Developing and Testing a Two-dimensional Concept of Commitment

EXPLAINING THE RELATIONSHIP PERCEPTIONS OF AN INDIVIDUAL IN A MARKETING DYAD

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Academic Dissertation
With the permission of the University of Helsinki Faculty Agriculture and Forestry will be presented for public defence in auditorium XII of the University main building Aleksanterinkatu 5, on Friday 17th January 2003 at 12 o’clock.
To Pia, Toni and Ossi; Those who bared.
Abstract

During the last ten years, one important line of discussion in the discipline of relationship marketing has centred on the concepts of commitment and trust as reflective of relationship perceptions. As the key reflective feature of business interaction is the dualism between calculative monetary considerations and the social elements of relationships, the path to understanding relational behaviour is to combine the business-rational elements with the psychological elements in decision making.

Given recent theoretical developments in both relationship marketing and social psychology, a model was constructed based on the principles outlined. Among the theoretical elements are Morgan & Hunt’s (1994) Key Mediating Variables Model, Geysken et al.’s (1999) ideas on economic and non-economic satisfaction, Rusbult’s investment model (1981, 1993), Thibaut and Kelley’s (1959) ideas on social exchange, the concept of two-dimensional commitment (Lydon & Al, 1997) and Meyer and Allen’s (1990) views on three-dimensional commitment. Building an axiomatic basis of the phenomenon and combining this with theoretical models of commitment produced a theory of how an individual views his or her socio-economic (instrumental) relationships.

Structural-equations modelling was used to solve the empirical problem. In the estimations the model was first trimmed with a sample of Finnish forest owners (n=130). It was then tested on another sample (n=130), in which it was also contrasted to a rival model. The result supported the original model in all the tests, and thus provides consistent support for the developed theoretical ideas.

The results suggest that the emotional “layering” of relationship perceptions happens only when the psychological rewards outrun the psychological costs. It is from this “out running” that emotional commitment arises. This dimension of commitment affects the calculative (or transactional) elements so that the relationship is transformed from pure transaction to relational (long-term) orientation.

From a managerial point of view, two important contributions are made. First, as the model presents the process of how relationships transform from the transactional to the relational, it also shows the manager when relational tools are needed to tackle problems that exist in marketing. Second, the results indicate that, in some instances, a management-myopic orientation could be harmful to close business relationships. Thus, the latter finding is important for those with an accentuated need to operate on a close interpersonal level (e.g. key-customer management, key business relationships, relationships with key institutional investors.)
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The language was checked (apart from this section) by Joan Nordlund of University of Helsinki language services. Naturally, however, I am personally responsible for any of the mistakes existing in the thesis.

Last but not least I am in debt to my opponent Fellow Keith Blois of Oxford University Templeton College. It goes without saying that the most visible and important occasion in the 7-year history of this thesis is the actual defence. Here the acceptance of the opponent puts me into the demanding position of rising to the high standards represented by Fellow Blois.

Espoo 15th December 2002
PART A

DEVELOPING A THEORETICAL MODEL OF

RELATIONSHIP PERCEPTIONS
1. Introduction
1.1. Changes in Business Modes

A lot of present-day disciplinary discourse argues that increasing competition is countered by forming alliances and networks\(^1\). Spekman (1996) notes that a change from hierarchical forms of organisations to partnership-enhancing\(^2\) networks happened in the mid-80’s. The networks or alliances compete, but the individual companies involved in a certain network do not. Cannon and Perrault (1999, p. 439) comment on the new thinking by stating that:

Nowhere has such

\[\text{(...) rethinking of how to improve the efficiency and effectiveness of both marketing and procurement efforts) new thinking been more evident than in the arena of relationships in business-to-business markets. Innovative managers world-wide are experimenting with a myriad of approaches to make their relationships with their business suppliers and customers more productive and enduring.}\]

It is worth noting that Cannon and Perrault (1999) mention both business suppliers and customers. Thus the integration efforts are directed at both the higher and the lower levels of the marketing-channel hierarchy. According to Morgan and Hunt, this integration holds true not only for suppliers and customers, but also for other stakeholders (1994, p. 21). Thus, it seems that partnerships are no longer defined via the classical marketing-channel terms of the producer-intermediary-buyer relationship, but are rather seen as a general “pie-expansion effort” (Jap, 1999, p. 461) in which all members of the network benefit from increasingly close relationships. Thus, a transition from the transactional to the relational is becoming a reality, as anticipated 13 years ago in the classic article by Dwyer, Shurr and Oh (1987)\(^3\). All in all, it is becoming increasingly important to be a successful partner in a business relationship. What is at the core of success in this relationship creation and maintenance?


\(^{2}\) In Relationship Marketing possibly the most influential sources that refer to a similar shift from “transactional to relational” orientation are Dwyer, Shurr & Oh (1987) and Andersson & Narus (1991).

\(^{3}\) This theme is also prevalent in Sheth & Parvatiyar, 1994.
1.2. The Close Connection Between Relationships and Networks

All the incentives for relationship formation inherently link relational phenomena with network formation. This is why some authors have postulated that relational phenomena are at the centre of the network phenomenon [e.g. Grönroos, 1999]. Louis Stern (1996) comments on this nicely:

“...cooperation is critical to strong, functional competition. Some major elements leading to dyadic cooperation are (a) the creative use of positively valenced influence strategies, (b) commitment on the part of channel members, and (c) an atmosphere of trust. These are the means for building effective relationships. The end results are high performance dyads that will form the core of the networks in which they are located.”

Thus, it seems that in the future, relationships and their quality will strongly affect the success of organisations, especially those dependent on networks of different sorts. The question is how to succeed in relationship creation, which seems to be becoming equally important for all organisations. Is it the trustworthiness of any organisation that leads to the creation of commitedness to mutual goals⁴ among its partners, or is it something else?

1.3. The Perceptual Reality of an Individual

According to the cognitive-scientific idea of social schemata, we judge the same social situations differently because schematal “spectacles” vary. Individual reality –whatever the setting - is thus the reality of perceptual imagery. Figure 1.1.⁵ shows the idea of perceptions as the “visible” link between one’s psyche and the objective reality.

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⁴ Various references suggest the same, although reference to the superfluity of research findings on the relationship between trust and commitment is given in Geyskens, Steenkamp and Kumar (1999).

⁵ Compare this to Kurt Lewin’s life space (1935). Psychological representations or perceptions have been separated from the original model to give an accentuated emphasis to the flow of images. Perceptions of interpersonal business interactions are “classified” using a simple structural model. Atomism (B. Russel, 1929) thus frames the phenomena under investigation, and no study on the signal-response relationship of impulses or on the deep underlying psychological processes has been conducted;
Figure 1.1. Perceptions as the visible process of relational adaptation

As the figure shows, the impulses a person receives from both internal and external sources enter the perceptual process. The resulting “flow of images” reflects the lightning-speed process of combining the impressions from the two sources. As the speed of the process is high, and everything happens on a symbolic level, the interpretation of the flow of images is hard (like viewing a film frame-by-frame). We should, however, imagine how the above figure would fit into normal casual situations: the situational reality is shared by those present, but the perceptual images are unique for each person. You are now reading a dissertation about relational interaction. At present, you might not be totally convinced that perceptions are at the core of relationship formation – or further – of the marketing of products. Other readers might be wondering what all this has to do with business interaction. Further, there may be readers who have a sincere wish to understand what is being presented here, but who are so troubled by other things in their lives that the message does not get through. Therefore, when we enter into social situations, we are likely to be trapped by our own psychological realities. Further, even when the symbols of communication are as clear as the written word, the interpretation (of the actual message) is still far from being straightforward.

only the structural nature of perceptions has been considered.

6 See the axiomatic basis section of Chapter 3.
Thus, while the perceptual realities are probably very different between the actors\(^7\) (at each instant), the same also goes for the interpretation of any social situation. While the images are unique to an individual, they are also impossible to communicate perfectly to another person. All this presents us with two new questions. First, how do approximate symbols\(^8\) of social communication result in social systems that are able to function effectively? Second, how can we explain the perceptual reality of an individual in a relationship – a marketing relationship?

1.4. Satisfaction, Commitment and Trust - the Concepts Reflecting Perceptions of Ongoing Relational Exchanges

Within discourses on human relationships we often use the terms trust or commitment to describe some sort of deeper attachment to the relational object. Satisfaction is also used as a concept to represent how we evaluate our relational engagements. In service-quality research, the concepts of trust and commitment have been found to be highly relevant to relationship return evaluations (Rust, Zahornik, Kenning, 1995), while in the discipline of social psychology, there is research on the close connection of satisfaction with the concept of commitment (e.g. Rusbult 1980). Further, in relationship marketing, trust is seen as central to successful relationships (Dwyer, Shur and Oh, 1987; Morgan and hunt, 1994; Gabarino and Johnson, 1999). Thus it seems that within the sphere of these three concepts lies the key to understanding the evaluations we make about our relational exchanges.

While satisfaction, commitment and trust are considered to reflect the perceptual evaluations of a relationship, there is not much agreement on the nature of these concepts (e.g. Geyskens, Steenkamp and Kumar, 1999). Trust is seen to develop out of transference from trust-in-information to trust-in-persons - “instrumental affiliation becomes emotional attachment” (Fine and Holyfield, 1995, p. 26) - whereas commitment is thought to be composed of affective, instrumental and cognitive elements (Gundlach Acrol and Mentzer, 1995). Thus, it seems that there are mixed and problematic ideas concerning these three concepts, and one key element in this model-building exercise is

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\(^7\) For examples of this happening in the context of the marketing channel see Rosenbloom, 1985, p. 125. Ford (19xx) also uses the concept of psychic distance developed by Gordon Allport (1989).

\(^8\) Used in line with the symbolic interactionist meaning – i.e. referring to all significant symbols of interaction and not just the intended explicit expressions of those involved.
making an attempt to organise ideas about the evaluation of a business relationship by those involved.

1.5. The Need for this Study and its Relation to Future Models of Socio-economic Exchange

It seems that the conceptual sphere of relationship perceptions needs to be clarified. Further, as it seems that perceptual phenomena are at the core of future competition, this is an important theoretical task. With reference to Stern’s (1996) comment, several models of both relationship marketing and social psychology present the perceptual gauges of relationships (e.g. commitment, trust, and satisfaction) as parts of the explanatory models of human relationships, be they intimate or business relationships. Within relationship marketing, even a special commitment-trust theory was proposed by Morgan and Hunt (1994) as being explanatory of the logic of (business) relationship perceptions. Further, as business relationships are a sub-phenomenon of all interpersonal relationships (Becker, 1960), the models of both social psychology and relationship marketing should communicate - or be “nested” - in the language of SEM (Structural Equations Modelling).

Thus, as already argued, the sphere of perceptions is not properly addressed in marketing theory. The problems arise from several features of the theoretical work. First, while commitment and trust are seen as important mediating concepts, their definitions are so varied that the key concepts are often interchangeable within a lot of scholarly work. Apart from the semantic confusion, this results in theoretical problems. Second, models of relationship perceptions do not correspond with social-psychological models with a similar paradigmatic background. This is problematic since it is unlikely that we have different mental tools for tackling relational settings in a business context and in casual settings. While the depth of involvement is likely to vary, the mental tools themselves are not. Third, it seems that the models developed in marketing are sometimes “management myopic” in that they attempt to answer the question of how relationships should be managed. This narrow view leaves out a lot of the understanding that could be derived from a study of such relationships with a more “positivistic”9 approach.

9 A general notion referring to the philosophical orientations that argue for the non-normative and non-relativistic approach to theory building (e.g. scientific realism, logical empirism, critical realism).
Thus, the aim of this dissertation is to answer the following questions: *How do individuals organise the perceptual images of the key personal (business) exchanges, and what kind of model of socio-economic exchange will we arrive at if we take the social dimensions of this exchange into account?* It seems that modern marketing theory has the elements needed to build up a comprehensive and systematic view of the subject, even though this has not yet been done. At present the lack of connection with social-psychological thinking has left the discipline vulnerable to chaotic definitions of the key concepts. The next chapter explicates the task of this research and elaborates on the questions that arose in this chapter as research questions. It also presents the structure of the thesis. Altogether, these elements constitute the key information-creating outcome of the study.
2. The Research Purpose and Structure of the Thesis

2.1 Purpose

The purpose of this study is to create new scientific knowledge about how *individuals* construct their socio-economic bargaining positions within a dyadic setting. Of interest are the dyadic settings in which both social and economic considerations enter the mental processes of those involved. In practice, this means engagements in which we voluntarily restrict our behavioural repertoire for the sake of achieving some higher goals in life. Thus, dyadic settings are *instrumental* in that the relationship exists only because it is a tool for both people involved to achieve something “more general” in life. Further, such relationships could be seen as both calculative (due to the instrumental elements) and social (due to the personal involvement). As these types of dyads are the basis of future marketing and network co-operation, it is of great importance to understand their functioning logic.

The core aim of this study is to increase knowledge of relationship-marketing phenomena by investigating the social-exchange dimensions of economic exchange. Exchange settings are examined on the individual level, but measured via a dyadic signal in non-contrived situations. In practice, the setting is such that the respondents are asked to reflect on their relationship with a business “associate”. The reactions are measured using a structured-interview format. The concepts introduced in the theoretical chapters exist as latent constructs behind each measurement scale.

The dyadic setting and the individual perceptual reality thus frame the behavioural dimensions of economic exchange. While economic exchange is closely linked to social exchange, it is, in fact, subject to the psychological processes of the individuals entering into it. The purpose of this study is to reveal the logic of the perceptions (behind this exchange), and it is thus at the core of marketing research. Simultaneously, it is a view based on the respondents’ subjective experiences of a relationship.

As the study measures only the perceivers’ side of the dyad, and the perceptions they have of the exchange, the description concentrates on explaining the logic behind an
individual’s socio-economic “computations”. By revealing this logic and the inter-relationships of the concepts involved, the work offers a contribution to the disciplinary research by clarifying the core foundations of dyadic-relationship perceptions in socio-economic settings.

Research on the mental organisation of the organisational-culture-determined repertoire of shared symbols has concentrated on the dyadic perceptions of an individual. The logic and organisation of these symbols reflect how the interpretation is arrived at. While there are numerous models of and approaches to how the signals are organised, the morphological form of this organisation is still not properly known in a business setting. In this context, recent work in both relationship marketing and social psychology warrants enthusiasm because of similar conceptual developments. As both disciplines consider commitment, enthusiasm, personal calculations, beliefs, attitudes and trust to be the basis of relational perceptions, and as the model structures are very similar, the view of how we organise our relationship perceptions should also be similar. However, at present, there is still a lot of confusion in the two explanatory models that exist in the two background models. Thus, an obvious task in this research is to tackle this problem of non-communication from a relationship-marketing perspective. The issues addressed in the theoretical parts of the study are listed bellow. The practical objectives are mentioned as outcomes of the theoretical work and model testing, and the final one is to provide a basis for further research.

A. Mapping the Conceptual Basis – Basic Concepts

1. What are the key concepts of relationship perceptions?
2. How could the concepts be grouped to acquire a theoretically sound “layering”?

B. Building a Structure – the Model

3. What different structural possibilities could be established between the concepts?

C. Practical and Managerial Implications

4. Providing tools for gauging the dyadic-relationship perceptions (perceptual imagery) of the members of external and internal company networks.
5. Providing an operational instrument for evaluating the committedness of the members of a network, and further, the critical factors affecting the level of commitment (or lack of it).

D. Basis for Further Research

6. Developing a solid basis for further research on relationship perceptions.

The above statements and questions describe the knowledge-creation task undertaken in this research. All the theoretical aims are closely tied to the phenomenon called commitment. Given that such a key mediating concept exists, what are the factors contributing to the level of commitment? Further, is commitment one-, two- or three-dimensional? What are its outcomes? These theoretical objectives produce results of practical value, although, as such, the practical outcomes are by-products of the theoretical work.

The search for validity requires the thorough testing of the measurement devices utilised in this work. Thus, the tools resulting from the theoretical exercise should also be applicable to other similar situations involving measuring the perceptions of the other, and the information generated should be useful in organisational settings that rely heavily on relational interaction. For instance, organisations that find it meaningful to increase the depth and efficiency of their customer-satisfaction-probing systems could benefit from the knowledge created. Further, those that are in the process of developing instruments for measuring different levels of intra- and inter-organisational relationships are provided with readily-available measurement devices. As the core of the research is in questions related to relational interaction, the results provide in-depth tools for those interested in enhancing the “quality” of such interaction. As mentioned above, all these issues are essential aspects of modern network operations.
2.2 Structure

This study investigates human perceptions of socio-economic-exchange relationships (as existing in dyadic settings), and the application area is industrial marketing (closely related to network thinking). Thus, it offers a behavioural perspective on the factors affecting business-relational exchange. By combining models from both relationship marketing and social psychology, I aim to build a model of socio-economic exchange, which in turn reflects the concept of commitment. The network-competition derived need to understand what goes on in business relationships leads to the need to combine the two approaches. The new ideas developed within these disciplines express commitment as a key reflective feature of the disposition of those involved in continued co-operative relationships. Commitment is critical, as it may be seen as the mediating concept of both relationship quality and the propensity to exit a relationship. It is thus at the core of the long-run success of all types of organisational structures in terms of reduced risks\textsuperscript{10} and enhanced\textsuperscript{11} organisational learning\textsuperscript{12} via the provision of a long-term operational horizon and the requisite will of those involved to co-operate.

Therefore, by clarifying the psychological basis of dyadic commitment, we should be able to clarify the concept of commitment in business relationships. At the same time, by providing a link between models of social psychology and relationship marketing, we establish a link in the other direction. Thus this approach also provides some insight into general interpersonal relationships. Figure 2 below presents the research strategy chosen.

\textsuperscript{10} Related to the danger of disproportional commitment (see, for instance, Gundlach, Achrol and Metzger, (1995))
\textsuperscript{11} Vital for developing and streamlining any kind of social structure for efficiency.
\textsuperscript{12} On organisational learning see, for instance, Iacobucci (1996), Schein (1987), Slater and Narver (1995).
According to Hunt (1991), philosophers of science agree that the methodology of science is “its logic of argumentation” (p.21). Thus, in order to explore the logic of long-term relational exchanges, a research strategy (Figure 2.1. above) consisting of five phases was designed. The figure describes a process in which the deductive logic of the theoretical elements (Chapters 3 and 4) is combined (Chapter 5) with the as-good-as-possible indicators of the empirical world. Therefore, the technical analysis (Chapter 6) should produce a statistical structure that is similar to the theoretical structure developed earlier, although the degree of this “similarity” is subject to how reliable and valid the operationalised measures are in capturing the essence of the phenomenon. As the work has, as its basis, highly-developed models (and their measures), the natural way to approach the analysis was to use rigid statistical tools – namely SEM (Structural Equations Modelling). Thus the end result of the exercise is a hybrid model combining confirmatory factor analysis with a regression model of the latent underlying variables. Figure 2.2. below follows Sekarans’ (2000) idea of the structure of a research report. It
features at the beginning of every chapter in order to give the reader an idea of how the research tasks are being fulfilled step by step.

The thesis proceeds as follows; The introductory chapter gives a basic view of the key concepts. This continues via a more rigid, or calculus-type\textsuperscript{13}, of approach in Chapter 3. Chapter 4 draws the previous models together and presents the ideas that arise in a structural form and as a hypothesis. Chapter 5 describes the measurement-development procedures. The results are given and discussed in Chapter 6, and the conclusions and answers to the research questions are presented in Chapter 7.

\textsuperscript{13} Which is needed in order to build a fully formalized theoretical system - i.e. a theory (Hunt 1991).
3. Theoretical Background

3.1. Overview

This chapter builds up a theoretical basis of commitment by combining the core views of relationship marketing and social psychology. The key definitions and the relationships of the concepts themselves are then discussed. The model arising from the argumentation is then presented in Chapter 4. Figure 3.1. below shows how Chapter 3 is linked to the general logic of the thesis. The research problems are framed within theoretical problems that can be put to the test (chapter 6) via the empirical research setting (Chapter 5).

Figure 3.1. How Chapter 3 fits into the research setting
The rationale can be understood if we move from the last block (C) to the first one (A). The concepts and structures presented in both relationship-marketing and social-psychological literature comprise the necessary material of this model-building exercise (block C). However, in order to fully understand the genesis of these conceptual models, we need to understand the basis on which the ideas arose (block B). This is necessary in order to provide an understanding of the overlap, and also to have a view on the differences between the different disciplinary views of exchange. Further, in order to understand the scope of these ideas, we need to define the basic premises of the phenomenon itself (as an axiomatic basis – block A). The axiomatic view entails building a simplified representation of the forces, processes and system in which relational action happens. Therefore, Chapter 3 advances from the basic foundations towards building a theoretical presentation of the setting in which relationships happen. It is only after this grounding that the core phenomenon of commitment and related conceptual ideas can be presented.
3.2. The Axiomatic Basis of Relational Phenomena

3.2.1. Communication, Negotiation and the Social System

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Figure 3.3. The Axiomatic basis in the context of Chapter 3

Figure 3.3. shows how the axiomatic basis forms the starting point for constructing the theoretical models of relationship perceptions. The concept of commitment could be a starting point for organising ideas about relationship perceptions, but as such it has problems associated with it that will become clear in the following sections.

If we assume that individuals enter socio-economic\textsuperscript{14} relationships in order to reach some higher personal goal\textsuperscript{15}, we might argue that the socio-economic relationships are \textit{both voluntary and of instrumental value} to those involved. “Voluntary” means that there are certain limits on the kind of relationships into which we enter (for instance, limits on coercion). Further, the instrumental nature is dependent on the actor’s believing (perceiving) that the current involvement is something that enables him or her to “push” towards some higher personal goals.

\textsuperscript{14} I.e. Economic relationships that also have a social (exchange) content.
\textsuperscript{15} For instance, the employer – employee relationship – the employer gets the input of the employee, but the employee gets monetary (and often professional) rewards that provide the possibility to enjoy a normal life in modern society. Thus, the relationship is an instrument in achieving general satisfaction in life.
If the relationships entered into by an individual are voluntary and instrumental in nature, what does this mean for the setting in which they arise? Three levels of variables can be seen to affect the social-interaction situations between organisational members. These are the communication process between the individuals (ie. all gestures and symbols that are included in the sending and receiving of symbols), the negotiation that results from this communication, and the system that results from the negotiation (Stryker and Statham, 1985). The communication could be described as symbolic communication; significant symbols are those that have a direct meaning for the general task of the individual. Negotiation refers to the process of aligning one’s personal goals with those of the other members of the social system. The significant others are the counterparts of the previously-mentioned negotiation, and especially those that have a direct effect on how the individual is able to pursue his or her own goals. Figure 3.4. presents the individual perceptual reality in a relational setting.

The intrinsic and extrinsic forces of the individual and of his or her surroundings are reflected as a continuous flow of perceptual images. According to Sigmund Freud, an individual may be conscious, pre-conscious or unconscious (1991) of the content of

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16 I.e. the social-exchange process.
these images, but as such, the content is still visible in the affective reactions and in the cognitive processes (Lewin, 1935). Our perceptions are symbolic representations of our psychological experiences; external stimuli are processed by the psychological processors and re-represented in the symbolic language of perceptions. As such, the interpretation process related to all communication situations is inherently interwoven with the symbolic language of our psychological processes. What comprises the above is a subjective-experience world in which perceptions\textsuperscript{17} guide our behaviour. We thus have a setting in which communication between individuals is seen as symbolic communication - or interaction (Mead, 1934). However, as the general communication process is inherently symbolic in nature, so is the perceptual space of an individual\textsuperscript{18}.

If communication and negotiation are symbolic in nature, what, then, is the system like? Social systems, by definition, are composed of social actors who have a “hierarchical” relationship with each other. A system is defined by the different “positions” existing in it and by the functional relationship existing between these positions. We thus have a group of social actors who have a certain (social) spatial location and are connected by some (social) vector-like forces. The social positions in this system could be called roles, and the vector-like forces role expectations\textsuperscript{19} (Stryker and Statham, 1985). Figure 3.5. shows the idea.

\[\text{As the resultant of the forces affecting our mental processes.}\]
\[\text{On this and the structure of the self, see, for instance, Burke and Reitzes (1981, p. 84.)}\]
\[\text{“The conceptual bridge between social structure and role behaviour is the concept of role expectations (Sarbin and Allen, 1975, p. 497). It is worth noting that: “…even though certain dimensions of interpersonal relations may be culturally invariant, the social meaning of a particular role relationship may vary from culture to culture” (Wish, Deutsch, Kaplan, 1976, p. 419).}\]
Figure 3.5. A Social system – The arrows represent relationships, the ellipsoids role positions. The figure is a simplified representation of the setting, as in a truly relational setting every member of the system is involved with all the other members.

The inter and intra-individual communication processes are composed of the entire spectrum of factors entering the signalling of the social agents. The general model of communication, in which messages are sent through a medium and received by an individual, applies. However, as the social symbols consist of a lot of communication material that is non-wordy, non-intentional and subject to heavy perceptual biases, a symbolic-interactionist perspective seems to apply. The critical point is to understand how members of these social networks interpret the symbols – i.e. perceive the symbolic communication – and what effect all this has on the core phenomenon.

On the role level, therefore, an individual’s perception of another’s social position defines the type of role position he or she adopts, while on the level of communication and perceptions, everything is subjective by nature - even the whole definition of the
communication situation. As the perceptual images represent the adaptive and negotiation processes that define the social position of the individual in the surrounding social system, the processes of negotiation (or exchange as the process is labelled in the remaining part of the thesis) is thus the key to understanding the multiple exchanges ongoing in the group of people comprising the social system. The following axiom-like statements describe the core assumptions of the relational settings in which the phenomenon of interest occurs.

1. The relationships are socio-economic (instrumental) by nature.
2. The relationships are voluntary in that if the instrumental value is removed the individual exits the relationship.
3. Communication is symbolic and the significant symbols include all those (symbols) that may be interpreted as having a meaning to the (personal) task motivating the engagement.
4. Negotiation is the process of combining both external and internal symbols to acquire a position in a system that may be seen to fulfil the motivating task of the individual.
5. Significant others are the counterparts in the negotiation who can influence the end result (or how well an individual is able to pursue his or her personal goals) of the negotiation.
6. Significant symbols are the symbols of the negotiation that are interpreted as having an effect on the end-result (or how well an individual is able to pursue his or her personal goals) of the negotiation.
7. Perceptions are the images (or the flow of images) that reflect an individual’s subjective experiences.
8. Relationship perceptions can be gauged by reflecting on the flow of images arising in a reaction to a (deliberately) introduced signal of a relational counterpart.
9. Reflecting on the flow of images produces information on how well the individual sees him-/herself as being able to fulfil his/her own “higher goals” through this instrumental engagement.

As such, this “negotiation” could also be closely related to the concept of organisational learning (e.g. Argyris, 1977; Senge, 1990; Slater and Narver, 1995; Sinkula, 1994) through the adaptive and socialisation mechanism inherent in it.
10. The relationship outcome is directly dependent on *how well* the individual sees him-/herself being as able to fulfil his/her own “higher goals” via this instrumental engagement.

This concludes the discussion of the axiomatic basis on which the phenomenon of socio-economic exchange is built. The next section delves into views on how we organise our perceptions of “the other” – i.e. the elements of the previously-mentioned process of negotiation. The intention is to build up a view of how an individual perceives a partner in a marketing relationship. This is therefore also a highly individualistic view of how a person (in a dyadic setting) organises the key conceptual evaluation affecting the relational engagement. The discussion starts from the key concept of commitment and proceeds to models of social and marketing exchange.

### 3.2.1 Can the Concept of Commitment Explain Relational Exchanges?

#### 3.2.1.1. The Concept of Commitment

What ties people into relationships? How strong are the relationships? What constitutes the basis of long-term orientation in a relationship, and what are the outcomes of close interpersonal engagement? The concept of commitment in business exchanges generally refers to the phenomenon that one party to social interaction voluntarily restricts his or her behavioural alternatives because of some *long-term orientation*. Committed partners are willing to *invest* in valuable assets specific to an exchange (Anderson and Weitz, 1992; Gundlach, Achrol and Mentzer, 1995). Commitment is essential for successful long-term relationships (Gundlach, Achrol and Mentzer, 1995). Commitment is also seen to be of critical importance in network operations (Anderson, Håkansson, Johanson, 1994, p.7). Further, and as with the concept of trust, commitment has also been found to exist on significantly different “levels” among firms with a relational orientation and those with a transactional orientation (e.g. Gabarino, Johnson, 1999, p. 81). Given that commitment implies a willingness to make short-term sacrifices to realise long-term benefits (Dwyer, Shurr, and Oh 1987), it could be considered central to successful relational exchanges (Morgan and Hunt, 1994).
Commitment has been the focus of inquiry in Social Psychology. Following on from Kelley and Thibaut’s (1978) ideas of interdependence, and Rusbult’s (1980, 1983) views on relationship commitment, recent work has come to argue that “commitment reliably promotes pro-relationship motivation and behaviour” (Wieselquist, Rusbult, Foster and Agnew, 1999). It is associated with “a) disparagement of alternatives… b) willingness to sacrifice… c) accommodative behaviour” (Agnew, Rusbult, van Lange and Langston, 1998), and the partner in a “committed couple can be described as a person a) who has a strong personal intention to continue the relationship b) feels attached… c) feels… obligated… d) imagines… long-term future…, e) places primacy in… relationship… f) has overcome challenges… g) has poor alternatives…, h) has many tangible and intangible resources that would be lost if the relationship were to end… and… i) confronts difficulties in ending (or strong social pressure to continue) a relationship” (Arriaga and Agnew, 2001). Commitment is also seen as a determinant of the higher-order concept of relationship quality (Fletcher, Simpson and Thomas, 2000). Thus it is fair to argue that it is a key explanatory feature of interpersonal relational experiences. These experiences happen on the subjective level (i.e. perceptions; Lewin, 1935), and their structural nature is implied in Rusbult’s (1983, p. 102) reference to “the tendency to maintain a relationship and to feel psychologically attached to it”. This structural view is further backed by Lydon, Pierce and O’Regan (1997, p. 105), who developed a two-dimensional model in which “the positive attitude or satisfaction dimension of commitment” is labelled Enthusiastic Commitment and the “feeling one ought to continue a relationship” Moral Commitment. A new addition to this discussion is the three-dimensional view put forward by Arriaga and Agnew (2001). They talk of the affective, cognitive and conative components of commitment that refer to concepts of “psychological attachment, long-term orientation of an individual and the intention to persist in a relationship” (p. 1190). Thus it seems that relationships can be explained by using the concept of commitment. Further, as business relationships are a sub-phenomenon of all interpersonal relationships (Becker, 1960), the explanations should be expandable to marketing relationships. However, as the following will show, the concept of relational interaction is far from clear in relationship marketing and social psychology.

21 On transactional vs, relational, see, for instance Dwyer, Shurr, Oh, 1987
22 Compare this with Meyer and Allen’s (1991) model of commitment – a similar three-
3.2.1.2. Problems in Explaining Relational Behaviour

The journal articles approaching interpersonal behaviour from the perspective of commitment (and the related concepts of trust, satisfaction, rewards, passion, love, cooperation, relationship stability, relationship quality) are motivated by comments such as: “…its (commitment) conceptual scope and components in channel relationships remain equivocal” (Kim and Frazier, 1998), “…researchers are going to be faced with the problem of dealing with very complex, overlapping, amorphous, and often ambiguous constructs” (Gundlach, Acrol and Mentzer (1995) speaking of commitment), “…there has been little attempt to elaborate if and how satisfaction differs conceptually and empirically from trust and commitment” (Geyskens, Steenkamp nad Kumar, 1999), “…no studies have examined how evaluations might vary for customers with strong or weak relational bonds” (Gabarino and Johnson (1999) speaking of the structure of relationship evaluations, trust and commitment), “deciding which specific measure to use when assessing relationship quality can be a nightmare…” (Fletcher, Simpson and Thomas, 2000), “despite extensive research on the central role of commitment…there is mixed agreement on precisely what constitutes commitment” (Arriaga and Agnew, 2001). Thus one could argue that, even though the conceptual sphere of relational engagements has been thoroughly mapped, the different aspects of these engagements have a multitude of concepts explaining a multitude of layers of individual experience in a relationship, and the general theoretical view is far from being unified. Thus, the core theoretical task presented in this thesis is to build up a combined (based on the perspectives of relationship marketing and social psychology) picture of the theoretical nature of commitment (in a business dyad). This is done by constructing a conceptual analytical basis (calculus23) of the phenomenon. The following starts from the classic models of relationship perceptions and continues to build up a comprehensive picture of the key concepts (definitions) and their relationships (transformation rules).

