MANAGING BUILDING AND CIVIL ENGINEERING PROJECT CLAIMS TO REDUCE CONFLICT INTENSITY AND CONTRACTORS' POTENTIAL TO DISPUTE

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SUMMARY

This research examined the relationship between a contractor's perception about fairness, conflict intensity and the contractor's potential to dispute in the process of administering claims on a project. The central questions addressed were: how do contractors' perception about fairness in the process for administering project claims influence conflict intensity and their potential to dispute? Are contractors' reactions to unfavourable decisions on claims moderated by their perceptions about the procedures and processes used to make the decisions and how?

Based on a review of the organizational justice literature, six constructs of perception about fairness were identified, namely outcome favourability, decision outcome fairness, procedural fairness, quality of decision-making process, quality of treatment experienced and control. Several sub-hypotheses were formulated and constructed in the form of a structural model that describes the relationship between conflict intensity, a contractor's potential to dispute and the six constructs.

Data was collected using structured questionnaire via face-to-face interviews with 41 contractors' contract managers/quantity surveyors on 41 completed projects. Using structural equation modeling technique with Partial Least Square (PLS) estimation approach, the data obtained was analyzed. The analysis revealed some key findings:

(1) Five constructs of 'perception about fairness' predicted about 38% of the variance in conflict intensity. The results showed that the higher the procedural fairness the lower the intensity of conflict. The effect of quality of treatment on

conflict intensity was indirect through quality decision-making process and then via procedural fairness such that contractors, who perceived that they were treated properly, perceived that the contract administrator implemented a good quality decision-making process. Those contractors, who perceived that the contract administrator implemented a good quality decision-making process, perceived that the procedure for administering claims was fair, and they did not display conflict behaviour.

(2) Six predictors accounted for 46% of the variance in contractors' potential to dispute. The higher the conflict intensity the higher the contractors' potential to dispute. Also, the higher the perceived decision outcome fairness the lower the contractors' potential to dispute. Those contractors, who perceived that they were treated properly, perceived that the contract administrator's decision was fair and they indicated a low potential to engage in dispute. Similarly, those contractors, who perceived that the procedure for administering claims was unfair, displayed conflict behaviour and indicated a high propensity to engage in dispute.

(3) There was lower intensity of conflict and lower potential to dispute against unfavourable outcome when the procedure for administering claims was perceived to be fair than when procedure was perceived to be unfair. Similarly, when the outcome of claims was unfavourable, those contractors, who perceived that the quality of decision-making process was good, indicated a lower potential to dispute than those who perceived that the quality of decision-making process was poor. Further when the outcome of claims was unfavourable, there was lower intensity of conflict when

‘control’ in the form of pre-construction discussion and agreement on method for substantiating and assessing claims and on rules of evidence for claims was higher than when ‘control’ was lower.

(4) This study also discovered that when unfavourable outcome was received from claims, conflict intensity and potential to dispute was lower when parties have been involved in many projects together in the past than when they have been involved in few projects together. Additionally, when unfavourable outcome was received from claims, respondents with many years of experience in construction engaged in conflict behaviour than respondents with fewer years of experience, whereas respondents with many years of experience in construction indicated a lower potential to dispute claims than respondents with fewer years of experience.

The results provide an empirical evidence to support a claims administration strategy based on principles of fairness when attempting to reduce conflict and dispute on projects. Considering the questionnaire items used in measuring the key constructs of the research hypotheses, the study concluded with a series of recommendations and strategies for administering building and engineering projects claims to reduce conflict intensity and project owners’ exposure to dispute with contractors.

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LIST OF ABBREVIATIONS AND ACRONYMNS

CI	: Conflict Intensity
CPM	: Critical Path Method
CTROL	: Control
DOFAIR	: Decision Outcome Fairness
EOT	: Extension of Time
FA	: Factor Analysis
LE	: Loss and Expense
MRA	: Multiples Regression Analysis
NPTP	: Numbers of Projects executed Together in the Past
OFAVOUR	: Outcome Favourability
OTREAT	: Quality of Treatment Experienced
PA	: Path Analysis
PDISPU	: Potential to Dispute
PLS	: Partial Least Square
PLS-SEM	: Partial Least Square Structural Equation Modeling
PSSCOC	: Public Sector Standard Conditions of Contract of Construction Works
QDPROCESS	: Quality of Decision-Making Process
SEM	: Structural Equation Modeling
SIA	: Singapore Institute of Architects Conditions of Contract
SRA	: Simple Regression Analysis
TCE	: Transaction Cost Economics
YEX	: Years of Experience in Construction

CHAPTER ONE

INTRODUCTION

1.1 Background

Claims, conflicts and disputes are major sources of inefficiency in the delivery of building and engineering projects (Latham, 1994; Latham, 1993; Fenn, 1997). Barrie and Paulson (1992) observed that, the construction industry has experienced an increase in claims liability exposures and disputes along with an increasing difficulty in reaching reasonable settlement of claims in an effective, economical, and timely manner.

In the United Kingdom, contractors' claims for extension of time and loss and expenses claims are the second and fourth most frequent subjects of litigation between the main contractors and employers (Russel, 2001). In other countries, the construction sector is faced with similar problems (Jergeas and Hartman, 1994 – Canada; Uher, 1994 – Australia; and Barrie and Paulson, 1992 – USA). Robinson *et al*. (1996) observed an increasing trend of contentious behaviour in the Singapore and Malaysia construction industries. Wong (2005) reported that contractors' claims for variation and project delays are the first and second most frequently disputed issues in Singapore.

The problem with the handling of a contractor's claims is that it involves a strong underlying conflict of interest between the employer (project owner or the client), contractor and the person certifying the claims (contract administrator). Also, substantiation and assessment of claims are complex and subjective exercises that involve numerous assumptions (Perlman, 1984). Contractors themselves often find it difficult to ascertain the actual impact of claims events (Smith, 2002). The position of the claims certifier could also exacerbate the problem because, in the traditional contracting system, the claims certifier is typically the employer-appointed contract administrator, who may also be the professional architect or engineer on the project (depending on the contract); and in public contracts, he/she may be an officer in the employer's organization. When making decision on the contractor's claims, he/she may have to make decision regarding claims events arising from his/her own mistake or errors.

Under such circumstances, whether consciously or unconsciously, a contractor would evaluate and respond to the process for administering claims based on perception about the fairness of the process (Lind and Tyler, 1992). Even when the contract administrator's decision on claims is fair, a perceived lack of fairness in the process used to arrive at the decision could result in perceived lack of fairness in that decision. A perceived or actual lack of fairness can lead to dissatisfaction, create an atmosphere of hostility, anger, rejection of the claims certifier's decision, and ultimately could result in costly dispute resolution which may include litigation (Tyler and Bladder, 2000; Spittler and Jentzen, 1992). The experience may generate resentment, spoil business relationship and encourage strategic behaviour in the form of exaggerated claims of entitlement in future projects, uncooperative attitude and adversarial culture with attendant loss of efficiency for the construction industry at large (Abrahamson, 1984; Latham, 1993).

1.2 Statement of the Problem

Fairness is a multidimensional construct in that people form perceptions about fairness of a decision-making that affect them using different criteria (Roberts and Young, 1997). The pattern of the interaction among the constructs of fairness, their antecedents and their influence on people's behaviour and attitude is complex and could vary across different decision-making contexts (Cropanzano et al, 2001; Lind and Tyler, 1988; Alexander and Ruderman, 1987). There are three central schools of thoughts regarding how people form perception about fairness of any decision-making.

First, social and economic exchange theorists postulate that the greater the perceived favourability of the outcomes (hereafter referred to as outcome favourability) people receive from their group's decision-making and the perceived fairness of the outcomes (hereafter referred to as decision outcome fairness), which may be material (i.e. additional benefit in term of money, profit etc) or social/psychological (feelings of respect, support, acceptance etc), the more likely they will reciprocate in form of cooperation, and acceptance of the decisions made without contesting such decisions (Blau, 1964; Adams, 1965).

Second, procedural fairness researchers suggest that people's behaviour in a decision-making that affects them will not only depend on the decision outcome they receive but also on their perceptions about the fairness of the procedure used to arrive at the decision outcome (hereafter refereed to as procedural fairness) (Thibaut and

Walker, 1975; Lind and Tyler, 1988). Thus, people react to the nature of outcome they receive (outcome favourability and decision outcome fairness) and how the outcome is reached (procedural fairness) (Brockner et al., 2000). Third, interaction justice researchers posit that people are sensitive to the quality of inter-personal treatment they receive (hereafter refereed to as the quality of treatment experienced) during the implementation of their organizations' decision-making procedures (Bies amd Moag, 1986). Thus peoples' perception of fairness depends not only upon the presence of a given procedure, but also upon the way interaction occurs.

While prior discussions in the construction literature suggest that there is a positive relationship between a contractor's perceptions about fairness of the process for administering claims and the contractor's behaviour and attitudes (Kadefors 1999, 2000, 2005; Spittler and Jentzen, 1992; including some of the author's publications arising from this work – see Appendix 3) the pattern of the interrelationship among the various constructs of fairness perception and its effect on conflict and a contractor's dispute behaviour is not understood and has not been systematically tested. It is also not clear whether the pattern of the relationship between people's perceptions about fairness and people's behaviour, as found in other contexts, is applicable to construction. For example, in decision-making involving employees and their organizations, employees' evaluation of the fairness of their organizations' decision-making procedure has been found to be the most significant determinant of their behaviour (Greenberg, 1988).

However, a building and engineering contract is fundamentally different in that it is a commercial exchange relationship among economically independent parties; consequently, tangible or economic outcomes received by parties may be a more important determinant of their perception about fairness and thereby their behaviour. Although the success stories of cooperative strategies in construction, such as partnering and aliancing, provides some anecdotal evidence to suggest that evaluation of procedure is a significant factor that could influence parties' perception of fairness on a project, and thereby their disposition to cooperate. Nevertheless, the basis for linking perceptions about fairness and behaviour has remained logical and conceptual in the construction literature rather than empirical. Thus the nature of people's perception about fairness, its antecedents and its impacts on behaviour is not yet clear and has not yet been addressed in the construction project management literature. This study has been designed to fill the gap. The primary research questions addressed are:

- How do contractors' perceptions about fairness in the process for administering project claims influence conflict intensity and their potential to dispute?

- Are contractors' reactions to unfavourable decisions on claims moderated by their perceptions about the procedures and processes used to make the decisions, and if so how.

The study also addressed a secondary research question of whether years of experience in construction and experience of parties together in the past moderate their reactions to unfavourable decisions.

Answers to these questions would provide vital information to project owners' management teams on practices and strategies for administering a contractor's claims to reduce project owners' exposure to dispute with contractors. The findings would assist project management teams in taking some measures to counteract contractors' perceptions that may contribute to escalation of conflict arising from construction claims.

1.3 Research Aim and Objectives

Based on the research problem, the aim of this research is "to analyze the influence of a contractor's perception of fairness on conflict intensity and the contractor's potential to dispute in the process for administering claims on a project." The objectives are to:

1. develop a conceptual relationship between perception of fairness, conflict intensity and a contractor's potential to dispute the contractor administrator's decisions in the process for administering claims on a project.
2. analyse the conceptual relationship and, in that regard, understand the critical processes of how a contractor's perception of fairness in the process for administering claims on a project influence conflict intensity and the contractor's potential to dispute.
3. explore whether the outcome received, from claims, by a contractor and the contractor's perceptions about procedural fairness would interact to influence conflict intensity and the contractor's potential to dispute the outcome and, in that regard, to identify the pattern of the interaction.
4. explore whether the outcome received, from claims, by a contractor and the contractor's perceived quality of decision-making process would interact to influence conflict intensity and the contractor's potential to dispute the outcome and, in that regard, to identify the pattern of the interaction.
5. explore whether the number of projects executed together by parties in the past interact with the outcome received by the contractor from claims to influence

conflict intensity and the contractor's potential to dispute the outcome; and whether years of experience in construction interacts with the outcome received from claims to influence conflict intensity and potential to dispute.

6. based on the results, propose ways of administering a construction contractor's claims to reduce conflict and project owner's exposure to dispute with contractor.

Although researchers and stakeholders in the construction industry are aware that perceptions about fairness influence the success of the process for administering claims on a project, the subject has not been systematically and empirically investigated. The underlying heuristics by which perceptions of fairness is formed and how the perceptions influence conflict and dispute has not been investigated by previous studies. To achieve the objectives of this study, a general review of the literature on construction claims was conducted. This was followed a review of the literature on organizational justice (perception about fairness). A theoretical framework was developed which yielded a theoretical structural model of the relationship between the constructs of 'fairness', conflict intensity and potential to dispute. The structural model comprises of 22 sub-hypothesis. Two litigated claims were reviewed and analyzed to gain some preliminary understanding of the subject. The analysis of the cases validates some of the items used to measure the constructs of the research model. The model developed was tested with data obtained from a questionnaire survey. Several interaction and mediation relationships among the constructs were also tested.

1.4 Research Hypotheses

People's perceptions about the fairness of a decision-making may be influenced by various criteria. Some schools of thought may be outlined. The first, distributive justice (also known as decision outcome fairness), suggests that members of an organization would evaluate the fairness of their organization's decision-making procedure based on their perceived fairness of the outcome they receive from the procedure (Blau, 1964) [rooted in Adams' (1965) equity theory]. The second school of thought, outcome favourability concept, posits that a member of a group may describe the group's decision-making procedure as unfair and may become dissatisfied if the decision outcome arising from the process is perceived to be fair but not favourable (outcome favorability) (rooted in the assumption that people are self-interested – Blau, 1964; Homans, 1961; Thibaut and Kelly, 1959). Both decision outcome fairness and outcome favourability have been described as outcome-based perceptions of fairness (Tyler and Bladder, 2000).

The third school of thought – procedural justice, argues that peoples' perceptions about fairness of a decision-making would be profoundly influenced by the perceived fairness of the procedure used to arrive at the decision (Tyler and Lind, 1992; Lind and Tyler, 1988). They also suggest that people accept and react positively to even negative outcomes if the procedures used to arrive at those decisions are perceived to be fair. Several previous studies have concluded that evaluations of procedures are more relevant than evaluations of outcome when people judge the fairness of any decision-making making that affects them (Lind et al., 1993; Lind and Tyler, 1988).

Other criteria of fairness have been advanced, such as interaction justice (Bies and Moag, 1986) and control-oriented model of justice-judgment (Thibaut and Walker, 1975, 1978). Tyler and Bladder (2000) further grouped interaction justice criterion into the following: the quality of treatment people experienced and the quality of decision-making process and were described as process-based perceptions of fairness (Tyler and Bladder, 2000). On the other hand, control-oriented model of fairness perception has been described as a combination of process-based and outcome- based perceptions of fairness (Thibaut and Walker, 1975, 1978).

Drawing on decision outcome fairness and outcome favourability criteria, it can be conceptualized that a contractor's behaviour towards the handling of claims would be influenced by the contractor's perception about the fairness of the contract administrator's decisions and by the extent to which the contract administrator's decisions favours the contractor (based on self-interest explanation of peoples behaviour in any economic exchange – Homans, 1961; Williamson, 1979). However, Lind et al. (1993) argued that because impressions of the process and procedures used in a decision-making are typically available to the perceiver prior to impressions of the outcome they generate, people use their evaluation of process and outcome to generate a global impression of the fairness of procedure used in a decision-making process (overall procedural fairness) which is then used to determine how they should react to the decision-making.

Thus the relationship between a contractor's perception about the fairness of a contract administrator's decision (decision outcome fairness) and the contractor's disputing attitude, and between the contractor's perception about the process for administering claims (quality of decision-making process) and the contractor's disputing attitude would be mediated by the contractor's overall perception about procedural fairness. Positive overall perception of procedural fairness would reduce the likelihood of conflict and the likelihood that a contractor would formally dispute the decision of the contract administrator. Also, a contractor's positive impressions about the process for administering claims (quality of decision-making process) would reduce the likelihood of conflict and the likelihood that the contractor will dispute the contract administrator's decision.

Further, research has documented that people's evaluation of outcome and procedure both work together to influence people's attitude and behaviour. People have less negative reactions to unfavourable outcome when procedures are fair. Also, people have less negative reactions to unfair procedures when outcomes are favourable (Ehlen et al, 1999). Thus, a less favourable decision might be associated with less conflicting and disputing behaviour when the processes and procedure used in arriving at the decision are perceived to be fair. Based on the review of the organisational justice literature, the main hypotheses of this study are:

H1 Outcome favourability, perceived decision outcome fairness, perceived quality of treatment experienced and perceived quality of decision-making process would directly influence a contractor's overall perception about procedural fairness.

H2 Outcome favourability, perceived decision outcome fairness, perceived quality of decision-making process, perceived quality of treatment experienced, and perceived procedural fairness would directly influence conflict intensity.

H3 Outcome favourability, perceived decision outcome fairness, perceived quality of decision-making process, perceived quality of treatment experienced, perceived procedural fairness and conflict intensity would directly influence a contractor's potential to dispute.

H4 Outcome favourability, the perceived decision outcome fairness and perceived quality of decision-making process would be directly influenced by level of control.

H5 Outcome favourability, perceived decision outcome fairness, perceived quality of decision-making process and perceived quality of treatment experienced are interrelated.

