  
--- with.....

	Once a day or more	1- 4 times a week	1- 3 times a month	4 – 10 times a year	2 – 5 times a year	Once a year or less
Customer's purchase personnel	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Customer's logistics personnel	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Customer's R & D and other functions	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Customer's senior management	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

24. Frequency of **written** communication **you** have with this customer via

	Once a day or more	1- 4 times a week	1- 3 times a month	4 – 10 times a year	2 – 5 times a year	Once a year or less
Electronic mail	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fax	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Regular mail	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

25. How much do you agree or disagree that **your** communication with this customer is:

	Strongly Agree 1	2	3	4	5	6	Strongly Disagree 7
Timely	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Accurate	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Complete	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

26. Overall, how much do you agree or disagree that communications between ----- and this customer are:

	Strongly Agree 1	2	3	4	5	6	Strongly Disagree 7
Timely	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Accurate	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Complete	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

27. How much do you agree or disagree with the following statements?

	Strongly agree 1	2	3	4	5	6	Strongly disagree 7
We argue frequently with this customer about business issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Our arguments with this customer are very heated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We disagree with this customer about how we can best achieve our respective goals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Section F: Evaluation of Relationship with the Customer

The questions in this section relate to how ----- views benefits from this relationship

28. How much do you agree or disagree that .....

	Strongly Agree 1	2	3	4	5	6	Strongly Disagree 7
-----'s overall commitment toward this customer is very high	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This customer's overall commitment towards ----- is very high	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
It has taken a lot of time and effort to make this relationship an effective one	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

29. How much do you agree or disagree with the following outcomes for -----  
 --- from this relationship?

	Strongly Agree 1	2	3	4	5	6	Strongly Disagree 7
Our expectations concerning this relationship have been met	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is a fair distribution of costs and benefits in this relationship	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Economic benefits from this relationship are very positive	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
We benefit from this relationship through increased business with other clients	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### 30. Personal Profile

No. of years with -----

Experience(in yrs) in selling/ account management

Thank you for your help. I really appreciate it.

## Appendix K Reliability of Scales

**Table K-1: Reliability of Scales**

Scale Name	Coefficient Alpha	Adjusted Item to Total Correlation
<b>Operational Linkages</b>	0.90	
Our business planning activities are linked with this customer		0.79
This customer's systems are essential to our operations		0.80
Some of our operations are closely linked ( examples: production processes, logistics )		0.83
<b>Information Exchange</b>	0.89	
Proprietary information will be shared with each other		0.77
We will both share relevant cost information		0.78
We will include each other in product development meetings		0.84
We will share supply and demand forecasts		0.67
<b>Relational Norm</b>	0.89	
Problems are joint responsibilities		0.55
Both sides are concerned about the others profitability		0.72
One party will not take advantage of a strong bargaining position		0.68
We do not mind owing each other favours		0.79
We must work together to be successful		0.70
Both sides are willing to make changes		0.76
Suspend contract for the duration of problems		0.67
<b>Vendor Adaptation</b> (To meet this customer's needs ----- has )	0.92	
Changed product features		0.78
Changed personnel		0.77

Scale Name	Coefficient Alpha	Adjusted Item to Total Correlation
Changed distribution		0.81
Made capital investments		0.79
Changed production schedules		0.74
Changed financial conditions		0.68
<b>Customer Adaptation</b> (To meet -----'s requirements this customer has)	0.92	
Changed their product		0.75
Changed personnel to deal with supplier		0.72
Changed logistics		0.82
Changed their procurement process		0.81
Made capital investments		0.83
Changed financial terms		0.71
<b>Supply Complexity</b> (Compared to other purchases by the customer -----'s products have--)	0.83	
Complex requirements for storage, handling, or use in production		0.69
Complicated logistics, documentation or other import processes		0.64
High technical profile		0.65
Product functions or benefits that are difficult to understand		0.65
<b>Supply Importance</b> ( Compared to other purchases by the customer -----'s products are---)	0.95	
Very important towards meeting their strategic growth objectives		0.90
Essential to meet their customers' needs		0.83
Top priority in procurement decisions		0.89
Significant value of purchase		0.87
<b>Market dynamism</b>	0.88	