3.3. The Dualism of Exchange

23 As a formal structure consisting of the elements, definition and transformation rules of a theoretical
3.3.1. Social Exchange

Ideas on social exchange were developed at the end of the 50’s by a number of researchers (mainly Thibaut and Kelley, 1959; Blau 1964; and Homans, 1961). These researchers based their argumentation on the view that satisfaction in interpersonal relationships could been seen as an outcome of an exchange process. Thibaut and Kelley’s (1959) view of social exchange was based on the idea that an individual divides all the possible outcomes of dyadic social exchange into two rough categories labelled rewards and costs. Rewards refer to the pleasure, satisfaction and gratification the person enjoys (Thibaut and Kelley 1959), while costs consist of any factors that operate to “inhibit or deter the performance of a sequence of behaviour” (ibid.). What the authors further suggest (critical to social exchange) are two standards against which the outcomes of the interaction are gauged. The first is a personal standard, or a standard of the attractiveness of the relationship, which is labelled the Comparison Level (CL). The second is a standard by which the person decides whether to remain or to leave the relationship, and is labelled the Comparison Level for Alternatives (CL_{alt}).

“CL is the standard by which the person evaluates the rewards and costs of a given relationship in terms of what he feels he deserves”. (Thibaut and Kelley 1959). “CL_{alt} can be defined informally as the lowest level of outcomes a member will accept in light of available alternative opportunities“ (Ibid.)

Figure 3.6. Proceeding to the core phenomena of exchange.

Figure 3.7. presents the core ideas of social-exchange theorists.
What the social-exchange view of interpersonal relationships posits is that we perceive our relational satisfaction as a balance between sacrifices (costs) and benefits (rewards). This balance is further affected by two standards that relate the relationship in question to our other personal relational threshold (CL), and present alternatives (CL_{ALT}). One could argue that the personal relational threshold is a standard loaded with individual past experience, what one has come to expect from a relationship. These comparative mental tools frame the perceptions of the two basic dimensions – i.e. costs and rewards.

What Figure 3.7. shows is how our relationship-satisfaction perceptions are formed. The four exogenous and perceptual dimensions (rewards, costs, CL and CL_{ALT}) – be they conscious, pre-conscious or unconscious - define the level of satisfaction. In a dyad, one member might or might not perceive the relationship in the same way as the other. However, in order for us to be satisfied, the combination of the four antecedents of satisfaction should result in a positive evaluation. Thus, the rewards have to be higher than the costs, and the evaluation what of one deserves (CL) has to be positive. Further, the evaluation of one’s alternatives has to be low enough not to bring the level of satisfaction down to “dis-satisfaction”. The factors influencing the level of satisfaction vary, but both parties of the dyad still have to consider themselves as being on the
positive side\textsuperscript{24} in order for the relationship to last in the long run\textsuperscript{25}. How, then, does this social-exchange view relate to existing views in marketing?

3.3.2. The Social and Economic Dimensions of Marketing Dyads – Marketing as Exchange

Bagozzi authored a series of articles (1974, 1975a and b, 1984, among others) in the mid-seventies arguing for the centrality of exchange in marketing. He gives Alderson (1965) and Kotler (1972) as references in arguing for the position of exchange as “the” basis of marketing (Bagozzi, 1974). He further defines the exchange system:

“...as a set of social actors, their relationship to each other, and the endogenous and exogenous variables affecting the behaviour of the social actors in those relationships.” (ibid.).

The idea is thus very close to the previously-presented axiomatic, symbolic-interactionist and role-theoretical view of exchange. As such, the exchange basis of marketing consists of social actors, their (interpersonal) relationships and the forces affecting their behaviour. Specifically, the theory states that, in order to satisfy their needs, people engage in exchange relationships (and thus this notion is close to the economic view of exchange). Further, according to Bagozzi (1975), these exchange situations may be classified in three groups in relation to the number of people entering them (and thus also the complexity of the reciprocal exchanges). By complex exchange, Bagozzi (ibid.) refers to a situation in which there are at least three persons, each one being engaged in at least one direct exchange relationship, and in which the system is linked with a network of relationships.

\textsuperscript{24} The possibility of disproportional satisfaction is thus real. Further, it leaves the more satisfied partner vulnerable to relational exploitation. Gundlach, Achrol and Mentzer (1995) also refer to the possibility of disproportionate commitment as a source of exploitation. Here, the two standards are critical. Perceptions of one’s alternatives are a measure of the relational choices - and thus a measure of the “voluntariness” - of a relationship. Moreover, the perception of what one deserves is a concept loaded with the person’s relational past. In other words, a person with a lower comparison level is likely to be exploited by a person with a higher comparison level. These factors explain why social-exchange theory has been used in studying abusive relationships. The core result is that perceptual rationality may lead to situations in which gross disparity exists between the outcome values of the dyadic partners, although the relationship is still relatively stable. Due to the organisational nature of industrial-marketing relationships, this type of abusive or addictive relationship should be rare in normal business exchanges. However, one such case is reported in Berghäll (1997).

\textsuperscript{25} The notion of long-run operational horizons is central in various definitions of commitment (e.g. Rusbult, 1980; Meyer and Allen, 1991; Ariaga and Agnew, 2001)
When we speak about marketing as exchange, the critical thing to understand is the duality of the exchange concept itself – in other word the social and economic elements of exchange. Organisations are composed of a number of individuals whose relationships are based on social exchanges. These social exchanges are interwoven in such a way that the whole group of people is engaged in the higher goal of producing “monetary” revenue for the organisation as a whole. Depending on the success of the social system, the revenue flow provides each with a share that advances his or her personal goals. Thus, we engage ourselves in organisations (which are based on social exchange) to acquire (monetary) assets. As these monetary assets are only mediums of exchange, the core of social exchange is thus the process of transferring the intangible assets that each individual (of the organisation) holds into a (social) production system capable of satisfying individual goals. Combining notions of social, economic and marketing exchanges leads us to the following definition: *social exchange is the ongoing negotiation process that (by definition) produces the organisation. As the social organisation is born, a system that is capable of transforming intangible individual capabilities into items with a market value is formed.* Thus, the individual pursuit of personal goals results in collective gain. However, as the system is based on social exchange, the nature of this exchange defines the value and nature of the gain. The outcome value is dependent on the perceptual processes of the intra- and inter-individual negotiations.

From the individual point of view, every member of the system has a direct relationship with at least one other member, but exists simultaneously as a member within the network (the web of “indirect” relationships). What the indirectness thus implicitly posits is that we even have relationships with those with whom we are not engaged in a relationship. *This is the essence of organisational membership - a quasi-relationship.* We have a relationship with the organisation in which we exist as members even though we have never met the “organisation”. Bagozzi exemplifies a quasi-relationship thus:

“... an exchange can occur between a person and a television program”

*Bagozzi, 1975.*

A viewer is involved in a programme that she/he enjoys (receives reward), and gives a reciprocal reward to the programme by investing time (cost = the bygone-opportunity cost of doing something “useful”). We engage ourselves in such exchange situations
continually and without noticing throughout our everyday lives. All these exchanges consist of an exchange of rewards and the relative cost incurred by the “transaction”. The exchange may take place between two individuals - for instance between a salesman and a client - or between a person and a quasi-person (for instance a salesman on television). However, the relationship seems to be the prerequisite of the monetary exchange - as in the Bagozzi example that resulted in the viewer buying a ten-dollar book. What, then, is the nature of this prerequisite exchange, and how could we tap relational exchanges? What leads to the birth of higher-order quasi-relationships? Is commitment a multidimensional construct reflective of the general evaluation of a relationship behind the (quasi-) relationship?
3.4. Explaining Socio-Economic Exchanges

3.4.1. Holistic Evaluations of a Relationship

It was argued in section 3.A that commitment and the concepts related to it describe how well a relationship serves the purposes of those involved. However, as indicated in section 3.A.2 the dimensions of commitment are not clearly defined. Adding further fuel to the fire of vagueness, Fletcher, Simpson and Thomas (2000, p.341) refer to views that “… commitment, trust, satisfaction and love do not exist as separate psychological constructs. Instead they are all isomorphic indicator variables that underlie global evaluations of the partner and relationship”. Thus, there seems to be a view that commitment is a holistic evaluation of how well an exchange has succeeded between the partners of a dyad. However, as Fletcher, Simpson and Thomas (2000) go on to argue, the concepts mentioned could also be seen as separate concepts. Thus, ideas on commitment seem to range from viewing an evaluation of a relationship as consisting of a multitude of distinctly separate (but not yet properly defined) concepts to viewing all evaluative material as representing a single holistic evaluation.

In order to answer the questions posed at the end of the previous section, the concept of commitment needs to be defined in a clearer theoretical context. Thus, the core theoretical problem addressed in this research could be reformulated as follows: Is it possible that the theoretical problems related to the concept of commitment stem from too high an aggregation level? If the dimensions of commitment are already a second-order construct (e.g. Morgan and Hunt, 1994; Rusbult, 1979, 1980; Arriaga and Agnew, 2001), then commitment itself is a third-order construct. However, as commitment results in still higher-order constructs, we are faced with the impossible task of explaining relationship perceptions. Would it thus not be possible to view things...
differently - in a more simple fashion? While Chapter 4 delves into this specific issue, the following prepares the ground for this coming discussion.

3.4.2. The Concept of Commitment, its Antecedents and Outcomes

3.4.2.1. The Structural Nature of Commitment

According to Rusbult (1983), commitment has two dimensions, the behavioural-intent and the psychological-attachment dimensions of relationship evaluations. Further, Lydon, Pierce and O’Regan (1996) argue that commitment could be composed of a moral (obligation) and an enthusiasm dimension. Simultaneously, from the relationship-marketing perspective, Morgan and Hunt (1994) present a two-dimensional model of variables mediating the success of relational exchanges. Thus, while the original models of commitment show it as one-dimensional (Rusbult, 1979, 1980; Bui, Peplau and Hill, 1996), it is discussed as being two-dimensional. Further, the Meyer and Allen (1990) three-dimensional view has penetrated the disciplinary discussions in both relationship marketing (e.g. Gundlach, Achrol and Mentzer, 1995) and social psychology (e.g. Ariaga and Agnew, 2001; Agnew, Rusbult, van Lange and Langston, 1998). However, given the problems associated with the concept itself (section 3.A.2), and the issues mentioned in section 3.D, it could be concluded that commitment is a holistic evaluation of a relationship that is either one-, two-, or three-dimensional in nature. These dimensions include the affective, cognitive and conative dimensions of relational evaluations (Meyer and Allen, 1990; Arriaga and Agnew, 2001; Gundlach, Achrol and Mentzer, 1995), affect and behavioural intent (Rusbult,1983), the moral and enthusiastic dimensions of Lydon, Pierce and O’Regan (1996), and even the relationship evaluations that Morgan and Hunt (1994) define as commitment and trust. The following two sections delve more deeply into the nature of relationship evaluations in terms of social psychology and relationship marketing, represented in two prominent models from each of the disciplines.

26 It is admitted that these two models are limited in their representations of the disciplinary thinking behind them. However, as both are highly formalised presentations of the theory, they thus also provide the possibility for the ideas to be empirically tested. Therefore, purely formal (analytic) reasons motivate this choice. The selected models could also be said to represent classic views of how relationships are modeled in each discipline, and to contain something that could be labeled disciplinary “truth” – at least in a logical empiricist sense.
3.4.2.2. Two Models of Commitment

3.4.2.2.1. The Social Psychological View of Commitment as Expressed by the Investment Model

The investment model proposed by Rusbult (1980) is heavily based on Kelley and Thibaut’s (1978) ideas on interdependence. This approach assumes that individuals optimise, that is, maximise rewards while minimising costs. Satisfaction with and attraction to a relationship is a function of the gap between the outcome value of the engagement and expectations concerning the quality of relationships in general. Kelley and Thibaut’s (1959) idea of the theory of exchange is thus represented in the form that outcome value \( O_x \) is defined as:

\[
O_x = \Sigma W_i A_i
\]

where \( A_i \) represents an individual’s subjective estimate of the value of attribute I available in relationship X. \( W_i \) represents its subjective importance and is thus a weight. Attribute values may be positive or negative – in other words rewards or costs. They may be material or psychological, and exist only on the level of perceptions or also objectively. Rusbult mentions as examples intelligence, physical appearance, complementary needs, sense of humour, sexual satisfaction and attitudinal similarity.

The comparison level is defined as “the standard against which the attractiveness of a relationship is evaluated. It represents the average outcome value that the individual has come to expect.” As such, the comparison level is a construct consisting of the past experiences of an individual in similar situations.

Satisfaction is thus:

\[
SAT_x = O_x - CL
\]

It increases with an increase in perceived outcome value, or decreases with a decrease in general expectations. As satisfaction is seen to be associated with attraction, this equation represents the positivity of affect. As such, it is a “summated” measure of the

---

27 The concepts of relationship investments and satisfaction are also frequently used in relationship-marketing models (see, for instance, Smith and Barclay, 1997, p. 5)
emotional evaluation of the relationship. However, as we know from the original theory of social exchange (Thibaut and Kelley, 1959), this is not the only standard used to gauge relationships. The $CL_{ALT}$ is another standard and takes into account the effect that alternatives to the current relationship have on its outcome. Thus the (expected) satisfaction provided by the alternative ($A_y$) is similar to that in the previous equation:

$$A_y = O_y - CL$$

Thus, the stay/leave decision should be a simple deduction related to the previous two formulas. If the alternative is expected to provide a greater level of satisfaction, the decision should be to exit the current relationship. However, Rusbult proposes that the concept of commitment mediates this equation, and further that there is the concept of relationship investments that moderates the whole picture. She argues that there are two kinds of relationship investments, extrinsic and intrinsic. Extrinsic investments refer to the factors that are related to the external “frames of the relationship”. Thus, if you move into a similar location with your partner, you are likely to feel more tied to the relationship because of the external ties that it imposes. Intrinsic investments refer to the internal factors, such as those of emotion and time, that tie a member to the relationship. In this sense, relationship investments are the sacrifices one feels one has made to the relationship, and as such are a stabilising element of interpersonal involvement. The concept effectively counters the stay/leave decision arrived at by pure subjective estimates of satisfaction of the current relationship vs. its alternative. Commitment is thus the moderator of stay/leave decisions, and is affected by both the perceived relationship quality and relational investments. Rusbult presents commitment ($COM_x$) in the following equation:

$$COM_x = O_x + I_x - O_y$$  
(I_x = Investments to Relationship x)

What the original work of Rusbult thus does is to present the perceptual basis of our relationships via the social-exchange theory of Thibaut and Kelley (1959) and Kelley and Thibaut (1978), and it also brings in the concepts of commitment and relationship investments as stabilising elements of relational engagements. Satisfaction or attraction is one key variable behind commitment, and perceived bygone sacrifice is another. The third factor is relationship alternatives. Thus, while satisfaction is the sum of the emotional spheres of interaction, the concept of relationship alternatives is a conscious element of relational perceptions. Rusbult (1983) defines commitment as the tendency to
maintain\textsuperscript{28} a relationship and to feel psychologically “attached” to it. It is represented as having two dimensions, behavioural intent and psychological attachment. Rusbult argues that these two types of commitment should co-vary.

What is peculiar to Rusbult’s view of social interactions is that higher investments mean higher commitment. This is in contrast with neo-classical economic models of exchange in which all opportunity costs are included and all “sunk costs” are discounted (Call and Holahan, 1983, p. 149). Here, the relationship investments exist on the level of the dyad and are something that cannot be easily transformed into investments related to another relationship (Rusbult 1983). It is thus clear that what Rusbult argues is that a person commits him- or herself to a relationship more readily if he or she has sacrificed resources to it. The commitment-investment relationship is presented here as somewhat “self-fulfilling”.

Of the last equation Rusbult says: “Stay/leave behaviours (ST/LV) are said to be directly mediated by the individual’s psychological/Cognitive commitment to maintain his or her relationship”. Figure 3.9. below presents the social-psychological view of the social-exchange “paradigm” according to Bui, Peplau and Hill’s (1996) formulation. It is one of the most recent formulations of the Rusbult investment model.

\textsuperscript{28} Intention to persist? Long-term orientation? Compare this with Arriaga and Agnew’s (2001) dimensions of commitment.
As can be seen, the model contains the elements mentioned by Thibaut and Kelley (1959), in other words those of cost, rewards, comparison level and CL_{ALT} (quality of alternatives), and the concepts introduced by Rusbult (1983): relationship investments, commitment and stay/leave decisions. The dependencies are presented in a way that closely follows the ideas in social-exchange theory. However, what is somewhat surprising is that, even though Kelley and Thibaut (1978) acknowledge a two-dimensional commitment construct, and Rusbult refers to it in her work, this two-dimensionality is not present in the schematic presentation of the theory. What is crucial here is that the division of affective and cognitive layering in the model is vague. However, it is clear from the above discussion that satisfaction has an effect on the emotional elements of commitment, and quality of alternatives on the cognitive elements. Further, the concept of relationship investment has the elements of extrinsic and intrinsic investment, and one would suspect that these two elements would load on the cognitive and emotional elements respectively. However, again the figure does not show this. What is also noteworthy is the outcome side of the model. It seems that, given that the original aim of building the investment model was to explain relationship stability (Rusbult, 1980), all the other apparent outcomes of different levels of commitment seem
to have been forgotten. One might ask whether the stay/leave decision is the only outcome of varying levels of commitment.

Bui, Peplau and Hill (1996) tested the stability of the investment model over a 15-year time span, and it was found to predict changes in close personal engagements: “Perhaps most important, the theory successfully predicted long-term relationship stability” (Bui, Peplau and Hill, 1996). If commitment in close personal engagements is an outcome of satisfaction, relationship investments and alternatives, how does the two-dimensional nature of commitment itself fit into the picture? While this question will be answered in Chapter 4, the next section delves into the relationship-marketing picture of relationship perceptions as expressed in Morgan and Hunt’s model (1994).

3.4.2.2.2. The Relationship-marketing View of Relational Bonding as Expressed in the KMV Model

In referring to the reason for the emergence of a relational orientation in marketing, known as relationship marketing, Morgan and Hunt (1994) point to changes in the global economy. Today, companies - even large ones - are embedded in networks of co-operating companies. This paradoxical nature of today’s competition means that “to be an effective competitor requires one to be a trusted co-operator” (Morgan and Hunt, 1994). Some of the multitude of industrial-economic processes, such as JIT and TQM, are given as examples of efforts to increase the efficiency of these networks. However, they also require a more long-term orientation towards co-operation - hence relationship orientation. The trust and the commitment of the companies involved are presented as the key to successful operations. Even though the authors consider that companies should base their outward-bound interactions on relationship orientation, they go even further and suggest that the company’s internal relationships also exist in the domain of the focal chain of relationships. A company, its different departments, its interaction with its competitors and with the government, with goods and service suppliers, and further, with customers, are all presented as based on relationships. What the authors recognise is that “in strategic alliances between competitors, partnerships between firms, and in government in public-purpose partnerships, and internal marketing, there are neither
These changes in the competition situation led Morgan and Hunt (1994) to propose a “Key Mediating Variables model” for the description and explanation of relational interaction. The key mediating variables of the model are commitment and trust. The concept of commitment is defined as “...an exchange partner believing that an ongoing relationship with another is so important as to warrant maximum efforts at maintaining it; that is, the committed party believes the relationship is worth working on to ensure that it endures indefinitely”. Trust, in turn, is defined as “one party having confidence in an exchange partner’s reliability and integrity”. This definition is said to resemble Morman, Deshpande and Zaltmann’s (1993) definition of trust as “...a willingness to rely on...”. Rotter’s (1967) classic definition as “a generalised expectancy ... that the other’s word can be relied on” is reminiscent of these conceptualisations.

Morgan and Hunt’s (1994) KMV model draws on recent relationship-marketing discourse to create a theory of relational interaction. Five antecedents, relationship-termination cost, relationship benefits, shared values\(^{30}\), communication\(^{31}\) and opportunistic behaviour, prescribe how the two mediating variables settle, resulting in five outcomes capable of explaining the key success dimensions of business-relational behaviour. The higher the relationship-termination costs, the relationship benefits or the shared values of the involvement the higher is the commitment. Commitment is also affected by the level of trust, which in turn is affected by shared values, communication and opportunistic behaviour. Figure 3.10. presents the Key Mediating Variables model (including the core idea of the Commitment-trust theory):

\(^{29}\) They therefore propose the following definition of relationship marketing: “Relationship Marketing refers to all marketing activities directed toward establishing, developing, and maintaining successful relational exchanges” (Morgan and Hunt, 1994).

\(^{30}\) Here the perceived shared values could also be labelled perceived ethical difference between “me” and the “other” – or perceived psychic distance. Shelby Hunt has done some pioneering work in this area: see, for instance, Hunt and Vasquez-Parraga (1993).

\(^{31}\) Here, the concept of communication must refer to its perceived sufficiency. In that sense it is reminiscent of what Moorman (1995, p 320) labels information transmission processes. This links the relational model to the ideas developed in organisational-learning literature (e.g. Sinkula, 1994; Slater and Narver, 1995). Individuals exist in an organisation and interpret the signals received and sent. The interpretation gives meaning to the roles adopted, and thus affects the way an organisation functions – organisational memory (Hedberg, 1981, in Moorman 1995)
As commitment increases, the outcome is a greater level of acquiescence, a lower propensity to leave and increased co-operation. While the increase in co-operation is also a result of an increase in trust, this increase also increases the perceptions that possible existing conflicts are seen as being constructive and thus functional for the relationship. Higher levels of trust also result in less uncertainty. Thus the model consists of a two-layer mediating structure in which the holistic evaluations of trust and commitment affect the outcomes of the relationship. Are these mediating concepts similar to those presented earlier? Is what Morgan and Hunt (1994) label trust really the affective or enthusiasm dimension of the social-psychological models? Trust, being a precursor of commitment, is contrary to the process models in social psychology (e.g. Wieselquist, Rusbult, Foster, Agnew, 1999).

The concept of commitment has two distinct features;

a) “an exchange partner believing...”, i.e. a belief component.

b) “...that it (relationship) endures indefinitely”, i.e. a perceptual time dimension.
Verbal statements concerning belief and time are typical cognitive reactions (Hovland and Rosenberg, 1960). Both the belief and time components of the commitment definition seem to point towards a cognitive component of relational interaction. This part of the mediating structure could be what has been presented earlier as calculative commitment.

The concept of trust is seen as being composed of three dimensions:

a) “...one party has confidence in an exchange partner’s reliability and integrity”, i.e. confidence

b) “trust is defined as willingness to rely”, i.e. some sort of predisposition

c) “a generalised expectancy”, i.e. again a belief, but with general predisposition.

The trust concept seems to be composed of affective and cognitive elements of social behaviour. The discussion here is, in this sense, reminiscent of that of Smith and Barclay (1997), who “find it meaningful to separate ... trusting behaviours and perceived trustworthiness”. Gundlach, Achrol, and Mentzer (1995, p.81) also suggest that “… it is useful to distinguish between the structure of commitment inputs, 2) the impact the inputs have on the vital intervening process of social norm development and opportunism, 3) the impact the inputs have on long-term commitment (both attitudinal intentions and actual commitment in future exchanges)”. In the approach to commitment discussed above, the same difference between intentions and actual behaviour is again prevalent. Judging from this, the perceptual and the behavioural dimensions of trust seem to be mixed and interwoven. While confidence and willingness to rely seem to refer to an affect, the belief is cognitive. As such, the Morgan and Hunt definition of trust seems to share some common ground with the concept of commitment, but if the belief element is removed, the Key Mediating Variables model could be seen as a cognitive-affective model of relational interaction. Thus, even though it is unclear on this point, the model could refer to an emotional element of relationship perceptions. Opportunism would certainly tap basic emotional reactions. It is also likely that the concept of shared values would translate into perceived similarity on the emotional level, and that of

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32 It is interesting to note here that, when Morgan and Hunt (1994) use the term willingness, they are
communication into information sufficiency that is related to trust “by assisting in
resolving disputes and aligning perceptions and expectations” (Etgar, 1979). Contrasting
these ideas to the classic view of trust further supports the notion that trust is the wrong
label in the second evaluation of the KMV model. According to Rempel, Holmes and
Zanna (1985), trust is a trait of “the most desirable qualities of close relationships” and
“trust requires a willingness to place oneself in a position of risk”. Further, “Trust
evolves through mutually satisfying interactions and increasing confidence in the
relationship.” It is thus presented - through the findings of Larzelere and Huston (1980)
– as being related “to love and to intimacy of self disclosure” [ibid.]. As with the
concept of commitment, this perceptual concept is also related to the concepts of love in
the literature on social exchange. However, the notion of “intimacy of self disclosure”
implies that social-psychological trust is deeper and more complex than what is meant by
trust in the KMV model (Morgan and Hunt, 1994). Even though relationship-marketing
models have similar elements33, the degree of intimacy of the relationship seems to be a
tough requirement in terms of industrial-marketing exchanges. If Rempel, Holmes and
Zanna’s (1985) ideas of trust do not fit in the aforementioned models of relationship
perceptions, is it possible that the emotional dimension of social-psychological
commitment is thorough enough to capture the emotional layer of the perceptions
existing in business relationships? Is what Morgan and Hunt (1994) label trust really the
same thing that is labeled affective commitment in models of social psychology? These
questions are addressed in Chapter four. The next section delves into the antecedents of
commitment.

33 Here, a good comparison is Iacobucci and Ostrom’s definition of trust as the “obverse of “risk” in
relationships” (1995, p. 59). Thus, trust is more like a measure of emotional security than a holistic
evaluation of the ongoing exchange.
3.4.2.3. The Antecedents of Commitment

The antecedents of views of commitment as social exchange include concepts such as (psychological) rewards and costs, comparison level, comparison level for alternatives, investments (intrinsic and extrinsic) and satisfaction\textsuperscript{34}. As satisfaction is an outcome of psychological evaluation, it is close to the emotional elements of commitment. Further, as extrinsic investments and relationship alternatives are presented as cognitive evaluations (Rusbult, 1983), they are thus close to the calculative element.

Antecedents of the KMV model (Morgan and Hunt, 1994) include the emotional (trust-related) concepts of opportunism, communication and shared values vs. calculative shared values, relationship termination costs and relationship benefits, which are presented as “causal” predictors of commitment and trust.

A suitable starting point for this discussion on antecedents would be the layering of the mediating holistic concepts. These concepts should be as broad as possible in order to incorporate all possible material that may have an effect on the mediating holistic evaluations of a relationship. Further, in terms of emotional evaluation, one would suspect it not to be based on very “fragmented” or highly-refined concepts in that, as emotional layering incorporates material that is non-conscious and non-cognitive, it is not likely to be complex in structure. Thus, this group of concepts should, in very general terms, balance the positive and negative emotions evoked by the relationship signal. For instance, Morgan and Hunt’s (1994) antecedents of opportunism, communication and shared values seem to be derivatives of the broader concepts of psychological rewards and costs. Thus, even though Morgan and Hunt’s (1994) concepts are derived from a wealth of relationship-marketing literature, they seem too “discrete” to be an exhaustive presentation of the things that could affect the emotional commitment of those involved.

On the calculative side, one would suspect that normal economic matters are critical to

\textsuperscript{34} Geyskens, Steenkamp and Kumar also suggest that “in more recent years, satisfaction often has been replaced by trust and/or commitment as a focal consequence(s) of channel relationships” (1999, p. 223). They go on to describe commitment and trust as arising out of economic and noneconomic satisfaction plus the level of conflict existing in channel relationships. Thus their view is close to what is proposed here that the mediating structure of relationship perceptions is based on economic (calculative)
the calculative element of commitment. Thus, the calculative antecedents should incorporate aspects such as the economic performance of the relationship, the effect the (financial) alternatives have on commitment, and the role of the un-transferable assets that are tied into “this” relationship as a barrier to exiting. The concepts of relationship benefits (measured as the perceived economic benefits of the relationship in the original study) and relationship-termination cost put forward by Morgan and Hunt (1994) come close to these ideas. Moreover, the comparison level (as the standard; that one perceives one deserves) could, in the calculative sphere, be seen in the light of economic performance because, in a business setting, the comparison level that precludes a co-operative agreement is likely to consist of the financial calculations used as the basis on which the performance of a possible new relationship is evaluated. Further, again in a business relationship, the concept of the comparison level for alternatives is likely to be close to the idea of the bygone opportunity cost of not choosing “the” alternative to “this” relationship. Thus, perceived ideas of “how we would have managed with the alternative” are contained in this standard. One suspects that Morgan and Hunt’s (1994) relationship-termination costs overlap the concept of relationship investments, which presumably incorporates everything that inhibits the exit decision.

As such, both of these models are closely tied to their disciplinary background, but at the same time contain a lot of overlapping material. Thus, a model-building exercise could incorporate these antecedent concepts as the basis for constructing an antecedent structure of socio-economic exchanges. I will now turn to the outcomes.

3.4.2.4. The Outcomes of Commitment

Models of social exchange are relevant to the outcomes-of-commitment construct only in terms of the stay/leave decision. It seems that a heavy emphasis on explaining relationship stability has meant that social-exchange models have neglected outcomes that reflect everyday variability in the level of commitment. Thus, Morgan and Hunt’s (1994) view is more fruitful in that the outcomes are broken into a number of concepts.

According to the KMV model (ibid.), outcomes include acquiescence, propensity to leave, co-operation, functional conflict and uncertainty. On the semantic level all these vs. affective (non-economic) evaluations. See Chapter 4 for a deeper discussion on the subject.
concepts could exist in close interpersonal exchanges. Acquiescence is a measure of the propensity to agree in the interpersonal setting, while the propensity to leave could be seen as overlapping the stay/leave decision. Further the level at, or “eagerness” with which, people in close relationships engage in co-operative efforts should be a measure of the closeness of the dyad. Still, the concepts of functional conflict (i.e. how constructive the agreements are seen to be) and uncertainty both reflect how emotionally burdened a relationship is. Thus, on the face of it, outcomes in the KMV model should also apply to close interpersonal encounters. However, given that these relationships are high in involvement, this emotional aspect could turn outcomes into a more complex phenomenon. In a high-involvement setting, the emotional burdening of the relationship evaluation might be so heavy that the whole view is distorted by the general “tone” of the emotional reaction (good-bad, trustworthy – un-trustworthy, etc.). However, this is not likely to apply in a business setting due to the lower emotional involvement. Still, it is worth noting that the outcomes should follow the general layering of the mediating concepts: the emotional layer should produce emotional outcomes and the cognitive layer calculative outcomes.

This concludes the discussion of the theoretical background. The next chapter considers the argumentation on how perceptions of socio-economic relationships could be modelled. Before that, the following remarks summarise the theoretical basis of the study.

3.5. A Summary of the Argumentation in Chapter 3

This thesis approaches relational matters from the viewpoint of scientific realism (Niinluoto (1987), Hunt (1991)), according to which phenomena are the target of research. The core phenomenon was argued to be that of socio-economic exchange, which refers to an exchange setting in which those involved act from instrumental motives (related to some higher personal goal), and in which the relationships themselves are voluntary. The settings of interest were defined as dyadic settings focusing on the perceptions of an individual entering the socio-economic (instrumental) dyad. Further, the exchange happens in social systems in which communication is symbolic by nature. Significant symbols contain the core content of the perceptual messages sent and received. At the same time, the symbolic nature of the messages also describes the
“internal” processes of how those involved adapt their perceptual realities with the “reality” of the system. On the basis of models of socio-economic exchange, one could argue that holistic measures of how “well” the adaptation is going at each instance can be gauged from the concept of commitment. Concerning the concept itself, the models discussed present the phenomenon as containing either one, two or three dimensions, namely the calculative plus the emotional level of relationship evaluation, or the calculative, affective and conative components of this processing. The incorporation of antecedents and outcomes here seems to facilitate the construction of a unified representation of how perceptions of socio-economic relationships are organised in the mental sphere of an individual.