H6 The influence of outcome favourability, perceived decision outcome fairness, perceived quality of decision-making process, and perceived quality of treatment experienced on conflict intensity would be mediated by overall perception about procedural fairness.

H7 The influence of outcome favourability, perceived decision outcome fairness, perceived quality of decision-making process, and perceived quality of treatment experienced on a contractor's potential to dispute would be mediated by overall perception about procedural fairness.

H8 A contractor's overall perception about procedural fairness and about the quality of decision-making process would moderate the relationship between outcome favourability and conflict intensity; and between outcome favourability and the contractor's potential to dispute the outcome.

In order to address the main hypotheses, several sub-hypotheses were further developed (see hypotheses h1 to h22 of the theoretical framework in Chapter Three). The sub-hypotheses yielded a structural model that describes the relationship between the constructs of fairness' perception, conflict intensity and a contractor's potential to dispute (see Figure 3-8, Chapter Three). The model formed the basis for the data collection and analysis.

1.5 Rationale for the Study

1.5.1 Dearth of research on perception about fairness in construction

Despite the implications of fairness' perception for conflict and dispute development, and thereby the performance and efficiency of the construction industry, little attention has been paid to the subject in the construction literature. Notable exceptions include Abrahamson (1984); Spittler and Jentzen (1992); Rooke et al (2003); Kadefors (1999, 2000, 2005). Spittler and Jentzen (1992) and Rooke et al.'s (2003) work only suggest that fairness may be a concern to parties in construction and may be the reason for a claims culture and adversarial relationships in the construction industry while Abrahamson (1984) discussed fairness with respect to risk allocation in construction contracts.

Kadefor (1999, 2000 and 2005) applied theories of human fairness perceptions to client-contractor relations. Kadefor's work is a notable exception of an attempt to investigate, in-depth, how perception of fairness could influence contract relations in construction. Kadefor (2005) suggested that concerns of fairness influence the behaviour of individuals and firms. Kadefor (1999) argued that "fairness constraint" sets the rules for interaction among participants in a construction project. However, Kadefor's works (1999, 2005) are exploratory studies in which inferences were drawn from two cases relating to negotiation of variations. The studies did not attempt to formulate any theoretical framework that could enable instrumentation of the key constructs of fairness perception. The underlying factors and critical process of how perceptions of fairness are formed, and how they influence conflict and dispute remains an under researched subject in the construction literature.

1.5.2 Dearth of research on socio-psychology of people's behavior in construction

For many years, claims, conflict and dispute have been studied and managed based on the assumption that people are self-interest seeking in any exchange (Adams, 1965; Williamson, 1979), and that people always look for opportunity to gain more resources for themselves in their interaction with others. Thus, it is generally believed that parties will engage in uncooperative behaviour, such as conflict and dispute, if the outcome they receive from their interaction on a project is unfavorable or falls below their expectation. However, some studies in economics and sociology have also argued that social psychological variables such as ‘perceived fairness’ (organizational justice) also play an important role in determining people’s behavior in both social exchange and economic transactions (Bradach and Eccles, 1989; Nee 1998).

Organizational justice theorists argued that claiming and uncooperative attitude and the perceptions and choices that surround them, such as disputing behaviour, are psychologically and socially conditioned (Lind, 1997). Thus, a simple self-interest test of whether people benefit from decision-making is a poor guide to understanding people’s behaviour (Tyler and Lind, 1992). Social-psychologists argued that people’s attitudinal responses to a decision-making are not only determined by economic variables or criteria but also by socio-psychological aspects of a decision-making, such as perceived lack of openness, equity, trust, and honesty (Van den Bos and Lind, 2004).

According to Bresnen and Marshall (2000), socio-psychological aspects are central when attempting to effect change of attitudes, improvements in interpersonal relations, and transformation of construction project organizational cultures. Diekman et al.’s (1994) study also showed the importance of socio-psychological variables. They classified issues influencing the likelihood of dispute into (1) People issues (2) Process issues and (3) Project issues. They found that people issues are the most significant aspect that either greatly help or hinder a project. The reason is that disputes are generated by people and are handled by people – a view supported by Rhys Jones (1994).

Cheung and Suen (2002) reinforced the importance of social-psychological dimensions of conflict when they conclude that claims and conflicts, if not well handled, would escalate especially when emotional and psychological reasons are involved. Loosemore (1998) had also shown the importance of psychological pressure on parties' reaction in a construction conflict situation. As a result of these previous studies, the construction industry is witnessing a gradual shift to cooperative strategies such as, partnering and aliancing. Partnering creates desire to move beyond narrow self-interest towards the spirit of cooperation and trust (Wood and McDermott, 1999). However, if socio-psychological changes are not addressed and effected, even with partnering, there is high potential for dispute (as exemplified by the case of *Birse Construction Ltd v. St David Ltd, 1999*).

Critchlow (1998) observes that the weakness of research on strategies for cooperative behaviour, including partnering, lies in overlooking the importance of socio-psychological issues. Indeed, Phua (2004) proposed the need for further research to explore the socio-psychological variables influencing cooperation in decision-making and problem-solving processes (such as the process for administering claims) in the construction industry. However, there is a dearth of knowledge on the underlying socio-psychology factors and processes influencing cooperative behaviour in construction. The relationship between socio-psychology variables and cooperative behavior in construction is still logical and conceptual rather than empirical (Bresnen and Marshall, 2000).

1.5.3 Dearth of theory and empirical-based approach to the study of construction, conflict and dispute

In the construction literature, there are numerous studies on construction claims, conflict and dispute (see detailed review in section 2.6). Fenn (2002) criticised these studies for their lack of empirical foundation. He also noted that although there are many studies on the causes of construction conflicts and disputes, there are almost no discussions of the philosophical aspects of cause and causation. Besides, most of the studies are anecdotal. They do not reveal the underlying mechanism of claims, conflict and dispute development.

According Fenn (2002), the management approach underlying previous studies does not attempt to provide information for avoiding conflict and dispute; hence, they provide little guidance for the actors who have the most control over the construction process prior to development of formal dispute. In view of these gaps, Fenn (2002) argued that there is need to examine construction claims, conflict and dispute from the etiological approach so as to understand the antecedents of conflict escalation and dispute development. In that respect, Diekman et al (1994) had looked at the antecedents of dispute by developing a method to identify dispute prone projects, so that parties involved can take steps to reduce the likelihood of contract disputes.

However, Diekman et al's (1994) study did not examine the socio-psychological aspects influencing conflict and dispute behaviour. Also, the study is not based on any theoretical and philosophical foundation, and hence has limited application for the development of theory and practice in construction project management. The present study makes use of a theory-based approach to investigate how people’s perceptions of fairness influence conflict and dispute in construction projects.

1.6 Practical and Theoretical Implications of the Research

This study is important because unlike many studies in construction claims, conflict and dispute, it used a theory-based model developed from organizational justice literature to empirically investigate the antecedents of conflict and dispute in the process for handling claims. The significance is realised by its contribution and application to the theory and practice in claims administration, conflict and dispute management in the context of construction. The theoretical and practical significance are now discussed.

1.6.1 Theoretical Implications

This research bridged the theoretical gaps in the study of claims, conflict and dispute in the construction literature by explaining conflict and dispute from a new theoretical perspective developed from organizational justice literature. It described and clarified the relationship between perception of fairness, conflict intensity and a contractor's potential to dispute in process for administering claims on a project. This is underscored by studies in psychology and management which suggest that there are different constructs of fairness perception, and the constructs are not equally important in all situations. In addition, the interaction among the constructs, and their effect on people's behaviour would vary across different organizational and decision-making contexts (Hauenstein, 2002).

Further, empirical research in psychology has found that the use of fairness perception as decision criteria to cooperate is not only applicable to individuals in an interpersonal relationship or in relationships between individuals and organisations, but also fairness perception is used by corporate executives when representing their organizations in inter-organizational transactions (Lind et al, 1993). Thus, cooperation between different firms involved in a project would, ultimately, be determined by cooperation among executives representing different firms working on the project (Bresen 1991).

Thus, the knowledge developed from the findings of this study advances the theories of organizational behaviour in the context of construction project organisation. The theoretical contribution is underscored by previous authors who have argued that there is the need to (1) increase the research base and develop a taxonomy to define the problems of construction claims, conflict and dispute ((Fenn, et al 2002) and (2) the need for empirical-based studies and discussion of philosophical aspects of conflict and dispute (Fenn, et al 2002).

Further, this study is conducted from the organizational justice perspective. While a lot is known on the concept of fairness in other organizational decision-making and conflict settings, relatively little is known on the subject in the construction literature. Being the first systematic, structured and empirical work on the subject, the study is significant in that the theoretical framework developed could be used to implement similar studies in various countries, thereby enabling international comparison.

Finally, this study contributes to the general organizational behaviour and decision-making literature by applying organizational justice theory to a new setting: the process for administering a contractor's claims in a building and civil engineering projects. In addition, unlike some of the prior research in other contexts that used experiments with student-subjects (van de Bos et al, 1998; Taylor and Altman, 1987; Folger et al, 1983), this study used field data collected from real life cases thus enhancing the external validity of the results.

1.6.2 Practical implications

The findings provide understanding of what might predispose a contractor to be dissatisfied with the handling of claims and, consequently, engage in conflict behaviour and, potentially, dispute a contract administrator's decision. The knowledge developed provides information for owners' project management teams on practices and strategies for designing and implementing the procedure for administering claims to reduce conflict and dispute with contractors.

The study assumes that owners' project management teams can take some measures for counteracting contractors' beliefs and perceptions that are the basis for perceived lack of fairness, dissatisfaction, and disputes; thereby enabling owners to reduce their exposure to dispute with contractors. This approach may yield better financial payoffs than the conventional approach of managing claims purely based on the assumption of self-interest and then trying on a post-hoc basis to cope with disputes and problems arising from those decisions (Lind, 1992). The importance of this approach is underscored by a recent study (Yiu and Cheung, 2006) which concludes that as far as construction conflict resolution is concerned 'prevention is better than cure'. Yates and Hardcastle (2002) opined that research into the causes of conflict and dispute is essential if it leads to the development of preventive measures.

1.7 Definition of terms

Some of the terms used throughout this thesis are now defined:

Justice and Fairness: 'Justice' is defined as 'the perception of fairness' or 'fairness perception". Hence 'justice' and 'fairness' are used interchangeably throughout this study.

The employer: In this study "the employer" refers to 'the building owner', 'the developer', or 'the client'. It is the organization or individual commissioning or initiating the project. The employer may be a public client or private client. The employer employs the designer, contractor and other service providers needed to execute the project and bring the building to fruition. The employer is the financier of the project but may not necessarily be the user.

The contractor: In this study, "the contractor" refers to the main contractor. The contractor is 'a person or organisation, who undertakes for a reward to carry out for another person, works of a building or civil engineering character' (Wallace, 1995). A contractor may be an individual or corporate organization registered to undertake such responsibilities. The contractor is required to execute the project according to the contract documents and agreement and within the specified completion period and for an agreed sum of money. However, the contract may allow the contractor to claim for additional time and additional money for events specified in the contract agreement.

Employer's project management team

Employer's project management team includes the different service providers (consultants) engaged by the employer to design, supervise, coordinate, assess, monitor, and control (directly or indirectly) the activities of the contractor during the construction process for the purpose of ensuing that the project conforms to the required quality, and is constructed within the budget limit and the time stipulated in the contract. Hence in a traditional contract system, the employer's project management team includes the designers ranging from the architect (who may also be the project manager or contract administrator), structural engineer, to services engineers (mechanical and electrical), and the quantity surveyor.

Claims Certifier: Traditionally, the claims certifier is the employer appointed 'contract administrator' who may be 'the architect' or 'the engineer' or the 'project manager', 'the superintending officer' or 'the supervising officer'. In this study the term 'claims certifier' and 'contract administrator' are used interchangeably. In contracts undertaken by local authorities, government departments, and statutory bodies, the claims certifier is typically one of the employees of the authority, department or statutory body. Beside other duties as may be assigned to the claims certifier by the employer, the claims certifier is contractually responsible for assessing and certifying claims presented by the contractor and is required to give a decision on the validity of the claims and quantum of entitlement due to the contractor. He/she also acts in a quasi-arbitral capacity in any dispute of differences that arises between the employer and contractor, including matters relating to his/her own decisions. In traditional contracts, the claims certifier – typically the designer or project architect may rely on the quantity surveyor in order to form his opinion and judgment before certifying the contractor's claims. For the purpose of data collection, it is assumed that in the process for administering claims, the claims certifier is a key figure in the employer's project management team. The actions of the claims certifier would reflect the attitude of the employer's project management team and would influence the contractor's evaluation of the fairness of the claims process.

The process for handling claims: In this study 'the process for handling claims' is used interchangeably with 'the process for administering claims' and "claims Process". In a construction project, the contract may allow the contractor to claim for additional time and additional money for relevant events specified in the contract agreement. In this study, the process for handling claims would refer to the on-site process of presenting, substantiating, assessing, deciding and negotiating a contractor's claim; and subsequent adjustment to the contract time and employer's payment of certified additional cost claims.

Conflict Intensity: In this study, conflict intensity is defined as a combination of frequency and severity of disagreements and the extent to which disagreements influence the working relationship between the parties.

Potential to Dispute: Dispute is conceived as a manifest conflict - a form of conflict that comes to the awareness of parties and that requires a resolution. In this study, it as a situation when a claim or assertion made by one party is rejected by another party and this rejection is not accepted. Dispute will therefore arise when negotiation and discussion on a claims and conflict breaks down and a party seeks formal resolution.

1.8 Scope of the Research

The scope of this research is now described.

1.8.1 Domain of investigation

Claims, conflict and disputes may exist at all levels in the contractual chain such as in client-consultants, client-contractor, consultants-contractor, contractor-subcontractor, and subcontractor-subcontractor relationships. Claims, conflict and dispute in the client-contractor relationship are considered to be the core of the problem associated with the supply chain in construction (Yates and Hardcastle, 2002). Hence, this study focuses on conflict and dispute in the context of the process for handling main contractors' claims for extension of time and additional cost.

1.8.2 The unit of analysis

This study is conducted from the main contractors' perspective. Organizational justice theories have been found to be applicable to corporate executives deciding whether to accept a non-binding judgment on an inter-organizational dispute (Lind et al, 1993). In this study, the on-site process for handling construction claims is conceived as an inter-organizational conflict resolution and non-binding decision-making process involving the employer, contractor and the claims certifier – who is the decision-maker.

However, the study assumes two discrete parties in the process for handling contractors' claims namely: the contractor and the employer's project management team. The rationale is that in the traditional contracting system, claims presented by contractors are usually assessed and decided by the claims certifier, who typically is an agent engaged and paid by the employer. Although as an agent of the employer, the claims certifier is normatively required in common law to act impartially and independently when assessing and deciding claims (Nicklisch, 1990), the interdependency of the various roles of the claims certifier, and the fact that he/she is paid by the employer would, in reality, make the contractor perceive the claims certifier as an employer's representative. Hence, it is reasonable to assume that in the administration of claims, the contractor and employer's project management team's interactions would be the dominant underlying inter-organizational interaction.

It is assumed that an understanding of contractors' views would assist project owners and their management teams to take some measures for counteracting contractors' perceptions that may be the root cause of dispute.

1.8.3 The unit of observation

In this study, information is sought from contractors' contract managers, quantity surveyors, or personnel responsible for identifying, substantiating, presenting and negotiating claims regarding their experience with the handling of claims on completed projects procured by traditional procurement method.

1.8.4 The geographical coverage

Based on the review of the general organizational justice literature, the research model of this study is developed in the international context. However, the model is analyzed with data obtained in Singapore. Being a Commonwealth jurisdiction, it is assumed that construction industry practices in Singapore are relatively offshoots of those in England; hence the two litigated construction claims cases reviewed were selected from the United Kingdom where information on litigated claims are well documented and are readily available as public documents.

1.9 Research Method

This study employed a cross-sectional sample survey research design. In order to obtain data needed to address the research question, category A1, A2 and B1 of the Building and Construction Authority's (BCA) register of contractors made up the sampling frame. Data were obtained through interview survey of the contractors' personnel with the aid of a structured questionnaire. The respondents were asked to respond to the questions based on their experience with the administration of claims on a project they have executed and completed, and which involved extension of time and additional cost claims.

The questions were designed to measure the main constructs of the research hypotheses. The questionnaire items measuring the constructs were derived from the literature and from a review and content analysis of decision transcripts of two litigated claims coupled with discussion with industry experts. After considering the research problem which involved the need to test complex interaction among constructs, Structural Equation Modelling (SEM) technique using Partial Least Square (PLS) estimation (hereafter referred to as SEM-PLS) as implemented in PLS-Graph 3.0 software was selected to analyse the data (see section 4.7 for a detailed justification of the research method and discussion of the tool).

1.10 Organization of the Thesis

Chapter One presents the statement of the research problem, objectives, rationale, significance of the study, scope and overview of the research method. **Chapter Two**

provides a general background review on construction claims, the process for handling claims, previous works and theories on sources of conflict and dispute, and the relevance and applicability of organizational justice concept to construction claims, conflict, and dispute.