Scale Name	Coefficient Alpha	Adjusted Item to Total Correlation
(In the market where this customer is located there is wide variation in -----)		
Product features and specifications offered by different vendors		0.79
Vendor support services		0.76
Technology used by supplier		0.79
Product availability (for the main categories purchased by customer)		0.60
<b>Commitment</b>	0.84	
-----'s overall commitment toward this customer is very high		0.69
This customer's overall commitment towards ----- is very high		0.70
It has taken a lot of time and effort to make this relationship an effective one		0.57
Our expectations concerning this relationship have been met		0.60
There is a fair distribution of costs and benefits in this relationship		0.57
Economic benefits from this relationship are very positive		0.64
We benefit from this relationship through increased business with other clients		0.40
<b>Communication Quality</b>	0.92	
Your communication is timely		0.69
Your communication is accurate		0.70
Your communication is complete		0.57
Communications between the firm and this customer are timely		0.60
Communications between the firm and this customer are accurate		0.57
Communications between the firm and this customer are complete		0.64
<b>Conflict</b>	0.86	
We argue frequently with this customer about business issues		0.77



Scale Name	Coefficient Alpha	Adjusted Item to Total Correlation
Our arguments with this customer are very heated		0.80
We disagree with this customer about how we can best achieve our respective goals		0.64
<b>Competition</b> (This market is competitive for-----)	0.80	
Product group1		0.62
Product group2		0.69
Product group3		0.60
Product group4		0.49
Product group5		0.53
<b>Price Volatility</b> (In the market where this customer is located, there were large fluctuations in average price level for-----)	0.94	
Product group1		0.89
Product group2		0.89
Product group3		0.90
Product group4		0.79
Product group5		0.71
<b>Ease of Vendor change</b> (The customer can change to other vendors with minimal change in processes for -----)	0.92	
Product group1		0.90
Product group2		0.78
Product group3		0.88
Product group4		0.84
Product group5		0.58

## Appendix L Mean Values and T-Test of Differences

**Table L-1: Mean Values and T-Test of Differences**

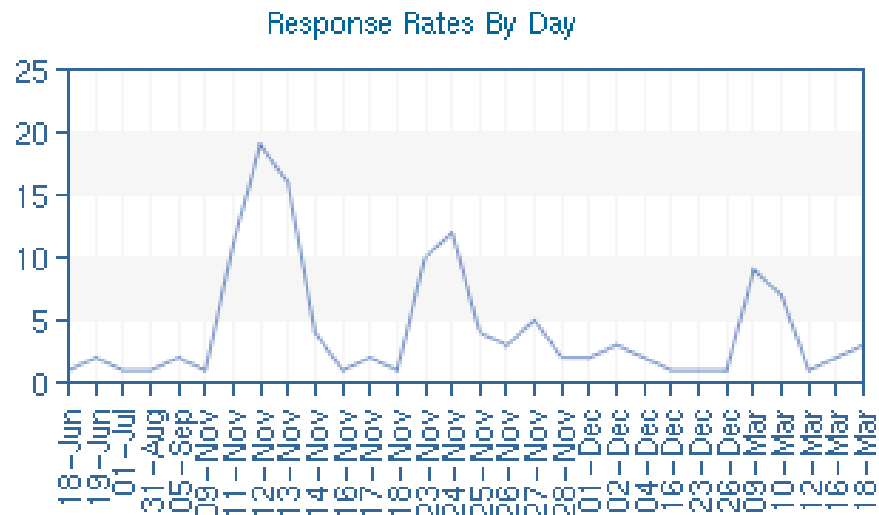
Item	Mean	Std. deviation	t - test Test value= 4	Significance (2 tailed)
Our business planning activities are linked with this customer	3.93	1.66	-0.49	0.62
This customer's systems are essential to our operations	3.37	1.59	-4.50	0.00
Some of our operations are closely linked (examples: production processes, logistics)	3.58	1.65	-2.88	0.01
Proprietary information will be shared with each other	4.38	1.80	2.38	0.02
We will both share relevant cost information	4.41	1.67	2.81	0.01
We will include each other in product development meetings	3.98	1.76	-0.15	0.88
We will share supply and demand forecasts	3.11	1.82	-5.57	0.00
Problems are joint responsibilities	3.41	1.45	-4.61	0.00
Both sides are concerned about the others profitability	3.75	1.45	-1.96	0.05
One party will not take advantage of a strong bargaining position	3.64	1.42	-2.86	0.01
We do not mind owing each other favours	3.40	1.37	-5.04	0.00
We must work together to be successful	2.67	1.46	-10.43	0.00
Both sides are willing to make changes	2.89	1.28	-9.88	0.00
Suspend contract for the duration of problems	3.48	1.50	-3.93	0.00
Changed product features	4.37	1.77	2.35	0.02
Changed personnel	4.71	1.62	5.02	0.00
Changed distribution	4.49	1.65	3.37	0.00
Made capital investments	4.90	1.67	6.14	0.00
Changed production schedules	4.52	1.76	3.34	0.00
Changed financial conditions	4.33	1.79	2.07	0.04
Changed their product	4.47	1.74	3.09	0.00
Changed personnel to deal with supplier	4.88	1.53	6.57	0.00
Changed logistics	4.35	1.60	2.51	0.01
Changed their procurement process	4.35	1.64	2.42	0.02
Made capital investments	4.77	1.59	5.54	0.00
Changed financial terms	4.03	1.62	0.22	0.82
Competition-Product group1	2.67	1.83	-7.13	0.00
Competition-Product group2	3.01	1.74	-5.10	0.00