In sum, it could be said that if we accept the postulate of the centrality of exchange as the core phenomenon of marketing, the next question concerns how this exchange could be explained. Given Hunt’s suggestion that marketing could be a science if the positive dimensions (i.e. phenomena existing independently of the perceiver) were addressed (Hunt 1991), such positive dimensions could refer to the psychological dimensions of marketing interaction. Relationship marketing could thus be a science that focuses on the positive dimensions of human interaction related to economic exchange, but also linked to the social-psychological dimensions behind this exchange. Thus, while the science of economics is more broad and thorough in its discussion of monetary optimisation, social psychology is more thorough in its discussion of human social behaviour. Therefore, the scope left for marketing is far from trivial or narrow - it is the vast space existing between psychology and economics, in other words socio-economic exchanges. These types of exchange are as old as human cultures, but are also highly meaningful for the development of social systems. Today, this form of exchange is prevalent through the organisational form that we call a commercial enterprise, and it increasingly happens through networks. Thus, if the emotional elements of exchange are expanding beyond the border of the “focal company” (Morgan and Hunt, 1994), it seems that the organisational form of the socio-economic system is also expanding into new areas. This new development could be called the birth of the “super-corporation”, and it is not only the big multinationals that are part of this development, but also small-scale firms entering partnership agreements.
The following points represent the logic of the argumentation in this chapter:

1. In order to be scientific, any disciplinary research must concentrate on studying the phenomena around us.
2. The core phenomenon in this work is socio-economic exchange.
3. What is the model of such an exchange?
4. New developments in both theoretical relationship marketing and social psychology suggest that relationship perceptions can be explained in terms of a model that has a two- or three-element mediating structure. These are the emotional and cognitive elements descriptive of holistic relationship evaluations.
5. Relationship-marketing models seem to be mixed in their explanations of the logic of the phenomenon, while social-psychological models seem to lack understanding of non-exclusive-relationship outcomes.
6. Is it possible to build a general model of socio-economic exchange by combining elements of the models presented?
4. The Emerging Model and Hypotheses

4.1. Overview

Figure 4.1. shows the link in the model-development phase between the theoretical ideas and the empirical testing of these ideas. It also shows how the model development will proceed.

Figure 4.1. Model Development in the context of the general thesis design.
According to the internationally renowned neuropsychologist Donald Stuss, “…our ability to understand the thoughts of other people - to sometimes "read between the lines" – appears to be generated by a single region in the brain (www.bbc.co.uk, 2002). He is referring to the area called the frontal lobe. He continues: “It enables us to socialise by feeling sympathy for others, appreciating humour or understanding when someone else is being sarcastic or deceptive “(ibid). Eric Johnson writes on Stusse’s findings:

In their summary of the study, Stuss and Shammi point out that the right frontal lobe has long been considered "the most silent of brain areas." But their findings suggest it may instead be a kind of cerebral clearinghouse, a place where all the components of self-awareness—memory, logic, language, sensation, and emotion—come together. Understanding humor is a serious business, Stuss says. "You need the ability to make an inference; you also need the ability to have a self-awareness concept. Then you need the connectivity to your emotional reactions. The right frontal lobe has the ability, because of its connectivity to different brain regions, to actually pull that all together."

Thus, following on from Sigmud Freud’s view of the layers of human consciousness (section 3.A), recent neuro-psychological research also sees the human ability to self-reflect as a core element explaining the “human” in us. It is ironic that a hundred years have passed since Freud presented his ideas about human personality being structured into unconscious, pre-conscious and conscious layers (Freud, 1991), and as being trapped by the animal-like evolutionary past. Present-day neuro-psychology treats the same problems as biological matters existing in different parts of the brain, but these same ideas were already being expressed in the early psychoanalytic movement. Here the resemblance is strong in that, for the neuropsychologist, the limbic system (existing in a similar form in almost every living mammal) contains the primal instincts and is the location of core affective experiences, while the frontal lobe contains the self-reflective feature of the consciousness. While Stuss talks of the connection between the limbic system and other parts of the brain with the frontal lobe, Freud (1991) refers to the deterministic psychology of a human by which the conscious manifestations of our will or personality are subject to other deeper-lying structures of personality (namely the unconscious). Thus, given the axiomatic basis presented in the previous chapter (see.
3.A.) and the conceptual confusion represented in sections 3.A.1.2 and 3.C, it does not seem to be a very far-fetched idea to view the holistic evaluations of a relationship as being a manifestation of the different levels of consciousness. The following explains this, although the discussion begins from the concepts mentioned in the previous chapter.

4. 2. Commitment as a Concept Reflecting Different Layers of Consciousness in Evaluating One’s Relational Engagements – the Axiomatic Basis Revisited

If there are various ways of evaluating our relationships inherent in the concepts of commitment, trust, satisfaction, rewards, passion, love, cooperation, perceived relationship stability, and perceived relationship quality (section 3.A.1.2.), and if all these evaluations happen on the level of perceptions expressed in the symbolic language of perceptual imagery (section 3.A.), then the different ways in which we see our relationships must reflect the different aspects of the same core experience of the “other”. Thus, an individual exists in a relationship but experiences it on a somewhat detached perceptual level (Fig. 1.1). We are singular psychological entities, but our experiences are manifested in the different layers of psychological existence (cognitive, affective, conative). Further, we may be conscious, pre-conscious or unconscious of the core psychological processes affecting our subjective experiences, but still the reactions are a deterministic result of our own individual psychological makeup. In line with Freud (1991), this views the individual psyche as a deterministic entity in which reactions are a direct result of the psychological processing of impulses. Cognitive experiences may be manipulated in line with the ideas of Festinger (1957), but affect, and especially the unconscious, exist “as it is”. The direct result of this is that the relationship an individual psychological entity has with his or her surroundings can be expressed as a relationship between a singular psychological entity and the impulses received from those surroundings. Consequently, the relationships we have exist on the level of perceptual reality. The nature of the conceptual view (what elements and concepts are considered) is of secondary importance as long as it captures the array of perceptual experiences. In line with this, it could be argued that commitment as a concept describing both affect and cognition, and incorporating, a long-term perceptual time-span, offers a good label for the subjective evaluations we make in socio-economic relationships, and thus is also useful in explaining the layers in which an individual (psychologically) experiences a relationship. This thesis adopts the position that commitment is the label given to the
evaluations of one’s relational engagement, and that the different dimensions of commitment reflect our different layers of consciousness in making our evaluations of our relationships. While we can be referred to as cognitive, affective and conative creatures, we can also bypass the issue of psychological structure and approach relationship perceptions purely in terms of how self-reflective we can be concerning the layers that affect our behaviour. As already mentioned, conscious relationship evaluations are likely to be subject to the issues mentioned by Festinger (1959) in that we can manipulate the elements in order to achieve consistency. Pre-conscious evaluations, have been referred to as feeling-like impressions of enthusiasm (Lydon, Pierce and O’Regan, 1996), psychological rewards (Rusbult, 1980) and feeling-like impressions of stress, anxiety, and other forms of emotional burden – i.e. psychological costs (Rusbult, 1980). Thus, pre-conscious matter consists of all the material that can be retrieved in order to evaluate a relationship, but that cannot be handled in conscious terms. Figure 4.2. below presents the same ideas as Figure 1.1, but divided on the basis of the different levels of consciousness and expressed in terms of how well an individual can reflect on the perceptual experiences a relationship arouses.

![Diagram showing layers of consciousness and commitments](image-url)

Figure 4.2. Commitment as a representation of two layers of consciousness

1. Labeled dependability in Rempel, Holmes and Zanna, (1985)
It is clear from the figure that perceptual experiences are the specific part of the external impulses received on the subjective level of the individual. The levels (of consciousness) the impulse touches upon define the logic of how the process then continues. An individual receives perceptual material, and depending on the symbolic content, the different layers of consciousness are probed by the impulse. Thus he or she understands the conscious processes the impulse provokes, feels that the message also has some other content in it (preconscious), but may never understand what type of unconscious content it has. Still, each of the layers is likely to have an impact on how the person behaves. On the conscious level, the reaction could be seen as a chain of perfectly conscious mental processes. However, even though the processes are conscious – according to the psychoanalytic view – the general logic (i.e. the way the elements are related to each other) might betray the unconscious thoughts. At the same time, our affect (positive or negative) will supplement (in line with Feather, 2001) our general evaluation of the impulse received, and thus the perceptual flow of images is coloured depending on the colour of the lens through which we are viewing it. Further, on the unconscious level, the outcomes are unseen and unknown, but might be expressed later in a completely different setting of relational interaction. The symbols of communication that tap some critical experiences of an individual are very likely to become part of relational interaction. The “critical incidents” of relational exchange are thus likely to be based on some communication material touching upon a core “infantile” experience of a relational party, or to be the result of a deliberate destructive act (Hibbard, Kumar and Stern, 2001) reminiscent of these experiences. The bottommost direct arrow (pointing from “unconscious” to “infantile outcomes”) represents the relational outcomes when some uncontrolled material enters the picture. This connection is likely to remain latent in a normal operating situation, but is likely to become active in the face of the destructive
acts mentioned by Hibbard, Kumar and Stern (2001), for instance. What is worth noting from the above-mentioned notion of unconscious relationship elements is that there will always remain material that affects our relational exchanges but that cannot be captured by our models. The following section describes the model arising out of the social-psychological and relationship-marketing views of commitment, but organised in line with the axiomatic argumentation put forward in this section and at the beginning of Chapter 3.

4.3. Mediating Variables – the Emotional and Calculative Layers of Relationship Perceptions

As already mentioned, there are three alternative views on the number of layers inherent in the concept of commitment. First, there are the three-layer views of Meyer and Allen (1991) prevalent in relationship marketing and supported by Gunlach, Acrol and Mentzer (1995) and Gruen Summers and Acito (2000). Meyer and Allen’s (1991) view is also represented in social psychology, for instance in Ariaga and Agnew’s (2001) definition. Second, commitment could be seen as consisting of two mediating layers, as in the models from social-exchange theory, namely the theory of interdependence (Kelley & Thibaut, 1978) and Rusbult’s \(^{35}\) (1980, 1983, 1993) investment model of two-dimensional commitment, and also presented in the field of relationship marketing in the form of the KMV model, for instance (Morgan & Hunt, 1994). Finally, as Rusbult (1980), Bui, Peplau and Hill (1996), and Morgan and Hunt (1994) suggest, the concept could also be uni-dimensional.

Given the argumentation put forward in the previous chapter, and that commitment is a

\(^{35}\) However, even Rusbult herself now talks of the 3-layer model of commitment (e.g. Agnew, Rusbult, van Lange and Langston, 1998).
holistic evaluation of a relationship dependent on the level of consciousness, the mediating structure of socio-economic exchanges could be seen as a two-layer holistic subjective evaluation of the flow of images introduced by reflecting on a relationship one has with someone. This view is consistent with the ideas behind the axiomatic basis of relational phenomena (p. 18), social exchange (p. 21), the view of marketing as exchange (p. 23), the two-dimensional nature of the commitment construct in social psychology (Rusbult, 1980; Lydon, Pierce and O’Regan, 1996), and the KMV model of Morgan and Hunt (1994). It is also consistent with the ideas mentioned at the beginning of this chapter and in section 4.1. Thus it is proposed that the mediating structure has two layers, one comprising the emotional evaluation (pre-conscious) of the relationship perceptions and the other containing the calculative evaluations (conscious). As Bagozzi (p. 25) and Morgan and Hunt (1994) (p.33) suggest, the emotional element is a precursor of the calculative elements. However, Wiselquist, Rusbult, Foster and Agnew (1999) argue that commitment should be a precursor of trust and not vice versa. Thus, in a relationship with an emotional content, the emotional evaluations have an effect on the calculative evaluations. This does not mean that the relationship was originally based on emotional elements - quite the contrary, as argued in the previous chapter (section 3.A.): instrumental motives drive people into socio-economic relationships in which emotionally rewarding engagements create a forward-looking “attitude” in those experiencing it. Figure 4.4. below presents the two-layer mediating structure.

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As argued above, relationship perceptions are expressed in the concepts of emotional and calculative commitment and reflect the flow of perceptual images. The lower part of this model (concepts with an arrow pointing to or from emotional commitment) represents the emotional sphere of these evaluations, and the upper part consists of the calculative elements. These evaluations are within the mental “reach” of an individual, and thus can be manipulated. However, the need for cognitive consistency or dissonance reduction (Festinger, 1957, p. 18) implies that the cognitive sphere has to be in harmony, and thus there are limits to how big a gap can exist between the emotional evaluations and the calculative elements. Fulfilling this need for mental harmony is likely to result in the “manipulation” of the internal interpretations of the flow of images\(^37\).
4.4. The Antecedents of Emotional and Calculative Relationship Perceptions

It was suggested in Chapter 3.D.1.3. that the antecedents of relationship perceptions could be derived from the models presented. Thus, it is argued that the emotional layer consists of two broad evaluations of the nature of the relationship concerning how rewarding and how cost-incurring the engagement is. As these evaluations are separate, there may be considerable tension when both the rewards and the costs of the relationship are high. Defining the concept of (psychological) rewards incorporates all the possible positive emotional rewards that could be gained from a relational engagement. Similarly, the concept of (psychological) costs incorporates all the possible (psychological) burdens, strains and other emotional-energy-depleting matters that are tied to the relationship in question.

The third antecedent of emotional commitment could be considered the concept of emotional investment, which incorporates all the emotional material that is un-transferable to another relationship and that has been unilaterally “sacrificed for the sake” of the relationship in question. The fourth antecedent is that of perceived psychic distance. However, the problem with these two concepts is that, as socio-economic relationships are lower in involvement, they are also likely to be simpler in evaluative structure, and the concepts of rewards and costs might also tap the investment and psychic-distance features. This argumentation touches on the problems that have been found to exist in the measurement of the concept of (psychological) comparison level, for instance in Rusbult (1980).

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37 In line with Festinger’s idea of cognitive consistency (1957).
38 This may be a vicious circle in which rising tensions in a relationship cause additional strain via the imbalance with a simultaneously existing high level of rewards.
I will now move on to the antecedents of the calculative sphere. As I argued in section 3.3.2.3, the calculative elements of perceptions of socio-economic relationships should contain factors referring to the “economic performance of the relationship”, the opportunity cost of a bygone relational engagement (thus reflective of the price of the bygone opportunity), and extrinsic investments in the relationship. The concept of “economic performance” refers to the balance between the perceived economic rewards and the economic costs incurred through being in the relationship. It does not necessarily have to be “monetary” in nature if the prospect of acquiring higher economic benefits in the future is somehow tied in with the relationship. For instance, when one embarks upon university education, one forms a relationship with the educational institution but the “economic” rewards are long to come. Nevertheless, they must be counted in the model of these types of instrumental engagements.

The opportunity cost - or the concept of alternatives - could be defined as all the perceptual material that reduces the value of the current relationship because of the factors related to an alternative. Thus, an appealing alternative is a threat to the current relationship, and it is likely that dissonance-reducing processes, as suggested by Festinger (1957, p. 18), happen in a situation of choosing between this and “the other”. Extrinsic relationship investments refer to all the tangible resources that have been sacrificed (tied) to the present engagement. Figure 4.6. below represents the idea of the antecedents of the two-layer model of relationship perceptions.

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39 See, for instance, Bui et al. (1996) p. 1245.
The figure illustrates how emotional and calculative antecedents are transformed into holistic evaluations of the socio-economic relationship. Emotional antecedents comprise the emotional layer, which also has an effect on the calculative layer of evaluation. Calculative commitment is composed of the perceived economic performance, the effect of the alternatives and the “moderating” concept of relationship-specific investments. Thus, what a person “sees or feels” is the calculative element of relationship evaluation, plus the pressure the emotional layer (the arrow from emotional commitment to calculative commitment) exerts on calculative commitment.


4.5. Outcome Variables

The outcome variables describe the end-product, i.e. the nature of the relationship resulting from the exogenous and the respective mediating variables. The word causal could be used here to describe the “micro temporal relationship” that the variable levels of calculative and emotional commitment have on the outcome variables.

The outcome concepts of the models presented in Chapter 3 include relationship stability, acquiescence, propensity to leave, co-operation, functional conflict and uncertainty. Of these concepts, relationship stability (Rusbult, 1983) seems to coincide semantically with propensity to leave (Morgan & Hunt, 1994). However here we are faced with striking differences in terms of the relationships. First, the Rusbult model deals with romantic involvement, where it is natural to assume that the decision to leave is a very grave one. On the other hand, business relationships are seldom exclusive, and even if they are, they still deal with issues that involve the parties less. Second, the level at which the relational partners consider matters must be very different. It could be assumed that, while business relationships are analysed on the cognitive level, romantic involvement, by definition, happens on the emotional level. Third, given the emotional complexity of romantic involvement, the stay/leave decision must reflect the vast multitude of psychological material involved in the decision making. Thus, while the relationship-marketing theorist can distinguish between certain outcomes of relational interaction, such outcomes are likely to be less psychologically complex and shallower than in the romantic-involvement situation. In sum, all the concepts included in Morgan & Hunt (1994) might be assumed to be captured in Rusbult’s (1980) concept of relationship stability.

In considering what might compose the outcome structure, the first thing to remember is the two-layer nature of the proposed mediating concept of commitment. Holistic
evaluations of the relationship result in different outcomes, but it is likely that the outcomes are very dependent on which sphere they are from. The emotional-level outcomes are, again, a bundled “feeling” comprising all the emotional material, while the calculative elements contain “separable” material. Given the outcomes in the KMV model (Morgan & Hunt, 1994), the two-dimensional-commitment construct (Lydon, Pierce and O’Regan, 1997), and the ideas of disproportionate commitment (Gundlach, Achrol and Mentzer, 1995), it is proposed that the outcomes of the calculative layer consist of acquiescence (or power), propensity to leave and propensity to co-operate. Further, in the emotional sphere, emotional security and the perceived constructiveness of conflicts are the outcomes of enthusiasm. As Morgan and Hunt (1994) propose, the emotional layer may affect the propensity to co-operate. Figure 4.8. shows the structure.

![Diagram of the model](image)

Figure 4.8. The outcome concepts of the model

In considering the concepts and the structure presented above, one could start with the social-exchange-theory outcome of the exit decision (propensity to leave). This concept must be located in the calculative sphere, given the social-exchange theorists’ (e.g. Rusbult, 1983) arguments that it is the concept of commitment that mediates the exit decision, and especially the concept of relationship investment, which “puts a brake” on the direct conceptual relationship between satisfaction and exiting. Thus, given the
antecedents, the propensity-to-leave concept should be dependent on the calculative-sphere evaluations of the relationship. As such, the concept could be defined as a subjective estimate of “how much” is needed before an individual exits a relationship. It is likely that the level of the propensity to exit varies according to the experiences a person has, and it is thus a continuous and not a dichotomous variable.

As far as the other calculative outcomes are concerned, the concepts of acquiescence and propensity to co-operate are likely to be located in the calculative sphere because consideration of whether to agree or to co-operate is likely to be calculative. Agreement and tying one’s hands in co-operative efforts (in a socio-economic setting) should be conditioned by the expected returns of the involvement. In other words the instrumental nature of the involvement should be continuously in the background, and should exert limits on what a dyad member might agree to. Thus, the instrumental value of the engagement is weighted against the present value of future uncertain outcomes. If the instrumental value of the relationship is low, people are not likely to agree to risky projects, but if it is high, the level of acquiescence is also likely to be high. Thus, acquiescence could also be labelled power since it can condition others (Thorelli, 1986). Power has also been defined in studies on channels as the possibility to make others do what one wants them to do (Rosenbloom, 1985; Juslin, 1981), but in social-psychological terms it is related to dependence (Agnew et al. 1998). Acquiescence could be the other side of the same coin (in voluntary relationships!), as psychological power would suggest - the one with the higher level of acquiescence is thus less “powerful” or more dependent on the perceptual level. Thus, as mentioned earlier, because of gaps in perceptual realities, dyad members are susceptible to exploitation (Gundlach, Achrol and Mentzer, 1995; see also Chapter 1 of this work).

In terms of emotional outcomes, the core outcome should be that of emotional security, or non-uncertainty, which is a holistic perception that the relationship is secure. It could also be labelled trust on Rempel, Holmes and Zanna’s (1985) dimension of dependability. However, as with the KMV trust concept, the problem (Chapter 3, p. 34) is the superficial nature of the engagements. Thus, the concept might be labelled quasi-trust. Now the question is that if we first argue that trust does not exist in socio-economic relationships, how can we label the outcome of security trust? The only valid argument is that literature in the fields of relationship marketing (Morgan and Hunt, 1994, p. 24 –
trust as an intention) and social psychology considers trust an outcome of “past experience” (Rempel, Holmes and Zanna, 1985). It is therefore more likely to be an outcome rather than a mediating variable, although in a reduced form. The label emotional security would do just as well. This concept of emotional security is thus seen to be a holistic evaluation of how secure “I” am in the relationship in question.

The other derivative of the emotional layer could be the individual and emotional propensity – or courage – with which we approach conflict situations. If general emotional commitment exists, it could be translated as “openness” in confronting perceived potential conflicts. The outcome would be the perceived constructiveness of a disagreement situation, and visible only on the level of believing that “we can sort this out”.

The following section draws all the discussions of this chapter together and presents the general structure of the model.

4.6. The Whole Model: An Investment Model of Industrial Exchanges

![Diagram](Figure 4.9. Developing a view of the whole model of socio-economic exchange.)

As is already clear, the model organises the different types of relationship perceptions into two different layers of concepts. First, the calculative or cognitive sphere is covered by the top part of the figure. At the same time, emotional commitment and the related antecedents and outcomes cover the emotional sphere. As emotional evaluations are more in the pre-conscious terrain of affect, this has an effect on the relationship outcomes in an “indirect” way as the emotional pressure represented by the arrow from emotional commitment to calculative commitment. These two layers, the affective and the cognitive, form the first structural feature of the model. In other words the signals
entering our relationship “calculations” are processed on these two levels. The affective level has an effect on the cognitive level, but as such it incorporates all the non-cognitive and pre-conscious calculations a person makes about the relational engagement. The affective elements are combined in the concept of emotional commitment.

Naturally, the basic micro-temporal nature of the model (antecedents -> mediating variables -> outcomes) defines another structural feature. The basic relationship signals are broken up into the elements entering these types of considerations - i.e. all the relevant elements of relational signals should fit into the antecedent structure that is based on the ideas of social, economic and marketing exchanges. This horizontal (from left to right) layering also brings out the model assumption that, even though a lot of symbolic communication happens between the relational parties, only some parts of the general flow of signalling are relevant to “human calculations” of the nature of one's relationships – the significant symbols of communication. Figure 4.10. below presents these ideas in graphical form.

\[40\] Significant symbols refer to the symbols that are interpreted as relevant for “the general task” this instrumental (socio-economic) engagement is perceived to be fulfilling (see Chapter 3 on axioms).
As the figure shows, the emotional and calculative layering give the model its vertical structure. Further, the horizontal layering describes its predictive logic. Two groups of concepts result in two holistic evaluations of the relationship and create outcomes that describe the assertiveness of those involved in engaging in forward-looking co-operative actions and the vulnerability of the relationship. This last notion stems from the idea that, without the emotional layers, the relationship would be “purely” transactional. Thus one could argue that emotional layering is what distinguishes a relationship with a long-term orientation from emotionally-neutral interaction with a basic situational time horizon.

4.7. The Competitive view of Commitment.

Given the view that commitment is based on the level of consciousness, a natural competitive model of commitment structure would be unidimensional. This unidimensionality would stand out from the issues of the background (chapter 3) model structures (Rusbult’s (1983) and Morgan and Hunt’s (1994) unidimensional commitment), and also from views of the pre-conscious material of being as nothing
more than psychological material just about to come into the consciousness (in other words only the conscious layer of commitment would exist). Thus the competitive model of relationship perceptions would comprise only a single mediating layer of relationship evaluations.

![Diagram showing the rival model of commitment as a unidimensional construct](image)

Figure 4.11. The rival model – commitment as a unidimensional construct

As Figure 4.11. above shows, the affective is interwoven with the conscious in the holistic evaluation of the relationship. There is a uni-dimensional holistic evaluation that is in line with how Fletcher, Simpson and Thomas (2000) present Gottman’s (1990) idea of how relationship evaluations labeled commitment, trust, satisfaction and love are in fact different aspects of the same holistic evaluation. Thus, commitment is an attitude, as Gundlach Achrol and Metzer (1995) suggest in their concept of affective commitment, and a “general positive attitude” as Lydon, Pierce and O’Regan (1996) posit in their work on the structural nature of commitment.

What has not yet been mentioned is the direction of the arrows in the model. The antecedents combine in two holistic evaluations and the arrows thus point from them to the mediating concepts. Since the level of mediating concepts is reflected in the outcomes, the arrows point from the former to the latter. These arrow directions should
not be confused with the direction of the associative variation. Thus Figure 4.13.
presents the hypothesised directions of the associative variations between the concepts.

4.8. Summary of Chapter 4 - Hypothesis

| Mediating variables of relationship perceptions | Antecedents of the mediating variables | Outcomes of the mediating variables | The whole model of socio-economic | Hypotheses for testing the model developed |

Figure 4.12. Developing the hypotheses arising from the model.

This section gives the basic propositions concerning the direction of the effects of the antecedents on the mediating variables, and of the mediating variables on the outcomes.

The following list describes the hypotheses in words (i.e. verbalises the + and – signs):

**Direct Effects**

H₁ The higher the costs, the lower the emotional commitment.
H₂₁ The higher the relationship rewards, the higher the emotional commitment.
H₂₂ The higher the intrinsic investments, the higher the emotional commitment.
H₃ The better one feels one's relationship alternatives are, the lower the calculative commitment.
H₄₁ The higher the economic performance, the higher the calculative commitment.
H₄₂ The higher the extrinsic investments, the higher the calculative commitment.
H₅ The higher the emotional commitment, the higher the calculative commitment.
H₆₁ The higher the emotional commitment, the higher the perceived functionality.
H₆₂ The higher the emotional commitment, the higher the (emotional) security.
H₆₃ The higher the emotional commitment, the higher the level of co-operation in the relationship.
H₇₁ The higher the calculative commitment, the higher the level of Acquiescence.
H₇₂ The higher the calculative commitment, the higher the level of Co-operation.
H₈ The higher the calculative commitment, the lower the propensity to leave the relationship.

Figure 4.13. below presents the hypotheses in a schematic form.
The hypotheses are represented by + and – signs in the figure. As increasingly appealing alternatives and higher levels of costs are likely to lower the level of commitment, the direction is assumed to be negative. At the same time, however, higher levels of economic benefit, relationship investment and relationship rewards are likely to increase relationship commitment in both spheres of evaluation. Thus it is suggested that the association is positive. On the outcome side, the only negative association is assumed to be with higher levels of calculative commitment and propensity to leave. These propositions are a natural outcome of the definitions of the concepts discussed in sections 4.2 and 4.3.

The above hypotheses only concern the direct effects. At the same time as showing the direction of the associative variations, they also indicate the testing points of this modelling exercise. The following chapter presents the research design, i.e. the phases in the drawing up of the empirical test of the model.
PART B – THE EMPIRICAL TEST
5. Research Design – Data, Measurements, and Analysis

5.1. Overview

Figure 5.1. below presents the phase of the research that this chapter defines and clarifies. The core task of the chapter is to build a basis from which the research problems may be addressed. It thus builds up the strategy by which the empirical problem at hand is solved.

Figure 5.1. Research Design as part of the general thesis design.
5.2. The Analytic Purpose of the Study

According to Sekaran, “Scientific inquiry in the hypothetico-deductive mode can be discussed referring to its two distinct aspects – the process\(^\text{41}\) of developing the conceptual framework… and the design\(^\text{42}\), which involves planning the actual study…” (Sekaran (2000, p. 53). Thus the core task of the research design is to give the reader a view into how the actual empirical phase of the research was arrived at. This section presents the details of the research plan. As the purpose of the research is to test the previously-developed conceptual ideas, the test setting itself directly represents the sample, measurement and data requirements. The following figure shows the way in which this chapter proceeds.

![Figure 5.2. The structure of Chapter 5](image)

The analytic purpose of the study is to test the model of relationship commitment (Fig. 4.9.). This requires quantitative data and certain types of analytic techniques. The sampling design meets these quantitative needs. The section (5.3) dealing with measures develops the basic tools for gauging the dimensions of the phenomenon in question. The measurement-development phase is important since it dictates the quality of the results. Further, analytic techniques are needed that enable the data to be reclassified in a structure that corresponds with the assumptions put forward in the theory-development chapters (3 and 4). The analysis was designed to combine these elements and to set up a stepwise procedure for obtaining results. These phases thus comprise the practical method of addressing the research questions.

The above describes the process tackling the research problems, but what is critical in this process? According to Sekaran (2000, p. 122), research design should clarify:

\(^{41}\) Emphasis original

\(^{42}\) Emphasis original
1. the purpose of the study,
2. the type of investigation done,
3. the extent of researcher interference (with the study),
4. the study setting,
5. the unit of analysis and
6. the time horizon.

In terms of this study, the responses are as follows:
1. The purpose of the study is to test the hypotheses and models (see Chapter 4).
2. The type of investigation centres on the structure of the model and the causal relationships existing between the antecedent, mediating and outcome concepts (section 4.5.).
3. There is no researcher interference.
4. The study setting is non-contrived, i.e. the phenomenon is gauged “as it exists” and there is no manipulation.
5. The unit of analysis is individual, even though the relational signal is dyadic.
6. The time horizon of the study is one–shot cross-sectional, even though the sample is split into two sub-samples (one for model fitting and the other for testing the fitted model).

The first two statements have already been discussed (Chapter 4), and thus this discussion begins at the third point. As the research is in its preliminary phase of building a model of socio-economic exchange, it is obvious that no experimental setting was used as the means for acquiring the data. In any case the costs of such a setting were beyond the reach of this research.

Even though some researchers (e.g. Svensson, 2002) argue in favour of measuring the dyad as a “bi-directional issue”, dyads are often measured from only one direction. This was the approach taken in this study. The reason for this is that the core interest was in the way the respondents structured their subjective experience, and not in the dyad as such. The unit of analysis is thus individual.

The time-frame options included the longitudinal setting used by Bui & Al. (1997), for instance. However, as, again, the core purpose of the study was to capture the
perceptual image flow of the respondents as “still photographs” (with the theoretical tools described), the natural choice was a single-shot cross-sectional study.

These decisions provided a framework for the study sample. The sampling design is presented in the following section.

5.3. Sampling Design
The analytic purpose of the study frames the sampling design so that the core aim of the sampling is to create the necessary data base. The following describes the position of the sampling in the research design.

According to Sekaran (200, p. 267), “Sampling is the process of selecting a sufficient number of elements from the population so that by studying the sample, and understanding the properties or the characteristics of the sample subjects, it would be possible to generalise the properties or the characteristics to the population elements”.

Thus the process of sampling aims at:
1. acquiring a sufficiently large amount of data,
2. acquiring a representative sample of the population to provide for generalisability of the results,
3. acquiring data representative of the characteristics of interest.

While the first two statements refer to quantitative issues, the third is dependent on the properties or quality of the measurement instruments. Thus, the first two are relevant at this point.\footnote{Measurement is discussed in the next section.}
As this study tests a model of relationship perceptions, it needs data on socio-economic dyads that is general enough to provide a homogenous sample. Further, as it tests hypotheses and a model structure, it uses a quantitative approach based on structural-equations modelling (SEM)\textsuperscript{44}. Given the previously–expressed notion that the study is non-contrived, the remaining option was for a survey design utilising structured measurement instruments. These practical issues influenced the method choice.