Chapter Three reviews the literature on organizational justice and presents the theoretical framework of the study. It discusses the relationships between the constructs of fairness perception, and previous empirical findings in other contexts. It then draws a parallel concept in the context of the process for handling construction claims, and finally presents a research model describing the relationship between constructs of fairness perception, conflict intensity and contractors' potential to dispute. The chapter also conducts a review and content analysis of judicial decision transcripts of two litigated construction claims. The aim is to gain some preliminary understanding of the theoretical framework developed. Also, the analysis of the cases validates some of the items used to measure the constructs of the research model. **Chapter Four** discusses the research methodology adopted in this study. It presents the following: (1) the research design (2) sampling frame (3) data collection procedure (3) measurement of constructs and pretest (4) data processing and (5) data analysis strategy. **Chapter Five** presents the response to the questionnaire survey. It examines the profile of the respondents, respondents' experience, profile of respondents' organizations, and the profile of projects upon which the responses were based, level of claims and conflicts on the projects, and how the conflicts were resolved.

Chapter Six presents the analysis of the research model and a presentation of the results. The results were interpreted and discussed in the light of theory. **Chapter Seven** presents data analysis on interaction effects hypotheses. Chapter **Eight** presents the summary of the findings, followed by evaluation of the main hypotheses. It then highlights the theoretical and practical implications, limitations and recommendations for future research.

1.11 Summary

The purpose of this study is to investigate how criteria of perception of fairness in the handling of claims relate with one another and how their interrelationships influence conflict intensity and contractor's potential to dispute the claims certifier's decision. This chapter presents the statement of the research problem, research objectives, rationale, scope, and the significance of the study. Finally it presents the outline of the study.

CHAPTER TWO

CONSTRUCTION CLAIMS AND SOURCES OF CONFLICT AND DISPUTE

2.1 Introduction

This chapter presents a general background review on claims conflict and dispute. It reviews the setting and context in which this study is conducted – the process for handling main contractors' claims. It also describes the nature and origin of construction claims and a typical process for handling claims. It identifies the main actors and the primary objectives of the claims handling process. The chapter also discusses the difficulties associated with substantiation of claims by contractors, and assessment of claims by claims certifiers (contract administrator). The chapter further discusses the reason why perception of fairness matters in the process for handling claims. In the final section, the chapter reviews and evaluates previous theories on conflict and disputing behaviour; and thereafter presents the focus of this study followed by an evaluation of the theoretical approach adopted.

2.2 Construction Claims

In broad terms, a claim is an assertion of a right to money, property, or a remedy and can be made under the contract itself; for breach of the contract, or for breach of a duty in common law (Powell-Smith and Stephenson, 1994). Construction claims can be in the form of money and time claims by the contractor against the employer for extension of time and additional payment arising from a specified event in the contract, and variation claims arising from changes.

For the purpose of this study, construction claims refer to any application by the main contractor to the Engineer (or Architect) pursuant to any relevant clause of the contract – for any additional payment, extension of time and or damages for any alleged breach of duty by the Employer (Client), the Engineer (or Architect) (Kumaraswamy and Yogeswaran, 2003).

Hence, construction claims in the context of this study refer to claims by the main contractor against the employer and may be categorized according to three main types as follows (Yates and Hardcastle, 2002): (1) claims for extension of time – time claims (2) claims for loss and expense claims – money claims and (3) variation claims – money claims. Items (1) and (2) are closely related and are now discussed together.

2.2.1 'Time' and 'Money' Related Claims

'Time' claims would generally arise from delays. Construction delay may be defined as the time during which part of the construction project is extended or not performed due to an unanticipated circumstance (Bramble and Callahan, 1992). During such period, the contractor is unable to deploy labour and plant to achieve the intended output or progress of work in relation to the agreed construction programme.

Delays imply two things, namely, delay to progress and delay to completion (Pickavance, 1997). Delay to progress is one in which the work on site does not follow the programme. It does not necessarily affect the project completion date or result in an extended completion. A delay to completion is a delay that causes work to continue beyond the contractual completion date or the contractual completion date as extended. Therefore, before the contractor can be entitled to extension of project time, the *delaying event must cause both delay to progress and delay to completion time*. If it does not cause delay to progress then the occurrence of the event *per se* is generally of no consequence (Pickavance, 1997). Similar to Pickavance's (1997) definition, delay can also be generally defined as "*any time extension to the contract period that extends the time for completion beyond the date for practical completion" (*Fendt, 2000).

Pickavance's (1997) and Fendt's (2000) definitions describe delay in relation *to the contract completion time while* Bramble and Callahan's (1992) definition includes delay and disruption. Disruptions are events that distort the planned output of work and may not necessarily cause delay to completion. This study focuses on delay and disruption claims. Hence, the definition of delay provided by FORMSPEC (1990-1991), is adopted as follows:

> '*acts or events that postpone, extend or in any other manner alter the schedule or completion of all or any part of the work. Delay includes deferral, stop, slow down, interruption and extended performance, and all related hindrance, rescheduling, disruption, interference, inefficiency and productivity and production, losses…'*

The above definition encompasses two elements of delay claims including extension of time (prolongation), and disruption of work. Prolongation typically involves claims for extension of time and loss and or expense. Disruption involves the loss of productivity, a reduction in the output of construction resources, those being, primarily, labour and plant. Disruption costs may be distinguished from prolongation costs by virtue of the fact that prologation cost is a function of time. Time-related costs represent the costs of the contractor such as site establishment, site management, and plant costs.

Thus in most standard conditions of contract, a contractor is entitled to extension of time (EoT) for delay events attributable to some act of prevention by the employer or some other excusable events. Extension of time is significant for two reasons. First, it sets a new date for completion and once granted would absolve the contractor from the payment of liquidated damages to the employer if the contractor can complete the project by the new date for completion. Liquidated damages would only start to run from the extended date in the event of further delay by the contractor. Second, where extension of time is granted the contractor is afforded a basis to claim for time-related damages and disruption losses (Chow, 2004) for certain events (as stipulated in the contract).

2.2.2 Variation Claims

Variation claims are claims arising from project scope changes in the form of additions or 'omissions' to the contract or substitution of items by other items of work. Scope changes are usually initiated by a variation order, letter of intent, or instruction typically issued by the architect or engineer or some other party specifically empowered by the contract to do so (Chow, 2004; Bushait and Manzanera, 1990). Variations may necessitate additional payment or compensation or an increase in the contract sum and may in some cases result in reduction of the contract sum. Variation orders may also generate delays and need for prolongation of project completion, and thus may entitle contractor to EoT and/or Loss and Expense (LE) claims.

2.3 Process for Handling Claims

2.3.1 Principal Actors in the Claims Process

A typical process for handling claims involves three principal players as follows: (1) The employer (2) The contractor and (3) The claims certifier. The employer is the financier or investor in the project. In event of changes to the contract or delay to the project by the employer's acts or the acts of those for whom the employer is responsible including the employer's representative's acts, servants, or agents or relevant events specified in the contract agreement, the contractor is entitled to claim for extension of time (EoT) and/or loss and expense (LE). The contractor is also entitled to claims for the additional cost of variations; hence, in an employer-contractor relationship, the contractor is usually the claimant

In this study, the term 'claims certifier' refers to the employer-appointed contract administrator responsible for assessing and certifying the validity of the contractor's claims and the quantum of entitlements due, and recommending the contractors' claims for payment by the employer (see Section 1.7).

2.3.2 Stages of Claims Process

Administering the contractor's claims entails the claims certifier's assessment and decision on the validity of claims presented by the contractor and subsequent adjustment to the contract time and certification of the 'money' components of the claims for payment by the employer. The employer and or the contractor may disagree with the claims certifiers' recommendation and may refer any point of disagreement back to the claims certifier (this proviso may not be available in some building and construction contracts). At this stage, the claims certifier acts as a quasi-arbitrator (Nicklisch, 1990). The claims process may also involve negotiation between the employer and the contractor. However, should negotiation end in a deadlock, the matter may be resolved using another form of resolution technique such as litigation, or alternative dispute resolution methods such as arbitration, conciliation or mediation.

Typically, the elements of the process of handling claims are as summarized in Figure 2.1. For the purpose of this study, the process may be categorized into 3 main stages as follows:

1 Pre-claims stage
2 Claiming stage
3 Decision and resolution stage.

2.3.2.1 Pre-claim Stage

The pre-claims stage precedes a claims event. One of the most important aspects of this stage is the submission and periodic update of the master programme by the contractor. The contractor at the outset of a project usually submits the master programme for the execution of the works. The master programme has been described as the best source of data available when assessing and deciding extension of time, and when ascertaining a loss and/or expense claim (Trickey and Hackett, 2001). Additionally, the programme needs to be periodically updated so as to reflect the impact of any delay and to show the schedule for the remaining works. The activities at the pre-claim stage also include keeping of appropriate records that are necessary for assessing and deciding the contractor's entitlement to extension of time and additional money (Thomas, 2001). Next, the contractor identifies potential claims events.

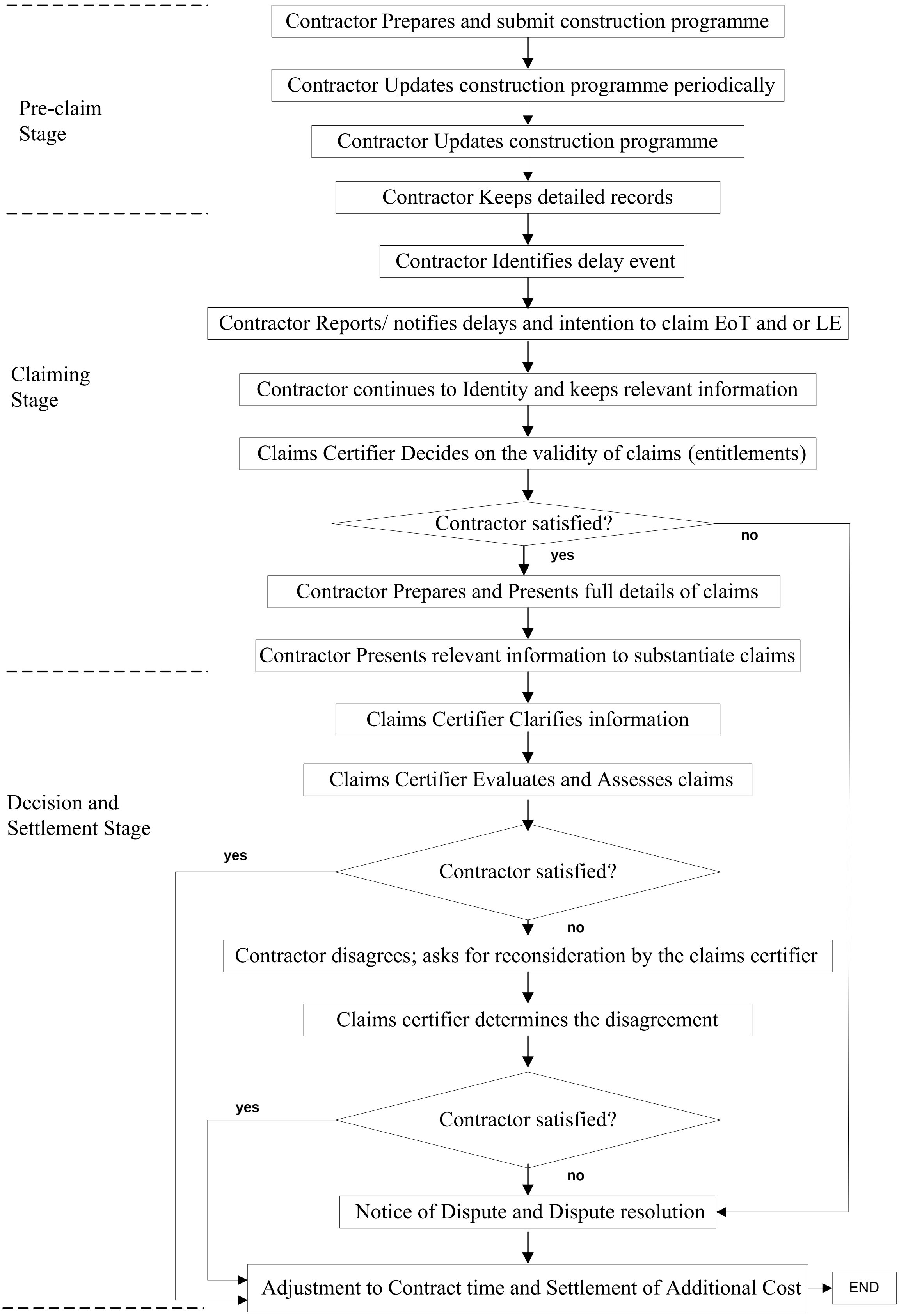


Figure 2.1 Features of a typical Process for Handling Claims
(Source: Author)

2.3.2.2 Claiming Stage

Upon the identification of the claims event at the pre-claim stage, the contractor notifies the claims certifier of the event together with its intention to claim. Additionally, information relevant to the delay event are identified and kept. Following this, the claims certifier determines, in principle, the validity of the contractor's claims. Thereafter, the contractor prepares and presents the claims together with relevant information to substantiate the claims.

2.3.2.3 Decision and Settlement Stage

At the decision and settlement stage, the claims certifier assesses the contractor's claims, based on relevant information, and renders a decision on the quantum of the contractor's entitlement. Prior to the decision, the contractor may be required to clarify information supplied. At this stage, the contractor may object to the claims certifier's decision and may request for a review of the decision. This may also involve negotiation between the parties. However, if the employer and the contractor cannot reach a settlement, they can appeal by referring the differences to other forms of alternative dispute resolution method such as arbitration, conciliation or mediation or litigation depending on the agreed procedure in the contract agreement. At this point, a formal dispute is articulated. The concern of this study is with the process for administering claims prior to the articulation of a formal dispute.

2.3.3 Primary Objective of the Claims Process

In construction contracts, the claims certifier is obliged to assess the contractor's claims and give the contractor a fair and reasonable extension of time, and certify additional cost (where applicable) for acts of prevention by the employer or other relevant event listed in the contract [for example Clause14.3.3 of The Singapore Public Sector Standard Conditions of Contract for Construction Works (PSSCOC) (2006); and Joint Contract Tribunal (JCT) 1998, Clause 25.3]. In principle, a claim is allowed in order for the contractor to recover losses from claims events specified in the contract agreement (Sims, 1975). Based on the principle of a claim as proposed by Sims (1975), it is reasonable to assume that in order to ensure fairness in the administration of contracts; the contractor must not gain from claims. The contractor should only be entitled to the EoT or additional payment equivalent to the delay it has suffered because of the relevant claims events. In order words, the contractor's entitlements must not be greater than the amount of damage suffered. The contractor must also be left in no worse position as a consequence of the genuine claims event than he would have been had the event not occurred.

2.4 'Problem' with Construction Claims

Four reasons may be ascribed to the problematic nature of construction claim, and are discussed below.

2.4.1 Complexity of Construction Claims

Typically, in a claims process, the contractor is required to substantiate EoT claims and additional cost claims, upon which the claims certifier then assesses the claims and renders a decision on the contractor's claims. But most delay and disruption claims are complex. Substantiating and assessing a claim are difficult exercises. Problematic area is typically the difficulty in quantifying delay costs with any precision (Smith, 2002). Calculation of delay cost and EoT may also be difficult (Smith, 2002).

Depending on the contract conditions, specific aspects of delay and disruption claims can include the following: (1) Overheads (2) Loss of productivity (3) Subcontractors delay cost (4) Escalation of labor (5) Escalation of plant (6) Escalation of material (7) Loss of profits/profit earning capacity (8) Finance charges (9) Off-site storage charges (10) On-site storage charges (11) Claims preparation costs. Where the contract allows for these heads of claims, arguments are often generated about the rates of compensation, quantity of the impacts of such events, and especially the composition of the cumulative effects of claims events, loss of productivity, disruption, and indirect costs (Smith (2002). The majorities of these heads of claims are ambiguous and sensitive and cannot be calculated with any degree of accuracy (Ren et al, 2001). Disruption costs are essentially production related and as such are often difficult to prove. Many issues are typically involved when assessing delay and disruption cost. They include: risks which the contractor has taken on board in preparing his tender and, in particular, estimating the productivity level of his resources, poor workmanship, inclement weather, poor supervision, plant breakdowns, and poor quality or damaged materials.

With all these factors affecting construction output, it is difficult for a contractor to demonstrate and prove on a balance of probabilities that his reduced productivity resulted from events which were the responsibility of the employer or relevant event specified in the contract agreement. As observed by Smith (2002), contractors themselves often find it difficult to ascertain the actual impact of claims events. Hence handling of claims involves a lot of uncertainties.

The uncertainty is reflected in the terminology used in most standard forms of contract to describe the duty of the claims certifier regarding contractors' claims. For example, Clause 14.3.3 of the Public Sector Standard Conditions of Contract for Construction Works– PSSCOC published by the Singapore Building and Construction Authority (in its fifth edition, 2006) stipulates as follows:

> 'When the Superintending Officer has received sufficient information to enable him to decide the Contractor's application [for extension of time], he shall, within a reasonable time, make in writing to the Contractor such extension of time, if any, of the whole or any phase or part of the Works (as the case may be) as may **in his opinion be fair, reasonable** and necessary for the completion of the Works………".

In construction claims, "reasonableness" and 'fairness' required by the contract are subjective. Although, 'reasonableness' and 'fairness' are relation to what is needed to complete the works, the contract administrator's assessment and decision regarding the contractor's entitlement would involve numerous assumptions and subjective judgments because of the complexity of claims.