Item	Mean	Std. deviation	t - test Test value= 4	Significance (2 tailed)
Competition-Product group3	2.95	1.71	-5.58	0.00
Competition-Product group4	3.12	1.82	-3.96	0.00
Competition-Product group5	3.85	1.93	-0.68	0.50
Ease of shift to other vendors for Product group1	3.16	1.95	-4.21	0.00
Ease of shift to other vendors for Product group2	3.60	1.90	-1.91	0.06
Ease of shift to other vendors for Product group3	3.53	1.88	-2.25	0.03
Ease of shift to other vendors for Product group4	3.52	1.87	-2.05	0.04
Ease of shift to other vendors for Product group5	4.30	1.90	1.33	0.19
Price fluctuation for Product group1	2.15	1.71	-10.71	0.00
Price fluctuation for Product group2	2.41	1.79	-7.93	0.00
Price fluctuation for Product group3	2.31	1.78	-8.63	0.00
Price fluctuation for Product group4	2.39	1.64	-7.98	0.00
Price fluctuation for Product group5	3.03	2.02	-3.97	0.00
Product features and specifications offered by different vendors	3.49	1.59	-3.53	0.00
Vendor support services	3.42	1.50	-4.26	0.00
Technology used by supplier	3.74	1.49	-1.96	0.05
Product availability (for the main categories purchased by customer)	3.24	1.64	-5.13	0.00
Very important towards meeting their strategic growth objectives	3.10	1.59	-6.34	0.00
Essential to meet their customers' needs	3.10	1.57	-6.42	0.00
Top priority in procurement decisions	3.28	1.65	-4.88	0.00
Significant value of purchase	3.30	1.70	-4.62	0.00
Complex requirements for storage, handling, or use in production	4.34	1.59	2.36	0.02
Complicated logistics, documentation or other import processes	4.00	1.72	0.00	1.00
High technical profile	3.94	1.63	-0.44	0.66
Product functions or benefits that are difficult to understand	4.66	1.43	5.16	0.00
Your communication is timely	2.16	0.84	-25.02	0.00
Your communication is accurate	2.03	0.79	-28.52	0.00
Your communication is complete	2.20	0.91	-22.66	0.00
Communications between the firm and this customer are timely	2.40	0.96	-18.92	0.00

Item	Mean	Std. deviation	<i>t</i> - test Test value= 4	Significance (2 tailed)
Communications between the firm and this customer are accurate	2.35	0.97	-19.26	0.00
Communications between the firm and this customer are complete	2.51	1.05	-16.27	0.00
We argue frequently with this customer about business issues	4.68	1.74	4.45	0.00
Our arguments with this customer are very heated	5.32	1.47	10.27	0.00
We disagree with this customer about how we can best achieve our respective goals	5.08	1.39	8.86	0.00
-----'s overall commitment toward this customer is very high	3.23	1.55	-5.65	0.00
This customer's overall commitment towards ----- is very high	3.16	1.37	-7.02	0.00
It has taken a lot of time and effort to make this relationship an effective one	2.83	1.27	-10.54	0.00
Our expectations concerning this relationship have been met	3.14	1.25	-7.86	0.00
There is a fair distribution of costs and benefits in this relationship	3.06	1.05	-10.24	0.00
Economic benefits from this relationship are very positive	3.07	1.28	-8.29	0.00
We benefit from this relationship through increased business with other clients	3.83	1.54	-1.28	0.20