According to Hair and al (1998, p. 605), SEM modelling requires somewhere between 100<200 observations. Since the aim of this study was first to build and to then test a model, it needed two similar samples. Further, as the measures utilised were developed from the original models, additional observations were needed for the pilot testing of the modified scales. Still, as became clear only in the pilot phases, the response rate needed to be taken into account in order to secure enough responses. The following criteria for the sampling were defined:

1. The sample size needed to be such that 200 to 400 (i.e. 2*100-200) observations could be acquired.
2. If the response rate happened to be low (10%, for example) the study would need a sample of 2000 to 4000 in order to create a big enough statistical basis for the model testing.
3. Five hundred subjects were needed for measurement-testing purposes.

The sampling was thus conducted as follows.
1. The population consisted of all Finnish forest owners owning an estate greater than 5 ha in size and who were on the circulation list of the Forest Owner Supplement of the Finnish Agricultural Producers’ newspaper (n=324,000).
2. From this population a random sample of 2500 was picked.
3. Of these 2500 addresses, 500 were randomly chosen for pilot-testing purposes.

\textsuperscript{44} See section 5.4. for further discussion.
4. The pilot tests were further backed up by personal interviews with 130 forest owners conducted by students on a Forest Products Marketing course (PMARK7). Each of the 30 students on the course interviewed five forest owners. In short, the final population was a random sample of 2000 (private) forest owners.

5.4. Measures and Measurement

Figure 5.4. positions the measurement development in the research design.

![Diagram of measurement development](image)

Figure 5.4. Measurement development in the context of Chapter 5

The core issues related to measurement are the concepts of reliability and validity. While validity refers to the “ability” of the measurements to target (measure) the phenomenon in question, reliability refers to the accuracy of the measurement itself. While problems related to reliability result in “noisy” data, problems in validity result in erroneous and misleading data. Measurement development is thus a critical phase of the research design because if it does not succeed, the whole research is put in jeopardy. Figure 5.5. below, taken from Sekaran, presents this core issue of the different concepts of the “goodness of the data” (Sekaran, 2000).

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45 The selection was not random and thus the statistical representativeness of this phase is doubtful. However, as the main aim was to test the basic features (wording, length, multiple-item superfluousness, etc.) of the measurement instrument, the representativeness was not an issue. The students also gave their own assessment of the measurement form in order to throw light on the interview setting itself and the feeling aroused in the interviewers.
As Sekaran’s figure shows, there are five types of validity and four types of reliability that describe aspects of measurement goodness. According to Bagozzi (1996), validity is defined through Putnam’s (1962) law-cluster concept and refers to the “degree to which a concept and its measures achieve theoretical and empirical meaning within the overall structure of one’s theory”. Thus, the previous concepts are discrete but represent the general structural phenomenon. The following list describes each of Sekarans’ concepts.

**Reliability**

1. Test-retest reliability refers to how consistent the reliability is in “new” measurement situations.
2. Parallel-form reliability refers to how much similar scales provide the same reliability.
3. Inter-item consistency refers to how the different scale items measure the same construct.
4. Split-half reliability refers to how much the sub-scales of the original scale provide the same reliability estimates.
Validity

1. Content validity refers to how representative of the phenomenon or dimension the scale of measurement is.

2. Predictive validity refers to how well an instrument is able to provide predictive information, i.e. how well the measure predicts future happenings.

3. Concurrent validity is related to predictive validity in that it refers to how well a scale predicts the differences known to exist (via some other criterion).

4. Convergent validity refers to how well the different attempts to measure the same concept are in agreement, i.e. how much the scale items are in agreement in loading on the same latent dimension, for instance.

5. Discriminant validity refers to how well the scale is able to discriminate the phenomenon under consideration. For instance, if the scale items are overlapping with other scale items in the same study, an item of satisfaction would also load on psychological rewards.

If the above principles guide the development of the measurement instruments, how, then, should the measurement instruments themselves be created? Figure 5.6. below presents two views on measurement development.

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**Figure 5.6. Two views on measurement development**

1. Determine what is to be measured.
2. Prepare a draft questionnaire.
3. Perform a critical review.
4. Conduct a pretest and evaluate the results.
5. Revise the questionnaire, and


1. Specify what information will be sought.
2. Determine type of questionnaire and method of administration.
3. Determine the content of individual questions.
4. Determine the form of response to each question.
5. Determine the wording of each question.
6. Determine the sequence of questions.
7. Determine the physical characteristics of questionnaire.
8. Re-examine steps 1-7 (and revise).


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The process of measurement development advances from the basic statements (reflecting each measured concept) towards an increasing sharpness in tackling the latent concepts.
in question. The number of items is also reduced in this process. From a practical point of view, the aim of measurement development is to create an instrument that has credibility (reliability and validity) in terms of assessing the concepts and structures it is supposed to assess, and it does this by presenting the statistical distributions as being similar (isomorphic) to the hypothesised theoretical structure. Thus, the credible representation of the theoretical concepts is a necessary condition for achieving the results of the study (i.e. whether the hypothesised relationships exist or not). The following describes how the measurement instrument was arrived at in this research:

1. First, all the measurement instruments described in the original theories (Morgan & Hunt, 1994; Rusbult, 1980; Bui, Peplau, Hill, 1996; and Lydon, Pierce, O’Reagan, 1997) were combined in two questionnaire forms.

2. As all the measures were based on similar research traditions, a lot of the concepts were measured with similar items. Thus a lot of overlap existed in the original combined form of measurement items and therefore the number of items could be reduced.

3. In order to test the questionnaires, 50 of each were mailed and the respondents were asked to vocalise any thoughts the questionnaire raised. They were given a telephone number to call if they had any questions.

Table 5.A gives examples of the wordings of both the KMV model and the social-psychological model concerning similar concepts.

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46 What is important to note here is that, even though modern scientific method is based on deductive logic and statistical techniques, utilising deductive logic, the comparison itself (i.e., the comparison of the theoretical model with the empirical/statistical counterpart) is never based on deductive logic. This is at the core of the measurement issue.

47 The translated measures of the pilot phase are given in Appendix 1.
Questions derived from the social-exchange tradition

Rewards (Anchors: Strongly agree…strongly disagree) Alternatives (Anchors: Yes<->No, Aren’t able<->Can compete)

My raw-wood sales episode…
a) … was rewarding organisation stand out (from the rest) in some way?
b) … was something that I liked b) Are the other raw-wood procuring companies
c) … was interesting able to compete with the one that you dealt with?

Questions derived from the KMV model measuring relationship benefits

Please compare the organisation that bought your raw wood to its closest competitor on the following:
a. The price I would get (Anchors : Better than the competitor… Worse than the competitor)
b. The service received from the organisation
i. All in all, a better solution to my needs
j. The organisations’ interest in my needs

Table 5.A. Sample questions in the first pilot

As can be seen, the wordings are very similar, although those from the social-exchange tradition were more precise in presenting the respondent with only “one” dimension on which to react. Following this first pilot (50+50), the second one consisted of a combined measurement instrument containing both the social-psychological items and the relationship-marketing items. This questionnaire was already scaled down in terms of superfluousness of similarly-worded items and grossly unsuitable items for the dyadic signal\(^48\) in question. The following describes the process.

1. Four questionnaire forms were produced. Two consisted of measures from the key-mediating-variables model of Morgan & Hunt (1994), and two from the social-psychological measures of the relationship.

2. Both measures were phrased separately for the respondents had had personal contact with the signal\(^49\) and those who had not sold any wood.

3. The respondents were given a choice of analysing the raw-wood transaction they had completed or responding based on their perceptions of one of the three big raw-wood procurement organisations.

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\(^{48}\text{I.e. the raw-wood-procurement organisation was given as a signal to provoke responses.}\)

\(^{49}\text{I.e. Sold wood from their forests.}\)
Table 5.B. gives examples of the wording of similar items for those who had experienced a selling episode and those who had not.

**Selling episode**

8. Please compare the organisation that bought your raw wood with its closest competitor on the following dimensions:  
   a. The price I received  
      (Anchors: Better than the competitor... Worse than the competitor)  
   b. Service received from the organisation  
   c. The information that the procuring organisation gave to me about my forest  
   d. The possibility to use different means of payment  
   e. Easiness of selling  
   f. Suitable payment terms  
   g. Purchases speciality grades  
   h. Better-quality harvesting  
   i. All in all, a better solution to my needs  
   j. The organisation's interest in my needs

**NO SELLING EPISODE**

5. Please compare the organisation that came to your mind with its closest competitor on the following dimensions:  
   a. The price I would get  
      (Anchors: Better than the competitor... Worse than the competitor)  
   b. Service received from the organisation  
   c. The organisation's interest in my needs

Table 5.B. Sample questions in the second pilot

As can be seen, the items in the two examples are close to each other. Those without sales-transaction experience were given the form with simpler phrasing and fewer items measuring each concept on the assumption that the less experience-based information the respondents have, the less they are able to structure and classify their responses. It was thus assumed that those who had not had a relationship with a raw-wood procurement organisation still had a quasi-relationship (based on the interest that arises from simply owning forest) with one and were thus able to structure and analyse their relationships in some way.

The last pilot phase consisted of 130 personal interviews. Students on the PMARK7 course conducted them as an exercise. A structured questionnaire was used to obtain information on the relationships the forest owners had with the raw-wood procurement organisations. The interviewers recorded the responses on a form. The core aim here was to find out how deep the processing of the relationship was with the people who really had experience of the operations of a raw-wood procurer. The interviewers recorded their own experiences of the situation in a 5-page interview report.

Thus, the measurement development was based on material received from the following four sources.
1. A preliminary pilot phase with 100 mailed questionnaires of which 24 were returned.
2. The second preliminary pilot phase with 400 mailed questionnaires of which 87 were returned.
3. A total of 130 structured interviews carried out by students on the 1999-2000 PMARK7 course.
4. Thirty personal evaluations by the students on the PMARK7 course who participated in the exercise.

The final questionnaire modifications were the following.

1. The two questionnaires (no selling episode and selling episode) were combined. The respondents’ experience of selling wood was gauged via the background questions. This was done because it was felt that the respondents did not need to be separated – this would have been more confusing than beneficial.
2. A separate involvement/importance measure was created. This group of questions (no.1 a-f) was aimed at gauging how important (emotionally) the matters related to forestry were to the respondent.
3. The propensity-to-leave items were changed to reflect more the random nature of the raw-wood selling episodes.
4. The items gauging enthusiastic commitment were somewhat softened as the respondents in the pilot phases had found the questions intimidating.
5. The order of questions was changed so that the background information (personal) was requested at the end.

All the measures obtained in this phase are given in Appendixes 4 and 5. Because the return rate was low (see footnote 10) in the pilot phases, the critical task was to make the measurement device as short and easy to answer as possible. In addition, in order to increase the probability of getting responses, a prize was included in the research design. It consisted of a health-spa voucher (FIM 1000) and was given to a randomly-selected respondent. In practice, all the respondents filled in a separate piece of paper included in

50 I.e. an indication of how the two groups differed.
the envelope in order to ensure privacy on the response forms.

The questionnaire was now ready for the main field phase. Judging by the pilot responses, it was assumed that 1000 recipients would be enough to provide the necessary data. Thus, of the remaining 2000 names, every second one was picked, forming a group of 1000. The final four-page questionnaire was sent to all of these addresses. Four weeks later a reminder was sent to 780 of them.

This measurement-development process resulted in a 4-page measurement instrument that provided 260 useable responses.

5.5. Data-analysis Techniques

5.5.1. Basic Properties of the Measurements

Putting the previously-mentioned (section 5.3.) principles of validity and reliability to work means identifying the concepts that can be addressed in the study and those that cannot. In terms of validity, predictive and concurrent validity cannot be addressed because external criteria for their evaluation do not exist. Content validity is for the reader to judge (on the basis of how the measurement instruments have been developed). Convergent and discriminant validity can be addressed to some degree via the statistical procedures. Figure 5.7. shows how the selection is related to other parts of the research design.

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51 This was also due to the fact that the average age of the respondents was 63 years.
52 The response rate in the pilots was 25-28%.
53 See Appendix 2
According to Sekaran (2000, p. 307), data analysis has three objectives: “getting a feel for the data, testing the goodness of the data, and testing the hypotheses developed for research”. By getting a feel for the data she means getting an understanding of its basic distributional properties, which in turn means checking the core descriptive features that include the mean, standard deviation, variance, skewness and kurtosis. These features are checked before the second phase of the data analysis begins, i.e. checking for the goodness of the data. Given the above discussion on reliability and validity, the following statements describe what was done in this study to ensure the goodness of the data.

1. Reliability was estimated via SEM structural coefficients and composite reliability, and as variance extracted calculated by hand\(^{54}\).

2. Convergent validity was evaluated via exploratory factor analysis (EFA) by analysing how clearly the pattern of loadings reflected the separate underlying factors.

3. Discriminant validity was evaluated by analysing the correlations of the items with each other. Low inter-item correlation suggests that the measures are not overlapping and thus have discriminant properties.

The above describes the basic procedures carried out to check the quality of the measurement instruments. However, it does not assess the core issues related to this work, in other words the structural nature of the model and the related hypotheses. For this, other tools are needed.

### 5.5.2. Tools for Assessing the Structural Validity of the Data

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\(^{54}\) As recommended and instructed by Hair et al., 1998.
This study tests a structural model, and thus the core issue related to validity is that of structural validity. Since the structural nature of a model can be assessed using the structural-equations-modelling technique (SEM), this was a natural choice as the core technique.

Hoyle (1995, p. 17) describes the SEM model as: “…a hypothesized pattern of linear relationships among a set of variables”. SEM is a technique (or a collection of techniques) that combines confirmatory factor analysis (CFA) with regression modelling (path modelling). Thus it is also called hybrid modelling (Kline, 1998, p.244). The core advantage of SEM is that it is able simultaneously to provide information on the quality of the measurement and the structural nature of the phenomenon itself (Kline, 1998, p. 244). It is also able to provide information on the hypothesised conceptual relationships, both direct and mediated (Maruyama, 1998, p. 4), and as an extension of several multivariate techniques, it gives the researcher model-related information to the degree that no other multivariate technique can achieve (Hair, Anderson, Tatham and Black, 1998, p. 578). Hair et al. (ibid) describe the reason for the attractiveness of SEM modelling as:

“(1) it (SEM) provides a straightforward method of dealing with multiple relationships simultaneously while providing statistical efficiency, and (2) its ability to assess the relationships comprehensively and provide a transition from exploratory to confirmatory analysis. This transition corresponds to greater efforts in all fields of study toward developing a more systematic and holistic view of problems. Such efforts require the ability to test a series of relationships constituting a large-scale model, a set of fundamental principles, or an entire theory. These are tasks for which structural equation modelling is well suited.”

Thus the technique provides advantages that no other statistical approach in social sciences can match. However, as such, it is also very demanding in that researchers’ decisions have a direct effect on what information can be retrieved from the exercise. Further, as both the measurement setting and the theory have to be clearly defined, thorough testing is demanded of both the theoretical basis and the measurement instruments themselves. Given that the researcher cannot escape from poor model specifications or poor measurement, this is also the most rigid test one can conduct in
building a model. Kline (1998, p. 273) lists on the potential pitfalls of SEM exercises as follows:

1. Specifying a model post-hoc.
2. Omitted causes.
3. Too few indicators for each latent variable.
4. Using psychometrically inadequate measures.
5. Failing to recognize the directionality of the dependencies correctly.
6. Specifying feedback loops in the models.
7. Over-fitting the model or specifying indicators to load on more than one factor.
8. Adding disturbance or error correlations without good reason.
9. Not checking the data when it is put into the computer.
10. Ignoring the data-loss pattern.
11. Failing to examine distributional characteristics.
12. Not screening for outliers.
13. Assuming linearity without checking.
14. Re-specifying a model based on statistical criteria.
15. Failing to check the accuracy of one’s programming.
16. Analysing a correlation matrix when it is clearly inappropriate.
17. Analysing variables so highly correlated that the solution is unstable.
18. Estimating a very complex model with a small sample.
19. Setting scales for the latent variables inappropriately.
20. Ignoring the problem of starting values or providing grossly inaccurate ones.
21. When the identification status is uncertain, failing to conduct tests of solution uniqueness.
22. Failing to recognize empirical underidentification.
23. Failing to separately evaluate the structural and measurement parts of the model.
24. Looking only at the fit indexes; failing to see other information.
25. Interpreting a good fit as proving the model’s existence.
26. Interpreting a good fit as implying that endogenous variables are strongly predicted.
27. Relying too much on significance tests.
28. Interpreting the standardised solution in inappropriate ways.
29. Failing to consider equivalent models.
30. Failing to consider alternative models.
31. Reifying factors – believing that constructs presented in the model correspond to real-world factors.
32. Believing that a strong analytical method like SEM compensates for poor study design or slipshot ideas.
33. Failing to reproduce enough information so that readers can reproduce results.
34. Interpreting large direct effects of an SEM model as proof of causality.

Judging from the length of the list, even though it provides certain benefits over alternative techniques, SEM is far from being straightforward. Thus, in order to “ensure that both models (structural and measurement) are correctly specified and the results are valid”, Hair et al. (1998, p. 592) present a seven-stage process for building SEM models:

1. Develop a theoretically based model.
2. Construct a path diagram.
3. Convert the path diagram into a set of structural and measurement models.
4. Choose the input matrix type and estimate the proposed model.
5. Assess the identification of the structural model.
7. Interpret and modify the model.
The following presents these steps modified for the purpose of this research.

* SEM Development, steps 1 - 3

In terms of this research, the theoretical model development was described in Chapters 3 and 4 and the path diagrams were constructed as part of the model building in Chapter 4. Thus the exercise continues from step 3 of Hair et al’s (1998) seven-step process. However, as modern computer programs do the translation of path diagrams to the underlying equations, these equations were acquired from the computer printouts. As far as the measurement model itself is concerned, the following presents a schematic view of a CFA model used for measuring a single latent construct (factor).

![Diagram of CFA model](image)

**Figure 5.8. Measurement of a latent concept**

Figure 5.8 shows a CFA situation in which a latent concept, for instance relationship satisfaction, is measured by its operationalised measurement items. The respondents react to the signal by providing ticks on the questionnaire. All the items used in the measurement comprise the measurement scale. The standard approach is to present the latent concepts as ellipsoids while the observed variables are presented as rectangles (e.g. Kline, 1998; Bollen, 1989). Combining all the construct measurements of an SEM model comprises the measurement model itself. The structural model contains the latent concepts and the paths that link them (Kline (1998, p. 246), Maruyama (1998, p. 184)). Thus, the structural model is the one that is being researched but, as often in social

---

55 The measurement models are discussed in Chapter 7.

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sciences, since the latent concepts cannot be measured directly, one needs the CFA model (or measurement model).

* SEM Development, step 4*

As this exercise aims at developing a latent-variable SEM model of relationship perceptions, the type of input matrix preferred is a covariance matrix (Hair et al., 1998, p. 603), because correlations can only be used for path modelling. For effective modelling, the data is assumed to consist of independent observations, and be random, linear and normal (ibid. p. 601). Further, the estimation of the model is impossible if multicollinearity exists in the exogenous variables or if there are outliers (Kline (1998), Maruyama (1998)). In terms of Hair et al’s. (1998) seven steps, the latter part of step 4 and steps 5 – 7 can only happen via the actual data. Thus these phases are left for the next chapter. The following draws together the discussion on the research design and thus leads into Chapter 6 and the results.

**5.6. Analysis Design**

<table>
<thead>
<tr>
<th>Analytic purpose of the study</th>
<th>Sampling design</th>
<th>Measures &amp; Measurement</th>
<th>Data-analysis techniques</th>
<th>Analysis Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model testing</td>
<td>Data requirements of a test</td>
<td>Original measures</td>
<td>EFA</td>
<td>Reliability</td>
</tr>
<tr>
<td>Causal modelling</td>
<td>Data requirements of the pilots</td>
<td>Measurement Development</td>
<td>CFA</td>
<td>Estimation</td>
</tr>
<tr>
<td></td>
<td>Method used</td>
<td>Scale properties</td>
<td>SEM</td>
<td>Evaluation</td>
</tr>
</tbody>
</table>

Figure 5.9. Analysis Design in the context of Chapter 5

On the basis of the above discussion of the analytical purpose of the study (Section 5.1.), the sampling design (section 5.2.), the measurement issues (section 5.3.) and the data-analysis techniques used (section 5.4.), the following structure was designed.
A. Model Development

The above five steps are a modification of Hair et al’s. (1998) steps 4-7. The following describes how the analysis was carried out.

1. The basic properties of the data were first checked for normality, outliers, the unidimensionality of the scales and the structure of the exogenous concepts.
2. The items measuring the exogenous concepts were then subjected to EFA in order to establish the success of the measurement itself, as described in section 5.4.1. The data was also checked for multicollinearity.
3. The same was done for the outcome concepts.
4. The data was split randomly into two equal-sized sub-samples (n=130).
5. An SEM model was estimated from the first sub-sample.
6. This was followed by an evaluation of the model.
7. The model was then modified (as necessary) and re-estimated. The first phase of model development ended with an evaluation of the final SEM model with a view to submitting it to the Phase B test.

B. Model Test
Phase B followed the process depicted above (Fig. 5.11.). No model modifications were made. The idea here was to test whether the model developed in phase A was generalisable to sample B. Thus this phase proceeded as follows.

1. The items measuring exogenous concepts were subjected to CFA in order to establish the success of the measurement itself (see section 5.4.1.).

2. The same was done for the outcome concepts.

3. The SEM model was then estimated and evaluated.

4. A rival model was estimated and compared with model B.

5. The section concludes with a discussion of the hypotheses.

This concludes the discussion of the research design. The following chapter presents the results via the process described in this chapter.
6 Results

6.1. Overview

Figure 6.1. shows how this chapter is linked with the other chapters. The presentation of the results follows the order described in Chapter 5 on research design. This is reflected in the lower part of the figure.

Figure 6.1. The contents of Chapter 6, including part A of the model testing.
6.2. Goodness of Measurements

This chapter proceeds by first checking the convergent and discriminant validities of the exogenous and outcome concepts. Some comments on the issue of multicollinearity are also made. The data is then split into two equal-sized (n=130) sub-samples. The first subsample is used to develop the SEM model, and the second to test it.

### 6.2.1. The Basic Properties of the Data

In viewing the data the first thing is to get to know it. This is especially important in SEM modelling where the properties of the data are critical to the success of the exercise (Section 5.4.2). Table 6.A. gives this information.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>S.D.</th>
<th>Var.</th>
<th>Kurtos.</th>
<th>Skew</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investments 1</td>
<td>3.59</td>
<td>1.64</td>
<td>2.71</td>
<td>-1.21</td>
<td>0.10</td>
</tr>
<tr>
<td>Investments 2</td>
<td>3.34</td>
<td>1.71</td>
<td>2.92</td>
<td>-1.21</td>
<td>0.22</td>
</tr>
<tr>
<td>Cost 1</td>
<td>4.24</td>
<td>1.07</td>
<td>1.16</td>
<td>1.71</td>
<td>-1.51</td>
</tr>
<tr>
<td>Cost 2</td>
<td>3.71</td>
<td>1.24</td>
<td>1.56</td>
<td>-0.47</td>
<td>-0.72</td>
</tr>
<tr>
<td>Rewards1</td>
<td>3.02</td>
<td>1.43</td>
<td>2.06</td>
<td>-0.66</td>
<td>0.48</td>
</tr>
<tr>
<td>Rewards 2</td>
<td>2.92</td>
<td>1.39</td>
<td>1.93</td>
<td>-0.50</td>
<td>0.52</td>
</tr>
<tr>
<td>Economic Perf 1</td>
<td>3.22</td>
<td>1.33</td>
<td>1.77</td>
<td>-0.54</td>
<td>0.30</td>
</tr>
<tr>
<td>Economic Perf 2</td>
<td>3.33</td>
<td>1.39</td>
<td>1.95</td>
<td>-0.66</td>
<td>0.12</td>
</tr>
<tr>
<td>Economic Perf 3</td>
<td>2.88</td>
<td>1.39</td>
<td>1.93</td>
<td>-0.55</td>
<td>0.41</td>
</tr>
<tr>
<td>Security1</td>
<td>4.42</td>
<td>1.46</td>
<td>2.15</td>
<td>-0.23</td>
<td>-0.83</td>
</tr>
<tr>
<td>Security 2</td>
<td>4.87</td>
<td>1.27</td>
<td>1.62</td>
<td>1.15</td>
<td>-1.28</td>
</tr>
<tr>
<td>Co-operation 1</td>
<td>2.31</td>
<td>1.12</td>
<td>1.27</td>
<td>-0.12</td>
<td>0.72</td>
</tr>
<tr>
<td>Co-operation 2</td>
<td>2.35</td>
<td>1.10</td>
<td>1.21</td>
<td>-0.13</td>
<td>0.64</td>
</tr>
<tr>
<td>Propensity to leave</td>
<td>2.58</td>
<td>0.64</td>
<td>0.41</td>
<td>0.46</td>
<td>0.24</td>
</tr>
<tr>
<td>Acquiescence</td>
<td>3.01</td>
<td>1.62</td>
<td>2.62</td>
<td>2.51</td>
<td>1.02</td>
</tr>
<tr>
<td>Alternatives</td>
<td>3.13</td>
<td>1.36</td>
<td>1.86</td>
<td>-1.18</td>
<td>-0.30</td>
</tr>
<tr>
<td>Constructiveness 1</td>
<td>2.36</td>
<td>1.08</td>
<td>1.17</td>
<td>-0.33</td>
<td>0.44</td>
</tr>
<tr>
<td>Constructiveness 2</td>
<td>2.76</td>
<td>1.18</td>
<td>1.41</td>
<td>-0.68</td>
<td>0.25</td>
</tr>
</tbody>
</table>
As the table shows the means are almost within a one-point distance of the scale centre, with the exception of the measures of security. All of the measures except Propensity to Leave show low scores on variance, while in terms of kurtosis and skewness, the basic impression is that the data is negatively skewed (flat distributions) and some items have high values. Thus, the data was normalised using the SPSS normalisation tool (Blom). This procedure also has the advantage of dealing with outliers (Kline, 1998, p. 83).

Given that losing the original measurement scale was not an issue here, the transformation does not affect the interpretability of the results.

### 6.2.2. Convergent and Discriminant Validity

Convergent validity refers to how well different attempts to measure the same concept are in agreement (Section 5.3), for instance if the scale items are in agreement when loaded on the same latent dimension. R-type factor analysis is a technique that searches for common variation in a group of variables (Hair et al., 1998, p. 90), thus it was used to test convergent validity. The technique of Principal Axis Factoring (PAF) with oblique rotation was considered particularly appropriate because it is the same factoring algorithm that is used in SEM CFA modules. Further, oblique rotation was chosen because oblique structures are realistic, and the relationships between the independent variables would vanish if an orthogonal structure were used (Maruyama, 1998, p. 137).

Table 6.B. shows the factor structure of the exogenous items and the related communalities.

<table>
<thead>
<tr>
<th></th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
<th>F5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Communalities</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investment 1</td>
<td>-0.7</td>
<td></td>
<td></td>
<td>.6</td>
<td></td>
</tr>
<tr>
<td>Cost 1</td>
<td>0.82</td>
<td>.71</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rewards 1</td>
<td>0.85</td>
<td>.88</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Econ. Perf.1</td>
<td>0.66</td>
<td></td>
<td>.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investment 2</td>
<td>-0.79</td>
<td></td>
<td>.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost 2</td>
<td>0.46</td>
<td>.36</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rewards 2</td>
<td>0.6</td>
<td>.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Econ. Perf.2</td>
<td>0.9</td>
<td>.85</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Econ. Perf.3</td>
<td>0.77</td>
<td></td>
<td>.66</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alternatives</td>
<td>0.74</td>
<td></td>
<td>.58</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N=260, $r^2 = 0.67$
As the table shows, the items load on separate and appropriate factors. Thus, it could be assumed that some common factors exist behind the individual scale items. The cut-off point used in the analysis was 0.3, and thus the previous table provides support for the notion that convergent validity exists. The search for discriminant validity of the concepts is shown in Table 6.C. below.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Investment 1</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Investment 2</td>
<td>.5884**</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Cost 1</td>
<td>-.2843**</td>
<td>-.3753**</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Cost 2</td>
<td>-.2311**</td>
<td>-.2083**</td>
<td>.4649**</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Rewards 1</td>
<td>.4757**</td>
<td>.4406**</td>
<td>-.4368**</td>
<td>-.4147**</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Rewards 2</td>
<td>.4407**</td>
<td>.4470**</td>
<td>-.4623**</td>
<td>-.4203**</td>
<td>.8210**</td>
<td>1.0000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Econ..Perf. 1</td>
<td>.4172**</td>
<td>.3857**</td>
<td>-.2841**</td>
<td>-.3315**</td>
<td>.5968**</td>
<td>.6177**</td>
<td>1.0000</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Econ..Perf. 2</td>
<td>.4480**</td>
<td>.4239**</td>
<td>-.3316**</td>
<td>-.3069**</td>
<td>.6483**</td>
<td>.7143**</td>
<td>.7053**</td>
<td>1.0000</td>
</tr>
<tr>
<td>9</td>
<td>Econ..Perf. 3</td>
<td>.3940**</td>
<td>.4097**</td>
<td>-.3929**</td>
<td>-.3274**</td>
<td>.5829**</td>
<td>.6142**</td>
<td>.6109**</td>
<td>.7155**</td>
</tr>
<tr>
<td>10</td>
<td>Alternatives</td>
<td>.3174**</td>
<td>.1781**</td>
<td>-.1923**</td>
<td>-.0014</td>
<td>.2485**</td>
<td>.1745**</td>
<td>.1938**</td>
<td>.1297*</td>
</tr>
</tbody>
</table>

Table 6.C. Pearson correlation coefficients (two-tailed) of the exogenous items\(^56\).

Even though most of the relationships are below 0.5, the table shows some substantial relationships, namely between items of economic performance and relationship rewards. The rest of the item-correlation levels are also higher than one might expect. Thus there could be some problems with discriminant validity – especially with the concept of rewards and economic benefits. However, the previous PAF exercise undermines these findings\(^57\).

What is also worth noting in the context of the above correlation table is that multicollinearity is a phenomenon where some of the predictor variables are so highly related that they seem to represent the same latent factor. One indication of possible multicollinearity is exceptionally high correlations. Kline mentions correlations of above

\(^{56}\) Only the inter-scale high figures are given in bold.
0.9 as suggestive of possible redundancy (Kline, 1998, p. 77). In SEM, multicollinearity in the exogenous variables is problematic as it can result in the model being empirically under-identified (Kline, 1998, p. 146). A possible solution to the problem might be to remove the problematic variables, but this would distort the model from the theoretical version of it. However, judging from the correlations shown above, there is a possibility of multicollinearity, and this needs to be considered as the exercise proceeds.

The above discussion of the exogenous concepts suggests that convergent validity is likely to exist, but that discriminant validity is somewhat problematic in the items covering relationship rewards and perceived economic benefits.

Table 6.D. below presents the convergent and discriminant validity analyses of the outcome variables. As can be seen a 4-dimensional solution was computed. This was done because the SPSS showed the 5-dimensional solution to be unstable.

<table>
<thead>
<tr>
<th></th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Communalities</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Co-operation 1</td>
<td>0.58</td>
<td></td>
<td>0.31</td>
<td>0.76</td>
</tr>
<tr>
<td>Co-operation 2</td>
<td>0.95</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Security 1</td>
<td>0.54</td>
<td></td>
<td>0.24</td>
<td></td>
</tr>
<tr>
<td>Security 2</td>
<td>0.94</td>
<td></td>
<td>0.95</td>
<td></td>
</tr>
<tr>
<td>Constructiv.1</td>
<td>0.4</td>
<td></td>
<td>0.85</td>
<td></td>
</tr>
<tr>
<td>Constructiv.2</td>
<td>0.79</td>
<td></td>
<td>0.6</td>
<td></td>
</tr>
<tr>
<td>Aquiescence</td>
<td>0.35</td>
<td></td>
<td>0.59</td>
<td></td>
</tr>
<tr>
<td>Propen. To Leave</td>
<td>0.9</td>
<td>0.58</td>
<td></td>
<td>0.34</td>
</tr>
</tbody>
</table>

(n=260, r^2 = 0.62)

Table 6.D. The pattern matrix of the outcome variables

The 4-dimensional structure is clear. The items load on the common dimensions and the only confounding elements are the single-item indicators in factor 4. Thus, the PAF analysis again provides support for the existence of convergent validity. Table 6.E. below shows the correlations of the outcomes as a tool in the search for discriminant validity.