As result of the apparent subjectivities and ambiguities associated with the assessment and decision-making on claims, it is likely that parties would, consciously or unconsciously, make use of procedural fairness evaluation as part of their decision heuristics when responding to claims process or when responding to the decision arising out of the process especially when the decision outcome is unfavorable or is tending to be unfavourable (Lind and Tyler, 1988). Even when there is actual fairness in the claims certifier's decision, a perceived lack of fairness in the decision-making process could lead to negative attitudinal and behavioural reactions (Lind and Tyler, 1988).

2.4.2 Methodologies for Analyzing Extension of Time and Formulas for Calculating Delays and Disruption Cost

The problems in the handling of claims may also be adduced to the methodologies for analysing claims. There are different methodologies that the contractor may use to substantiating EoT claims, upon which the claims certifier (contract administrator) then assesses the claims, also using one or more of the varieties of methods. There are uncertainties and apparent confusion and lack of uniformity/standardization in the techniques for analyzing delays (Kumaraswamy and Yogeswaran, 2003). The following delay analysis techniques are among the commonly used methods (Alkass et al, 1995): (a) global impact technique (b) net impact technique (c) adjusted as-built Critical Path Method (CPM) (d) 'but-for' or collapsing contractor's delays (e) 'but-for' or collapsing employer's delays (f) snapshot technique (g) time impact technique.

These delay analyses techniques may be grouped into two levels of sophistication: simplistic approach which includes global impact technique, net impact technique and adjusted as-built CPM; and detailed approach which includes 'but-for' or collapsing contractor's delays, 'but-for' or collapsing employer's delays, snapshot techniques, and time impact techniques. The problem with simplistic approaches is that they do not scrutinize delay types. As a result, delays which should not be included in the analysis are included thereby exaggerating the results. In addition, these techniques are only applied once to the as-planned schedule, which assumes that the critical paths were constant throughout the project. This leads to delays potentially being deemed critical when in fact they are not. Some of the simplistic methods also do not consider concurrency in delays (Alkass et al, 1995).

While the detailed approaches appear to be sound methods for analyzing delay, they also pose certain problems. The "but-for" techniques scrutinize delay types and accounts for concurrency but they do not account for changes in the critical path. The time impact and snapshots methods have been described as the most systematic and most objective methods but they have been criticized for their inability to scrutinize delay types (Williams, 2003).

Alkass et al. (1995) demonstrated the problem with delay analysis techniques. The authors used the same information to determine a contractor's entitlement under the various delay analysis techniques. The different analysis techniques generated markedly different results ranging from 2 days to 38 days. This indicates that the techniques are based on different underlying principles and assumptions. Even sophisticated delay analysis techniques, using software, involve subjective judgments and they would yield different results when different software are used and different assumptions are made (Marrin, 2005). Williams (2003) proposed the use of system dynamics model and causal mapping for delay analysis. The methods appear to be objective and sophisticated. However, causal-mapping also involves some subjectivity in that information gathering to identify the causes of project delay and its impact is based on interviews of project participants.

The role and place of subjective judgments in delay analysis was considered by the courts in the case of *John Barker Construction Ltd. v London Portman Hotel Ltd.*, (1995) and in *Royal Brompton Hospital NHS v Hammond (2002)*. While subjectivity in delay assessment was rejected in the former, the judge in the latter case appeared to recognize the unavoidable role of subjectivity in delay analysis. The Judge, Richard Seymour QC appeared to have approved the adoption of an impressionistic approach to claims assessment. The judge formed the following view:

> '……. the making of assessments of whether a contractor was entitled to an extension of time……did not depend upon any sort of scientific evaluation of any particular type of material, but simply upon impression formed on the basis of previous experience'.

Further, methods for calculating disruption claims also involve subjectivity and are controversial. For example, the use of Eichelay's formula, Emden's and Hudson's formula in estimating the overhead component of delay and disruption claims remains an area of controversy in practice and in the research community (Zack, 2002).

2.4.3 Position of Claims certifiers in Traditional Contracting System

In addition to the problems highlighted in sections 2.4.1 and 2.4.2, the position of the claims certifier in the traditional contracting system can also exacerbate conflict and dispute during the handling of claims. Theoretically, the involvement of an independent third party decision-maker in any claims process should reduce conflict and dispute (Aubert, 1963). However, the involvement of a third party may be ineffective and may escalate conflict if one or both parties in a claim process perceive the third party's role as unfair (Walton, 1969). Thus, perceived lack of fairness in the claims certifier's role can lead to perceived lack of fairness in the decision he/she makes.

In the construction industry, there are two third-party models for contract administration and they may be classified according to two different contracting systems: (1) The English System, and (2) The Continental Europe System. In the English model for claims administration and resolution (for example, in JCT standard forms and the ICE Conditions) closely adopted by F.I.D.I.C conditions of contracts and contracts in most commonwealth jurisdictions including Singapore, the designated third party decision-maker and conflict-settler is the employer-appointed contract administrator (who traditionally, is the architect or the Engineer). In the model, the procedure for the contractor's claims is that extension of time, and loss and expense claims are to be submitted first to the Engineer. The Engineer is required to assess the merit of the claims and make a decision and recommend settlement to the employer and contractor. If they are not satisfied with the recommendation, the parties can refer the differences back to the Engineer. If the parties cannot agree, they may opt for other forms of resolution techniques ranging from arbitration to litigation. Here the Engineer acts as the project planner, supervisor, as well an independent third party when resolving claims.

The Continental Europe system comprises standard forms of contract in Denmark, France, Germany, Italy, Netherlands, Norway, Portugal, Spain, Sweden and Switzerland. In the event of excusable delays, the contractor is allowed to claim for EoT. However, unlike the English model where the Engineer is accorded a third party function to decide the validity and certify contractor's claims and its associated cost, the continental model provides for direct negotiation and agreement between the employer and the contractor. There is no provision for third party certifying and quasi-arbitral role of the contract administrator appointed by the employer (Nicklisch, 1990). This is usually based on the provision of the contract. If they fail to reach agreement, they may later (at the end of project) refer the matter to a court of arbitration or a state court.

The third party claims certifying and quasi arbitral role of the Engineer (or

Architect) under the English model for claims administration has been he subject of conflicting views (Nicklisch, 1990; Kristensen, 1985; Mortimer-Hackwins, 1984; Westring, 1984). The main theme of the conflicting views is in respect of fairness of the Engineer's (or Architect's) role in the claims process, and hence fairness of his/her decision. The main concern is that the Engineer is paid by the employer and represents the interest of the employer. The Engineer may also have to represent his/her own interests in the process for handling claims since he/she may also be responsible for the claims event (Nicklisch, 1990). In the recent past, this concern has led to the reduction of the powers of the engineer in the Conditions of Contract for Construction for Building end Engineering Works Designed by the Employer [International Federation of National Association of Consulting Engineers (FIDIC) "New Redbook", 1999]. The weakness of the English model has also led to the advent of alternative dispute resolution techniques such as dispute review boards (DRB) or claims review board (CRB), standing neutral or dispute resolution adviser (DRAd), and dispute adjudication board (DAB).

Some authors argue that the use of the employer-appointed contract administrator in claims and dispute process is appropriate since the Engineer or Architect is the designer of the project and he/she is conversant with the history and the course the project has taken, and hence is in the best position to provide the most objective assessment of claims (Mortimer-Hawkins, 1985). However, since the employer-appointed claims certifier may also have to represent his/her own interests in claims assessment, some authors have described the common law normative requirement of his/her independence as a naïve fiction (Nicklisch, 1990).

Although most of the previous views on the subject are based on anecdotal evidence, it is reasonable to hypothesise that irrespective of contract and common law requirements, the third party independent claims certifying and quasi-arbitral role of the claims certifier would be an area of concern to contractors in terms of perceived fairness. It is also reasonable to hypothesise that the ultimate test of the claims certifier's role would strongly depend on how he/she exercises his/her claims certification and decision-making duties in practice.

2.4.4 Conflicts in Project Claims

Conflict can be defined as a serious difference between two or more beliefs, ideas, or interests (Conlin et al., 1996). The process for handling construction claims involves a high degree of cognitive conflict and strong underlying conflict of interest. Cognitive conflict can arise from differences in interpretation of data relating to issues of facts and typically can be caused by lack of adequate information, misinformation, different views on what is relevant, and different assessment procedures (Moore, 2003). On the other hand, *conflict of interest* occurs where the respective interests of the parties are perfectly opposed and divergent because a particular decision may maximise the outcome for one of the parties at the expense of the other party (Thibaut and Walker, 1978). There are two reasons for the incompatibility of interest in construction claims: (1) the nature of questions that must be addressed before deciding on the validity and quantum of contractor's entitlements and (2) the potential impact of the claims certifier's decision on the employer and contractor. First, decision-making on claims would involve the following questions (Perlman, 1984):

1 Should the construction period be extended because of the claim event?

2 and if so, should the contractor be paid for additional cost?

3. If an extension of time is inappropriate, should the contractor be required to pay liquidated damages?

The answers to the above questions are such that the positions of the employer and the contractor are incompatible and opposite.

For example, validation of the contractor's claims by the claims certifier would imply extension of project completion time and depending on the contract agreement it may also imply additional expenses for the employer. On the other hand, invalidation of the contractor's claim would require the contractor to accelerate the progress of works at its own expenses or alternatively allow the project to prolong beyond the agreed contract completion time and hence become liable to payment of liquidated damages to the employer for late completion. This suggests that a claims event indirectly creates a latent "conflict situation" between the contractor and the project owner. The latent conflict would involve a strong underlying conflict of interest [Based on Boulding's, (1972) definition of conflict]. As a result of the strong underlying conflict of interest, parties are likely to be less willing to accept the claims certifier's decision as correct (Kramer and Tyler, 1996). This could create an atmosphere of hostility, anger, and high potential for exaggerated claims of entitlement.

Second, in order for the claims certifier to form a view on the validity of the contractor's claims and make recommendation on the quantum, typically the claims certifier must address the following questions of facts (Perlman, 1984):

1. whether the work which caused delay is required by the contract or is extra work.
2. whether the delay is due to the contractor's inefficiency or the employer's or

his/her representative's actions

3. whether the delay is on the critical path
4. whether the employer-related delay is concurrent with another contractor-related delay
5. whether the contractor actually incurred added costs.

Reaching a reasonable decision on these issues of fact would depend on the type and quality of information and the approach adopted in evaluating the information (a view accepted from an expert witness by His Honour Judge Richard Seymour Q.C in *Royal Brompton Hospital NHS Trust v. Frederick A Hammond & others*. The use of different information and methodology by the contractor and claims certifier to substantiate and assess claims respectively would produce different results and conclusion and hence high potential for differences, conflict and dispute. In view of these circumstances, it is reasonable to conclude that handling delay and disruption claims comprises a high degree of conflict of interest and high degree of cognitive conflict.

2.5 Previous works on the causes of construction claims, conflict and dispute

The causes of construction claims, conflict and dispute have been explored by previous researchers. A summary of the literature on causes of conflict and dispute is provided in Table 2-1. Yates and Hardcastle (2000) observe that there is confusion in the literature as regards suggested causes of conflict and dispute. Most of the studies do not reveal the fundamental reasons for conflict and disputes. Few of the studies suggest tentative recommendations for preventive measures, thus allowing parties to be aware of, and perhaps avoid factors which causes dispute. Furthermore, in most of the studies, the root causes of conflict and dispute are not clearly distinguished. The so-called ‘causes’ which are identified in most studies are in reality only the ‘symptoms’ (Yates and Hardcastle, 2000).

Table 2-1 Previous works on the sources of conflicts and dispute

Author	**Sources of conflicts and dispute**
Bristow and Vasilopoulous (1995)	Six areas: unrealistic expectations; contract documents; communications; lack of team spirit; and changes
Conlin et al (1996)	Six areas: Payment; performance; delays; negligence; quality; and administration.
Heath et al (1994)	Seven areas: contract terms ; payment ; variation, time; nomination; renomination; and information
Hewit (1991)	Six areas: Change of scope; change condition; delays; disruptions; acceleration and termination.
Rhys Jones (1994)	Ten areas: management; culture; communications; design; economics; tendering pressure and laws; unrealistic expectation; contracts and workmanship.
Semple et al (1994)	Four areas: acceleration; access; weather; and changes.
Sykes (1996)	Two areas: misunderstanding and unpredictability.
Abrahamson (1984); Smith(2002); Bosche (1978); Kartam and Kartam (2001); and Levitt et al (1980)	Inappropriate risk allocation
Powell-Smith and Sims (1989); Trickey (1990); Clegg (1992)	Contract clauses
Diekman et al (1994)	Three areas: Project issues, People issues, and Process issues
Vidogah and Ndekugri (1997, 1998)	Key source: Management practice
Howard et al (1997)	Conflicting objectives of the employer and contractor
Whitfield (1994)	Mis-understanding and poor communications; personal and cultural values and professional ethics; diverging interests; and personality of individuals.
Baden-Hellard (1988)	Organization of construction process; differences in customs and practices of different participants
Loosemore and Djebarni (1994)	Unexpected problems
Ridgway (1994)	Cultural problems (lack of ethics; greed; and lack of commitment)
Fenn et al (1997)	Standard form of contract
Conlin et al (1996)	Procurement strategy
Kumaraswamy (1997)	Information and communication problem; decision-making problem; risk allocation
Yogeswaran et. al. (1997)	Contract procurement system; contract documents; project management strategies; human resources
Mohsini and Davidson (1992)	Sufficiency of information; task dependence
Mohsini, et al. (1995)	Availability and access to information; clarity of scope of participation, extent of specialization; ask dependence

Source: Author’s review and Fenn et al. (1997)

Only a few of the studies have identified the root causes of conflict such as Mohsini and Davidson (1992) and Mohsini et al. (1995). Also, most of the studies seemingly disregard the interrelatedness of the causes. The interrelated nature of the root causes may explain why conflict and disputes occur on some projects, but not on others (Yates and Hardcastle, 2000). Fen et al (1997) criticized the previous literature on causes of conflict and dispute for their failure to provide philosophical discussion of causes and causation.

2.6 Disputing Behaviour – a review of theories and research approach

In the literature, attempts have been made to explain conflict and dispute behaviour from different but interrelated perspectives including Economic and Quasi-economic perspective, Transaction Cost Economics (TCE) perspective, Social-legal and Political perspective, and Organizational Justice Perspective. These are now reviewed in more detail.

2.6.1 Economic and Quasi-economic Perspective

The economic and quasi-economic perspective (MacCoun, et al, 1992; Posner, 1986; Priest and Klein, 1984) is based on the notion that people are self-interested and they would dispute if they think it would benefit them. It is based on the premise that disputing behaviour would analyse the benefit and cost associated with pursuing claims (Bebchuck, 1984). In other words, disputing behaviour may be explained only by judging the outcome or anticipated outcome of the claims process. In which case, the procedure used in arriving at the decision outcome is of no significant importance to the disputant.

Based on this school of thought, it is reasonable to hypothesize that contractors would engage in disputing behaviour based on the value of the claim allowed by the claims certifier, the potential loss that would accrue from the claims and the extent of unfavourable decisions received from claims. However, other authors (quasi-economic view) argued that people would also consider social cost before engaging in a dispute (Black, 1987). This is the underlying principle behind the notion that people are less likely to engage in dispute against family and friends than against people with whom they have more distant relationships (Harris et al, 1984). Nevertheless, both economic- and quasi economic view are based on the assumption that peoples are self-interest seeking and would seek to maximize their gain (material or psychological) in an exchange relationship.

2.6.2 Transaction Cost Economics Perspective

There has been an increasing application of transaction cost economics (TCE) theory (Williamsson, 1985) to problems in construction (Eccles, 1981; Gunnarson and Levitt, 1982; Reve and Levitt, 1984; Winch, 1989). Yates and Hardcastle (2003) applied TCE to gain understanding of the sources of construction conflict and dispute. According to TCE (Williamson, 1975), the problem of economic organization is the problem of contracting in which there are several alternative ways of accomplishing a task. Each alternative is associated with explicit and implicit contractual and administrative mechanisms. The goal of an organization is to find the most cost efficient route. The underlying assumption of TCE is that the choice among alternative organizational arrangement (referred to as governance structures) is determined by comparison of the cost of transacting under each. Thus the goal of every economic organization is to minimize transaction cost by choosing a governance structure that minimizes the costs.

Transaction cost consists of cost not directly related to the production of goods and services (Klein et al., 1978). In construction, transaction cost may include cost of deciding, planning, arranging, and negotiating contracts between employer and contractor, and the cost of renegotiating contracts, and resolving conflict and disputes as changes in project scope may require and the cost of enforcing the terms of the contract as agreed (Yates and Hardcastle, 2003). Transaction cost also includes any losses resulting from inefficient plans, arrangement or agreements or decisions; inefficient responses to changes, and imperfect enforcement of agreement. For instance, cost of litigation arising from disagreement on additional cost and EoT claims. According to TCE, transaction cost may be attributed to the incompleteness of contracts which often arises from difficulties in measurement (such as the inability to clearly define project scope and predict uncertainties at the outset of project) – referred to as bounded rationality; and inability and the difficulties involved in exiting or terminating the contract relationship – referred to as asset specificity (Williamson, 1975, 1996).