## Appendix M Survey Response Rates

**Table M-1: Survey Response Rates**



Note: The responses shown prior to 9<sup>th</sup> November represent the trial phase when the author and others could log in and test various changes as they were incorporated

## Appendix N      Communication Frequency

**Table N-1: Frequency of Sales Representatives' Face-to-Face Communication**

Frequency of face to face communication you have with	Once a day or more %	1- 4 to times a week %	1- 3 times a month %	4 – 10 times a year %	2 – 5 times a year %	Once a year or less %
Customer's purchase personnel	0.8	6.3	24.6	37.3	18.3	12.7
Customer's logistics personnel	1.6	3.2	7.9	20.6	33.3	32.5
Customer's R & D and other functions	0.8	0.0	7.1	23.0	32.5	36.5
Customers' senior management	0.8	1.6	8.7	27.8	31.7	29.4

**Table N-2: Frequency of Sales Representatives' Telephone Communication**

Frequency of telephone communication you have with	Once a day or more %	1- 4 to times a week %	1- 3 times a month %	4 – 10 times a year %	2 – 5 times a year %	Once a year or less %
Customers' purchase	11.9	38.1	28.6	10.3	7.1	4.0
Customers' logistics	4.0	18.3	15.1	20.6	11.1	31.0
Customers R & D and other functions	0.0	7.1	19.0	16.7	24.6	32.5
Customers' senior management	0.8	12.7	19.8	18.3	20.6	27.8

**Table N-3: Frequency of Non-Verbal Communication**

<b>Frequency of written communication you have via</b>	<b>Once a day or more %</b>	<b>1- 4 to times a week %</b>	<b>1- 3 times a month %</b>	<b>4 – 10 times a year %</b>	<b>2 – 5 times a year %</b>	<b>Once a year or less %</b>
Electronic mail	17.5	32.5	30.2	12.7	4.0	3.2
Fax	0.0	0.9	16.0	16.0	20.8	46.2
Regular mail	0.0	5.8	14.6	7.8	12.6	59.2

**Table N-4: Frequency of Face-to-Face Communication by Other Personnel**

<b>Frequency of face to face communication between other personnel in The firm with</b>	<b>Once a day or more %</b>	<b>1- 4 to times a week %</b>	<b>1- 3 times a month %</b>	<b>4 – 10 times a year %</b>	<b>2 – 5 times a year %</b>	<b>Once a year or less %</b>
Customer's purchase personnel	1.6	3.2	7.1	23.0	22.2	42.9
Customer's logistics personnel	0.8	4.0	4.0	11.1	19.8	60.3
Customer's R & D and other functions	0.8	1.6	5.6	14.3	26.2	51.6
Customers' senior management	0.8	3.2	3.2	11.1	31.0	50.8

**Table N-5: Frequency of Telephone Communication by Other Personnel**

<b>Frequency of telephone communication between other personnel in The firm with</b>	<b>Once a day or more %</b>	<b>1- 4 to times a week %</b>	<b>1- 3 times a month %</b>	<b>4 – 10 times a year %</b>	<b>2 – 5 times a year %</b>	<b>Once a year or less %</b>
Customer's purchase personnel	6.3	12.7	20.6	15.1	19.0	26.2
Customer's logistics personnel	8.7	12.7	10.3	12.7	11.9	43.7
Customer's R & D and other functions	1.6	4.0	10.3	7.9	23.0	53.2
Customers' senior management	0.8	5.6	6.3	9.5	26.2	51.6