57 If a substantial relationship existed, it would also show as an unclear factor structure.
As the table indicates, no scale items are correlated with any another scale above the level of 0.62, which is the figure arrived at between the items Acquiescence and Co-operation 1. Further, Acquiescence seems to be the only concept with high cross-loadings as such. The only exception to this is the relationship between Co-operation 1 and Security 1. However, in general, none of the associations suggests multicollinearity (0.9).

Thus, in concluding the discussion on outcomes, again it could be said that PAF seems to provide support for both convergent and discriminant validity, but that the correlations take away some of the discriminant validity. The following section deals with SEM model development. From here on the models concern the split samples of 130 observations.

---

Only inter-scale high figures are in bold.
6.3. Part A - Model Development

6.3.1. Measurement Models – Fit and Reliability

Figure 6.3. CFA as a phase in the model development

Figure 6.3. above shows where CFA fits in the development of the model. The measurement models of the exogenous items and the outcomes are viewed separately, and then the items are averaged for the second phase of the SEM exercise – model estimation. Thus the model itself is a reduction of the whole second-order structure. This choice was made due to the possible identification problems that might otherwise arise from trying to estimate a complex model (with 10 first-order factors, and two second-order factors) with only 18 indicators. Figure 6.4. below presents the measurement model of the exogenous constructs of the first sub-sample (sample A).
Figure 6.4. Measurement model of the exogenous concepts – sample 1 (n=130)

According to Hair, Anderson, Tatham and Black’s (1998) seven-step process for evaluating structural models (Section 5.4.2.), after screening for offending estimates, the first step is to concentrate on evaluating the overall fit of the model. Then one should proceed to the fit of the measurement model and finally to the structural model (ibid, p. 621). No offending estimates were found, and Table 6.F. below gives the overall fit information of the CFA model.

---

59 Negative error variances, non-significant error variances, standardised coefficients above 1, large
The first impression is that the model has an acceptable fit. Only the AGFI values and the chi-square probability level are on the borderline. Even the chi-square statistic, if transformed into chi/df, provides an acceptable fit (1.76). Thus the model has a fit that warrants proceeding to the next phase of the evaluation – in other words the measurement-model fit.

Of measurement-model fit, Hair et al. (1998, p. 623) state that “…the constructs can be evaluated separately by (1) examining the indicator loadings for statistical significance and (2) assessing…reliability”. As all but the single indicant loading are significant, the model is given support from the CFA analysis. As far as reliability was concerned, the construct loadings (composite reliability and variance extracted) were computed as recommended by Hair et al. (1998, p. 624), which yielded the following figures:

<table>
<thead>
<tr>
<th>Goodness-of-fit Statistics:</th>
<th>Good fit if:</th>
</tr>
</thead>
<tbody>
<tr>
<td>DF</td>
<td>26</td>
</tr>
<tr>
<td>Chi-Square</td>
<td>43.80 (p=0.016)</td>
</tr>
<tr>
<td>RMSEA</td>
<td>0.073</td>
</tr>
<tr>
<td>RMR</td>
<td>0.037</td>
</tr>
<tr>
<td>GFI</td>
<td>0.94</td>
</tr>
<tr>
<td>AGFI</td>
<td>0.87</td>
</tr>
<tr>
<td>PGFI</td>
<td>0.44</td>
</tr>
<tr>
<td>NFI</td>
<td>0.92</td>
</tr>
<tr>
<td>NNFI</td>
<td>0.93</td>
</tr>
<tr>
<td>PNFI</td>
<td>0.53</td>
</tr>
<tr>
<td>CFI</td>
<td>0.96</td>
</tr>
</tbody>
</table>

Table 6.F. Fit information of the CFA model of exogenous variables

---

standard errors (Hair et al., 1998, p. 610).

According to Maruyama (1998, p. 239), the indexes can be divided into absolute indexes, relative indexes and adjusted indexes. Absolute indexes show if there is still a significant amount of residual variance unexplained after the model fitting. Here, the absolute indexes are chi-square, rmr and GFI. Relative indexes explain how this model performs when compared to the alternatives. These indexes set a baseline for worst-fitting models (i.e. zero value). In this study, the NFI index is such a model. Adjusted indexes combine model fit with parsimony. The higher values indicate parsimony.


“favourable if less than 3” (Kline, 1998, p. 131). Recommended level if between 1 and 2 (Hair et al., p. 623)
Table 6.G. above presents a picture in which the reliability estimates are acceptable. The only figure falling below 0.5 is the Variance Extracted (VE) figure of costs. However, even the composite-reliability (CR) figure is above 0.5. Thus the measurement gets support from the reliability figures. A presentation of the outcome CFA model follows.

A similar logic was followed with regard to the outcomes. Figure 6.5. below presents the measurement model.

---

**Table 6.G. Reliabilities of the Exogenous model**

<table>
<thead>
<tr>
<th></th>
<th>CR(^{63})</th>
<th>VE(^{64})</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rewards</td>
<td>0.86</td>
<td>0.80</td>
</tr>
<tr>
<td>Economic Performance</td>
<td>0.84</td>
<td>0.64</td>
</tr>
<tr>
<td>Cost</td>
<td>0.60</td>
<td>0.43</td>
</tr>
<tr>
<td>Investments</td>
<td>0.72</td>
<td>0.56</td>
</tr>
</tbody>
</table>

---

\(^{63}\) Composite Reliability – should be over 0.5 (Hair et al. 1998, p. 612).

\(^{64}\) Variance Extracted – should be over 0.5 (Hair et al. 1998, p. 612).
As can be seen, the loadings of the single indicant items were set at 0.8, and the error variances of the indicators of these two single indicant concepts were set at 1. As the error variance of Constructiveness 2 turned negative, its value was set very close to zero\textsuperscript{65}. Table 6.H. below gives the models-fit information.

<table>
<thead>
<tr>
<th>Goodness-of-fit Statistics:</th>
<th>Good fit if:</th>
</tr>
</thead>
<tbody>
<tr>
<td>DF</td>
<td>13</td>
</tr>
<tr>
<td>Chi-Square</td>
<td>17.45 (p=0.18)</td>
</tr>
<tr>
<td>RMSEA</td>
<td>0.048</td>
</tr>
<tr>
<td>RMR</td>
<td>0.026</td>
</tr>
<tr>
<td>GFI</td>
<td>0.97</td>
</tr>
<tr>
<td>AGFI</td>
<td>0.91</td>
</tr>
<tr>
<td>PGFI</td>
<td>0.35</td>
</tr>
<tr>
<td>NFI</td>
<td>0.97</td>
</tr>
<tr>
<td>NNFI</td>
<td>0.98</td>
</tr>
<tr>
<td>PNFI</td>
<td>0.45</td>
</tr>
<tr>
<td>CFI</td>
<td>0.99</td>
</tr>
</tbody>
</table>

Table 6.H. Endogenous measurement model fit information (model A)

The table shows a good fit. No indexes are below the recommended levels for acceptance. Table 6.7. below shows the reliabilities of the two constructs that could be evaluated\textsuperscript{66}.

<table>
<thead>
<tr>
<th></th>
<th>CR</th>
<th>VE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-operation</td>
<td>0.94</td>
<td>0.87</td>
</tr>
<tr>
<td>Security</td>
<td>0.84</td>
<td>0.73</td>
</tr>
</tbody>
</table>

Table 6.I. Reliabilities of the outcome model.

The reliabilities of the two constructs are well above the acceptance limit, which seems to suggest suitable reliability. The next stage is to estimate the first structural model.

\textsuperscript{65} This is a suggestion given for treating such Heywood cases (Hair and Al, 1998, p. 610). Here the problem is probably due to the identification problems caused by two single indicant latent variables.

\textsuperscript{66} As the error variance of Constructiveness 2 was fixed at 0.005.
6.3.2. Estimating and Modifying the SEM Model

As already mentioned (Section 5.5), following the discussion on convergent and discriminant validity, the data was split randomly into two equal-sized sub-samples. The multiple-item scales were then averaged to form a setting in which there were 10 indicators for 2 latent variables. Figure 6.6. below shows the current phase of empirical testing.

Figure 6.6. The core of the model-development phase

Continuing from Chapter 5 (section 5.4.), what is left of the 7-stage process of testing structural models are the estimation, evaluation and modification (if necessary) phases. Figure 6.6. below presents the estimated model.

Figure 6.6. The Estimated Model of Relationship Perceptions
In the estimation, the first version gave a negative error variance for Calculative Commitment (calc). Given the increased level of correlation between the concepts of Rewards (Pal) and Economic Performance (Eperf), the errors of these variables were also allowed to correlate. Thus the above model already shows these modifications. Table 6.J. below gives the goodness-of-fit information

<table>
<thead>
<tr>
<th>Goodness of Fit Statistics:</th>
<th>Good fit if:</th>
</tr>
</thead>
<tbody>
<tr>
<td>DF</td>
<td>22</td>
</tr>
<tr>
<td>Chi-Square</td>
<td>38.34 (p=0.017)</td>
</tr>
<tr>
<td>RMSEA</td>
<td>0.076</td>
</tr>
<tr>
<td>RMR</td>
<td>0.035</td>
</tr>
<tr>
<td>GFI</td>
<td>0.94</td>
</tr>
<tr>
<td>AGFI</td>
<td>0.86</td>
</tr>
<tr>
<td>PGFI</td>
<td>0.38</td>
</tr>
<tr>
<td>NFI</td>
<td>0.93</td>
</tr>
<tr>
<td>NNFI</td>
<td>0.93</td>
</tr>
<tr>
<td>PNFI</td>
<td>0.46</td>
</tr>
<tr>
<td>CFI</td>
<td>0.97</td>
</tr>
</tbody>
</table>

Table 6.J. Goodness-of-fit information

As can be seen, the model is acceptable. None of the values is critically low, and even the chi/df figure is 1.74 and thus acceptable (see footnote 7). The core question is thus whether the structural form of the model is sound. The first impression is that the coefficients are as proposed in Section 4.7. of Chapter 4. However, there are three effects that are apparently either weak or not identified, namely the paths from Alternatives (NVAIHT) to Calculative Commitment (calc), Emotional Commitment (emo) to Co-operation (COOP), and the non-significant path from Calculative Commitment (calc) to Acquiescence (NPOWER_1). In considering possible model modifications, theory should always prevail over empirical modification. However, in this case, the nature of the data might point the way towards simplifying the model. Here again, minimalism should be the rule. As a starting point, the possibility of removing Acquiescence is what first comes to mind (due to the unidentified path). Given that the empirical setting of this research is infrequently-happening episodes in the raw-wood trade, it might be plausible to assume that the non-identified path is real. Thus, from a theoretical perspective, it might be possible, or even likely, that the concept of
Acquiescence\textsuperscript{67} does not fit a relationship with relatively rare personal contacts, and it thus might not be relevant to the respondents. Consequently, a trial was run excluding this concept, and the new model is shown in Figure 6.7.

![Figure 6.7. The modified\textsuperscript{68} model of relationship perceptions](image_url)

Table 6.K. shows the Model fit information.

<table>
<thead>
<tr>
<th>Goodness-of-fit Statistics:</th>
<th>Good fit if:</th>
<th>Unmodified model</th>
</tr>
</thead>
<tbody>
<tr>
<td>DF</td>
<td>14</td>
<td>22</td>
</tr>
<tr>
<td>Chi-Square (p=0.21)</td>
<td>17.86</td>
<td>38.34</td>
</tr>
<tr>
<td>(p=0.017)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RMSEA</td>
<td>0.045</td>
<td>0.076</td>
</tr>
<tr>
<td>RMR</td>
<td>0.017</td>
<td>0.035</td>
</tr>
<tr>
<td>GFI</td>
<td>0.97</td>
<td>0.94</td>
</tr>
<tr>
<td>AGFI</td>
<td>0.90</td>
<td>0.86</td>
</tr>
<tr>
<td>PGFI</td>
<td>0.30</td>
<td>0.38</td>
</tr>
<tr>
<td>NFI</td>
<td>0.97</td>
<td>0.93</td>
</tr>
<tr>
<td>NNFI</td>
<td>0.98</td>
<td>0.93</td>
</tr>
<tr>
<td>PNFI</td>
<td>0.38</td>
<td>0.46</td>
</tr>
<tr>
<td>CFI</td>
<td>0.99</td>
<td>0.97</td>
</tr>
</tbody>
</table>

\textsuperscript{67} Measured via how well the respondents would accept a policy change from the lumber-procuring organisation.

\textsuperscript{68} The model was modified even further by removing the multicollinear element of EPERF. The results of this exercise are presented in Appendix 7.3. However, this phase is not reported as the cognitive structure of the exogenous structure grows so thin in this modification.
The model does not seem to differ significantly from the just-identified version (chi-square p-value is 0.21). Further, the NFI, NNFI and CFI indexes suggest that the model is significantly better that the null model. As RMR indicates, the average residuals are close to zero. When the model fit is compared to that in the earlier model, the indexes are higher, and only the level of parsimony is slightly reduced. However, here one has to be careful since the model structures are different. Thus, only RMSEA could provide information on the difference in fit (Maruyama, 1998, p. 246) although RMSEA is more significant in the modified than in the original model. Thus, the data provides support for the notion that the trimmed model is better. The next section tests how the modified model would fit the unused sub-sample (sample B, n=130) of the original data (n=260).

6.4. Part B - Model Testing

6.4.1. Measurement Models – Fit and Reliability

This phase proceeded in the same order as the previous phase but no model modifications were attempted. Figures 6.9. and 6.10. show the measurement models of the exogenous and outcome variables. The model itself is then estimated and evaluated, and a competing model drawn from the theory is estimated. The chapter ends with an evaluation of the hypothesis.
Figure 6.9. shows the CFA model of the model-B exogenous measurements.

Figure 6.9. The measurement model of the model-B exogenous constructs

As with the Model A, here, too, the single indicant loading of Alternatives was fixed at 0.8, with the error variance fixed at 1. Further, the Reward 1 (REW1) and Economic Performance 1 (EPER1) errors were allowed to correlate, thus reflecting the correlated measurements. Table 6.L. shows the goodness-of-fit.

<table>
<thead>
<tr>
<th>Goodness of Fit Statistics:</th>
<th>Good fit if:</th>
</tr>
</thead>
<tbody>
<tr>
<td>DF</td>
<td>25</td>
</tr>
<tr>
<td>Chi-Square</td>
<td>61.79 (p=0.00)</td>
</tr>
<tr>
<td>RMSEA</td>
<td>0.11</td>
</tr>
<tr>
<td>RMR</td>
<td>0.030</td>
</tr>
<tr>
<td>GFI</td>
<td>0.91</td>
</tr>
<tr>
<td>AGFI</td>
<td>0.81</td>
</tr>
<tr>
<td>PGFI</td>
<td>0.41</td>
</tr>
<tr>
<td>NFI</td>
<td>0.92</td>
</tr>
<tr>
<td>NNFI</td>
<td>0.91</td>
</tr>
<tr>
<td>PNFI</td>
<td>0.51</td>
</tr>
</tbody>
</table>
Table 6.L. CFA of exogenous goodness-of-fit (sample B) information

As the table indicates, the model only shows a tentative level of acceptance. The chi/df figure is 2.47 which, according to Klein (1998, p. 131), is within the limits of being acceptable. However, Hair et al. (1998) seem to disagree on this, and set the limit of chi/df at a maximum of 2. Further, the chi-square indexes, RMSEA and AGFI, do not provide support for the model at the 0.05 level. However, as the other indexes seem to indicate significance, it could be concluded that there is some support. Table 6.M. gives the reliabilities of the model indicators.

<table>
<thead>
<tr>
<th></th>
<th>CR</th>
<th>VE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rewards</td>
<td>0.92</td>
<td>0.85</td>
</tr>
<tr>
<td>Economic Performance</td>
<td>0.89</td>
<td>0.73</td>
</tr>
<tr>
<td>Cost</td>
<td>0.67</td>
<td>0.51</td>
</tr>
<tr>
<td>Investments</td>
<td>0.77</td>
<td>0.62</td>
</tr>
</tbody>
</table>

Table 6.M. The reliability of the measurements

The table shows that all the reliabilities that can be computed are above the 0.5 level of acceptance. Thus, even though the model is only partly supported, the reliabilities seem to be good. The next step was to construct a the CFA model of the outcomes.

As the error variance of Constructiveness 2 (CON2) turned Heywood (negative), the figure was fixed using the Model A CON2 error variance as an estimate (0.15). The resulting model is depicted in Figure 6.10. The loading of the single-item indicator was fixed at 0.8 to indicate a reliability figure of 0.64, while the error variance was also fixed at 1.
Table 6.N.below shows the goodness-of-fit of the model.

<table>
<thead>
<tr>
<th>Goodness-of-fit Statistics:</th>
<th>Good fit if:</th>
</tr>
</thead>
<tbody>
<tr>
<td>DF</td>
<td>10</td>
</tr>
<tr>
<td>Chi-Square</td>
<td>13.67 (p=0.19)</td>
</tr>
<tr>
<td>RMSEA</td>
<td>0.051</td>
</tr>
<tr>
<td>RMR</td>
<td>0.025</td>
</tr>
<tr>
<td>GFI</td>
<td>0.97</td>
</tr>
<tr>
<td>AGFI</td>
<td>0.92</td>
</tr>
<tr>
<td>PGFI</td>
<td>0.35</td>
</tr>
<tr>
<td>NFI</td>
<td>0.97</td>
</tr>
<tr>
<td>NNFI</td>
<td>0.98</td>
</tr>
<tr>
<td>PNFI</td>
<td>0.46</td>
</tr>
<tr>
<td>CFI</td>
<td>0.99</td>
</tr>
</tbody>
</table>

Table 6.N. Goodness-of-fit of the CFA model of model-B outcomes.

The table indicates a good fit, although the problems associated with the error variances have to be taken into account. Some problems arose with the associated discriminant validity, and also because there were only a few indicators. I am being paid back for my
over-zealous shortening of the measurement instrument. Still, however, as the model-fit information is consistent across the models, the solution seems to be supported and relatively stable. Table 6.O. shows the reliability figures of the model-B outcome concepts.

Table 6.O. The reliability of the model-B outcomes

<table>
<thead>
<tr>
<th></th>
<th>CR&lt;sup&gt;69&lt;/sup&gt;</th>
<th>VE&lt;sup&gt;70&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-operation</td>
<td>0.93</td>
<td>0.87</td>
</tr>
<tr>
<td>Security</td>
<td>0.83</td>
<td>0.71</td>
</tr>
</tbody>
</table>

The table paints a similar picture to the model-A outcome reliabilities, and the measurement of the outcomes is apparently stable. The following section concerns the structural model.

6.4.2. Estimating the SEM Model

Figure 6.11. shows the same model structure as the modified phase-A model, but for sample B.

Figure 6.11. Model B – modified from Sample A and estimated in Sample B.

---

<sup>69</sup> Composite reliability – it should be over 0.5 (Hair et al., 1998, p. 612).

<sup>70</sup> Variance Extracted – it should be over 0.5 (Hair et al., 1998, p. 612).
Table 6.P. shows the goodness-of-fit of the model, and of the modified sample-A model for comparison.

<table>
<thead>
<tr>
<th>Goodness-of-fit Statistics(^{71}):</th>
<th>Good fit(^{72}) if:</th>
<th>Sample A</th>
</tr>
</thead>
<tbody>
<tr>
<td>DF</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Chi-Square</td>
<td>14.75 (p=0.40)</td>
<td>p&gt;0.05</td>
</tr>
<tr>
<td>RMSEA</td>
<td>0.001</td>
<td>value &lt;0.08</td>
</tr>
<tr>
<td>RMR</td>
<td>0.021</td>
<td>value small</td>
</tr>
<tr>
<td>GFI</td>
<td>0.98</td>
<td>value&gt;0.9</td>
</tr>
<tr>
<td>AGFI</td>
<td>0.93</td>
<td>value&gt;0.9</td>
</tr>
<tr>
<td>PGFI</td>
<td>0.30</td>
<td>n.a.</td>
</tr>
<tr>
<td>NFI</td>
<td>0.97</td>
<td>value&gt;0.9</td>
</tr>
<tr>
<td>NNFI</td>
<td>1.00</td>
<td>value&gt;0.9</td>
</tr>
<tr>
<td>PNFI</td>
<td>0.38</td>
<td>n.a.</td>
</tr>
<tr>
<td>CFI</td>
<td>1.00</td>
<td>value&gt;0.9</td>
</tr>
</tbody>
</table>

Table 6.P. Goodness-of-fit information

The goodness-of-fit is very similar to that in the sample-A model, which provides some indication that the model might be generalisable to the population as a whole. The individual indexes themselves seem to show slightly higher values throughout for model B. The above over-identified model is very close to the just-identified model, and as the p-value suggests, the difference in fit of these two models is not statistically significant. Thus, the model is supported from this perspective.

**6.4.3. The Rival Model**

![Diagram](https://via.placeholder.com/150)

Figure 6.11. Creating a rival model as a phase in the model testing.

\(^{71}\) According to Maruyama (1998, p. 239), the indexes can be divided into absolute indexes, relative indexes and adjusted indexes. Absolute indexes show if there is still a significant amount of residual variance unexplained after the model fitting. Here, the absolute indexes are chi-square, rmm and GFI. Relative indexes explain how this model performs when compared to the alternatives. These indexes set a baseline for worst-fitting models (i.e. zero value). In this study, the NFI index is such. Adjusted indexes combine model fit with parsimony. The higher values indicate parsimony.
Since the above models seemed to have an acceptable level of fit, the last evaluation test was to set up a competing model, as suggested by Hair et al. (1998, p. 591) and Maruyama (1998, p. 247). This strategy was adopted because “The strongest test of a proposed model is to identify and test competing models that represent truly different hypothetical structural relationships” (Hair et al., 1998, p. 591). The setting may be theory-driven in that the alternative view is selected from theory-based argumentation, or an equivalent-model strategy may be adopted, according to which the paths of the original model have a different configuration (Hair et al., 1998, p. 591; Maruyama, 1998, p. 248; Kline, 1998, p. 131). In line with the argument presented above, it was natural to select the uni-dimensional view formulated in Rusbult’s (1980, 1983) investment model of relationship commitment, according to which the concept of commitment is presented as being only one-dimensional, and all the model-A and –B antecedents and outcomes are mediated by a single latent variable. Figure 6.12. shows the estimated uni-dimensional view of relationship commitment.

Figure 6.12. The rival model estimated from sample-B data but with a uni-dimensional commitment construct.

Table 6.Q. gives the goodness-of-fit information.

<table>
<thead>
<tr>
<th>Goodness-of-fit Statistics:</th>
<th>Good fit if:</th>
<th>Sample A</th>
</tr>
</thead>
<tbody>
<tr>
<td>DF</td>
<td>17</td>
<td>14</td>
</tr>
<tr>
<td>Chi-Square</td>
<td>25.08 (p=0.0093)</td>
<td>p&gt;0.05</td>
</tr>
<tr>
<td>RMSEA</td>
<td>0.061</td>
<td>value &lt;0.08</td>
</tr>
<tr>
<td>RMR</td>
<td>0.026</td>
<td>value small</td>
</tr>
<tr>
<td>GFI</td>
<td>0.96</td>
<td>value &gt;0.9</td>
</tr>
<tr>
<td>AGFI</td>
<td>0.89</td>
<td>value &gt;0.9</td>
</tr>
<tr>
<td>PGFI</td>
<td>0.36</td>
<td>n.a.</td>
</tr>
<tr>
<td>NFI</td>
<td>0.95</td>
<td>value &gt;0.9</td>
</tr>
<tr>
<td>NNFI</td>
<td>0.95</td>
<td>value &gt;0.9</td>
</tr>
<tr>
<td>PNFI</td>
<td>0.45</td>
<td>n.a.</td>
</tr>
<tr>
<td>CFI</td>
<td>0.98</td>
<td>value &gt;0.9</td>
</tr>
</tbody>
</table>

Table 6.Q. A comparison of the goodness-of-fit information in the rival model and model B.

The table shows the rival model as acceptable in terms of goodness of fit, but not as good as the model with two mediators. The more simple structure of the rival model increases the indexes of parsimony, but at the cost of other indexes. Thus the model seems to provide support for the two-layer mediating structure. The following section presents the results of the hypothesis.

### 6.5. Results of the Hypotheses

![Diagram showing the steps: Model from part A → Estimating model A → Evaluating model A → Estimating a rival model → Evaluating the rival → Results & hypothesis evaluation]

Figure 6.12. The results in the context of Chapter 6.

In their discussion of the seven-step process of structural-equation modelling, Hair et al. (1998) suggest that the last phase of evaluating a model involves the structural model itself, in other words, it is done by interpreting the structural coefficients and their significance levels. As this information on the previous models is given in Appendices 3-9 (containing the outputs of the LISREL computations), the only comparison offered here
is with the hypothesis presented in Chapter 4. Table 6.R. below shows the hypothesised relationships, the structural coefficients and the significance levels associated with the path coefficients.

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Coeff.(B)</th>
<th>T-values(^{23}) A</th>
<th>T-values(^{18}) B</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>H(_1)</td>
<td>-</td>
<td>-0.80</td>
<td>-5.16</td>
<td>-4.43</td>
</tr>
<tr>
<td>H(_{31})</td>
<td>+</td>
<td>+0.23</td>
<td>+4.65</td>
<td>+2.23</td>
</tr>
<tr>
<td>H(_{32})</td>
<td>+</td>
<td>+0.28</td>
<td>+1.76</td>
<td>+1.86</td>
</tr>
<tr>
<td>H(_3)</td>
<td>-</td>
<td>+0.03</td>
<td>+1.37</td>
<td>+0.33</td>
</tr>
<tr>
<td>H(_{41})</td>
<td>+</td>
<td>+0.54</td>
<td>+4.06</td>
<td>+2.74</td>
</tr>
<tr>
<td>H(_{42})</td>
<td>+</td>
<td>+0.51</td>
<td>+0.91</td>
<td>+2.62</td>
</tr>
<tr>
<td>H(_3)</td>
<td>+</td>
<td>+0.30</td>
<td>+5.39</td>
<td>+1.39</td>
</tr>
<tr>
<td>H(_{61})</td>
<td>+</td>
<td>+0.35</td>
<td>+6.29</td>
<td>+4.24</td>
</tr>
<tr>
<td>H(_{62})</td>
<td>+</td>
<td>+0.55</td>
<td>-7.00</td>
<td>-5.17</td>
</tr>
<tr>
<td>H(_{63})</td>
<td>+</td>
<td>+0.36</td>
<td>+1.82</td>
<td>+2.43</td>
</tr>
<tr>
<td>H(_{71})</td>
<td>+</td>
<td>-</td>
<td>0.00</td>
<td>-</td>
</tr>
<tr>
<td>H(_{72})</td>
<td>+</td>
<td>+0.40</td>
<td>+2.70</td>
<td>+3.13</td>
</tr>
<tr>
<td>H(_8)</td>
<td>+</td>
<td>+0.47</td>
<td>+5.79</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Table 6.R. Results of the hypotheses – the unsupported figures are in bold

The table shows that most of the hypotheses are supported in the models tested. The paths with identification problems were omitted, but there remain two paths that are partly supported and one that is not supported - H\(_3\) (the alternative having an effect on Calculative Commitment). Further, H\(_{42}\) (Investments with an effect on calculative commitment) is not supported in model A (the unmodified model), while it is in model B. Curiously enough, however, hypothesis H\(_3\) was supported in model A but not in model B. As this concerns the effect emotional commitment has on calculative commitment, it also has theoretical meaning. However, the results given in Appendix 7.3 (with the multicollinear element of EPERF removed), shows support for the path again. Thus, in this sense, model B presents the path as suspicious, but the general feeling is that it is still relevant.

This concludes the chapter in which the results are presented. The next and final chapter discusses the results, the limitations of the research, the answers to the research questions, the managerial implications and directions for further research.

\(^{23}\) If the direction is known, a one-tailed test may be used (Hair et al., 1998). The t-value limit for p<0.05 is then 1.64.
PART C - CONCLUSIONS
7. Discussion, Limitations and Directions for Further Research

7.1. Overview

This chapter presents the discussion about the results, the limitations of the research, the answers to the research questions, the managerial implications and directions for further research. Figure 7.1. below shows the link between Chapter 6 (Results) and the other chapters in this thesis.

![Diagram showing the structure of Chapter 7]

Figure 7.1. The structure of Chapter 7
7.2. Discussion and Limitations

The core motivating factor for this thesis was the search for a model that would explain the logic of relationship perceptions in marketing dyads. The aim was to combine ideas of social exchange with those of relationship marketing in order to build a theoretical basis on which – on an individual level – a model of marketing as exchange might be constructed. In axiomatic terms, it was assumed that the subjective reality of an individual is the sphere in which relational phenomena happen, that it is symbolic in nature and is a continuous process of negotiation. Since the idea was to build a static view of the antecedents and outcomes of the perceptual calculations related to a relationship, the conceptual basis of the phenomenon was defined starting from static models of relationship evaluation. It was argued that the concept of commitment could be redefined in a way that reflects the layers of consciousness from which we react to relational signals. This resulted in the construction of a two-dimensional model of commitment. The conscious layer of relationship evaluation was labelled calculative commitment, while the pre-conscious, feeling-like evaluation of a relationship was labelled Emotional Commitment.

This two-layered model of socio-economic relationships was then put to a test, in which the two-dimensional nature of the model received consistent support. This two-layered view is also better in explaining the relationship than a single holistic evaluation. As the model combines key theoretical ideas from both social psychology (e.g. Thibaut and Kelley, 1959; Kelley and Thibaut, 1978; Rusbult, 1980 and 1983; Arriaga and Agnew, 2000) and relationship marketing (e.g. Morgan and Hunt, 1994; Gundlach Acrol, and Mentzer, 1995; Geyskens, Steenkamp and Kumar, 1999), it also contains a sufficient thoroughness at its conceptual basis to explain the logic of relationship perceptions. At
the same time, the axiomatic base (Chapters 3, 3.A., 4, and 4.1) also provided the possibility to define the dimensions of commitment in a way that avoided the problems mentioned (Chapter 3.B) in the original models of relationship perceptions. The following delves into these issues more thoroughly.

7.2.1 Summary of the Model Structure
The thesis started with the premise that changes in modes of competition and in increased visibility of societal institutions has lead to the need to understand how we structure our perceptions. Two different paths of development give accentuated meaning to relational matters. The first is the visibility of organisations leading to relational bonding from the target-audience side, and the second is the increasing complexity of production systems leading to production networks. The former establishes societal institutions as quasi-persons, and the latter gives critical value to the efficiency of the social system itself. It was thus argued that the future seems to point to an increased need to understand the socio-economic exchanges going on in instrumental relationships.

The next stage was to pose the question: are our psychological realities inherently subjective and represented in a flow of perceptual images? If so, there exists a gap between the subjective realities of those involved in dyadic-exchange settings. Thus, if there is a gap between the perceptual and physical realities, it was argued that there must be some sort of process of negotiation that is able to align individual personal aims in a way that produces a (social) organisation. Thus, “the higher goals” are the motivating factor for engaging in instrumental relationships. These instrumental relationships could be considered partly economic and partly social. The instrumental rewards promote our cause of achieving higher goals in life. However, the social elements contain the process that defines the position and the roles we adopt as members of organisations. By aligning our aims, social negotiation is able to produce a system that has the capability of transferring intangible individual skills into value production. As it seems that the efficiency with which social positions are negotiated (measured by the existing level of agreement) is dependent on the (symbolic) interpretation of this communication process, the perceptual process has a direct effect on the efficiency of the network. Friction in social processes results in a waste of resources on the organisational level.