According to TCE, incomplete contracting at the pre-contract stage set the stage for performance problem during the execution of the contract when contingencies occur which are not fully or are ambiguously covered by formal contract provision thereby hindering the ability of parties to adjust and adapt. In that event, one of the parties or both parties to the transaction may have incentive to behave opportunistically by taking actions that increase cost. Opportunistic behavior includes lying, stealing, and cheating thereby leading to conflict and dispute between the parties, which could increase overall cost. TCE is thus based in the premise that "contractual" man is self-interest seeking and opportunistic. In order to reduce transaction cost by preventing opportunism, TCE proposed the need for the use of appropriate formal governance for transactions (Coase, 1937; Williamson, 1985), in the form of contractual and administrative mechanism that could safeguard the transaction by ensuring continuity of the working relationship between the parties.

Based on TCE, some previous studies in the construction literature conclude that conflict and dispute on construction projects are inevitable. They arise as a result of incompleteness of construction contracts (caused by bounded rationality and uncertainties) thereby leading to opportunistic behaviour and consequently conflict and dispute (Yates and Hardcastle, 2003). Based on TCE analysis, the quest to reduce transaction cost in construction by reducing opportunism has lead to the emergence of different governance mechanisms such as procurement systems, contract terms and procedures for claims, dispute resolution systems including contract provisions for resolving disputes.

2.6.3 Socio-legal and Political Perspectives

Attempts have been made to explain disputing behaviour from sociological and political perspectives (Kritzer et al, 1991; Felstiner, 1975, 1974). This school of thought distinguishes three stages of claiming including naming the event as an injury or wrong, blaming the other party or organization for causing the wrong and claiming compensation through a legal or administrative forum (Felstiner et al, 1981) and by engaging in contractual dispute. Work in this area suggests that in the transition between perceived injury, blaming and claiming through conflict and dispute behaviour, the dispute may be abandoned or resolved (Lind, 1992). Thus, disputes usually would have an incubation period where they evolve from some experience that is perceived as injurious by at least one party. However, an injurious experience will not automatically lead to a dispute; the perceived injurious experience must be transformed into grievance where some party is blamed; some redress must be requested and then refused for a dispute to occur (Felstiner et al, 1980). Researchers in this area proposed the need for an ongoing process for discussing complaints so as to reduce potential for formal disputes.

In construction, taxonomy of this approach includes the use of dispute avoidance techniques such as comprehensive contract provision for handling claims, and the use of claims review board (CRB), standing neutral or dispute resolution adviser (DRAd), and dispute adjudication board (DAB) and also the use of multi-tier dispute resolution system which provide that parties will first settle conflict or difference in relatively simple and inexpensive ways, and that only when such efforts do not succeed then can the use other more complex approach. The aim is to enhance the possibility that a dispute may be resolved and abandoned before they become expensive.

2.6.4 Organizational Justice Perspective

The organizational justice (fairness) perspective of disputing behaviour offers a new perspective on the question of what can be expected to motivate disputing behaviour and uncooperative attitude (Lind, 1995, 1994; Tyler and Lind, 1992; Lind and Tyler, 1988). Organizational justice focuses on the links between the way people are treated, the process used to decide issues affecting people, the perception of justice and injustice, and responses such as dissatisfaction, and consequent behavioural reaction such as rejection of decision and disputing behaviour.

Organizational justice researchers posited that it is the perception of injustice that would shift people from cooperative and accepting modes of interacting with their organization to competitive and self-interested modes of interacting (Greenberg, 1990). They model predicted that a person who feels unfairly treated will want to complain and pursue his or her complaint until a feeling of fairness has been restored. In other words, once people feel that they had suffered injustice, they may engage in a search for some forum or action that will restore justice.

While some of the previous work in the construction literature also suggests that fairness perception plays an important role in conflict and dispute development (for example, Spittler and Jentzen, 1992; Abrahamson, 1984), they pay little attention to empirically testing their arguments. In particular they do not explore how organizational justice norms influence conflict and dispute in the context of construction. Thus, this study attempt to fill the gap by applying the concepts of organizational justice to investigate how perception of fairness is formed in the process for handling claims and its influence on conflict intensity and contractors' propensity to engage in formal dispute.

2.7 Supplementarity and Complementarity of Organizational justice and Previous Research in construction conflict and dispute

Applying organizational justice concept to the study and management of construction conflict and dispute complements existing approach in the following ways. Economic and quasi-economic and TCE perspective of disputing behaviour are based on the premise that people are self-interest-seeking and will act opportunistically to maximize their gain. They imply that the greater the perceived favourability of the outcomes (outcome favourability) people receive from their group's decision-making, which may be material (i.e. additional benefit in term of money, profit etc) or social/psychological (feelings of respect, support, acceptance etc), the more likely they will reciprocate in form of cooperation, and acceptance of decision-made without contesting such decisions (Blau, 1964; Adams, 1965).

Organizational justice researchers posit that self-interest test of whether people benefit by disputing the authority's decision (economic and quasi economic perspective) is a poor guide to understand the root of conflict and disputing behavior (Lind, 1992). It provides little information for avoiding dispute. Organizational justice combines economic- and socio-psychological criteria to understand what motivates people's behavior thus a supplement to these approaches. Further, TCE advocates the need to minimize transaction cost by choosing a governance structure that reduces opportunism thereby minimizes transaction costs. TCE assumes that transaction cost arises from in appropriate governance structure (Williamson, 1985).

However, TCE did not account for the fact that transaction cost may not only arise from the use of inappropriate governance structure but also from perceptions of fairness in the implementation of the governance structure (Lind, 1997). For instance in the handling of a contractor's claims, conflict often escalates and dispute protracts and give rise to increased transaction cost because of the difficulties of reaching agreement on what amount of the contractor's claims is fair. Even though contract mechanism (formal governance structure) structured to reduce cost of resolving claims, conflict and dispute (transaction cost) may be available to guide the resolution of claims, the perceptions of fairness in the implementation of the mechanism (informal aspect) may render the mechanism ineffective and may result into disputing behaviour and, in turn, could generate further transaction costs. While transaction-cost economics concept account for only problems with formal governance structure, organizational justice account for the informal aspects as well.

TCE approach may lead to the use of wrong governance mechanism in that it did not account for the informal effect of governing structures. In other words, it fails to account for the perceptions of fairness generated by specific governance structure and the consequential impact in the creation of further transaction costs. Using formal governance structure (formal constraints) to control transaction costs may be inadequate and may fail if informal norms such as justice to the formal structure (organizational justice) are absent (Lind, 1997). A formal structure may be implemented in unfair ways. Formal and informal constraints therefore combine to shape the performance economic exchange relations (Nee, 1998).

In construction, with partnering contract, there is high potential for dispute and increase in transaction cost if parties are not committed to norms of fairness (as exemplified by the case of *Birse Construction Ltd v. St David Ltd (1999*). Wood and Ellis (2005) explored a main contractor's experience with partnering in the United Kingdom. From their study, there appear to be uncertainty among the contractor's personnel interviewed about some success factors of partnering such as openness, equity (a construct of organizational justice), trust (may be generated by perception of fairnes), honesty, cooperation, teamwork. The scores of these social and psychological factors were found to have dropped between the initial phase and latter phase of the project. Critchlow (1998) noted that the weakness of research on partnering lies in overlooking the importance of socio-psychological issues.

An understanding of how perception of fairness is formed and how it influence peoples behaviour and attitudes in the construction procurement and decision-making processes should therefore provide a more complete and vital information not only for designing formal governance mechanisms but also for their implementation. Thus organizational justice complements other approaches to the study of conflict and dispute.

2.8 Applicability of organizational Justice Concept to Construction Conflict and Dispute Management

A construction contract relationship is an economic transaction based on economic exchange process, whereas organizational justice theories are based on social exchange process (Simpson, 1972; Adams, 1965; Homans, 1961; Jacques, 1961; Patchen, 1961). However, the assumptions of social exchange process and economic exchange process would apply to construction contract relationships because a construction contract relationship is an economic exchange but embedded in social relations.

Conceptually, social exchange theories evolved from economic exchange process, but with some differences in their assumptions. Social exchange process assumes that there is similarity between the process through which individuals evaluate their social relationships and economic transaction in the market. Social relationships are viewed as exchange processes in which individuals make contributions for which they expect certain outcomes. Similar to economic exchange, social exchange theory thus assumes that individuals have expectations about the outcomes that should result when they contribute their time or resources in interaction with others (Vroom, 1964). People's sensitivity to the expected outcome is central to the concept of distributive fairness (a key construct of organizational justice).

Also, social exchange theories are based on the assumption that the individuals use social comparison processes to decide whether or not a particular exchange is satisfactory (Mowday, 1996). Information obtained through interaction with others is used to determine whether an exchange has been advantageous. For example, individuals may compare their outcomes and contributions in an exchange with the outcomes and contributions of the others with whom they are interacting. Where there is relative equality (perceived or actual) between the outcome and contributions of parties to an exchange, satisfaction is likely to result from the interaction (Mowday, 1996). As a result, social exchange theories suggest that individuals in social interaction behave in similar manner to the 'economic man' of classical economics in that individuals are motivated to maximize their rewards and minimize their costs (Walster, Bercheid, and Walster, 1976; Vroom, 1964). The self-interest-seeking assumption of people is also central to the outcome favourability and distributive fairness (key constructs of organizational justice).

Social exchange theories also recognized that individuals exist in an environment characterized by limited and imperfect information. This introduces ambiguity to the exchange process. As a result of the ambiguity present in most social situations, individuals rely on information provided by others (either directly or indirectly by their actions and inactions) in their interaction (Lind and Tyler, 1988). This is central to the concept of process and procedural fairness (key aspects of organizational justice).

Drawing a parallel in the context of construction, the claims handling process is associated with imperfect information and uncertainties in that substantiation of claims by the contractor and assessment of claims by the claims certifier involves many assumptions and some subjectivity. It also involves conflict of interest coupled with potential for perceived lack of independence and neutrality of the employer-appointed claims certifier – especially in a traditional contracting system (see section 2.4 for a detailed discussion). In view of these commonalities between the conditions associated with construction claims and the assumption of social exchange theories, it is reasonable to hypothesize that similar to the assumptions underlying social exchange process, parties in the construction process would rely on information provided by the other parties either directly or indirectly by their actions and inactions (implied or actual) to evaluate how decisions are made during the construction process. Consequently, their evaluation would influence their attitudinal response to the decisions made.

Further, fairness is one of the components of trustworthiness (Zaheer, et al., 1998). Fairness via trustworthiness can facilitate an economic transaction (Granovetter, 1985) by enhancing cooperation and reducing behaviour that harm the transaction (Tyler and Bladder, 2000). Although Williamson (1993) argued that in an economic transaction trust is calculative (given with the aim of receiving favourable outcome) rather being non calculative in that people trust each other based on expected benefit to be gained. In other words people trust if they have expectations that the outcome of the relationship would benefit them. Yet, empirical studies have suggested that even in an economic transaction, trust is may be non calculative (such as in social exchange process) and may involve aspects such as trustworthiness, reliability, fairness, and can influence success in a transaction (Tyler and Degoey, 1996).

In view of these, the assumptions of social and economic exchange are similar and are both reflected by organizational justice concept. Organizational justice could therefore thus provides a more complete understanding of the human psychology of attitudes and behaviour as it operates in economic exchange relationships such as construction contracts.

2.5 Why perception of fairness matters in construction claims process

There are three reasons why perceptions of fairness matters in construction: First, based on the problems highlighted in section 2.4, it may be difficult to know when illegitimate claims are allowed and certified, and when legitimate claims are rejected hence there is wide latitude for actual or perceived lack of fairness. Second, since contractors themselves often find it difficult to ascertain the actual impact of claims events (Smith, 2002), contractors would make use of perception about fairness (actual or perceived) as one of the basis to reject claims certifiers' decisions and would influence their propensity to engage in conflict and disputing behaviour. Third, the employer-appointed contract administrator who is responsible for administering contract and assessing claims is typically in a severe conflicting interest situation, and coupled with the difficulties in assessing claims, it is reasonable to hypothesize that contractors would evaluate the process for handling claims not only based on the outcome they receive but also on their evaluation of the perceived fairness of the process used to decide claims.

Further perceptions about fairness have some implications for project success and performance in the construction industry. It could generate contractual dispute. Dispute is unhealthy for the employer, contractor and all participants in the construction process. It consumes organizational resources in terms of expenses and personnel time diverted to resolve the dispute (Shadbolt 1999). In 1995, Bristow and Perrier determined that litigation fees for a suit for more than USD6000 but less than USD100,000 would cost more than the amount claimed (Bristow and Vasilopoulos, 1995). Hence disputes may lead to poor project performance and constitute an impediment to efficiency of the construction industry (Latham, 1993). For instance, Pickavance (1997) suggested that although the plaintiffs in a litigated claim, *John Barker Construction Ltd v. London Portman Hotel Ltd.* won their case, the cost of pursuing the dispute coupled with the delay in payment by the defendants is thought to have been a significant contributor to their subsequent liquidation.

Further, in a construction dispute, when relationships become adversarial, energies are directed to things other than getting the job done right, on time and within budget (Smith, 1992). On top of these drawbacks, disputes can also impact indirectly on the business relationships between the employer and the contractor. The indirect costs of dispute and uncooperative behaviour are perhaps the most expensive and most injurious (Lind, 1997).

Also, the implications of fairness perceptions are reflected in an ethnographic investigation of claims culture in the construction industry conducted by Rooke et al. (2003). In the study, the viewpoint of a contractor is represented as follows:

> 'The client (employer) is out to get the best possible deal by 'screwing' the contractor at every opportunity. It is therefore both necessary and just that the contractor should adopt the same approach. Since clients (employers) are stupid as well as greedy, by and large, contractors will get the better of them' (Pages 170 – 171).

The attitude portrayed above has a strong emotional and moral content (Rooke et al., 2003). The emotional contents include contractors' resentment of employers' unfair practices.

Also, the contractor's viewpoint is indicative of strategic behaviour postulated by Adams's (1965) equity theory (a construct of "justice"). Adams's theory posited that when people perceive inequity in their interaction with others, they would engage in counter behaviour targeted at restoring equity. According to Adams (1965) counter behaviour may include: (1) altering outcomes (2) cognitively distorting inputs or outcomes and (3) taking action designed to change input or outcomes. In construction, some contractors' claiming strategies include planning for claims at the tender stage and sometimes during the course of a project. One practice at the tender stage is a pricing technique that minimizes the tender price with the view of making claims after contract award by exploiting mistakes in the bill of quantities. Another strategy is programming of work to maximize its vulnerability to delay and hence claims (Rooke et al., 2004).

Further, Abrahamson (1984) discussed the long-run effects of unfair risk allocation (actual or perceived) in construction contracts on the construction industry. According to him, a contractor's losses on a contract (short-run effect) must be paid for in the long-run by his other employers. On the other hand, an employer's loss on investment due to unnecessary expenses discourages future investment in construction. The implication for the construction industry is that it discourages entry of resources into construction – human, capital and material. Clearly, justice or fairness perception has implications for the performance of the construction industry.

2.8 Summary

Construction claims may be in the form of 'time' and or 'money'. A typical process for administering claims would involve pre-claims stage - where information is gathered prior to any claims events, claiming stage - where claims are identified and presented and decision and settlement stage where claims are assessed, decided, negotiated and settled. Claims presented and substantiated by the contractor would typically be processed by the claims certifier, who assesses and renders a decision on the contractor's entitlements, upon which the employer pays the monetary claims involved. A claim is allowed primarily to compensate the contractor for loss suffered as a result of a relevant claims event stipulated in the contract. However, the process for administering claims is not straightforward. Disputes often arise on the quantum of entitlements.

Although a claim may involve issues of fact, it is associated with strong underlying conflict of interest between the contractor, employer and the claims certifier. This is further compounded by the fact that construction claims are complex, and involve numerous assumptions. Different methodologies for analyzing EoT and for calculating disruption claims would produce different results when applied to the same situation. Under such circumstances, substantiating and assessing claims provides wide latitude for perceived lack of fairness. The problems with claims could be exacerbated by the claims certifier's attitude and behaviour in practice.

There are also various alternative theories that has been applied to explained and manage conflict and dispute. They include economic and quasi-economic perspective, transaction cost economics perspective (TCE), socio-legal and political perspective, and organizational justice perspective (perception about fairness). There are also numerous studies on construction claims, conflict, and dispute but little attention has been given to the examination of how perception of fairness (organizational justice) could influence conflict intensity and contractors' potential to dispute.

Organizational justice perspective could complement and supplement the other approaches to the study of construction conflict in that it goes beyond "self-interest seeking" assumption of why people engage in dispute behavior. It combines economic criteria and social-psychological variables in explaining conflict and dispute. The application of TCE assumes that people are self-interested and would seek to maximize gain for themselves in any transaction. Hence TCE implies that construction conflict and dispute are inevitable. Whereas organizational justice combines formal and informal aspects of transaction, thereby suggesting that people responsible for administering construction contracts could reduce, avoid, or prevent conflict and dispute. Although fairness perception (organizational justice) has been identified as an important force that could influence negative behaviour in construction, little empirical work has been done on the subject. To address the first objective of this study (section 1.3), the next chapter presents a review of the literature on organizational justice and develops a theoretical framework of the relationship between a contractors' perception of fairness, conflict intensity and contractors' potential to dispute.