## Appendix O      Skew and Kurtosis Tests

**Table O-1: Skew and Kurtosis Tests**

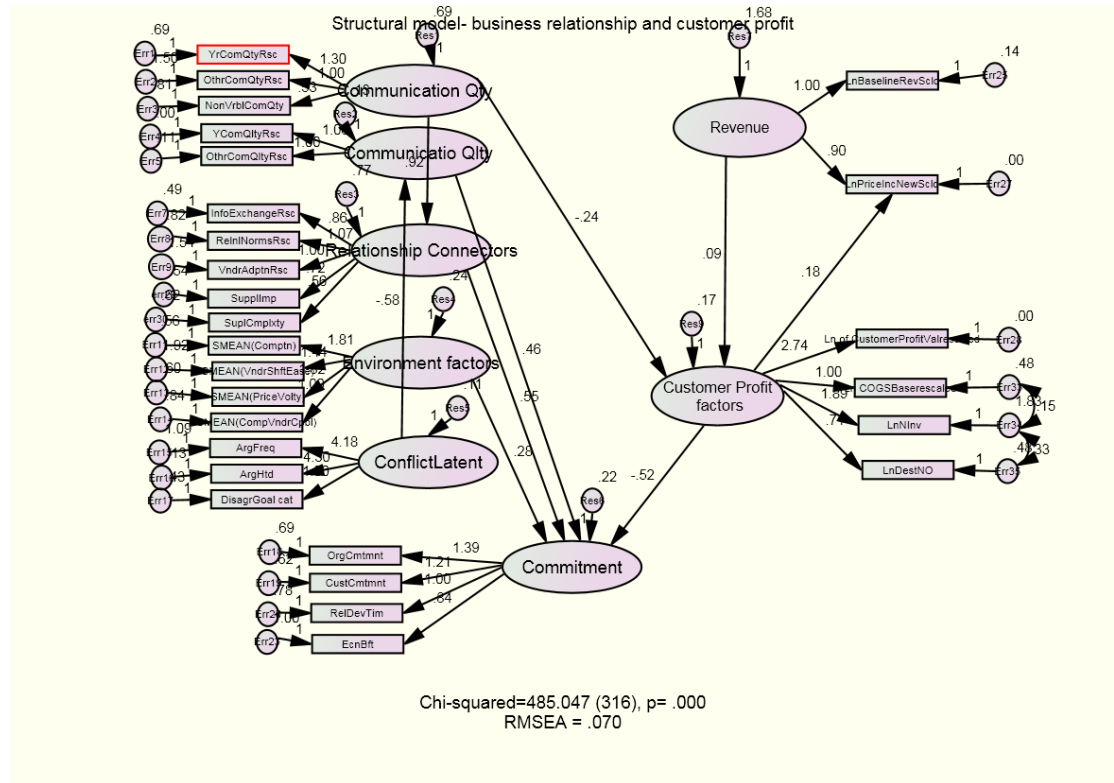
Variable	Skew	Kurtosis	Z skew	Z kurtosis
PrcVarPrdGrp1	1.86	2.82	8.54	6.45
PrcVarPrdGrp2	1.51	1.57	6.90	3.60
PrcVarPrdGrp3	1.43	1.39	6.53	3.19
PrcVarPrdGrp4	1.32	1.53	6.03	3.51
CmptnPrdGrp1	1.22	0.73	5.59	1.67
RelExpctn	1.04	1.38	4.78	3.17
YrCTimely	0.95	2.43	4.34	5.57
YrCCmplt	0.90	0.90	4.14	2.06
YrCAcrt	0.90	1.37	4.11	3.15
RelDevTim	0.85	0.80	3.91	1.83
PrcVarPrdGrp5	0.85	-0.27	3.90	-0.62
JtWrkng	0.82	0.20	3.75	0.45
EseChngPrdGrp1	0.81	-0.45	3.73	-1.03
CmptnPrdGrp3	0.81	0.00	3.71	0.00
VrPrdAvl	0.81	0.05	3.70	0.11
CmptnPrdGrp2	0.78	0.12	3.58	0.28
SImpGth	0.75	-0.10	3.45	-0.24
EcnBft	0.74	0.96	3.38	2.19
VrPrdFtrs	0.72	-0.20	3.28	-0.46
VrVndrSprt	0.70	-0.08	3.22	-0.18
CustCmtmnt	0.68	0.31	3.10	0.70
FrcstLnk	0.67	-0.64	3.07	-1.45
OrgCAcrt	0.65	0.36	3.00	0.82
OrgCmtmnt	0.65	-0.18	2.97	-0.41
SImpCustNds	0.64	-0.35	2.91	-0.80
OrgCCmplt	0.63	0.00	2.87	0.00
NonOpportnst	0.62	-0.27	2.82	-0.61