What, then, is the internal logic of relationship perceptions? Given that the flux of
perceptual images is a representation of the internal negotiation process, the symbols of this flux are an “explicit” indicator of the content of this relational adaptation. Thus, the image flow also represents the internal and external signals that permeate the psychological processors. In terms of the model created, it is a “net” for capturing the flow of perceptual images. These images are structured in a certain way and arise from certain antecedents, while resulting in some other outcomes. Figure 7.3. below describes the model that was constructed following the testing reported in Chapter 6.

![Diagram](image)

**Figure 7.3. The Investment Model of Industrial Marketing Exchanges (MIME)**

The figure comprises three boxes delineated by broken lines. Two of these present the layers of transaction and relationship evaluations mentioned earlier, while the third one presents the outcomes in terms of defining how well the “negotiated” relational setting results in efficient relational exchange.

The model has a two-dimensional mediating structure, as in Morgan and Hunt (1994), and as mentioned Rusbult (1980, 1983) and by Lydon, Pierce and O’Regan (1996).
Further, it contains the affective, conative and cognitive dimensions of commitment as mentioned by Meyer et al. (1990), Gundlach et al. (1995), Fletcher et al. (1999) and Wieselquist et al. (1999). It reflects Bagozzi’s social and economic man (1975), and is able to explain quasi-relationships as well as close, engaging marketing relationships. It looks similar to Morgan and Hunt’s (1994) Key Mediating Variables model, but morphological similarity does not mean that it is the same model. It contributes to our understanding of relationships in several ways.

1. It combines the social-psychological and relationship-marketing views of relational engagements.
2. It presents the concept of commitment as an evaluation of a relationship dependent on the level of consciousness. This has never been done before.
3. It ties commitment explicitly to the marketing-as-exchange view in the disciplinary discussion.
4. It ties the concept of commitment to a structured view of the individual personality entering into socio-economic engagement.
5. It explicitly combines the social and economic computations an individual makes in an exchange setting. It thus rises above the pure economic view of the transaction, and also above the pure social view of a relationship. The resulting view is at the core of marketing research.
6. The theoretical structure has the properties of being explanatory, predictive and also retrodictive.
7. The work contributes to our practical understanding of how to measure relationships in a business setting.
8. The work contributes to our understanding of the limits of relationship management and the social negotiation of role positions in business networks.

In terms of the core logic of the model, the exogenous variables define what kind of propensities to co-operate, to exit and to view conflicts as constructive, and what level of dependability (trust) result from the negotiations. As these concepts are descriptive of close interaction, they could also be seen as reflecting the closeness of the dyad. In view of the fear that network competition is reaching the stage at which this closeness is of high importance, the outcome concepts could thus be seen as a measure of the

74 Reflected in the concept of propensity to leave (perceptual time frame) as a behavioural intent (Meyer
Chapter 3 gave the theoretical basis of the models under consideration, and in this context, the present view of relationship perceptions speaks the same language as Morgan and Hunt’s (1994) KMV model, and is also in line with Rusbult’s (1980) ideas of commitment. As the model describes holistic evaluations of calculative and emotional commitment as a “still photograph” of the continuous flow of perceptual images, it could be used as a tool for capturing the psychodynamics of socio-economic settings. Thus it could help in gauging how the subjective experiences of an individual change as new relational experiences affect those involved. The model is thus like a slicer used for preparing tissue samples for a microscope. It captures relationship perceptions at a single point in time and gives the viewer an idea of what the “fibres” are that tie the dyad members together. This description also points towards the “reasons” why things exist as they do. Thus the model has the property of being explanatory.

7.2.2. Commitment - A Theory of Relationship Perceptions?
According to Hunt (1991), a well-defined theoretical structure is based on a calculus of a phenomenon and the correspondence rules associating this theoretical structure with a certain empirical phenomenon. The calculus itself is suggested to consist of the elements, the definitions of the elements and the transformation rules linking them in a systematic way. The fact that this thesis was built on an axiomatic basis means that the definitions and transformation rules of the background models may be used to build a comprehensive view on commitment. Moreover, as commitment was (analytically) defined as representing the two layers of relationship evaluation that are accessible, the systematic structure that was built up could be seen as a theory of socio-economic-relationship perceptions. The model was also based on a systematically related set of statements that are empirically testable (Hunt, 1991), and thus the theoretical structure also has the property of being intersubjectively verifiable. Consequently, what this thesis proposes is that the theoretical structure that was built (and tested) could be seen to be at the core of marketing-as-exchange discourse. Specifically, it is the theory of how an

and Allen, 1990), or intention to persist (Wiselquist et al., 1999).
75 The author is aware that this is not a scientific definition of why a model is explanatory. However, as the model exists as an law-like statement and is inter-subjectively verifiable, it also has the property of being scientifically explanatory. Readers who are interested in further discussion are referred to Hunt (1991).
76 I.e. leaving aside the un-conscious layer.
individual engaged in socio-economic relationships behaves (if this behaviour is assumed
to be a logical result of the perceptual reality of an individual – i.e. if we are assumed to
be logical at all). However, as the work is still in its preliminary phases, there are definite
limitations concerning the generalisability of the results. These are discussed in the
following section.

7.2.3 Limitations
Three levels of limitations are acknowledged here, on the levels of
theory, concepts and measurement. Each is discussed separately.

- Theoretical limitations
This work discusses relationship perceptions through the concept of commitment and its
different definitions. The related constructs of trust, involvement and possible other
moderators are discussed only briefly and not tested at all. The view presented thus
stands only on the stilts that have been discussed and tested.

- Concepts
The concepts were presented from a lot of material that is relevant for explaining
relational exchanges. However, some alternative ways of framing and defining them may
still exist. In particular, those that were left out of the model will need addressing in the
future. Further, as the theoretical exercise began from an axiomatic basis, the conceptual
limitations also extend to the axioms themselves. Those that are wrong or poorly set
result in problems for the present view of relationship perceptions.

- Measurements
As was seen at the beginning of Chapter 6, the measurements did not succeed on the
level they might have been expected to do. Thus, the data had a low level of variance-to-
be-explained in the now underidentified propensity-to-leave concept. In this case,
additional items would probably have helped. Thus the results are subject to this problem
in the data. Further, the accentuated level of correlation (between the measurement
scales of different concepts) probably affected the estimation problems referred to as
Heywood cases. Moreover, the interdependence of measurements of relationship
rewards and perceived economic benefits suggests that the measures do not properly tap
the 2-layer view of relationship perceptions. Thus, additional work needs to be done
especially on the emotional side of relationship perceptions.

A further limitation is that the testing was done on a single relationship using a single measurement instrument, so there is likely to exist some level of method bias (Maruyama, 1998, p.89). Therefore, in the future, it would be necessary to provide a multimethod-multitrait test setting to enable method bias to be estimated.

In conclusion, it could be said that the model presented in Figure 7.3. is supported to a level that exceeded expectations, even though there were some problems with the data. This seems to support the claim that the model has a solid theoretical basis. As Kline (1998) argued, problems with data result in weaker paths between the SEM variables. It seems that, in this work, the strong theoretical basis made it possible to overcome the problems in the data. It is the view of the author that constructing a better measurement setting would provide more support for the model.

The following section comments on the research questions posed in Chapter 2.

### 7.3. Answers to the Research Questions

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<th>7.3. Managerial implications</th>
<th>7.4. Directions for further research</th>
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<tr>
<td>Relational vs transactional orientation</td>
<td>Rel. quality?</td>
<td>Relational tools in relational settings</td>
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<td>Limitations</td>
<td>Commitment?</td>
<td>Dangers of mgnt. myopia</td>
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<td></td>
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Figure 7.4. Answers to the research questions in the context of Chapter 7

In order to facilitate comparison between the results presented and the theoretical and empirical parts of the study, the research questions are listed again and addressed one by one.
A. Mapping the Conceptual Basis – Basic Concepts

1. What are the key concepts of relationship perceptions and what are the possible different definitions of these concept?

   According to the model developed in Chapter 4, the key variables are single, two and three-dimensions of commitment. These dimensions are defined as holistic representations of the evaluations related to the image flow arising from a dyadic signal.

2. How could the concepts be grouped to acquire a theoretically sound “layering”? 

   The layers of relationship perceptions are seen as calculative and emotional. It is via this layering that an individual’s reaction to the relational signal could be comprehensively explained.

C. Building a Structure – the Model

3. What different structural possibilities exist in this emerging model?

   The answer to this question must arise from the two-layer view of perceptual image flow. Emotional content transfers relationships from the purely transactional to the relational. Paths between variables seem to exist, as presented in Figure 7.3. The basic structural feature of the model is the emotional vs. calculative layering. Another possibility is that the mediating layer is uni-dimensional, but as this was tested and found to be poorer in explanatory power than the two-layer view, the latter seems to be supported. However, a uni-dimensional setting might exist in purely transactional relationships.

D. Background of the Phenomenon

4. What kind of motivational basis might there be behind the key phenomenon?

   As claimed in Chapter 3 (axiomatic basis), the basic motivation for engaging in socio-economic-exchange relationships is instrumental. This instrumental nature of the relationship defines the limits of engagement in that without this motivational element the person exits the dyad.
The practical and managerial implications and the directions for further research are discussed in the following sections.

### 7.4. Managerial Implications

The core managerial implication is that relationship-marketing tools are only needed in situations in which *emotional elements* enter the relationship evaluations, because it is only then that the settings become relational (i.e. described in terms of emotional involvement). Further, as Figure 7.3. shows, it is possible to gauge what effects a certain kind of a marketing programme might have on the relationship evaluations. For instance, if customers are emotionally committed, but this does not translate into operational actions, the reason might be a lack of perceived investment or fears of poor economic performance. If our customers do not feel secure enough to engage in the closer relationship demanded by a new R&D project, it might be because of unnecessary strain on the emotional level – i.e. high psychological costs. Thus, in moving through the figure (7.3.), the reader is asked to simulate different types of business settings and to see what kinds of outcomes are arrived at.

The other key implication is that the closer the relationships become the harder the idea of relationship “management” is. This is a direct result of the fact that relational positions are socially negotiated to fulfil the instrumental aims of those involved. As it is impossible to control the other members’ perceptions, taking a unilateral position towards the relationship might give a completely wrong signal of how things are run. If the managerial process steadily deteriorates the position (on the level of perceptions) of the other member of the dyad, there comes a point when the instrumental value of the engagement vanishes. In this sense, there could be nothing more destructive to a relationship than the concept of opportunism mentioned by Morgan and Hunt (1994).
These two managerial outcomes restrict the relational approach to the (few) key customers a company has. In the key-customer setting, the motivation arising from strategic decisions (related to partner choice) provides a steady basis on which to build up the relationship.

The following answers to the research questions are related to the managerial implications.

5. Provide an understanding of the perceptual realities at the base of network management.

As the perceptual realities of those involved are never perfectly overlapping, there is always the risk of misunderstanding and wrong judgement. Thus, in a setting in which relational matters are of accentuated importance (close business-to-business settings), it is vital to take every precaution to ensure that the other party in the dyad is heard. Here, one might even suggest that, if relationships are of critical importance, organisations should exchange members in order to guarantee communication, and also assign members of “our own” organisation the task of seeing things only from the customer’s side. These ideas are near to account-management thinking, but this might not be enough in big organisations, and special relationship managers may be needed.

6. Provide tools for gauging the dyadic-relationship perceptions (perceptual imagery) of the members of both external and internal company networks.

As the key mediating concepts of the model are future-looking dimensions of commitment, the levels of these variables gauge how content the customers are. In this sense, the “still photograph” reflects the satisfaction with the service provider. Given the close relationship between satisfaction and the concept of enthusiastic commitment (Section 3.D.2), it must be an element in the emotional evaluations of the relationship. Further, the developed model makes no distinction concerning the kind of socio-economic dyad to which it applies, and could thus be explanatory in terms of both the internal and external relationships.
7. Provide an operational instrument for evaluating the commitedness of the members of a network and further, the critical factors affecting the level of commitment (or lack of it).

As the model provides a structural view of the nature of the phenomenon, it also gives the user detailed information on what causes the configuration of the two-layer perceptions in question. Thus a low level of either calculative or emotional (or both) commitment can be reduced to the exogenous constructs.

7.5. Directions for Further Research

As has already been mentioned, the measurement procedure had its problems. Thus, it was necessary to take a step backward and modify the instrument in order to obtain the accurate 4-item scales necessary for SEM modelling. This is also related to the next phase, in which the whole model (not only the present sub-model) should be estimated. What is of critical importance in this phase is to solve the slight problems in discriminant validity and multicollinearity.

Further, as already discussed, the method bias has to be assessed by taking a multimethod, multitrait approach (MM matrix) to measurement development. Thus, the survey setting itself should be modified to include different scales measuring the same concepts, and different approaches to gathering the data. Different dyads should be assessed.

Following on from this, it would be useful to provide sound instruments for measuring respondent involvement in the relationship measured. It would also be relevant to gauge the theoretical relationships between these two concepts (commitment and involvement).
The concept of trust has permeated this exercise, and it would be useful to consider the degree to which discussion of trust is relevant to business-to-business research. This study presents a consistent and theoretically based view of relationship perceptions in such a setting, and thus forms a basis for further research. Given the questions it provoked, it also provides a basis for developing a research programme to investigate how socio-economic relationships are perceived by those involved.

7.6. Summary

It could be argued that we form relationships only when we have an emotional connection to the relational object. This means that the non-cognitive elements of the relationship perceptions are those that manifest its birth, and it seems to be the reason why a lot of advertising, public communication and news conferences, for example, aim to be emotionally moving. Emotional signals result in non-cognitive processing and, without noticing, we have a relationship with the message sender. The very quality of being emotionally moving creates a relationship that translates into dependency.

Entering a social organisation is transactional from the beginning. We enter a relationship based on some cognitive calculation that it might provide us with economic benefits, and we thereby invest time and emotional resources in it. If the resulting relationship has elements that we see as emotionally rewarding, and further, if these rewards are higher than the emotional burden, we become enthusiastic about it. Such enthusiasm is attitude-like in that we perceive the relationship as being rewarding even though there might be a lack of knowledge confirming this. The enthusiasm, satisfaction and attraction in themselves constitute a phenomenon described as a holistic experience. In other words,
this element is either positive or negative, and depending on the sign, affects everything related to this sphere of relational involvement. It is thus a typical affective variable and could be described as some sort of “black-white” or “good-bad” thinking.

From a role-theoretic perspective, what happens (when we enter a dyadic setting) is that, at first, we have expectations about the other that are dependent upon the socially defined role positions in which we perceive the other and ourselves as existing. Thus, relationships are more likely to form in a situation in which we can interpret the other as behaving according to the role-expectations we throw at the other. We are also more likely to form relationships when we ourselves exist in a role position that is more psychologically comfortable to our partner. Both of these situations arise from the fact that if we are ambivalent about our role position we are likely to signal this ambivalence. The receiver, in interpreting it, is likely to perceive higher levels of psychological cost, and thus relationship formation is inhibited by the level of the ambivalence-determined psychological burden felt by the relational parties. Thus it is easy to understand that persons behaving according to culture-determined stereotypes of a particular role position are likely to be more successful in creating relationships. These results could be applied to network relationships in that people who consistently behave according to their organisational-culture-determined role position are better at establishing relationships because they carry a lighter psychological burden. This explains why all unnecessary misunderstandings arising from either internal factors or from inconsistencies related to social position result in deficiency for the whole social system. However, as social systems are continuously faced with new situations, the social positions have to be constantly re-negotiated. In themselves, all social systems are constantly facing a flow of signals that could disrupt the smooth operation of the organisation-defining social negotiation going on both between and within individuals.

Given the above ideas, the theoretical elements explaining human-relationship perceptions in both social psychology and relationship marketing were used to build a model of the relationship perceptions existing in a socio-economic setting. The core idea in this model was to separate the economic and social considerations into two different layers of relationship evaluation. This separation provides a view on how transactional and relational engagement function, and on how the relational elements (i.e. the emotional elements) enter the scene transforming the transactional orientation of a
relationship in a long-term (relational) orientation. This led to the development of a model that could tackle these research problems, which was then put through a series of empirical model-trimming and model-testing estimations.

What, then, was achieved? As the empirical test consistently suggested that the models were acceptable, it shed light on how socio-economic exchange might be evaluated by those involved. Further, as it combined the theoretical elements of social psychology with the scientific explanations existing in marketing, it provides a bridge between the previously somewhat separated disciplines. In doing so it also adds to the discussion on marketing as exchange, and places the theoretical ideas developed in relationship marketing at the centre of marketing research. By combining the social psychological elements with the modelling of marketing phenomena, the work succeeded in building a unified view of socio-economic-exchange relationships. As such, it supports the claim made by Becker (1960) 42 years ago that business relationships are a sub-phenomenon of social-exchange relationships. Nevertheless, as Rubult et al. (1999) argue, instrumental relationships are likely to be different from close interpersonal relationships in that cognitive interdependency is not likely to exist. Thus, pure social relationships and pure economic relationships are different from one another, and socio-economic relationships have their own unique logic. All in all, this logic can be expressed along the dimensions of commitment.
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APPENDIX 1: Pilot study (n.=400) measures of the Forest Owner data

The instrument consisted of the sub-models of commitment and their related concepts. The following table gives the complete list of questions; The items referring to the final instrument are in italics.

Instructions:
The following three-page section asks your impressions of your raw-wood trade episode. Please answer each question according to first impression. The right answer is thus the one that first comes to mind. Please evaluate You’re your most recent episode by answering the following questions. Tick the option closest to your own opinion.

REWARDS
1. How well do the following statements describe your most recent experience of selling raw-wood: (Anchors for the following questions (1->4): Strongly agree 1 2 3 4 5 Strongly disagree)
Selling raw-wood...
d) … was a rewarding exercise
e) … was a pleasant happening
f) … was an interesting happening
g) … was an enjoyable happening
h) … was very straightforward

COMMUNICATION
2. The organisation buying the raw-wood...
(a) ... makes frequent contact with me.
(b) ... often sends me different types of written material and brochures.
(c) ... keeps me up-to-date on new developments.
(d) ... is in close contact with me.
(e) ... is easily approachable in matters related to the raw-wood trade.

SHARED VALUES/PERCEIVED SIMILARITY
3. To what extent do you agree with the following statements?
a) In general we have similar opinions on things.
b) The organisation and I have similar values (in life).
c) The organisation and I have similar views of what is right and wrong.
d) The representatives of the organisation have the same ideas about good and bad as I do.
e) The representatives of the organisation have the same expectations of life as I do.
f) The representatives of the organisation are similar to me.

ECONOMIC PERFORMANCE
4. How do the following statements describe your last raw-wood-sales episode:
This raw-wood sales episode...
a) … resulted in great economic benefit
b) … resulted in less economic income than it was supposed to.
c) … was definitely the best solution for selling my raw-wood.
d) … did not work out well for me.
e) … wasn’t as good a choice as I would have deserved.

ALTERNATIVES
5. In general, are all the organisations that buy raw-wood equal from your point of view? 
   No they are not 1 2 3 4 5 6 7 Yes, they are
6. However, did this (raw-wood buying) organisation stand out from the rest? 
   No 1 2 3 4 5 6 7 Yes
7. How well can the others compete with the one with which you made the deal?  
   They cannot compete 1 2 3 4 5 6 7 Completely as equals

RELATIONSHIP BENEFITS
8. Please compare the organisation that bought your raw-wood to its toughest competitor on the following dimensions: 
   (anchors: The company I worked with offers better 1 2 3 4 5 The company I worked with offers worse)
   a. The price I obtained for the raw-wood.
   b. The service I received from the organisation.
   c. The information I received from the organisation about the raw-wood in question.
   d. The possibility of using different contract set-ups.
   e. The easiness of selling.
   f. The suitability of payment terms.
   g. Buying speciality grades.
   h. Better quality of felling.
   i. It was more suitable for me viewed from any direction.
   j. The organisation’s interest in my needs.

INVESTMENTS
9. Are you involved in some kind of social activity tied to the organisation in question? 
   (yes – no)
10. Do you see yourself as having co-operated for many years with this raw-wood purchaser? (yes – no)
11. When was it that you first sold raw-wood to this organisation? 
   (a= this was the first time, b= ___)
12. Sales of my raw-wood would suffer significantly if I now switched to another buyer. 
   (anchor as in 1-4)

COSTS
13. In general, is selling raw-wood financially costly for you? 
   Not at all costly 1 2 3 4 5 6 7 Yes, very costly
14. How do the following statements describe your raw-wood selling: 
   (anchors for questions 14 and 15 as in questions 1-4)
   Selling raw-wood… 
   a) … demands a lot of effort.
   b) … demands a lot of concentration and is (psychologically) consuming.
   c) … restricts normal life in a significant way.
   d) … causes a lot of stress.
   e) … makes me occasionally feel embarrassment, frustration, powerlessness or hate.

OPPORTUNISTIC BEHAVIOUR
15. How well do the following statements describe the organisation/association in question: 
   Sometimes to achieve its own goals the organisation … 
   (a) … alters the facts slightly.
(b) ...promises to do things without actually doing them.
(c) ...functions on un-sound principles.
(d) ...sometimes provokes situations that are disturbing afterwards.

ENTHUSIASTIC COMMITMENT
16. How well can you describe the raw-wood-selling episode using the following statements:
The raw-wood-sales episode was something…
(anchors Completely accurate 1 2 3 4 5 Not at all accurate)
a) ...that caused a lot of enthusiasm.
b) ...that caused a lot of satisfaction.
c) ...that I liked a lot.
d) ...that I enjoyed a lot.
e) ...that was very pleasant.
f) ...that brought trust in the raw-wood-buying organisation.
g) ... that can be described as "great and important".
h) ... that can be described as "magnificent".
i) ... from which you feel relieved after it is over.
j) ... that feels like a burden.

INVESTMENTS
17. How do the following statements fit the selling of raw-wood and the sacrifices related to it?
Co-operation with the organisation (over the years) has meant… (anchors as in 1-4)
a) ...a lot of sacrifices.
b) ...a lot of memories.
c) ...a lot of emotional ties.
d) ...a lot of good friendships.
e) ...something to which I am very attached.
f) ...an increasing amount of things that I like.
g) ... an increasing amount of things that are important to me.

COMMITMENT (a-c) and MORAL COMMITMENT
18. My relationship with the raw-wood purchaser is something…
(anchors as in questions 1-4)
a) ...to which I am very committed.
b) ...that I intend to keep up in future.
c) ...that deserves my greatest efforts.
d) ...that is a moral duty.
e) ...to which it is right to commit.
f) ...to which I have to commit.
g) ...that is related to honourable deeds.
h) ...what is right (i.e. based on a principle).
i) ...that I have to keep up.

AQUIESCENCE
19. How did you feel about the rules of the raw-wood trade? (anchors as in questions 1-4)
(a) The organisation’s ways of doing things are good and it was easy for me to conform to them.
(b) The organisation has good rules guiding its raw-wood purchasing and thus it is easy for me to conform to them.
c) In the future I will probably conform to the rules and regulations the organisation sets for its raw-wood
purchasing.
(d) I can identify with the raw-wood purchaser’s own rules and personnel, and therefore am happy to let
the organisation act on my behalf.
(e) The organisation did not force me into making any decisions.
(f) I feel I want to accept the buyer’s solutions.

PROPENSITY TO LEAVE (a- d) & FUNCTIONAL CONFLICT

20. Evaluate the following statements:
(anchors: Not at all likely  1  2  3  4  5  Very likely)
(a) How likely are you to selling your raw-wood to this organisation?
(b) How likely are you to selling your raw-wood to this organisation more than once?
(c) How long will the relationship with this organisation last?
   A short while 12345 Along time
(d) Can you commit yourself to this organisation for a longer time?
   Yes, absolutely 1 2 3 4 5 In no circumstances

(anchors as in question 1-4)
(e) If I have a disagreement with the organisation it is solved in a positive atmosphere.
(f) In this relationship disagreement is natural and not threatening.
(g) Differences in opinion are seen as a normal part of exchange and lead to positive outcomes
   for both parties.
(h) The differences of opinion (between me and the organisation) are more constructive
   argumentation than fighting.
(i) The raw-wood-sales episode was marked by constant arguments that didn’t lead to
   anything.
(j) The disagreements between me and the buyer lead to constructive outcomes.

CO-OPERATION

21. How well do the following statements describe the raw-wood-selling episode?
(Anchors: Describes well 1 2 3 4 5 Doesn’t describe at all)
(a) The exchange of ideas was frequent
(b) The planning of the felling was a co-operative effort.
(c) There was frequent telephone contact.
(d) The discussion and advice were open and co-operative.
(e) The implementation of the cutting happened as agreed.
(f) In this sales episode we acted as partners.

CO-OPERATION 2

22. How co-operative do you feel the organisation is on the following matters:
(Anchors: Very co-operative 1 2 3 4 5 Not at all co-operative)
(a) Planning of the felling.
(b) Planning of the selling.
(c) The general problems associated with taking care of my forests.
(d) Making the financial plans.
(e) The broader strategic planning of the forest estate.

UNCERTAINTY

23. How do You feel about the following statements?
The raw-wood-sales episode I had with this organisation is described as follows…
(Anchors: Fits well 1 2 3 4 5 Does not fit)
(a) … uncertainty in planning
(b) … uncertainty in decision making.
(c) … calm operation and trust.
(d) … predictability of actions.
(e) … the buyer behaving in the right way.
(f) … the respect that the buyer gave me.
(f) … the fact that the buyer didn’t treat me badly.

23. Do you have enough information concerning...
   (Anchors: Enough information 1 2 3 4 5 Not enough information)
   (a) ... what species to cut?
   (b) ... when to cut?
   (c) ... how much to cut?
   (d) ... at what price to sell?

24. How much do you trust your ability to make future decisions on...
   (anchors: Complete confidence 1 2 3 4 5 No confidence)
   (a) ... how much to cut , (b) ... the selling price, (c) ... the timing of the felling?
APPENDIX 2: Measures of the Data on Forest Owners - The Final Instrument

MEANING/INVOLVEMENT
1. How important is the forest you own to you? Please tick the box following the statement that best describes your opinion. (Strongly agree - Strongly disagree)
   a) My forest is an important source of personal income □ □ □ □ □
   b) My forest is an important source of estate income □ □ □ □ □
   c) My forest is important because of the leisure uses it provides □ □ □ □ □
   d) My forest is important for scenic reasons □ □ □ □ □
   e) My forest is important due to the natural/green values related to it □ □ □ □ □
   f) I like my forest a lot □ □ □ □ □
   g) I spend a lot of time working for my forest □ □ □ □ □

Instructions for filling in the rest of the form:
The following questions ask your opinion on one of the big raw-wood-purchasing organisations in Finland. To make it easier, you are asked to choose from the three biggest, and thus to base your response on what is most familiar to you. To provide for the possibility of comparison, the choice has been restricted to these three.
1. Please select the company, most familiar to you, from the following:
   1. StoraEnso Oyj 2. UPM-Kymmene (Champion) 3. Metsälitto
2. Each page has the same three names written at the top. Please circle your choice on each page. This will work as a memory aid as you fill in the questionnaire.
3. Please answer the questions according to the first impression that the company you selected (i.e. the most familiar company) arouses. Some of the questions may appear very similar but it is important that you answer them all.

REWARDS
2. How rewarding is selling raw-wood? Please select from the following statements:
   (anchor as in the first question but with a six-point scale)
   a) I feel that co-operating with the company is very rewarding.
   b) I feel that the company creates satisfied forest owners.

COMMUNICATION
3. How much is the raw-wood buyer in contact with you? The company…
   (anchor Completely accurate description – not at all accurate description, six-point scale)
   a) …contacts me frequently.
   b) …continuously sends me different types of brochures and written materials.
   c) …continuously directs commercial advertisements (on radio & tv) to the forest owners
   d) …advertises to everyone and not specifically to forest owners.

SIMILAR VALUES
4. How much do you and the company have in common in terms of values?
   (two six-point scales)
   a) I have similar values. (yes, totally similar - not at all similar)
   b) I have a similar conception of right and wrong. (yes, totally same – no, not at all same)
ECONOMIC PERFORMANCE
5. In economic terms, selling raw-wood to the organisation in question would be…
(anchor as in the first question but with a six point scale)
a) … more profitable than average
b) … very satisfactory in terms of financial.
c) … the safest choice.

ALTERNATIVES
To what a degree do the raw-wood buyers provide alternatives your point of view?
Please select the one statement that best reflects your view.
a) The company I selected clearly stands out from the rest.
b) The three big buyers are clearly better than the local buyer.
c) The three big buyers are clearly weaker than the local buyer.
d) All buyers are equal from my standpoint.
e) Don’t know.
(1. Stora-Enso, UPM-Kymmene, Metsäliitto)

COSTS
7. Did the raw-wood-sales episode cause any (psychological) burden? Please give your opinion according to the following statements: (anchor with a five-point scale)
a) Is it difficult to sell timber to the company? (Yes very difficult – Not at all difficult)
c) Do the statements issued or the actions performed by the company bother You at any time? (yes very often – no, never)

ENTHUSIASTIC COMMITMENT
8. How enthusiastic do you feel about the company: (anchor as in the first question but with a six point scale)
a) I feel very enthusiastic.
b) I like the company very much.
c) I feel that these types of multinational company make one proud to be Finnish.

INVESTMENTS
9. Over the years one forms … (anchor as in the first question but with a six-point scale)
a) … some kind of emotional bond to this type of company.
b) …personal friendships with the personnel of this type of a big company.

(ECONOMIC INVESTMENTS)
10. Do you have a ”marketing service agreement”, or other type of agreement, with this company in which it promises to look after your forest? (yes - no)

CALCULATIVE COMMITMENT
11. How do you feel? (anchor as in the first question but with a six-point scale)
a) I am very committed to the company.
b) The company deserves my greatest efforts.

AQUIESCENCE/POWER
12) It is my opinion that the company follows a good set of rules in its raw-wood purchasing activity, and thus it is easy for the forest owner to adapt to the rules and regulations it sets.
(anchor as in the first question but with a six-point scale)

PROPENSITY TO LEAVE
13. How likely are you to sell raw-wood to this company in the future? Please select the one statement that best reflects your view.
   a) If I sell raw-wood, I will always sell it to this company. □
   b) If I sell raw-wood, I will probably sell it to this company. □
   c) Even if I was selling raw-wood to this company now, I cannot say anything about the future. □
   d) I wouldn’t sell raw-wood to this company. □

FUNCTIONAL CONFLICT
14. Differences of opinion in the raw-wood trade. Please give your opinion according to the following statements: (anchor as in the first question)
   a) One can disagree with this company.
   b) Disagreement with this company is constructive.

CO-OPERATION
15. How capable of co-operation do you think this raw-wood buyer is?
   (anchor as in the first question)
   a) I feel that the company is very co-operative?
   b) Co-operation happens in a very positive atmosphere?

SECURITY/UNCERTAINTY
16. How secure can a forest owner be in his raw-wood-sales decisions? Please give your opinion according to the following statements:
   (anchors: Yes, a lot & many – No, not at all & none; six-point scale)
   a) Is there some uncertainty associated with selling raw-wood to this company?
   b) Are there be any threats associated with selling raw-wood to this company?