CHAPTER THREE

THEORETICAL FRAMEWORK

3.1 Introduction

This chapter addresses objective 1, which is to develop a conceptual relationship between perception of fairness, conflict intensity and contractors' potential to dispute claims certifiers' decisions in the process for administering project claims. It also develops interactive effect hypotheses to address objectives number 3 and 4, which explore whether the outcome received, from claims, by a contractor and the contractor's perceptions about procedural fairness would interact to influence conflict intensity and the contractor's potential to dispute the outcome, and whether the outcome received, from claims, by a contractor and the contractor's perceived quality of decision-making process would interact to influence conflict intensity and the contractor's potential to dispute the outcome. The chapter presents the main concepts of the study. It reviews the meaning of organisational justice. It also reviews relevant concepts and previous empirical findings on the influence of organizational justice on people's behavioural reaction in a decision-making. Drawing on the review, the chapter addresses objective one of this study by developing parallel concepts in the context of construction claims. It formulates several sub-hypotheses depicting the relationship between constructs of perception of fairness, conflict intensity and contractors' potential to dispute. Finally, the chapter presents a structural model that guides the research in terms of data collection and analysis.

3.2 Potential to Dispute

When claims presented by a contractor are rejected in part or as a whole, the contractor may accept the claims certifier's decision. The contractor may seek amicable resolution of the claims through negotiation, and alternatively, the contractor may refer its disagreement to a third party by initiating alternative dispute resolution process provided in the contract or may initiate legal proceeding in the court (Hegab, and Nassa, 2003). Thus, dispute may be defined as a manifest conflict - a form of conflict that comes to the awareness of parties involved and that requires a resolution. Fenn et al (1997) conceived construction conflict and dispute as continuum such that a dispute would arise from a process involving conflict.

Kumaraswamy (1998) described dispute as a situation when a claim or assertion made by one party is rejected by another party and this rejection is not accepted. Dispute will therefore arise when negotiation and discussion on a claims and conflict breaks down and a party seeks formal resolution with a third party. Dispute may be costly and may ultimately damage the business relationship among parties involved.

3.3 Conflict Intensity and Potential to Dispute

Collins (1995) defined a conflict as a serious difference between two or more beliefs, ideas, or interests. According to Beals and Siegel (1966), conflict is a breach in normally expected behaviour. March and Simon (1958) described conflict as a breakdown in standard mechanisms of decision making. Danhrendorf (1959) argued that a broad definition of conflict is appropriate for use at varying levels of analysis. Danhrendorf used the term 'conflict' for contests, competitions, disputes, and tensions as well as for manifest clashes between social forces. Coser (1966) criticised Danhrendorf's definition of conflict and argued that there is need to distinguish between actual conflict and its antecedents.

Coser (1966) defined conflict as an antagonistic struggle. Schmidt and Kochan (1972) describe conflict as an overt behaviour arising out of a process in which one party seeks the advancement of its own interests in its relationship with others. Lusch (1976) argued that conflict is an elastic concept that can be modeled to suit the purpose at hand. Pondy (1967) observed that the literature shows little consensus on the nature of conflict. He defined conflict as a dynamic process consisting of the following stages: latent, perceived, affective or felt, manifest stages. Latent conflict comprises potential sources of conflict behaviour such as bad communication. Perceived conflict is actual awareness or perception of being in conflict. Latent conflict may not reach the level of awareness. Affective or felt conflict is characterised by stress, tension, hostility, and anxiety. Manifest conflict is the activity dimension of conflict. It may include overt activity between two or more parties such as written or oral exchanges expressing disagreement.

In this study, conflict is conceived as an antagonistic struggle between the parties in the process for administering claims and as a process associated with three attitudinal responses: (1) Affects (2) Intention (3) Overt conflict behaviour (Thomas, 1992). Affective reaction and emotion are interchangeable (Thomas, 1992). According to Kumar (1989), emotion has two types of influence: it shapes cognition and introduces additional motivating forces that could either escalate or de-escalate conflict. For example, negative emotions once aroused, feed back on cognition to produce cognitive simplification, reduce trust, and construe the opposing party's behaviour negatively. Negative emotion reduces the ability to think in a cooperative fashion (Pruitt and Rubin, 1986) whereas positive emotion increases the tendency to take a broader view of the situation and to develop more innovative solutions (Carnevale and Isen, 1986) in order to resolve the differences. Negative emotion such as dissatisfaction, anger, and hostility, resulting from experienced frustration with the decision-making authority may increase aggressive behaviour (Baron, 1977). Positive emotion could increase generosity and helpfulness, leading to a more cooperative behaviour (Carnevale and Isen, 1986).

The next stage of attitudinal response in a conflict situation is emotion coupled with rational thinking which then results in intention. Intention is the decision to act in a given way. Intention intervenes between emotions and consequent overt behaviour (Thomas and Pondy, 1977). Locke (1968) argues that intention is the most immediate motivational determinant of choice. Numerous studies have supported this view by providing empirical evidence of a strong relationship between intentions and withdrawal behaviour (Newman, 1974; Portal et al 1974; Kraut, 1975). Hence after formation of intention, the final attitudinal response in a conflict development process is overt conflict behaviour. Overt behaviour is the observable actions that are performed. Overt behaviour may include the following (Putnam and Poole, 1987): (a) acceptance or rejection of decision arising from decision-making (b) arguments. The overt behaviour may also lead parties to seek other third-party forums in order to resolve their differences such as arbitration and litigation.

Intensity has been regarded as an important conflict characteristic (Bercovitch and Langley, 1993) but there is lack of clarity in the literature as to what precisely intensity signifies. Bercovitch and Langley (1993) measured intensity of conflict by using the number of fatalities in a dispute. Kressel and Pruitt (1989) include the following under the rubric of intensity: severity of conflict, intensity of the feelings, levels of anger, and strength of negative perceptions. Hence conflict intensity may be indicated by the level of tension generated. In this study, following Bercovitch and Langley (1993), Kressel and Pruitt (1989), Habib (1987) and Diekman et al (1994) conflict intensity is defined as a combination of the frequency and severity of disagreements and the extent to which disagreements influence the parties' working relationship.

According to Yiu and Cheung (2006), in construction conflict when the tension level reaches a threshold, the conflict level would be high even if the tension level subsides and the conflict may not return to the original level. Hence, conflict intensity may determine parties' decision to pursue claims at arbitration and ultimately litigation. Conflict intensity on a project may thus influence significantly the potential for contractual dispute. Diekman et al (1994) used frequency of dispute and severity of dispute as indicators of potential for dispute. In this study, rather than indicators of dispute potential, conflict intensity is conceptualized as influencing contractors' potential to formally dispute claims. Based on these considerations, it is postulated as follows (represented by Figure 3-1):

h1 Conflict intensity (CI) would have a positive effect on contractors' potential to dispute (PDISPU).

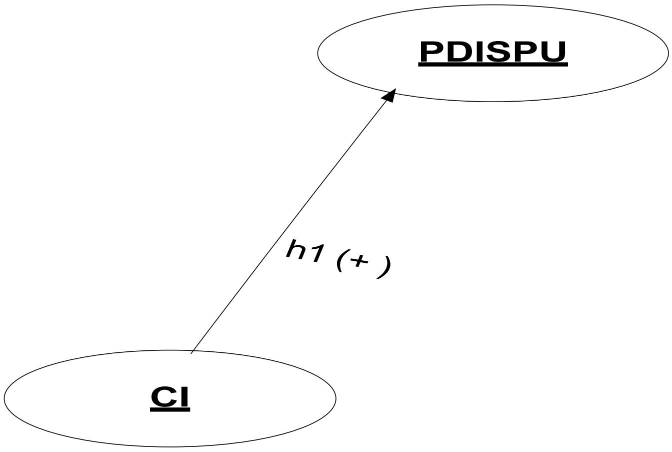


Figure 3-1 Model of the relationship between Conflict Intensity and contractors' Potential to dispute

3.4 Organizational Justice, Conflict Intensity, and Potential to Dispute

3.4.1 Concept of Organizational Justice

Greenberg (1996) defined organizational justice as people's perceptions of fairness in organizational settings. It is the perception of organization members regarding the fairness of procedure and processes used by their organization or decision-making authority to make decisions that affect them (Folger and Cropanzano, 1998). Organizational justice concept posits that people appear to care about fairness and apply it as a yardstick in their evaluation of a variety of decision-making process and contexts (Tyler, 1989). The concept of organizational justice argues that people's perception of fairness at a point in time provides a heuristic framework for interpreting and making decisions and responding to both contemporaneous and future events.

3.4.2 Perception of Fairness

Fairness is complex and multifaceted, comprising several constructs (Thirgood, 1999). Two primary constructs of perceived fairness have evolved and have received the greatest attention in the literature (1) distributive and (2) procedural justice (Greenberg 1990). The others include (3) outcome favourability (4) control (5) quality of decision-making process (5) interactional justice (Tyler and Bladder, 2000; Bies and Moag, 1986). The six criteria of perceived fairness may be grouped into (a) process-based (b) outcome-based (c) outcome/process-based (Table 3-1).

Table 3-1 Criteria of Organisational Justice

OUTCOME-BASED CRITERIA	PROCESS-BASED CRITERIA	OUTCOME/PROCESS-BASED CRITERIA
(1) Decision Outcome fairness (Distributive Justice)	(1) Procedural fairness (Procedural Justice)	(1) Control
(2)Outcome Favourability	(2)Quality of Treatment (Interactional Justice)	(2) Quality of Decision-making process

3.4.2.1 Decision Outcome Fairness/Distributive Justice

Distributive justice is the perceived fairness of decision outcome arising out of a decision-making process. It is grounded in equity theory (Homans, 1961; Adams, 1965). It focuses on the content of a decision. Distributive justice is an outcome-based criterion of perception of fairness.

3.4.2.2 Procedural Fairness

Procedural justice is the perceived fairness of the process used to reach a decision (Barret-Howard and Tyler, 1986; Greenberg, 1987; Folger and Konovsky, 1989). Hence procedural justice focuses on the process of how decisions are made. Procedural justice may be described as a process-based criterion of perception of fairness of decision-making.

3.4.2.3 Outcome Favourability

Outcome favourability is an outcome-based criterion of perception of fairness which argues that people evaluate decision-making based on the extent to which a decision outcome favours them (Thibaut and Kelly, 1959; Thibaut and Walker, 1978). This is based on self-interest seeking assumption of people (Homans, 1961; Blau, 1964; Williamson, 1985).

3.4.2.4 Control

Control criterion of justice is a combination of process and outcome-based judgment of fairness. It argues that people would be concerned about being given the opportunity to exercise some degree of control over the decision-making process that affects them and that the extent of control exercised would influence their perception of fairness of the decision-making process and of the decision made (Thibaut and Walker, 1975, 1978). Thibaut and Walker (1978) identified two aspects of control (1) process control – which enables conflicting parties to control the decision making process and (2) decision control – which enables parties to exercise control over the decision itself before it is rendered

3.4.2.5 Quality of Decision-making Process

Quality of decision-making process relates to the manner in which decisions are made or reached (Tyler and Bladder, 2000). It refers to those formal and informal aspects of the procedure that improve the nature, quality, and fairness of the decisions that are reached

3.4.2.6 Quality of Treatment Experienced/Interactional justice

Interactional justice also known as group-value model and later renamed relational model (Bies and Moag, 1986; Bies and Shappiro, 1987; Tyler and Lind, 1992) argues that organization members tend to evaluate their organisation's decision-making based on the quality of treatment they received. The model is based on the notion that fair treatment conveys information about the quality of relationship in a group.

3.5 Relationship between Organizational Justice, Conflict Intensity and Potential to Dispute

Alexander and Ruderman (1987) found that the following organizational attitudes were influenced by perception of fairness: (1) Conflict-Harmony (2) Turnover intention (3) Trust in management (4) Tension-Stress. The dissatisfaction could consequently escalate conflict intensity and ultimately disputing behaviour. Hence, higher level of perceived fairness is likely to pre condition lower intensity disagreements, and lower propensity for a contractor to dispute claims at arbitration or litigation.

In view of the multi-dimensional nature of perception of fairness, the rest of this chapter hypothesises the relationships among the six constructs of perception of fairness, conflict intensity (CI) and potential to dispute (PDISPU). The six hypothesised dimensions of fairness are as follows (see Table 3-1):

1. Procedural Justice (hereinafter referred to as Procedural fairness - PFAIR)
2. Distributive Justice (hereinafter referred to as decision outcome fairness - DOFAIR).
3. Favourability of decision outcome (hereinafter referred to as outcome

favourability – OFAVOUR)

4. Quality of decision-making process (QDPROCESS)
5. Quality of treatment experienced (QTREAT)
6. Control (CTROL)

3.6 Procedural Fairness: the fairness heuristic theory explanation of fairness

The concept of procedural justice suggests that members of an organization would not only judge the decision-making process of their organization by the outcome it produces but by other criteria, such as the fairness of the process used to arrive at the decision (Thibaut and Walker, 1975; Leventhal, 1980). One of the discoveries of Thibaut and Walker (1975) is that overall perceived fairness is affected substantially by factors other than whether the individual in question has won or lost in a decision-making process.

Procedural justice researchers suggested that when making fairness evaluations, members of an organization would be concerned with how decisions are made as well as the decisions themselves (Thibaut and Walker, 1975; Leventhal, 1976; Thibaut and Walker, 1978; Leventhal, 1980; Lind and Tyler, 1988). They argued that it is possible, by judicious choice, and design of decision-making procedure, to enhance how people evaluate unfavourable decisions (Lind and Tyler, 1989). Studies in this area believe that focusing on the outcome people receive from a group process to explain their behaviour is inadequate in explaining people's judgment of fairness of their group's processes, and would have limited applications in resolving conflict (Tyler and Lind, 1992).

Folger and Greenberg (1985) found that procedural justice goes beyond interpersonal relationships but extends to organizational settings. In a study of managers' perception of fair and unfair treatment across seven areas of management functions, Sheppard and Lewicki (1987) found that managers were concerned with both outcome and procedural justice. Organizational issues that have been linked to procedural justice include: pay for performance (St. Onge, 2000), employee benefits (Tremblay, et al, 2000), employee discipline (Cole and Latham, 1997), inter-group conflict (Huo, et al, 1996), institutional racism (Jeanquart-Barone, 1996), and performance appraisal (Barclay and Harland, 1995).

Empirical evidence has also shown that procedural justice concern extends to interorganizational dispute setting involving corporate executives (Lind, 1988; Lind et al, 1993). According to their study, procedural justice considerations apply to individuals – a corporate executive (organisation's representative), deciding whether to accept or reject an arbitrator's nonbinding judgment on an inter-organizational dispute. The process for handling construction claims may be described as an interorganizational decision-making and conflict resolution situation involving the employer and contractor and with the claims certifier acting as the third party decision-maker. Hence, it is likely that procedural fairness considerations would influence parties' behaviour and reactions in the handling of claims.

Fairness heuristic theory (Lind and Tyler, 1988 and Lind, 2001) explains why evaluations of procedure of decision-making are more relevant than evaluation of outcomes when people make overall evaluation about fairness of a decision-making process. Fairness heuristic theory argued that individual are often in situation where they must cede to authority and ceding authority to another person provides an opportunity to be exploited. As a result of the possibility of being exploited, individuals are uncertain about their relationships with authority. This uncertainty leads an individual to ask questions such as whether authority can be trusted, and if the authority will treat him/her in a nonbiased manner. Furthermore, the information required to make accurate evaluations regarding these matters is often incomplete or unavailable (van den Bos et al, 2001). Thus, people rely on heuristics or cognitive shortcuts to guide their subsequent behaviours. For instance, people tend to give weight to information that they received first, rather than to the information that come later (van den Bos et al, 1997). In the context of construction, the fairness-heuristic explanation of how people make fairness judgment suggests that people would use their evaluations of process and outcome from claims to generate a global impression of procedural fairness which is the used to determine their behavior or reaction.

3.7 Procedural Fairness, Conflict Intensity and Potential Dispute

Lind and Tyler (1988) concluded that the procedure used to arrive at a decision can have profound effects on fairness judgments and psychological attitudes and consequential behavioural reactions of those affected by the decision. Empirical studies that have confirmed Lind and Tyler's work include study on legal trial procedures (Lind et al, 1980); non trial procedures (Casper et al, 1988); mediation and arbitration proceedings (Adler et al, 1983); dispute resolution in organizations (Sheppard, 1985) and dispute resolution procedure in the context of business competition (Walker et al, 1974) involving different organisations.

Sheppard and Lewicki (1987) showed that unfair procedures led to greater devaluation of the desired object, low achievement striving, more anger and self-depreciation. Procedural fairness has been found to impact on acceptance of decisions arising from an organisation's process (Lind et al, 1993) and retaliation against organizations (Skarlicki and Folger, 1997). Research has also demonstrated that the experience of procedural justice led to greater overall satisfaction with outcome and consequential hostility towards decision-making authority (Tyler, 1987). In a study of two arbitration awards, Lind et al (1993) tested the hypothesis that individuals develop a global impression to determine whether or not a process is fair and use that impression to determine whether or not that authority should be obeyed. Both studies investigated the litigant's reactions to arbitration awards, and the subsequent decision to go to trial. Their results suggest that a global impression of fairness rather than individual dimensions determines the decision to accept the outcome of a decision-making process.