Variable	Skew	Kurtosis	Z skew	Z kurtosis
CmptnPrdGrp4	0.61	-0.35	2.79	-0.80
DstbnCstBft	0.61	1.11	2.79	2.53
CntrtSusp	0.61	-0.37	2.77	-0.85
SImpTotPur	0.59	-0.57	2.71	-1.31
HlpResPrb	0.56	-0.07	2.57	-0.16
CoppChngs	0.56	-0.06	2.56	-0.13
PrblmJntRsp	0.53	-0.40	2.43	-0.92
OrgCTimely	0.53	0.07	2.42	0.17
EseChngPrdGrp3	0.47	-0.74	2.14	-1.69
EseChngPrdGrp2	0.46	-0.69	2.09	-1.59
SImpProcPr	0.45	-0.72	2.07	-1.64
VrVndrTch	0.44	-0.15	1.99	-0.34
OthClntDev	0.37	-0.41	1.70	-0.93
Inclusion in Product Development	0.37	-1.01	1.68	-2.32
CmptnPrdGrp5	0.36	-0.92	1.65	-2.11
CChgFin	0.34	-0.84	1.56	-1.92
PrftConcern	0.33	-0.55	1.50	-1.26
EseChngPrdGrp4	0.32	-0.69	1.45	-1.57
CChgLgstcs	0.21	-1.04	0.97	-2.38
EseChngPrdGrp5	0.17	-1.16	0.79	-2.66
CChgProcmnt	0.10	-1.03	0.46	-2.35
Cost Information sharing	0.10	-1.12	0.45	-2.55
CmplxTchPrfl	0.07	-0.74	0.32	-1.69
Systems links	0.06	-1.07	0.27	-2.45
CmplxMktAccs	0.04	-1.02	0.17	-2.33
CmplxStrgReq	0.03	-0.97	0.14	-2.22
IP sharing	0.01	-1.22	0.05	-2.80
VChgFin	0.01	-1.13	0.03	-2.59
VChgPrdn	-0.08	-1.30	-0.36	-2.98
VChngProd	-0.10	-0.98	-0.47	-2.25

Variable	Skew	Kurtosis	Z skew	Z kurtosis
CplxPrBnft	-0.11	-0.61	-0.50	-1.39
Operations link	-0.12	-1.10	-0.56	-2.52
Planning links	-0.14	-0.97	-0.64	-2.22
VChgDtrb	-0.15	-0.90	-0.68	-2.06
CChgPrd	-0.16	-0.93	-0.72	-2.14
CChgPer	-0.20	-0.88	-0.93	-2.02
VChngPer	-0.22	-0.85	-1.00	-1.95
DisagGoal	-0.25	-0.94	-1.13	-2.15
ArgFreq	-0.27	-1.07	-1.25	-2.44
CChgInv	-0.31	-0.71	-1.40	-1.63
VCapInv	-0.59	-0.53	-2.71	-1.21
ArgHtd	-0.65	-0.37	-2.98	-0.85
PrcVarPrdGrp1	1.86	2.82	8.54	6.45

## Appendix P Complete Structural Model with Parameter Estimates

Figure P-1: Complete Structural Model



## Appendix Q Structural Path Estimates for equivalent models

**Table Q-1 - Estimates with Selected Structural Paths Reversed**

Structural paths	Original model		Commitment to Relationship connectors		Commitment to Communication quality		Customer profit factors to commitment	
	Estimate	<i>p</i>	Estimate	<i>p</i>	Estimate	<i>p</i>	Estimate	<i>p</i>
Relationship Connectors <--- Communication Qty	0.92	***	0.50	.003	0.93	***	0.95	***
Customer Profit_ factors <--- Revenue	0.09	.007	0.09	0.009	0.09	0.007	0.09	.007
Communication Qty <--- ConflictLatent	-0.58	***	-0.58	***	-0.58	***	-0.58	***
Customer Profit_ factors <--- Communication Qty	-0.24	.002	-0.23	.006	-0.24	.002	-0.12	.11
Commitment <--- Communication Qty	0.46	.005	0.48	.021	<b>0.11</b>	<b>.008</b>	0.42	.014
Commitment <--- Relationship Connectors	0.55	***	<b>0.81</b>	***	0.57	***	0.59	***
Commitment <--- Environment factors	0.28	.080	0.53	.017	0.35	.04	0.32	.007
Commitment <--- Customer Profit_ factors	-0.52	.001	-0.80	***	-0.51	0.003	<b>-0.17</b>	<b>.009</b>
<b>Fit Indices</b>								
Standardized RMR	0.11		0.12		0.11		0.12	
Chi-square =	485		499		485		490	
Degrees of freedom	316		316		316		316	
RMSEA	0.07		0.07		0.07		0.07	
PClose	0.01		0.00		0.01		0.00	
CFI	0.89		0.88		0.89		0.88	
ECVI	5.64		5.77		5.64		569	
AIC	609		623		609		614	

Note: Estimates of reversed pathways are shown in bold type.