In addition, some background questions were asked concerning the age, educational background, domicile, area of forest owned and raw-wood selling activities.
APPENDIX 3 - Confirmatory Factor Analysis of Model A Exogenous Constructs

DATE: 5/28/2002
TIME: 12:45

L I S R E L 8.30

The following lines were read from file D:\ESIT\DATAT\DATA-A\CONFAE.TYO:
metsom

Observed variables
NA_PAL_1  NB_PAL_1  NA_PER_1  NB_PER_1  NC_PER_1  NVAIHT_1  NA_KUS_1
NB_KUS_1  NA_INV_1  NB_INV_1  NPOWER_1  NPL_13_1  NAFCON_1  NBFCON_1
NA_COO_1  NB_COO_1  NA_SEC_1  NB_SEC_1  NB_SEC_1

Latent Variables pal  kus  inv  perf  alt  aq  pl  coop  fc  sec  emo  calc

Covariance Matrix

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Sample size 130
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NA_PAL_1  NB_PAL_1  = pal
NA_PER_1  NB_PER_1  = perf
NVAIHT_1  = 0.8 * alt
NA_KUS_1  NB_KUS_1  = kus
NA_INV_1  NB_INV_1  = inv
Set the errorvariance of NVAIHT_1 to 1
admissibility check off
Path Diagramm

END OF PROBLEM

Sample Size = 130
metson

Covariance Matrix to be Analyzed

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Number of Iterations = 15

LISREL Estimates (Maximum Likelihood)

NA_PAL_1 = 0.73*pal, Errorvar.= 0.24 , \( R^2 \) = 0.69
(0.065)              (0.041)
11.18                5.77

NB_PAL_1 = 0.87*pal, Errorvar.= 0.089 , \( R^2 \) = 0.89
(0.065)              (0.042)
13.50                2.13

NA_PER_1 = 0.65*perf, Errorvar.= 0.41 , \( R^2 \) = 0.51
(0.073)              (0.059)
8.94                 7.02

NB_PER_1 = 0.83*perf, Errorvar.= 0.12 , \( R^2 \) = 0.85
(0.064)              (0.042)
12.89                2.89

NC_PER_1 = 0.71*perf, Errorvar.= 0.37 , \( R^2 \) = 0.57
(0.073)              (0.056)
9.70                 6.65

NVAIHT_1 = 0.80*alt, Errorvar.= 1.00, \( R^2 \) = 0.28

Covariance Matrix of Independent Variables

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metsom
Goodness of Fit Statistics

Degrees of Freedom = 26
Minimum Fit Function Chi-Square = 46.61 (P = 0.0078)
Normal Theory Weighted Least Squares Chi-Square = 43.80 (P = 0.016)
Estimated Non-centrality Parameter (NCP) = 17.80
90 Percent Confidence Interval for NCP = (3.36 ; 40.11)

Minimum Fit Function Value = 0.36
Population Discrepancy Function Value (F0) = 0.14
90 Percent Confidence Interval for F0 = (0.026 ; 0.31)
Root Mean Square Error of Approximation (RMSEA) = 0.073
90 Percent Confidence Interval for RMSEA = (0.032 ; 0.11)
P-Value for Test of Close Fit (RMSEA < 0.05) = 0.15

Expected Cross-Validation Index (ECVI) = 0.79
90 Percent Confidence Interval for ECVI = (0.68 ; 0.96)
ECVI for Saturated Model = 0.85
ECVI for Independence Model = 4.72

Chi-Square for Independence Model with 45 Degrees of Freedom = 588.69
  Independence AIC = 608.69
    Model AIC = 101.80
    Saturated AIC = 110.00
  Independence CAIC = 647.36
    Model CAIC = 213.96
    Saturated CAIC = 322.71

Root Mean Square Residual (RMR) = 0.037
  Standardized RMR = 0.048
  Goodness of Fit Index (GFI) = 0.94
  Adjusted Goodness of Fit Index (AGFI) = 0.87
  Parsimony Goodness of Fit Index (PGFI) = 0.44

  Normed Fit Index (NFI) = 0.92
  Non-Normed Fit Index (NNFI) = 0.93
  Parsimony Normed Fit Index (PNFI) = 0.53
  Comparative Fit Index (CFI) = 0.96
  Incremental Fit Index (IFI) = 0.96
  Relative Fit Index (RFI) = 0.86

Critical N (CN) = 127.33

The Modification Indices Suggest to Add an Error Covariance
Between and Decrease in Chi-Square New Estimate
NA_PER_1 NA_PAL_1 10.0 0.10

The Problem used 22936 Bytes (= 0.0% of Available Workspace)
Time used: 0.383 Seconds
APPENDIX 4 - Confirmatory Factor Analysis of Model A Outcome Constructs

DATE: 5/29/2002
TIME: 10:10

LISREL 8.30

The following lines were read from file D:\ESIT\DATAT\DATA-A~1\CONFAO.TYO:

metsom
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Latent Variables pal kus inv perf alt aq pl coop fc sec emo calc

Covariance Matrix
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0.56705 0.53469 0.56266 0.60205 0.77675
0.26324 0.17329 0.20699 0.14877 0.21237
0.76090 -0.33726 -0.31457 -0.23012 -0.23341
-0.30913 -0.19266 0.66283 -0.38057 -0.33831
-0.30935 -0.26563 -0.29012 -0.07369 0.35262
0.73596 0.51679 0.44757 0.46576 0.44177
0.35314 0.22252 -0.22733 -0.28527 0.81510
0.37790 0.37901 0.36636 0.42706 0.43155
0.12949 -0.26616 -0.19697 0.48254 0.74739
0.56796 0.51114 0.45816 0.47221 0.44298
0.19885 -0.27560 -0.35690 0.42088 0.33542
0.68642 0.40753 0.39630 0.33770 0.38158
0.34749 0.10044 -0.22737 -0.19934 0.35707
0.27468 0.28249 0.72177 0.11362 0.13516
0.08020 0.06234 0.06253 0.05532 -0.12577
-0.13792 0.12906 0.16644 0.13206 0.09747
0.78573 0.37612 0.40328 0.38736 0.37545
0.34157 0.18531 -0.22103 -0.21645 0.34944
0.34173 0.40024 0.18158 0.32106 0.72992
0.59462 0.52174 0.49283 0.50720 0.49116
0.19558 -0.36285 -0.40592 0.51467 0.39253
0.51197 0.35681 0.12327 0.38127 0.83963
0.60430 0.49792 0.45074 0.48378 0.46959
0.20997 -0.38337 -0.40097 0.31459 0.38751
0.47498 0.30534 0.12909 0.35078 0.70830
0.79623 -0.35465 -0.31129 -0.27388 -0.33391
-0.33680 -0.11387 0.26401 0.37692 -0.28702
-0.23338 -0.42870 -0.21990 -0.18929 -0.27664
-0.42213 -0.37228 0.76568 -0.26982 -0.21665
-0.21175 -0.25706 -0.25985 -0.04277 0.29178
0.32154 -0.17311 -0.16736 -0.31448 -0.17099
-0.19541 -0.22113 -0.35096 -0.36764 0.51523
0.69418

Sample size 130

Paths

NPOWER_1 = 0.8*aq
NPL_13_1 = 0.8*pl
NAFCON_1 NBFCON_1 = fc
NA_COO_1 NB_COO_1 = coop
NA_SEC_1 NB_SEC_1 = sec

Set the errorvariance of NPOWER_1 1
Set the errorvariance of NPL_13_1 1
Set the errorvariance of NBFCON_1 0.005
admissibility check off

Path Diagramm

END OF PROBLEM

Sample Size = 130
Covariance Matrix to be Analyzed

<table>
<thead>
<tr>
<th></th>
<th>NPOWER_1</th>
<th>NPL_13_1</th>
<th>NAFCON_1</th>
<th>NBFCON_1</th>
<th>NA_COO_1</th>
<th>NB_COO_1</th>
</tr>
</thead>
<tbody>
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<tr>
<td>NPL_13_1</td>
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<td>0.72</td>
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<td></td>
</tr>
<tr>
<td>NAFCON_1</td>
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<tr>
<td>NBFCON_1</td>
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<td>0.32</td>
<td>0.73</td>
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<td></td>
</tr>
<tr>
<td>NA_COO_1</td>
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</tr>
<tr>
<td>NB_COO_1</td>
<td>0.47</td>
<td>0.31</td>
<td>0.13</td>
<td>0.35</td>
<td>0.71</td>
<td>0.80</td>
</tr>
<tr>
<td>NA_SEC_1</td>
<td>-0.43</td>
<td>-0.22</td>
<td>-0.19</td>
<td>-0.28</td>
<td>-0.42</td>
<td>-0.37</td>
</tr>
<tr>
<td>NB_SEC_1</td>
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<td>-0.17</td>
<td>-0.20</td>
<td>-0.22</td>
<td>-0.35</td>
<td>-0.37</td>
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</table>

Covariance Matrix to be Analyzed

<table>
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<tr>
<th></th>
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<td>NA_SEC_1</td>
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<td>NB_SEC_1</td>
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Number of Iterations = 16

LISREL Estimates (Maximum Likelihood)

<table>
<thead>
<tr>
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<th>NPOWER_1</th>
<th>NPL_13_1</th>
<th>NAFCON_1</th>
<th>NBFCON_1</th>
<th>NA_COO_1</th>
<th>NB_COO_1</th>
<th>NA_SEC_1</th>
<th>NB_SEC_1</th>
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<tbody>
<tr>
<td>NPOWER_1</td>
<td>0.80</td>
<td>q, Errorvar. = 1.00, R² = 0.46</td>
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</tr>
<tr>
<td>NPL_13_1</td>
<td>0.80</td>
<td>pl, Errorvar. = 1.00, R² = 0.39</td>
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<td></td>
</tr>
<tr>
<td>NAFCON_1</td>
<td>0.38</td>
<td>fc, Errorvar. = 0.64 , R² = 0.18</td>
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<td></td>
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</tr>
<tr>
<td>NBFCON_1</td>
<td>0.85</td>
<td>fc, Errorvar. = 0.0050, R² = 0.99</td>
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<td></td>
</tr>
<tr>
<td>NA_COO_1</td>
<td>0.88</td>
<td>coop, Errorvar. = 0.063 , R² = 0.92</td>
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</tr>
<tr>
<td>NB_COO_1</td>
<td>0.80</td>
<td>coop, Errorvar. = 0.15 , R² = 0.81</td>
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<td></td>
</tr>
<tr>
<td>NA_SEC_1</td>
<td>0.81</td>
<td>sec, Errorvar. = 0.11 , R² = 0.86</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NB_SEC_1</td>
<td>0.63</td>
<td>sec, Errorvar. = 0.29 , R² = 0.58</td>
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</tr>
</tbody>
</table>

Covariance Matrix of Independent Variables

<table>
<thead>
<tr>
<th></th>
<th>aq</th>
<th>pl</th>
<th>coop</th>
<th>fc</th>
<th>sec</th>
</tr>
</thead>
<tbody>
<tr>
<td>aq</td>
<td>-0.49</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.13)</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-3.67</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>pl</td>
<td>0.44</td>
<td>-0.43</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.10)</td>
<td>(0.14)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>4.23</td>
<td>-3.10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>coop</td>
<td>0.73</td>
<td>0.50</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.08)</td>
<td>(0.09)</td>
<td>(0.07)</td>
<td>(0.08)</td>
<td></td>
</tr>
<tr>
<td>8.99</td>
<td>5.49</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| fc | 0.59 | 0.27 | 0.51 | 1.00 |
|    | (0.08) | (0.09) | (0.07) |       |
| 7.01 | 2.89 | 7.44 |

| sec | -0.65 | -0.34 | -0.60 | -0.40 | 1.00 |
|     | (0.09) | (0.10) | (0.07) | (0.08) |
| -7.40 | -3.48 | -8.77 | -4.98 |

Goodness of Fit Statistics

Degrees of Freedom = 13
Minimum Fit Function Chi-Square = 17.45 (P = 0.18)
Normal Theory Weighted Least Squares Chi-Square = 16.86 (P = 0.21)
Estimated Non-centrality Parameter (NCP) = 3.86
90 Percent Confidence Interval for NCP = (0.0 ; 18.66)

Minimum Fit Function Value = 0.14
Population Discrepancy Function Value (F0) = 0.030
90 Percent Confidence Interval for F0 = (0.0 ; 0.14)
Root Mean Square Error of Approximation (RMSEA) = 0.048
90 Percent Confidence Interval for RMSEA = (0.0 ; 0.11)
P-Value for Test of Close Fit (RMSEA < 0.05) = 0.47

Expected Cross-Validation Index (ECVI) = 0.49
90 Percent Confidence Interval for ECVI = (0.46 ; 0.60)
ECVI for Saturated Model = 0.56
ECVI for Independence Model = 4.32

Chi-Square for Independence Model with 28 Degrees of Freedom = 541.44
Independence AIC = 557.44
Model AIC = 62.86
Saturated AIC = 72.00
Independence CAIC = 588.38
Model CAIC = 151.82
Saturated CAIC = 211.23

Root Mean Square Residual (RMR) = 0.026
Standardized RMR = 0.035
Goodness of Fit Index (GFI) = 0.97
Adjusted Goodness of Fit Index (AGFI) = 0.91
Parsimony Goodness of Fit Index (PGFI) = 0.35

Normed Fit Index (NFI) = 0.97
Non-Normed Fit Index (NNFI) = 0.98
Parsimony Normed Fit Index (PNFI) = 0.45
Comparative Fit Index (CFI) = 0.99
Incremental Fit Index (IFI) = 0.99
Relative Fit Index (RFI) = 0.93
Critical N (CN) = 205.73

The Problem used 15840 Bytes (= 0.0% of Available Workspace)

Time used: 0.348 Seconds
APPENDIX 5 - Confirmatory Factor Analysis of Model B Exogenous Constructs

DATE: 5/29/2002
TIME: 10:50

L I S R E L 8.30

The following lines were read from file D:\ESIT\DATAT\DATA-A\-1\CONFBE.TYO:

metsom
Observed variables
REW1 REW2 EPER1 EPER2 EPER3 ALT COST1
COST2 INV1 INV2 ACQUI PL CON1 CON2
COOP1 COOP2 SEC1 SEC2

Latent Variables rew cost inv eperf alt aq pl coop con sec emo calc

Covariance Matrix

Sample size 130
paths
REW1 REW2 = rew
EPER1 EPER2 EPER3 = eperf
ALT = 0.8 * alt
COST1 COST2 = cost
INV1 INV2 = inv

Set the errorvariance of ALT 1
Let the errors of REW1 and EPER1 correlate
admissibility check off

Path Diagramm
END OF PROBLEM

Sample Size = 130

metsom
Covariance Matrix to be Analyzed
### Covariance Matrix to be Analyzed

<table>
<thead>
<tr>
<th></th>
<th>COST1</th>
<th>COST2</th>
<th>INV1</th>
<th>INV2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COST1</strong></td>
<td>0.66</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>COST2</strong></td>
<td>0.35</td>
<td>0.74</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>INV1</strong></td>
<td>-0.23</td>
<td>-0.29</td>
<td>0.82</td>
<td></td>
</tr>
<tr>
<td><strong>INV2</strong></td>
<td>-0.27</td>
<td>-0.20</td>
<td>0.48</td>
<td>0.75</td>
</tr>
</tbody>
</table>

### LISREL Estimates (Maximum Likelihood)

**REW1** = 0.88*rew, Errorvar. = 0.13 , $R^2$ = 0.86  
(0.065) (0.029)  
13.62 4.29

**REW2** = 0.83*rew, Errorvar. = 0.12 , $R^2$ = 0.86  
(0.061) (0.025)  
13.61 4.60

**EPER1** = 0.79*eperf, Errorvar. = 0.22 , $R^2$ = 0.74  
(0.066) (0.037)  
12.00 5.83

**EPER2** = 0.81*eperf, Errorvar. = 0.20 , $R^2$ = 0.76  
(0.066) (0.035)  
12.32 5.85

**EPER3** = 0.72*eperf, Errorvar. = 0.26 , $R^2$ = 0.66  
(0.065) (0.039)  
11.00 6.81

**ALT** = 0.80*alt, Errorvar. = 1.00, $R^2$ = 0.31

**COST1** = 0.57*cost, Errorvar. = 0.33 , $R^2$ = 0.49  
(0.078) (0.068)  
7.37 4.94

**COST2** = 0.62*cost, Errorvar. = 0.36 , $R^2$ = 0.52  
(0.082) (0.076)  
7.50 4.69

**INV1** = 0.75*inv, Errorvar. = 0.25 , $R^2$ = 0.70  
(0.074) (0.064)  
10.15 3.82

**INV2** = 0.64*inv, Errorvar. = 0.34 , $R^2$ = 0.55  
(0.072) (0.059)  
8.85 5.77

Error Covariance for EPER1 and REW1 = -0.08  
(0.023) -3.35

### Covariance Matrix of Independent Variables
<table>
<thead>
<tr>
<th>rew</th>
<th>cost</th>
<th>inv</th>
<th>eperf</th>
<th>alt</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

rew  1.00

cost -0.67  1.00
        (0.08)
       -8.75

inv  0.73  -0.58  1.00
      (0.06)  (0.10)  12.00  -6.06

eperf 0.91  -0.58  0.76  1.00
      (0.03)  (0.09)  (0.06)  30.87  -6.71  12.80

alt  0.33  -0.28  0.33  0.31  -0.37
     (0.10)  (0.12)  (0.11)  (0.10)  (0.15)
      3.36  -2.43  3.10  3.16  -2.52

Goodness of Fit Statistics

Degrees of Freedom = 25
Minimum Fit Function Chi-Square = 62.41 (P = 0.00)
Normal Theory Weighted Least Squares Chi-Square = 61.79 (P = 0.00)
Estimated Non-centrality Parameter (NCP) = 36.79
90 Percent Confidence Interval for NCP = (17.43 ; 63.83)

Minimum Fit Function Value = 0.48
Population Discrepancy Function Value (F0) = 0.29
90 Percent Confidence Interval for F0 = (0.14 ; 0.49)
Root Mean Square Error of Approximation (RMSEA) = 0.11
90 Percent Confidence Interval for RMSEA = (0.074 ; 0.14)
P-Value for Test of Close Fit (RMSEA < 0.05) = 0.0041

Expected Cross-Validation Index (ECVI) = 0.94
90 Percent Confidence Interval for ECVI = (0.79 ; 1.15)
ECVI for Saturated Model = 0.85
ECVI for Independence Model = 6.60

Chi-Square for Independence Model with 45 Degrees of Freedom = 830.90
  Independence AIC = 850.90
  Model AIC = 121.79
  Saturated AIC = 110.00
  Independence CAIC = 889.58
  Model CAIC = 237.81
  Saturated CAIC = 322.71

Root Mean Square Residual (RMR) = 0.030
  Standardized RMR = 0.039
Goodness of Fit Index (GFI) = 0.91
Adjusted Goodness of Fit Index (AGFI) = 0.81
Parsimony Goodness of Fit Index (PGFI) = 0.41

Normed Fit Index (NFI) = 0.92
Non-Normed Fit Index (NNFI) = 0.91
Parsimony Normed Fit Index (PNFI) = 0.51
Comparative Fit Index (CFI) = 0.95
Incremental Fit Index (IFI) = 0.95
Relative Fit Index (RFI) = 0.86

Critical N (CN) = 92.59

The Modification Indices Suggest to Add an Error Covariance Between and Decrease in Chi-Square New Estimate

<table>
<thead>
<tr>
<th>INV1</th>
<th>EREW1</th>
<th>9.7</th>
<th>0.08</th>
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<tbody>
<tr>
<td>INV1</td>
<td>EPER3</td>
<td>12.4</td>
<td>-0.11</td>
</tr>
<tr>
<td>INV2</td>
<td>EREW1</td>
<td>8.9</td>
<td>-0.08</td>
</tr>
<tr>
<td>INV2</td>
<td>EPER3</td>
<td>12.9</td>
<td>0.12</td>
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</table>
The Problem used: 23520 Bytes (= 0.0% of Available Workspace)
Time used: 0.383 Seconds
### APPENDIX 6 - Confirmatory Factor Analysis of Model B Outcome Constructs

**DATE:** 5/29/2002  
**TIME:** 11:02

**L I S R E L 8.30**

The following lines were read from file D:\ESIT\DATAT\DATA-A-1\CONFBO.TYO:

```
metsom  
Observed variables  
REW1 REW2 EPER1 EPER2 EPER3 ALT COST1 COST2 INV1 INV2 ACQUI PL CON1 CON2 COOP1 COOP2 SEC1 SEC2  
Latent Variables rew cost inv eperf alt aq pl coop con sec emo calc  
Covariance Matrix  
```

```
0.89749 0.72911 0.81050 0.56343 0.61946
0.85143 0.63894 0.61833 0.64372 0.86438
0.56705 0.53469 0.56266 0.60205 0.77675
0.26324 0.17329 0.20699 0.14877 0.21237
0.76090 -0.33726 -0.31457 -0.23012 -0.23341
-0.30913 -0.19266 0.66283 -0.38057 -0.33831
-0.30935 -0.26563 -0.29012 -0.07369 0.35262
0.73596 0.51679 0.44757 0.46576 0.44177
0.35314 0.22252 -0.22733 -0.28527 0.81510
0.37790 0.37901 0.36636 0.42706 0.43155
0.12949 -0.26616 -0.19697 0.48254 0.74739
0.56796 0.51114 0.45816 0.47221 0.44298
0.19885 -0.27560 -0.35690 0.42088 0.33542
0.68642 0.40753 0.39630 0.33770 0.38158
0.34749 0.10044 -0.22737 -0.19934 0.35707
0.27468 0.28249 0.72177 0.11362 0.13516
0.08020 0.08234 0.06253 0.05532 -0.12577
-0.13792 0.12906 0.16644 0.13206 0.09747
0.78573 0.37612 0.40328 0.38736 0.37545
0.34157 0.18531 -0.22103 -0.21645 0.34944
0.34173 0.40024 0.18158 0.32106 0.72992
0.59462 0.52174 0.49283 0.50720 0.49116
0.19558 -0.36285 -0.40592 0.51467 0.39253
0.51197 0.35681 0.12327 0.38127 0.83963
0.60430 0.49792 0.45074 0.48378 0.46959
0.20997 -0.38837 -0.40767 0.51459 0.38751
0.47498 0.30534 0.12909 0.35078 0.70830
0.79623 -0.35465 -0.31129 -0.27388 -0.33391
-0.33680 -0.11387 0.26401 0.37692 -0.28702
-0.23338 -0.42870 -0.21990 -0.18929 -0.27664
-0.42213 -0.37228 0.76568 -0.26982 -0.21665
-0.21175 -0.25706 -0.25985 -0.04277 0.29178
0.32154 -0.17311 -0.16736 -0.31448 -0.17099
-0.19541 -0.22113 -0.35096 -0.36764 0.51323
0.69418
```

Sample size 130  
Paths  

\[
\begin{align*}
\text{PL} & = 0.8 * \text{pl} \\
\text{CON1} & = \text{con} \\
\text{COOP1} & = \text{coop} \\
\text{SEC1} & = \text{sec}
\end{align*}
\]

Set the errorvariance of PL 1  
Set the errorvariance of CON2 0.15  

admissibility check off  
Path Diagramm  
END OF PROBLEM  

Sample Size = 130
Covariance Matrix to be Analyzed

<table>
<thead>
<tr>
<th></th>
<th>PL</th>
<th>CON1</th>
<th>CON2</th>
<th>COOP1</th>
<th>COOP2</th>
<th>SEC1</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CON1</td>
<td>0.10</td>
<td>0.79</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CON2</td>
<td>0.18</td>
<td>0.32</td>
<td>0.73</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COOP1</td>
<td>0.36</td>
<td>0.12</td>
<td>0.38</td>
<td>0.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COOP2</td>
<td>0.31</td>
<td>0.13</td>
<td>0.35</td>
<td>0.71</td>
<td>0.80</td>
<td></td>
</tr>
<tr>
<td>SEC1</td>
<td>-0.22</td>
<td>-0.19</td>
<td>-0.28</td>
<td>-0.42</td>
<td>-0.37</td>
<td>0.77</td>
</tr>
<tr>
<td>SEC2</td>
<td>-0.17</td>
<td>-0.20</td>
<td>-0.22</td>
<td>-0.35</td>
<td>-0.37</td>
<td>0.51</td>
</tr>
</tbody>
</table>

Covariance Matrix to be Analyzed

<table>
<thead>
<tr>
<th></th>
<th>SEC2</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEC2</td>
<td>0.69</td>
</tr>
</tbody>
</table>

Number of Iterations = 15

LISREL Estimates (Maximum Likelihood)

\[
\begin{align*}
PL &= 0.80 \times pl, \text{ Errorvar.} = 1.00, R^2 = 0.39 \\
CON1 &= 0.41 \times con, \text{ Errorvar.} = 0.62, R^2 = 0.22 \\
&\quad (0.081) \quad (0.082) \\
&\quad 5.09 \quad 7.55 \\
CON2 &= 0.76 \times con, \text{ Errorvar.} = 0.15, R^2 = 0.79 \\
&\quad (0.060) \\
&\quad 12.77 \\
COOP1 &= 0.88 \times coop, \text{ Errorvar.} = 0.061, R^2 = 0.93 \\
&\quad (0.063) \quad (0.041) \\
&\quad 13.91 \quad 1.47 \\
COOP2 &= 0.80 \times coop, \text{ Errorvar.} = 0.15, R^2 = 0.81 \\
&\quad (0.064) \quad (0.039) \\
&\quad 12.51 \quad 3.94 \\
SEC1 &= 0.77 \times sec, \text{ Errorvar.} = 0.17, R^2 = 0.78 \\
&\quad (0.073) \quad (0.069) \\
&\quad 10.55 \quad 2.41 \\
SEC2 &= 0.66 \times sec, \text{ Errorvar.} = 0.26, R^2 = 0.63 \\
&\quad (0.071) \quad (0.057) \\
&\quad 9.38 \quad 4.44
\end{align*}
\]

Covariance Matrix of Independent Variables

<table>
<thead>
<tr>
<th></th>
<th>pl</th>
<th>coop</th>
<th>con</th>
<th>sec</th>
</tr>
</thead>
<tbody>
<tr>
<td>pl</td>
<td>-0.43</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>coop</td>
<td>0.50</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>con</td>
<td>0.30</td>
<td>0.55</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>sec</td>
<td>-0.34</td>
<td>-0.62</td>
<td>-0.47</td>
<td>1.00</td>
</tr>
</tbody>
</table>
Goodness of Fit Statistics

Degrees of Freedom = 10

Minimum Fit Function Chi-Square = 13.67 (P = 0.19)
Normal Theory Weighted Least Squares Chi-Square = 13.39 (P = 0.20)
  Estimated Non-centrality Parameter (NCP) = 3.39
  90 Percent Confidence Interval for NCP = (0.0 ; 17.13)

  Minimum Fit Function Value = 0.11
  Population Discrepancy Function Value (F0) = 0.026
  90 Percent Confidence Interval for F0 = (0.0 ; 0.13)
  Root Mean Square Error of Approximation (RMSEA) = 0.051
  90 Percent Confidence Interval for RMSEA = (0.0 ; 0.12)
  P-Value for Test of Close Fit (RMSEA < 0.05) = 0.43

  Expected Cross-Validation Index (ECVI) = 0.38
  90 Percent Confidence Interval for ECVI = (0.36 ; 0.49)
  ECVI for Saturated Model = 0.43
  ECVI for Independence Model = 3.38

Chi-Square for Independence Model with 21 Degrees of Freedom = 421.50
  Independence AIC = 435.50
  Model AIC = 49.39
  Saturated AIC = 56.00
  Independence CAIC = 462.57
  Model CAIC = 119.01
  Saturated CAIC = 164.29

  Root Mean Square Residual (RMR) = 0.025
  Standardized RMR = 0.033
  Goodness of Fit Index (GFI) = 0.97
  Adjusted Goodness of Fit Index (AGFI) = 0.92
  Parsimony Goodness of Fit Index (PGFI) = 0.35

    Normed Fit Index (NFI) = 0.97
    Non-Normed Fit Index (NNFI) = 0.98
    Parsimony Normed Fit Index (PNFI) = 0.46
    Comparative Fit Index (CFI) = 0.99
    Incremental Fit Index (IFI) = 0.99
    Relative Fit Index (RFI) = 0.93

    Critical N (CN) = 219.98

The Problem used 11616 Bytes (= 0.0% of Available Workspace)

Time used: 0.363 Seconds
Appendix 7.1. Model A (unmodified)

DATE: 5/30/2002
TIME: 11:22

L I S R E L 8.30

The following lines were read from file D:\ESIT\ET_JAL-1\TDK_VE-1\AMALLI.TYO:

metsom
Observed variables
ALT ACQUI PL REW EPERF COST INVEST
CONF COOP SEC

Latent Variables emo calc

Covariance Matrix

\[
\begin{array}{cccccccc}
0.78425 & 0.09186 & 0.98685 & 0.26162 & 0.30951 \\
0.61105 & 0.12292 & 0.54613 & 0.23553 & 0.72392 \\
0.12079 & 0.47617 & 0.29648 & 0.45884 & 0.63273 \\
0.00004 & -0.36776 & -0.15075 & -0.31529 & -0.22728 \\
0.48842 & 0.21027 & 0.26387 & 0.24521 & 0.30395 \\
0.25926 & 0.12322 & 0.47748 & 0.20431 & 0.45096 \\
0.15472 & 0.31940 & 0.28885 & -0.23039 & 0.18372 \\
0.51455 & 0.12322 & 0.47748 & 0.20431 & 0.45096 \\
-0.10602 & -0.50757 & -0.22673 & -0.40461 & -0.34578 \\
0.36225 & -0.22572 & -0.30196 & -0.40986 & 0.66115 \\
\end{array}
\]

Sample size 130

Paths

REW COST INVEST -> emo
EPERF ALT INVEST -> calc
emo -> calc
emo -> CONF COOP SEC
calc -> PL COOP ACQUI

set error variance of calc 0.00000005
Let the errors of REW and EPERF correlate
admissibility check off

Path Diagramm

END OF PROBLEM

Sample Size = 130

metsom

Covariance Matrix to be Analyzed

<table>
<thead>
<tr>
<th>ACQUI</th>
<th>PL</th>
<th>CONF</th>
<th>COOP</th>
<th>SEC</th>
<th>ALT</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACQUI</td>
<td>0.99</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PL</td>
<td>0.31</td>
<td>0.61</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONF</td>
<td>0.15</td>
<td>0.51</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COOP</td>
<td>0.48</td>
<td>0.35</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEC</td>
<td>-0.51</td>
<td>-0.30</td>
<td>-0.41</td>
<td>0.66</td>
<td></td>
</tr>
<tr>
<td>ALT</td>
<td>0.09</td>
<td>0.26</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REW</td>
<td>0.26</td>
<td>0.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EPERF</td>
<td>0.45</td>
<td>0.38</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COST</td>
<td>-0.37</td>
<td>-0.35</td>
<td>0.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INVEST</td>
<td>0.26</td>
<td>0.32</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Covariance Matrix to be Analyzed

<table>
<thead>
<tr>
<th>REW</th>
<th>EPERF</th>
<th>COST</th>
<th>INVEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>REW</td>
<td>0.72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EPERF</td>
<td>0.46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COST</td>
<td>-0.32</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INVEST</td>
<td>0.30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Number of Iterations = 18

LISREL Estimates (Maximum Likelihood)

ACQUI = 0.74*calc, Errorvar. = 0.43, R² = 0.56
    (0.059)    7.27

PL = 0.39*calc, Errorvar. = 0.46, R² = 0.25
    (0.069)    (0.058)    5.67    7.89

CONF = 0.49*emo, Errorvar. = 0.28, R² = 0.46
    (0.072)    (0.039)    6.77    7.12

COOP = 0.079*emo + 0.57*calc, Errorvar. = 0.22, R² = 0.66
    (0.26)    (0.033)    0.31    2.31    6.65

SEC = -0.66*emo, Errorvar. = 0.23, R² = 0.66
    (0.086)    (0.039)    -7.67    5.82

Error Covariance for EPERF and REW = -0.24
    (0.100)          -2.44

emo = 0.49*REW - 0.70*COST + 0.15*INVEST, Errorvar. = 0.28, R² = 0.72
    (0.12)    (0.13)    (0.10)    4.03    -5.52    1.51

calc = 0.77*emo + 0.088*ALT + 0.25*EPERF + 0.16*INVEST, R² = 1.00
    (0.13)    (0.069)    (0.11)    (0.10)    5.93    1.27    2.16    1.57