In addition, Alexander and Ruderman (1987) have shown that higher levels of procedural justice judgments are associated with fewer reports of conflict and greater reported harmony. Lind and Tyler (1989) posited that opportunity for parties to freely express their views (procedural justice variable) may have two possible effects. Firstly, it could promote positive post-conflict relations, by assuring that the resolution was seen as covering all issues in conflict, and secondly could harm post-conflict relations, by raising the likelihood of angry exchanges and by promoting dispute.

Despite the consistent findings in the literature that procedural fairness effect may influence attitudinal reaction profoundly, researchers have stated that the organisational context may influence the importance of procedural fairness (Greenberg, 1990). Studies have indicated that procedural fairness is more important in predicting evaluation of decision-making in ambiguous decision processes. This is perhaps due to the inherent uncertainties in such a process.

Based on these considerations, and drawing a parallel hypothesis in the context of the process for handling claims, it is likely that procedural fairness judgment would have profound effects on conflict intensity and consequently contractor's potential to dispute. It is likely that high levels of perceived procedural fairness would be associated with low conflict intensity; and low potential to dispute. Conversely, low levels of perceived procedural fairness would be associated with high conflict intensity; and high potential to dispute.

In line with these assumptions, the following sub-hypotheses are formulated to represent the relationship between procedural fairness and conflict intensity, and between procedural fairness and contractors' potential to dispute.

h2 Perceived procedural fairness (PFAIR) would have a negative effect on conflict intensity (CI)

h3 Perceived procedural fairness (PFAIR) would have a negative effect on contractors' potential to dispute (PDISPU).

Figure 3-1 is now extended to include sub-hypotheses h2 and h3; and the resulting model is shown in Figure 3-2.

In figure 3-2, because of the influence of procedural fairness (PFAIR) on conflict intensity (CI), it is reasonable to hypothesize that there is an indirect relationship between procedural fairness (PFAIR) and potential to dispute (PDISPU), through conflict intensity (CI). Hence it is hypothesized as follows:

h3a Conflict intensity (CI) would mediate the relationship between procedural fairness (PFAIR) and contractors' potential to dispute (PDISPU)

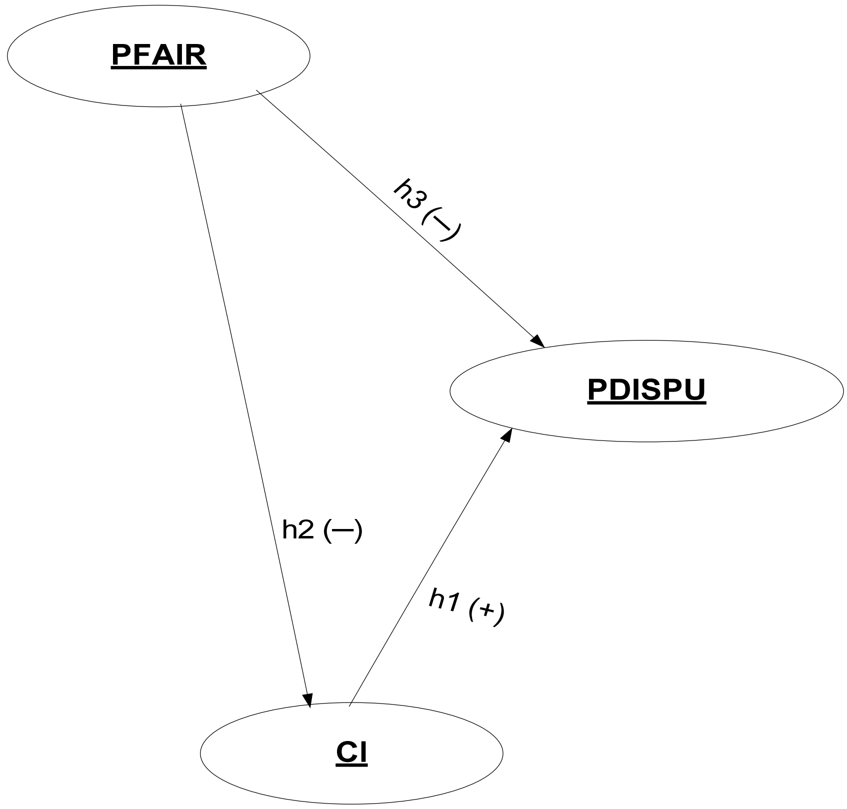


Figure 3-2 Model of the relationships between Procedural fairness, Conflict intensity, and Contractors' Potential to dispute

3.8 Outcome Favourability

Outcome favourability concept argues that the satisfaction of members of a group would depend on the extent to which the decision outcome from their groups' decision-making is favourable. In order words, people will be sensitive to the personal resources or material gains they receive during their interactions with the group (Tyler and Bladder, 2000; Brockner and Wiesenfeld, 1996). A member of a group may describe the group's decision-making process as unfair and may become dissatisfied if the decision outcome of the process is equitable, but not favourable (Thibaut and

Kelly, 1959). Outcome favourability judgment is rooted in economic exchange theory where people are viewed as motivated to maximize their gain in resources for themselves or, at least, to ensure that they will receive a fair amount of resources relative to others (Thibaut and Kelly, 1959; Homans, 1961; Blau, 1964; Thibaut and Walker, 1975).

3.8.1 Outcome favourability, Procedural fairness, Conflict intensity and Potential to dispute

Empirical findings have shown that favourable outcomes result in more positive behaviour (Greenberg, 1982; Walster, Walster, and Berscheid, 1978). Tyler and Bladder (2000) found correlation between outcome favourability and procedural justice. Their study also found empirical evidence that outcome favourability significantly influences feelings towards decision-making authority. Based on these, the following sub-hypotheses are formulated:

h4 Outcome favourability (OFAVOUR) would have a positive effect on perceived procedural fairness (PFAIR).

h5 Outcome favourability (OFAVOUR) would have a negative effect on contractors' potential to dispute (PDISPU)

h6 Outcome favourability (OFAVOUR) would have a negative effect on conflict intensity (CI)

Figure 3-2 is now revised to include sub-hypotheses four, five and six (h4, h5 and h6) and the resulting model is shown in Figure 3-3.

The fairness-heuristic explanation (see section 3.6) suggests that people use their evaluations of process and outcome to generate a global impression of procedural fairness which is then used to determine their behavior or reaction. This indicates the mediating effect of procedural fairness on the relationship between outcome and procedure. Lind et al (1993) in a study of two arbitration awards found that procedural justice may mediate the effect of an unfavourable outcome on the decision to accept the outcome of a decision-making process.

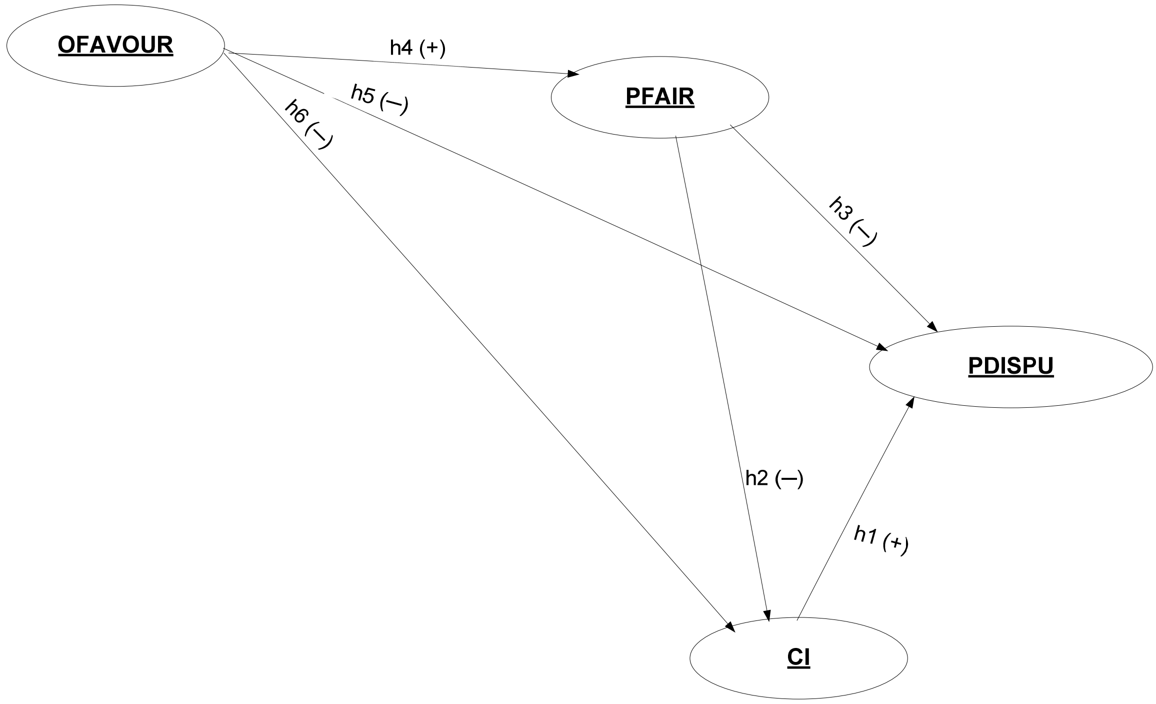


Figure 3-3 Revised model with Outcome favourability

Hence in Figure 3-3, because of the influence of outcome favourability (OFAVOUR) on procedural fairness (PFAIR), this study hypothesise that (1) there is an indirect relationship between outcome favourability (OFAVOUR) and conflict intensity (CI) through procedural fairness (PFAIR), and (2) there is an indirect relationship between outcome favourability (OFAVOUR) and potential to dispute (PDISPU) through procedural fairness (PFAIR). Based on these, the following mediating hypotheses are set as extensions of sub-hypotheses h5 and h6:

h5a Perceived procedural fairness (PFAIR) would mediate the relationship between outcome favourability (OFAVOUR) and contractors' potential to dispute (PDISPU).

h6a Perceived procedural fairness (PFAIR) would mediate the relationship between outcome favourability (OFAVOUR) and conflict intensity (CI).

3.9 Decision Outcome Fairness/Distributive Justice

Decision outcome fairness (DOFAIR) - distributive justice concept of what influence perception of fairness- suggests that organization members would evaluate an organization's decision-making process by looking at the fairness of the decisions generated by the organization's decision-making process (Blau, 1964) (based on Adams, 1965 equity theory). Distributive justice examines people's views about what is a fair outcome. It focuses on the content aspect of a decision. The primary determinant of distributive justice is the match or mismatch between what is considered to be the actual decision that should be made and the decision that is made in the particular situation (based on Hauenstein, 2002). In the context of claims process, it is the match or mismatch between the amount of contractors' EoT or additional cost claims allowed or certified by the claim certifier, and the amount of delay suffered or additional cost actually incurred.

Distributive justice theorists argued that when claims or entitlements are ambiguous and complex, and judgment of disparity between actual entitlement and entitlement allowed is difficult to make, people react based on whether outcomes are allocated or decided in a way that is consistent with the acceptable standard of distributive justice, rather than to evaluations of the absolute amount of resources they received. Simply put, distributive justice theories focus on whether there is parity between the distribution of outcomes and some standard for distributing the outcomes, be it input, need, or equal division among every member of the group. Relative deprivation theory (Crosby, 1976; Stouffer et al, 1949) and equity theory (Walster et al, 1978; Adams, 1965; Homans, 1961) are the two main studies that have contributed to the development of the distributive justice theory.

3.9.1 Relative Deprivation Theory

Relative deprivation theorists argue that satisfaction and dissatisfaction with an outcome is determined by comparisons between one's own outcomes and some type of standard. The findings of relative deprivation theories suggest that, when people are comparing their outcomes, they typically utilize standards of entitlements or deservedness (Crosby, 1976; Stouffer et al, 1949) or by comparing what they receive in other similar situations (Merton and Rossi, 1957). For example, perception of unfairness arises when people realise that their outcome falls short of their expectations. Such standards are rooted in people's conception of a fair outcome; people judge what they are entitled to, based on what they perceive as fair. Research has shown that people's satisfaction is a function of both how much they receive and how much they feel they should receive (Locke, 1969). The implication is that people's reaction is not only a function of how much they receive; their reaction could be strongly influenced by what they feel they should receive.

According to Tyler and Bladder (2000), the limit of relative deprivation as a theory is that it there is no way to tell in advance whether people will evaluate some distribution of outcomes to be fair. In other words, it does not allow prediction of what people will believe is their entitlements. Hence distributive justice (decision outcome fairness) addresses this shortcoming and examines what people perceived as fair distribution of outcomes. One important contribution of distributive justice theories is that they build upon findings of relative deprivation theories and provide model for understanding people's view about outcome fairness. Adam's (1965) equity theory has been given the most attention by early distributive justice theorists (Greenberg, 1990). Equity theory is described next.

3.9.2 Equity Theory

Equity theory focuses on proportionality of inputs and outcomes as an index of fairness (Adams, 1965). If the ratio is small, the members of a group may feel angry and resentful and may engage in uncooperative behaviours. Equity theory is similar to discrepancy theory (Locke, 1969; Katzell, 1964) which argues that satisfaction is determined by the differences between actual outcomes received and some other outcome levels. According to Adams (1965), the consequences of perceived inequity are as follows: (1) it creates tension (2) the amount of tension created would be equal to the amount of inequity perceived (3) the tension created would motivate people to reduce inequity (4) the strength of the motivation to reduce inequity is proportional to the perceived inequity. Simply put, the presence of inequity would motivate people to change the situation through behavioural or psychological means directed at returning to a condition of equity.

People may adopt the following alternative methods to restore equity (Adam, 1965): (1) altering outcomes (2) cognitively distorting inputs or outcomes, and (3) taking action designed to change input or outcomes. In the context of construction, such behaviour may include loading claims into future tenders in order to recover perceived or actual loss arising from perceived or actual lack of fairness in the handling of claims on a previous project or submission of inflated claims, distortion of information when substantiating claims, programming technique that makes the project vulnerable to delays and hence unnecessary claims. Adam (1965) postulations provide a theoretical basis to hypothesise that perception of distributive fairness would influence contractors' attitudinal and behavioural responses. Further, previous research has provided support for the predictions of distributive justice (Greenberg, 1988; Garland, 1973).

Mikula (1980) contends that the choice of distributive criteria is very much dependent on situation. Besides equity, alternative criteria for determining the fairness of distribution may include equality and need. Distribution based on equity principle (contribution principle) is appropriate in situations in which the resources to be distributed were acquired at least partly by independent work, and in which the amount is contingent upon the size of the contribution made. This is relevant to the process for handling contractors' claims. The equality principle is appropriate in situations in which the priority is to achieve group solidarity. The need principle is applicable in situation where the decision-making authority allocating resources is responsible for the welfare of the recipient. Given these competing criteria of distributive justice criteria, a distribution considered as fair by some objective criterion may be considered as unfair when other distributive criteria are used. Since construction is an economic exchange, equity may be a dominant criterion when compared to equality and need criteria. The concept of equity has been criticized in that people have the tendency to exaggerate their contribution to the transaction especially in an atmosphere of imperfect information and information asymmetry such as in the construction process (Greenberg and McCarty, 1990).

3.9.3 Decision Outcome Fairness and Procedural Fairness

Studies have provided empirical evidence of the positive relationship between procedural justice (procedural fairness – PFAIR) and distributive justice (decision outcome fairness – DOFAIR) in organizational setting (Lissak and Sheppard, 1983; Kanfer et al., 1987; Paese, 1985; Cornelius, 1985; Greenberg, 1987). In a meta-analysis, Hauenstein (2002) found a strong positive relationship between procedural justice and distributive justice.

Tyler (1984) surveyed defendants in traffic courts concerning their satisfaction with the outcome of their cases, their evaluations of the judges, and their evaluations of the court system. The study focused on distributive and procedural justice judgments, and their impact on respondents' attitude about the outcome, the judge, and the court. The study found that attitudes about outcome, the judge and court were strongly related to perceptions of fairness. The study revealed that procedural fairness was a more important determinant of respondents' attitudes towards court than perceived distributive fairness (decision outcome fairness). The study also found that both types of fairness were important in determining attitudes towards the judge, while distributive fairness was more important in determining satisfaction with the outcome. In line with these findings, Sweeney and McFarlin (1993) concluded that procedural fairness is generally a better predictor of psychological and behavioural responses to systems, institutions, and decision-makers, whereas distributive justice is a better predictor of responses to specific outcomes received. Based on these, it is likely that high levels of decision outcome fairness would be associated with high levels of procedural fairness evaluation in the claims process. Thus it is hypothesised as follows:

h7 Perceived decision outcome fairness (DOFAIR) would have a positive effect on the perceived procedural fairness (PFAIR).

3.9.4 Decision Outcome Fairness, Procedural Fairness, Conflict Intensity, and Potential to Dispute

There is empirical support linking distributive justice directly to behaviour. For example, Folger and Konovsky (1989) found that distributive justice affects attitude toward outcome received. In another study, Alexander and Ruderman (1987) found that distributive justice is significantly related to reactions such as job satisfaction, evaluation of supervisor, and conflict. Sense of equity can increase satisfaction with the organization (Alexander and Ruderman, 1987; Ronen, 1986). In a content analysis of complainants' stated reason for initiating wrongful termination lawsuits, Youngblood et al (1992) found that perceived violation of equity and distributive justice were cited frequently as reasons for the lawsuits.