Covariance Matrix of Independent Variables

<table>
<thead>
<tr>
<th></th>
<th>ALT</th>
<th>REW</th>
<th>EPERF</th>
<th>COST</th>
<th>INVEST</th>
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<tbody>
<tr>
<td>ALT</td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>0.78</td>
<td>(0.10)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REW</td>
<td>0.12</td>
<td>(0.07)</td>
<td>0.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.09)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.83</td>
<td>8.04</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>EPERF</td>
<td>0.11</td>
<td>0.70</td>
<td>0.63</td>
<td></td>
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<tr>
<td></td>
<td>(0.06)</td>
<td>(0.12)</td>
<td>(0.08)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.80</td>
<td>5.89</td>
<td>8.05</td>
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<td>COST</td>
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<td>-0.32</td>
<td>-0.23</td>
<td>0.49</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.05)</td>
<td>(0.06)</td>
<td>(0.05)</td>
<td>(0.06)</td>
<td></td>
</tr>
<tr>
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<td>0.00</td>
<td>-5.33</td>
<td>4.30</td>
<td>8.03</td>
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<tr>
<td>INVEST</td>
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<td>0.30</td>
<td>0.26</td>
<td>-0.16</td>
<td>0.63</td>
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<tr>
<td></td>
<td>(0.06)</td>
<td>(0.07)</td>
<td>(0.06)</td>
<td>(0.05)</td>
<td>(0.08)</td>
</tr>
<tr>
<td></td>
<td>3.25</td>
<td>4.66</td>
<td>4.32</td>
<td>-3.14</td>
<td>8.03</td>
</tr>
</tbody>
</table>

Goodness of Fit Statistics

Degrees of Freedom = 22
Minimum Fit Function Chi-Square = 41.58 (P = 0.0070)
Normal Theory Weighted Least Squares Chi-Square = 38.34 (P = 0.017)
Estimated Non-centrality Parameter (NCP) = 16.34
90 Percent Confidence Interval for NCP = (2.93 ; 37.59)
Minimum Fit Function Value = 0.32
Population Discrepancy Function Value (F0) = 0.13
90 Percent Confidence Interval for F0 = (0.023 ; 0.29)
Root Mean Square Error of Approximation (RMSEA) = 0.076
90 Percent Confidence Interval for RMSEA = (0.032 ; 0.12)
P-Value for Test of Close Fit (RMSEA < 0.05) = 0.14

Expected Cross-Validation Index (ECVI) = 0.81
90 Percent Confidence Interval for ECVI = (0.70 ; 0.97)
ECVI for Saturated Model = 0.85
ECVI for Independence Model = 4.97

Chi-Square for Independence Model with 45 Degrees of Freedom = 621.41
Independence AIC = 641.41
Model AIC = 104.34
Saturated AIC = 110.00
Independence CAIC = 680.09
Model CAIC = 231.97
Saturated CAIC = 322.71

Root Mean Square Residual (RMR) = 0.035
Standardized RMR = 0.051
Goodness of Fit Index (GFI) = 0.94
Adjusted Goodness of Fit Index (AGFI) = 0.86
Parsimony Goodness of Fit Index (PGFI) = 0.38
Normed Fit Index (NFI) = 0.93
Non-Normed Fit Index (NNFI) = 0.93
Parsimony Normed Fit Index (PNFI) = 0.46
Comparative Fit Index (CFI) = 0.97
Incremental Fit Index (IFI) = 0.97
Relative Fit Index (RFI) = 0.86

Critical N (CN) = 125.98

The Modification Indices Suggest to Add the
Path to from Decrease in Chi-Square New Estimate
ACQUI emo 8.7 1.63
PL emo 8.7 -0.85

The Modification Indices Suggest to Add an Error Covariance
Between and Decrease in Chi-Square New Estimate
ALT PL 10.6 0.17

The Problem used 24392 Bytes (= 0.0% of Available Workspace)
Time used: 0.520 Seconds
Appendix 7.2. – Structural Model Estimation – Model A

DATE: 5/30/2002
TIME: 11:28

L I S R E L 8.30

The following lines were read from file D:\ESIT\ET_JAL~1\TDK_VE~1\AMALLI.TYO:

```
metsom
Observed variables
ALT ACQUI PL REW EPERF COST INVEST
CONF COOP SEC

Latent Variables emo calc
Covariance Matrix

0.78425 0.09186 0.98685 0.26162 0.30951
0.61105 0.12292 0.29648 0.45884 0.63273
0.00004 -0.36776 -0.15075 -0.31529 -0.22728
0.48842 0.21027 0.26387 0.24521 0.30395
0.25926 -0.15949 0.63030 0.05267 0.36803
0.15472 0.31940 0.28885 -0.23039 0.18372
0.37982 -0.31793 0.32134 0.34832 0.63453
-0.10602 -0.50757 -0.22673 -0.40461 -0.34578
0.36225 -0.22572 -0.30196 -0.40986 0.66115

Sample size 130
Paths
REW COST INVEST -> emo
EPERF ALT INVEST -> calc
emo -> calc
emo -> CONF COOP SEC
calc -> PL COOP

set error variance of calc 0.00000005
Let the errors of REW and EPERF correlate
admissibility check off

Path Diagramm
END OF PROBLEM

Sample Size = 130
metsom

Covariance Matrix to be Analyzed

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```
Number of Iterations = 15

LISREL Estimates (Maximum Likelihood)

\[ PL = 0.44 \times \text{calc}, \text{Errorvar.} = 0.42, R^2 = 0.31 \]
\[ (0.052) \quad 8.08 \]

\[ \text{CONF} = 0.49 \times \text{emo}, \text{Errorvar.} = 0.27, R^2 = 0.47 \]
\[ (0.079) \quad (0.039) \]
\[ 6.20 \quad 7.07 \]

\[ \text{COOP} = 0.55 \times \text{emo} + 0.14 \times \text{calc}, \text{Errorvar.} = 0.20, R^2 = 0.69 \]
\[ (0.096) \quad (0.075) \quad (0.033) \]
\[ 5.77 \quad 1.89 \quad 6.00 \]

\[ \text{SEC} = - 0.64 \times \text{emo}, \text{Errorvar.} = 0.25, R^2 = 0.62 \]
\[ (0.096) \quad (0.041) \]
\[ -6.71 \quad 6.09 \]

Error Covariance for EPERF and REW = -0.15
\[ (0.071) \quad -2.17 \]

\[ \text{emo} = 0.53 \times \text{REW} - 0.66 \times \text{COST} + 0.19 \times \text{INVEST}, \text{Errorvar.} = 0.24, R^2 = 0.76 \]
\[ (0.12) \quad (0.13) \quad (0.096) \]
\[ 4.49 \quad -4.95 \quad 1.96 \]

\[ \text{calc} = 0.20 \times \text{emo} + 0.50 \times \text{ALT} + 0.51 \times \text{EPERF} + 0.45 \times \text{INVEST}, R^2 = 1.00 \]
\[ (0.21) \quad (0.15) \quad (0.22) \quad (0.19) \]
\[ 0.98 \quad 3.36 \quad 2.34 \quad 2.33 \]

Covariance Matrix of Independent Variables

<table>
<thead>
<tr>
<th></th>
<th>ALT</th>
<th>REW</th>
<th>EPERF</th>
<th>COST</th>
<th>INVEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALT</td>
<td>0.78</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.10)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REW</td>
<td>0.12</td>
<td>0.73</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.07)</td>
<td>(0.09)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.82</td>
<td>8.04</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EPERF</td>
<td>0.12</td>
<td>0.61</td>
<td>0.63</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.06)</td>
<td>(0.10)</td>
<td>(0.08)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.91</td>
<td>6.17</td>
<td>8.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COST</td>
<td>0.00</td>
<td>-0.31</td>
<td>-0.23</td>
<td>0.49</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.05)</td>
<td>(0.06)</td>
<td>(0.05)</td>
<td>(0.06)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.00</td>
<td>-5.29</td>
<td>-4.32</td>
<td>8.03</td>
<td></td>
</tr>
<tr>
<td>INVEST</td>
<td>0.21</td>
<td>0.30</td>
<td>0.26</td>
<td>-0.16</td>
<td>0.63</td>
</tr>
<tr>
<td></td>
<td>(0.06)</td>
<td>(0.07)</td>
<td>(0.06)</td>
<td>(0.05)</td>
<td>(0.08)</td>
</tr>
<tr>
<td></td>
<td>3.25</td>
<td>4.64</td>
<td>4.34</td>
<td>-3.14</td>
<td>8.03</td>
</tr>
</tbody>
</table>

Goodness of Fit Statistics

Degrees of Freedom = 14
Minimum Fit Function Chi-Square = 17.86 (P = 0.21)
Normal Theory Weighted Least Squares Chi-Square = 18.57 (P = 0.18)
Estimated Non-centrality Parameter (NCP) = 4.57
90 Percent Confidence Interval for NCP = (0.0 ; 19.94)

Minimum Fit Function Value = 0.14
Population Discrepancy Function Value (F0) = 0.035
90 Percent Confidence Interval for F0 = (0.0 ; 0.15)
Root Mean Square Error of Approximation (RMSEA) = 0.050
90 Percent Confidence Interval for RMSEA = (0.0 ; 0.11)
P-Value for Test of Close Fit (RMSEA < 0.05) = 0.45

Expected Cross-Validation Index (ECVI) = 0.62
90 Percent Confidence Interval for ECVI = (0.59 ; 0.74)
ECVI for Saturated Model = 0.70
ECVI for Independence Model = 4.12

Chi-Square for Independence Model with 36 Degrees of Freedom = 514.03
   Independence AIC = 532.03
     Model AIC = 80.57
     Saturated AIC = 90.00
   Independence CAIC = 566.84
     Model CAIC = 200.46
     Saturated CAIC = 264.04

   Root Mean Square Residual (RMR) = 0.017
     Standardized RMR = 0.027
   Goodness of Fit Index (GFI) = 0.97
   Adjusted Goodness of Fit Index (AGFI) = 0.90
   Parsimony Goodness of Fit Index (PGFI) = 0.30
     Normed Fit Index (NFI) = 0.97
     Non-Normed Fit Index (NNFI) = 0.98
     Parsimony Normed Fit Index (PNFI) = 0.38
     Comparative Fit Index (CFI) = 0.99
     Incremental Fit Index (IFI) = 0.99
     Relative Fit Index (RFI) = 0.91

   Critical N (CN) = 211.55
Appendix 7.3. –Structural Model Estimation – Model A with multicollinear element (EPERF) removed

DATE: 12/13/2002
TIME: 14:32

LISREL 8.30

The following lines were read from file D:\ESIT\ET_JAL-1\TDK_VE-1\AMALLI.TYO:

```plaintext
metsom

Observed variables
ALT ACQUI PL      REW    EPERF      COST      INVEST
CONF     COOP      SEC

Latent Variables  emo calc

Covariance Matrix
0.78425  0.09186  0.98685  0.26162  0.30951
0.61105  0.12292  0.54613  0.23553  0.72392
0.12079  0.47617  0.29648  0.45884  0.63273
0.00004 -0.36776 -0.15075 -0.31529 -0.22728
0.48842  0.21027  0.48842  0.23553  0.72392
0.25926 -0.15949  0.63030  0.05267  0.36803
0.15472  0.31940  0.28885 -0.23039  0.18372
0.51455  0.12322  0.47748  0.20431  0.45096
0.37982 -0.31793  0.32134  0.34832  0.63453
0.36225 -0.22572 -0.30196 -0.40986  0.66115

Sample size 130

Paths
REW COST INVEST -> emo
ALT INVEST -> calc
emo -> calc
emo -> CONF COOP SEC
calc -> PL COOP

set error variance of calc 0.00000005

admissibility check off

Path Diagramm
END OF PROBLEM

Sample Size =   130

metsom

Covariance Matrix to be Analyzed

```

```plaintext
PL  CONF  COOP  SEC  ALT  REW  
-------- -------- -------- -------- -------- --------
PL   0.61  
CONF  0.15  0.51  
COOP  0.20  0.35  0.63  
SEC  -0.23  -0.30  -0.41  0.66  
ALT   0.26  0.05  0.12  -0.11  0.78  
REW   0.24  0.32  0.45  -0.40  0.12  0.72  
COST  -0.15  -0.23  -0.32  0.36  0.00  -0.32  
INVEST  0.25  0.18  0.32  -0.23  0.21  0.30  

Covariance Matrix to be Analyzed

```

```plaintext
COST  INVEST  
-------- -------- 
COST   0.49  
INVEST -0.16  0.63  
```
Number of Iterations = 13

LISREL Estimates (Maximum Likelihood)

\[ PL = 0.42*calc, \text{ Errorvar.} = 0.43, R^2 = 0.29 \]
\[ (0.055) \]
\[ 7.93 \]

\[ CONF = 0.49*emo, \text{ Errorvar.} = 0.28, R^2 = 0.46 \]
\[ (0.076) \]
\[ 6.40 \]
\[ 7.11 \]

\[ COOP = 0.56*emo + 0.13*calc, \text{ Errorvar.} = 0.19, R^2 = 0.70 \]
\[ (0.099) \]
\[ 5.68 \]
\[ 1.77 \]
\[ 5.68 \]

\[ SEC = - 0.64*emo, \text{ Errorvar.} = 0.26, R^2 = 0.61 \]
\[ (0.091) \]
\[ -7.01 \]
\[ 6.29 \]

emo = 0.55*REW - 0.64*COST + 0.19*INVEST, Errorvar. = 0.24, R² = 0.76
\[ (0.11) \]
\[ 4.88 \]
\[ -4.94 \]
\[ 1.94 \]

calc = 0.50*emo + 0.55*ALT + 0.50*INVEST, R² = 1.00
\[ (0.18) \]
\[ 2.77 \]
\[ 3.41 \]
\[ 2.36 \]

Covariance Matrix of Independent Variables

\begin{tabular}{cccc}
ALT & REW & COST & INVEST \\
\hline
ALT & 0.78 & 0.12 & 0.00 & 0.21 \\
& (0.10) & (0.07) & (0.05) & (0.06) \\
REW & 0.12 & 0.72 & -0.32 & 0.30 \\
& (0.09) & (0.09) & (0.06) & (0.07) \\
COST & 0.00 & -0.32 & 0.49 & -0.16 \\
& (0.06) & (0.05) & (0.06) & (0.08) \\
INVEST & 0.21 & 0.30 & -0.16 & 0.63 \\
& (0.07) & (0.07) & (0.05) & (0.08) \\
\end{tabular}

Goodness of Fit Statistics

Degrees of Freedom = 12
Minimum Fit Function Chi-Square = 12.01 (P = 0.44)
Normal Theory Weighted Least Squares Chi-Square = 12.59 (P = 0.40)
Estimated Non-centrality Parameter (NCP) = 0.59
90 Percent Confidence Interval for NCP = (0.0 ; 13.38)

Minimum Fit Function Value = 0.093
Population Discrepancy Function Value (F0) = 0.0046
90 Percent Confidence Interval for F0 = (0.0 ; 0.10)
Root Mean Square Error of Approximation (RMSEA) = 0.020
90 Percent Confidence Interval for RMSEA = (0.0 ; 0.093)
P-Value for Test of Close Fit (RMSEA < 0.05) = 0.67

Expected Cross-Validation Index (ECVI) = 0.47
90 Percent Confidence Interval for ECVI = (0.47 ; 0.57)
ECVI for Saturated Model = 0.56
ECVI for Independence Model = 3.27
Chi-Square for Independence Model with 28 Degrees of Freedom = 405.86
Independence AIC = 421.86
Model AIC = 60.59
Saturated AIC = 72.00
Independence CAIC = 452.80
Model CAIC = 153.41
Saturated CAIC = 211.23

Root Mean Square Residual (RMR) = 0.015
Standardized RMR = 0.024
Goodness of Fit Index (GFI) = 0.98
Adjusted Goodness of Fit Index (AGFI) = 0.93
Parsimony Goodness of Fit Index (PGFI) = 0.33

Normed Fit Index (NFI) = 0.97
Non-Normed Fit Index (NNFI) = 1.00
Parsimony Normed Fit Index (PNFI) = 0.42
Comparative Fit Index (CFI) = 1.00
Incremental Fit Index (IFI) = 1.00
Relative Fit Index (RFI) = 0.93

Critical N (CN) = 282.63

The Problem used 15688 Bytes (= 0.0% of Available Workspace)

Time used: 0.488 Seconds

Chi-Square=12.59, df=12, P-value=0.39964, RMSEA=0.020
APPENDIX 8 - Structural Model Estimation - Model (B)

DATE: 5/29/2002
TIME: 10:27

LISREL 8.30

The following lines were read from file D:\ESIT\DATAT\DATA-A-1\BMALLITYO:

Observed variables
ALT ACQUI PL REW EPERF COST INVEST
CONF COOP SEC

Latent Variables emo calc

Covariance Matrix

\[
\begin{bmatrix}
0.76090 & 0.19885 & 0.68642 & 0.10044 & 0.28249 \\
0.72177 & 0.21827 & 0.53955 & 0.40192 & 0.79155 \\
0.18938 & 0.45779 & 0.35559 & 0.59032 & 0.67882 \\
-0.13317 & -0.31625 & -0.21335 & -0.34268 & -0.27296 \\
0.52601 & 0.17601 & 0.37815 & 0.31588 & 0.43032 \\
0.41427 & -0.24393 & 0.63190 & 0.12031 & 0.26615 \\
0.13953 & 0.25705 & 0.22157 & -0.17530 & 0.24667 \\
0.55944 & 0.20278 & 0.49347 & 0.33108 & 0.55465 \\
0.48255 & -0.39120 & 0.45233 & 0.24610 & 0.76312 \\
-0.07832 & -0.37159 & -0.19545 & -0.28810 & -0.27887 \\
0.31356 & -0.21522 & -0.22062 & -0.37825 & 0.62158
\end{bmatrix}
\]

Sample size 130

Paths

REW COST INVEST -> emo
ALT EPERF INVEST -> calc
emo -> calc
calc -> PL COOP

set error variance of calc 0.00000005
Let the errors of REW and EPERF correlate
admissibility check off

Path Diagram

END OF PROBLEM

Sample Size = 130

Covariance Matrix to be Analyzed

\[
\begin{bmatrix}
0.72 & 0.14 & -0.20 & 0.10 & 0.40 & -0.21 & 0.32 \\
0.14 & 0.54 & 0.33 & 0.20 & 0.26 & -0.18 & 0.25 \\
-0.20 & 0.33 & 0.76 & -0.08 & 0.55 & -0.18 & 0.45 \\
0.10 & 0.20 & -0.22 & 0.55 & -0.29 & -0.39 & -0.22 \\
0.40 & 0.26 & 0.20 & 0.76 & 0.22 & 0.48 & 0.45 \\
-0.21 & -0.18 & -0.39 & -0.18 & 0.59 & 0.48 & -0.22 \\
0.32 & 0.25 & 0.45 & -0.22 & 0.18 & 0.31 & 0.18 \\
0.10 & 0.08 & 0.22 & 0.76 & 0.22 & 0.31 & 0.43
\end{bmatrix}
\]

Covariance Matrix to be Analyzed

\[
\begin{bmatrix}
0.68 \\
-0.27 \\
0.41
\end{bmatrix}
\]

metsom
Number of Iterations = 12

LISREL Estimates (Maximum Likelihood)

\[ PL = 0.47^{\text{calc}}, \text{Errorvar.} = 0.50, R^2 = 0.30 \]
\[ \text{(0.063)} \]
\[ 8.94 \]

\[ \text{CONF} = 0.35^{\text{emo}}, \text{Errorvar.} = 0.41, R^2 = 0.23 \]
\[ \text{(0.084)} \]
\[ 4.24 \]
\[ \text{CONF} = 0.35^{\text{emo}}, \text{Errorvar.} = 0.41, R^2 = 0.23 \]
\[ \text{(0.055)} \]
\[ 7.51 \]

\[ \text{COOP} = 0.36^{\text{emo} + 0.40^{\text{calc}}}, \text{Errorvar.} = 0.22, R^2 = 0.71 \]
\[ \text{(0.15)} \]
\[ 2.43 \]
\[ 3.13 \]
\[ 5.79 \]

\[ \text{SEC} = -0.55^{\text{emo}}, \text{Errorvar.} = 0.32, R^2 = 0.49 \]
\[ \text{(0.11)} \]
\[ -5.17 \]
\[ 6.14 \]

Error Covariance for EPERF and REW = -0.26
\[ \text{(0.13)} \]
\[ -2.01 \]

\[ \text{emo} = 0.23^{\text{REW}} - 0.80^{\text{COST}} + 0.28^{\text{INVEST}}, \text{Errorvar.} = 0.29, R^2 = 0.71 \]
\[ \text{(0.10)} \]
\[ 2.23 \]
\[ -4.43 \]
\[ 1.86 \]

\[ \text{calc} = 0.30^{\text{emo} + 0.034^{\text{ALT}} + 0.54^{\text{EPERF}} + 0.51^{\text{INVEST}}}, R^2 = 1.00 \]
\[ \text{(0.21)} \]
\[ 1.39 \]
\[ 0.33 \]
\[ 2.74 \]
\[ 2.62 \]

Covariance Matrix of Independent Variables

<table>
<thead>
<tr>
<th>ALT</th>
<th>REW</th>
<th>EPERF</th>
<th>COST</th>
<th>INVEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALT</td>
<td>0.76</td>
<td>(0.09)</td>
<td>8.03</td>
<td></td>
</tr>
<tr>
<td>REW</td>
<td>0.22</td>
<td>0.79</td>
<td>(0.07)</td>
<td>(0.10)</td>
</tr>
<tr>
<td>EPERF</td>
<td>0.19</td>
<td>0.85</td>
<td>0.68</td>
<td>(0.07)</td>
</tr>
<tr>
<td>COST</td>
<td>-0.13</td>
<td>-0.34</td>
<td>-0.27</td>
<td>0.53</td>
</tr>
<tr>
<td>INVEST</td>
<td>0.18</td>
<td>0.43</td>
<td>0.41</td>
<td>-0.24</td>
</tr>
</tbody>
</table>

Goodness of Fit Statistics

Degrees of Freedom = 14
Minimum Fit Function Chi-Square = 14.75 (P = 0.40)
Normal Theory Weighted Least Squares Chi-Square = 13.43 (P = 0.49)
Estimated Non-centrality Parameter (NCP) = 0.0
90 Percent Confidence Interval for NCP = (0.0 ; 12.18)

Minimum Fit Function Value = 0.11
Population Discrepancy Function Value (F0) = 0.0
90 Percent Confidence Interval for F0 = (0.0 ; 0.094)
Root Mean Square Error of Approximation (RMSEA) = 0.0
90 Percent Confidence Interval for RMSEA = (0.0 ; 0.082)
P-Value for Test of Close Fit (RMSEA < 0.05) = 0.76

Expected Cross-Validation Index (ECVI) = 0.59
90 Percent Confidence Interval for ECVI = (0.59 ; 0.68)
      ECVI for Saturated Model = 0.70
      ECVI for Independence Model = 4.43

Chi-Square for Independence Model with 36 Degrees of Freedom = 553.93
      Independence AIC = 571.93
      Model AIC = 75.43
      Saturated AIC = 90.00
      Independence CAIC = 606.74
      Model CAIC = 195.32
      Saturated CAIC = 264.04

Root Mean Square Residual (RMR) = 0.021
      Standardized RMR = 0.034
      Goodness of Fit Index (GFI) = 0.98
      Adjusted Goodness of Fit Index (AGFI) = 0.93
      Parsimony Goodness of Fit Index (PGFI) = 0.30

      Normed Fit Index (NFI) = 0.97
      Non-Normed Fit Index (NNFI) = 1.00
      Parsimony Normed Fit Index (PNFI) = 0.38
      Comparative Fit Index (CFI) = 1.00
      Incremental Fit Index (IFI) = 1.00
      Relative Fit Index (RFI) = 0.93

      Critical N (CN) = 255.89

The Problem used    21504 Bytes (= 0.0% of Available Workspace)

      Time used:   0.359 Seconds
APPENDIX 9 - Structural Model Estimation - Rival Model

DATE: 5/29/2002
TIME: 10:34

L I S R E L 8.30

BY

Karl G. Jöreskog & Dag Sörbom

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Website: www.ssicentral.com

The following lines were read from file D:\ESIT\DATAT\DATA-A~1\BRIVAL.TYO:

metsom

Observed variables
ALT ACQUI PL REW EPERF COST INVEST
CONF COOP SEC

Latent Variables com
Covariance Matrix
0.76090 0.19885 0.68642 0.10044 0.28249
0.72177 0.21827 0.53959 0.40192 0.79155
0.18938 0.45779 0.35599 0.59032 0.67882
-0.13317 -0.31625 -0.21335 -0.34268 -0.27296
0.52601 0.17601 0.37815 0.31588 0.43032
0.41427 -0.24393 0.63190 0.12031 0.26615
0.13953 0.25705 0.22157 -0.17530 0.24667
0.53944 0.20278 0.49347 0.33108 0.55465
0.48255 -0.39120 0.45233 0.24610 0.76312
-0.07832 -0.37159 -0.19545 -0.28810 -0.27887
0.31356 -0.21522 -0.22062 -0.37825 0.62158

Sample size 130

Paths
REW COST INVEST ALT EPERF -> com
com -> CONF COOP SEC PL

admissibility check off

Path Diagramm
END OF PROBLEM

Sample Size = 130

metsom

Covariance Matrix to be Analyzed

<table>
<thead>
<tr>
<th></th>
<th>PL</th>
<th>CONF</th>
<th>COOP</th>
<th>SEC</th>
<th>ALT</th>
<th>REW</th>
</tr>
</thead>
<tbody>
<tr>
<td>PL</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONF</td>
<td>0.14</td>
<td>0.54</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>COOP</td>
<td>0.33</td>
<td>0.25</td>
<td>0.76</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEC</td>
<td>-0.20-0.22-0.38-0.62</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ALT</td>
<td>0.10</td>
<td>0.12</td>
<td>0.20</td>
<td>-0.08</td>
<td>0.76</td>
<td></td>
</tr>
<tr>
<td>REW</td>
<td>0.40</td>
<td>0.26</td>
<td>0.55</td>
<td>-0.29</td>
<td>0.22</td>
<td>0.79</td>
</tr>
<tr>
<td>EPERF</td>
<td>0.36</td>
<td>0.22</td>
<td>0.48</td>
<td>-0.28</td>
<td>0.19</td>
<td>0.59</td>
</tr>
<tr>
<td>COST</td>
<td>-0.21</td>
<td>-0.18</td>
<td>-0.39</td>
<td>0.31</td>
<td>-0.13</td>
<td>-0.34</td>
</tr>
</tbody>
</table>
INVEST  0.32  0.25  0.45 -0.22  0.18  0.43

Covariance Matrix to be Analyzed

<table>
<thead>
<tr>
<th></th>
<th>EPERF</th>
<th>COST</th>
<th>INVEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPERF</td>
<td>0.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COST</td>
<td>-0.27</td>
<td>0.53</td>
<td></td>
</tr>
<tr>
<td>INVEST</td>
<td>0.41</td>
<td>-0.24</td>
<td>0.63</td>
</tr>
</tbody>
</table>

metsom

Number of Iterations = 10

LISREL Estimates (Maximum Likelihood)

\[ PL = 0.48 \times \text{com}, \ \text{Errorvar.} = 0.49, \ R^2 = 0.32 \]
\[ (0.14) \quad (0.064) \]
\[ 3.39 \quad 7.70 \]

\[ \text{CONF} = 0.35 \times \text{com}, \ \text{Errorvar.} = 0.41, \ R^2 = 0.23 \]
\[ (0.11) \quad (0.053) \]
\[ 3.22 \quad 7.82 \]

\[ \text{COOP} = 0.74 \times \text{com}, \ \text{Errorvar.} = 0.21, \ R^2 = 0.72 \]
\[ (0.21) \quad (0.041) \]
\[ 3.62 \quad 5.15 \]

\[ \text{SEC} = -0.46 \times \text{com}, \ \text{Errorvar.} = 0.41, \ R^2 = 0.35 \]
\[ (0.13) \quad (0.053) \]
\[ -3.43 \quad 7.65 \]

\[ \text{com} = 0.0080 \times \text{ALT} + 0.33 \times \text{REW} + 0.24 \times \text{EPERF} - 0.50 \times \text{COST} + 0.37 \times \text{INVEST}, \ \text{Errorvar.} = 0.10, \ R^2 = 0.90 \]
\[ (0.064) \quad (0.14) \quad (0.13) \quad (0.16) \quad (0.13) \]
\[ 0.13 \quad 2.38 \quad 1.83 \quad -3.10 \quad 2.77 \]

Covariance Matrix of Independent Variables

<table>
<thead>
<tr>
<th></th>
<th>ALT</th>
<th>REW</th>
<th>EPERF</th>
<th>COST</th>
<th>INVEST</th>
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</thead>
<tbody>
<tr>
<td>ALT</td>
<td>0.76</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>(0.09)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REW</td>
<td>0.22</td>
<td>0.79</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.07)</td>
<td>(0.10)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3.08</td>
<td>8.03</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EPERF</td>
<td>0.19</td>
<td>0.59</td>
<td>0.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.07)</td>
<td>(0.08)</td>
<td>(0.08)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.89</td>
<td>7.12</td>
<td>8.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>COST</td>
<td>-0.13</td>
<td>-0.34</td>
<td>-0.27</td>
<td>0.53</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.06)</td>
<td>(0.06)</td>
<td>(0.06)</td>
<td>(0.07)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-2.34</td>
<td>-5.33</td>
<td>-4.72</td>
<td>8.03</td>
<td></td>
</tr>
<tr>
<td>INVEST</td>
<td>0.18</td>
<td>0.43</td>
<td>0.41</td>
<td>-0.24</td>
<td>0.63</td>
</tr>
<tr>
<td></td>
<td>(0.06)</td>
<td>(0.07)</td>
<td>(0.07)</td>
<td>(0.06)</td>
<td>(0.08)</td>
</tr>
<tr>
<td></td>
<td>2.79</td>
<td>5.90</td>
<td>6.07</td>
<td>-4.43</td>
<td>8.03</td>
</tr>
</tbody>
</table>

Goodness of Fit Statistics

Degrees of Freedom = 17
Minimum Fit Function Chi-Square = 28.30 (P = 0.042)
Normal Theory Weighted Least Squares Chi-Square = 25.08 (P = 0.093)
Estimated Non-centrality Parameter (NCP) = 8.08
90 Percent Confidence Interval for NCP = (0.0 ; 25.59)
Minimum Fit Function Value = 0.22
Population Discrepancy Function Value (F0) = 0.063
90 Percent Confidence Interval for F0 = (0.0 ; 0.20)
Root Mean Square Error of Approximation (RMSEA) = 0.061
90 Percent Confidence Interval for RMSEA = (0.0 ; 0.11)
P-Value for Test of Close Fit (RMSEA < 0.05) = 0.33

Expected Cross-Validation Index (ECVI) = 0.63
90 Percent Confidence Interval for ECVI = (0.57 ; 0.76)
ECVI for Saturated Model = 0.70
ECVI for Independence Model = 4.43

Chi-Square for Independence Model with 36 Degrees of Freedom = 553.93
Independence AIC = 571.93
Model AIC = 81.08
Saturated AIC = 90.00
Independence CAIC = 606.74
Model CAIC = 189.37
Saturated CAIC = 264.04

Root Mean Square Residual (RMR) = 0.026
Standardized RMR = 0.041
Goodness of Fit Index (GFI) = 0.96
Adjusted Goodness of Fit Index (AGFI) = 0.89
Parsimony Goodness of Fit Index (PGFI) = 0.36

Normed Fit Index (NFI) = 0.95
Non-Normed Fit Index (NNFI) = 0.95
Parsimony Normed Fit Index (PNFI) = 0.45
Comparative Fit Index (CFI) = 0.98
Incremental Fit Index (IFI) = 0.98
Relative Fit Index (RFI) = 0.89

Critical N (CN) = 153.30

The Problem used 18472 bytes (= 0.0% of Available Workspace)
Time used: 0.359 Seconds