Based on these theoretical considerations, it may be hypothesised that a higher level of perceived decision outcome fairness (DOFAIR) would be associated with lower conflict intensity (CI), and a higher level of perceived decision outcome fairness (DOFAIR) would also be associated with lower level of contractors' potential to dispute (PDISPU). Accordingly, the following sub-hypotheses are formulated:

h8 Perceived decision outcome fairness (DOFAIR) would have a negative effect on contractors' potential to dispute (PDISPU)

h9 Perceived decision outcome fairness (DOFAIR) would have a negative effect on the conflict intensity (CI).

Figure 3-3 is now extended to include sub-hypotheses h7 (section 3.9.3), h8 and h9 and the revised model is shown in Figure 3-4.

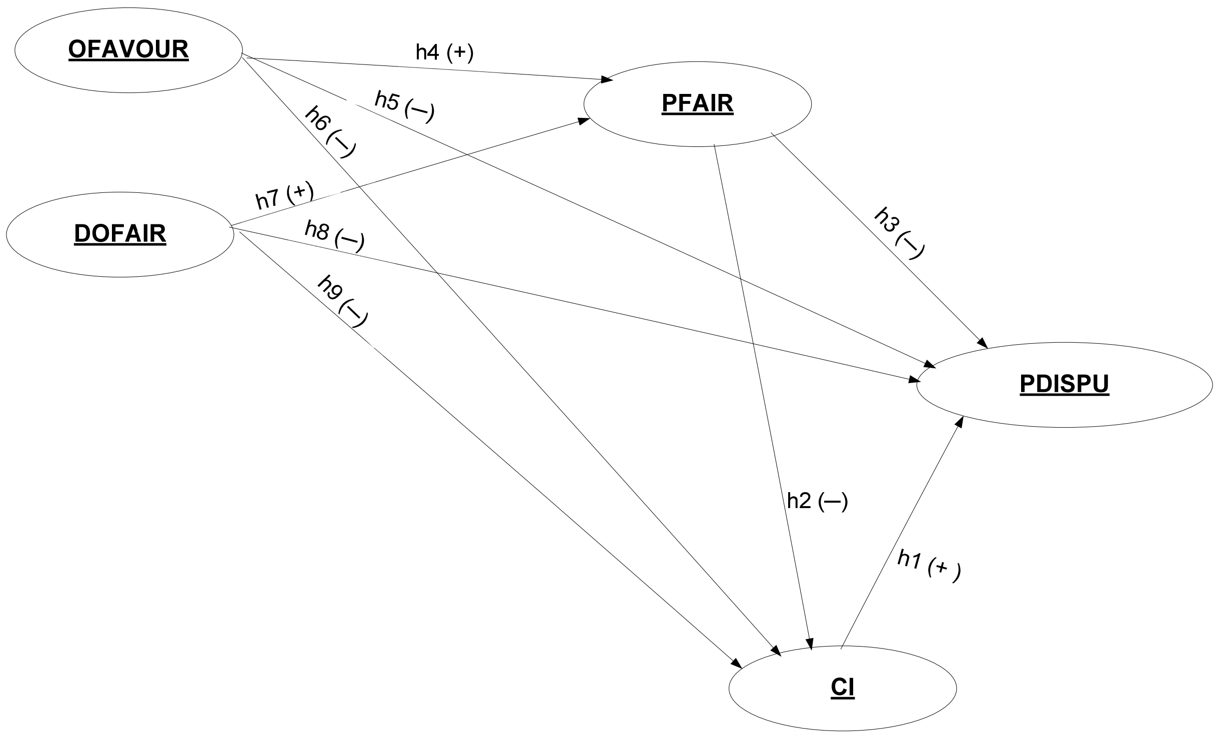


Figure 3-4 Revised model with Decision outcome fairness

The fairness-heuristic explanation (see section 3.6) also suggests that the mediating effect of procedural justice in the relationship between distributive justice and conflict intensity, and between distributive justice and potential to dispute. Thus, the following mediating hypotheses are set as extensions of sub hypotheses h8 and h9:

h8a Perceived procedural fairness (PFAIR) would mediate the relationship between decision outcome fairness (DOFAIR) and contractors' potential to dispute (PDISPU)

h9a Perceived procedural fairness (PFAIR) would mediate the relationship between decision outcome fairness (DOFAIR) and conflict intensity (CI)

3.10 Quality of the Decision-making Process

Tyler and Bladder (2000) explored what motivates attitude and cooperation in groups. They identified quality of decision-making process (QDPROCESS) as a broad category of criteria that may be used in evaluating fairness in any decision-making context. According to Tyler and Bladder (2000), quality of decision-making process refers to the manner in which decisions are made or reached (Tyler and Bladder, 2000). It refers to formal or informal aspects of a procedure that improves the nature, quality, and fairness of the decisions that are reached. It includes aspects such as neutrality and accuracy in the decision making. Neutrality refers to the extent to which people feel that the group makes decisions in an unbiased manner, based on facts and not on personal opinions or preferences (Tyler and Bladder, 2002). It is determined by the extent to which decision-making process involves accurate gathering of evidence.

Tyler (1989) argued that a violation of neutrality could lead to negative employee attitude toward an organisation. Tyler and Schuller (1990) provide empirical evidence that supports this assertion. In a sample of workers, neutrality was a significant independent variable in explaining organizational commitment. Tyler and Lind (1992) also argue that one of the more potent violations of the neutrality ideal is the belief that one has been discriminated against.

Further, people would be concerned that decisions are made with an effort toward accuracy. Effort targeted at accuracy and neutrality in a decision-making process conveys information about the fairness of the decision generated by the decision-making. Evidence of fundamental dishonesty or incompetence on the part of decision-making authority can also constitute a threat to the quality of decision-making process, and thereby perceived fairness and acceptance of decision reached (Tyler, 1990). Further, quality of decision-making may include issues such as consistency in decision-making. Consistency includes decision-maker's consistency in applying rules for claims across issues and across people. Quality of decision-making process is independent of whether the procedure leads to a favourable outcome. Also, the efforts to achieve accuracy in the decision-making process are distinct from the actual evaluation of whether the decision reached is accurate or not (distributive justice) (Tyler and Bladder, 2000). Hence, when organizations try to make accurate decisions, they are showing concern for those affected by the decisions (i.e. the group members that must live with the consequences of the decision).

Tyler and Bladder (2000) explore the impact of quality of decision-making process on attitudes, values and cooperative behaviours. Quality of decision-making was found to strongly influence employees' deference in terms of willingness to accept organisation's decisions. In the process for handling claims, due to the complexity and ambiguity involved in the substantiation and assessment of claims, and coupled with strong underlying conflict of interest, quality of decision-making would matter to contractors in terms of perceived neutrality, impartiality and independence of the claims certifier, efforts towards accuracy in assessing and deciding claims, professional expertise of the claims certifier, timely assessment and decision on claims, consistency in and correctly applying rules for claims.

Based on these theoretical points of view, it is likely that the higher the perceived quality of decision-making process (QDPROCESS) the higher the perceived procedural fairness. Also, higher levels of perceived quality of decision-making process would be associated with lower levels of contractors' potential to dispute while higher levels of perceived quality of decision-making process would be associated with lower levels of conflict intensity. Hence, the following sub-hypotheses are set out:

h10 Perceived quality of decision-making process (QDPROCESS) would have a positive effect on the perceived procedural fairness (PFAIR).

h11 Perceived quality of decision-making process (QDPROCESS) would have a negative effect on contractors' potential to dispute (PDISPU).

h12 Perceived quality of decision-making process (QDPROCESS) would have a negative effect on conflict intensity (CI).

Figure 3-4 is now extended to include hypotheses h10, h11, and h12. The resulting model is shown in Figure 3-5.

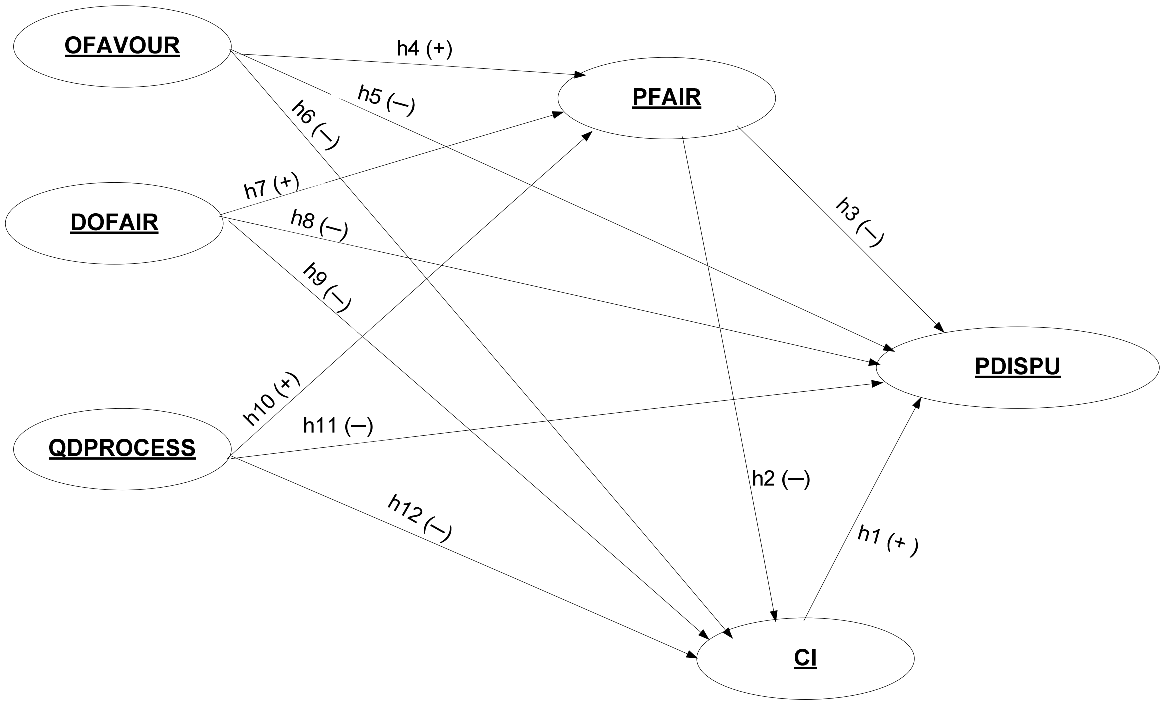


Figure 3-5 Revised model with Quality of decision-making process

As before, based on the fairness-heuristic explanation (see section 3.6), hypotheses 'h11' and 'h12' are extended as follows:

h11a Perceived procedural fairness (PFAIR) would mediate the relationship between perceived quality of decision-making process (QDPROCESS) and potential to dispute (PDISPU) h12a Perceived procedural fairness (PFAIR) would mediate the relationship between perceived quality of decision-making process (QDPROCESS) and conflict intensity (CI).

3.11 Quality of Treatment Experienced

People are sensitive to the way they are treated in their relationship or interaction with others (Bies and Moag, 1986). Thus, people's perception of fairness depends not only upon the presence of procedures and processes, but also upon the way interaction occurs. The quality of treatment people experience (hereafter referred to as the quality of treatment experienced – QTREAT) in their group would affect their perception of fairness, and consequently their attitude in that group (Tyler and Bladder, 2000). Quality of treatment concept is rooted in group value/relational model of procedural justice (Lind and Tyler, 1988; Tyler and Lind, 1992). Group value and relational models of procedural fairness are now discussed.

3.11.1 Group Value and Relational model of Procedural Justice

Group value and relational models of procedural justice are rooted in the interactional justice literature. Korsgaard et al (1998) discussed interactional justice as consisting of two primary components: treating those affected by decisions properly (i.e. being truthful in communication; and treating group members with courtesy and respect). Group value model suggest that procedures are evaluated in terms of their implications for group values and for what they seem to say about how one is viewed by the group using the procedure (Lind and Tyler, 1988). Group-value model postulates that in reacting to procedures, people are primarily concerned about their long term relationships (Tyler, 1989) and 'relational' aspect of procedures. The relational aspects are focused on the procedure itself and the information that procedure communicates about people affected by using the procedure (Tyler and Bladder, 2000). It differs from how the procedure leads to particular outcomes.

The interactional aspects of treatment are linked to the particular person who is operating the procedure used in the process, and they are distinct from the quality of decision-making (QDPROCESS) that the person is engaged in. For example, the person operating a decision-making procedure might treat people involved rudely, but nonetheless he/she may get high quality information, correctly apply the rules, and reach a neutral decision that may be regarded as insightful, objective and fair.

3.11.2 Quality of Treatment Experienced

Based on group-value model of procedural justice (Lind and Tyler, 1988), and relational model of procedural justice, Tyler and Bladder (2000) argued that quality of treatment experienced is a measure of relationship quality. Quality of treatment may be defined as the treatments members of groups receive as formal procedures are operated (Bies and Moag, 1986). Lind and Tyler (1988) stated that treatments are experienced beyond formal rules. Hence quality of treatment includes informal interactions of procedure. Aspects of treatments identified in literature are: (1) whether treatment is consistent with formal rules of how people should be treated (2) whether treatment reflects interpersonal sensitivity (3) whether treatment provides justification for the decisions authority have made (4) whether treatment demonstrates honesty and straightforwardness on the part of authority and (5) whether decisions made are timely (Tyler and Bladder, 2000).

Tyler (1989) and Tyler and Bladder (2000) identify two relational aspects of the actions of decision-making authorities—actions that indicate trustworthiness and status recognition. Status recognition refers to the quality of treatment that people experience in their interaction – whether they are treated politely or with dignity, and whether respect is shown for their rights and their entitlements.

3.11.3 Quality of Treatment Experienced, Procedural justice, Conflict Intensity and Potential to Dispute

Messick et al.'s (1985) study found that respondents seldom mentioned unfair allocations. Instead, they focused on issues such as being treated with politeness and consideration. Mikula et al (1990) found that a considerable proportion of the injustices which are reported refer to the manner in which people are treated in interpersonal interaction and encounters. Accordingly, these findings suggest that decision outcomes may be less central to the feelings and reactions than assumed by theories of distributive justice and outcome favourability. In other words, outcome-based judgments may play a secondary role in shaping peoples orientation toward group decision-making. This suggests that relational indicators are also important to people affected by a procedure. Tyler and Degoey (1996) showed that trustworthiness is primarily determined by relational and interactional concerns rather than by instrumental concerns for receiving desired outcomes from interaction with authority. It involves feelings that an authority has made good faith effort and treated the parties affected by the decision-making fairly. Trustworthiness measures the extent to which the people trust the motives of decision-making authorities.

Williamson (1993) argued that in a commercial relationship trust is instrumental and calculative in that people value trust because of benefits that people expect to receive. This suggests that quality of treatment would only be valued if it influences the outcome that people receive from decision-making. However, sociologists have theorised that economic transactions are particularly governed by feelings of trust in terms of social bond if those transactions are embedded in social relations (Granovetta, 1985; Brandach and Eccles, 1989). This has been empirically supported by Tyler and Degoey (1996) who show that even in commercial relations, trust may be non calculative in that it may not relate to what people expect to receive but rather it relates to identity, quality of relationship, and social bonding. Treating members of a group with dignity and respect creates a sense of identity and social bond to the group. It communicates information about the recognition of each group member's status and hence enhances the perception that decision-making authority is acting fairly.

Empirical studies have shown that trustworthiness and status recognition (aspects of treatment) may influence perceived procedural fairness (Tyler, 1994, 1989, 1987; Tyler and Bladder, 2000). In a study, trustworthiness and outcome favourability were the most important factors shaping the acceptance of decisions made by authority (Tyler and Degoey, 1996). Tyler and Bladder (2000) found that perceived quality of treatment accounts for the fact that negative treatments that occur outside the enactment of formal procedures is likely to be as powerful in stirring dissatisfaction as unfair treatment experienced in the implementation of procedures. Poor treatment provokes resentment because it conveys negative status information. Feelings of fair treatment have been found to lead to positive evaluation of the group (Brewer and Kramer, 1986), acceptance of organizational decision-making (Turner et al, 1987) and collaborative behaviour. Tyler and Bladder (2000) explored the impact of quality of treatment on attitudes, values and cooperative behaviours. Quality of treatment was found to have the strongest overall effect on satisfaction, and cooperative behaviours measured.

Construction contract relations are typically embedded in social relations hence quality treatment would be important to contractors in terms of whether they were treated with politeness and courtesy during the handling of claims, whether their contractual rights were respected, whether the employer's project team demonstrates sensitivity to their (contractors') entitlements, whether adequate explanations were provided for the decisions made and actions taken, and whether decisions on claims were timely. Based on these theoretical view points, it is likely that there is a positive relationship between perceived quality of treatment experienced (QTREAT) and each of the following: procedural fairness, conflict intensity, and contractors' potential to dispute. Hence the following hypotheses are set out:

h13 Perceived quality of treatment experienced (QTREAT) would have a positive effect on perceived procedural fairness (PFAIR).

h14 Perceived quality of treatment experienced (QTREAT) would have a negative effect on contractors' potential to dispute (PDISPU).

h15 Perceived quality of treatment experienced (QTREAT) would have a negative effect on conflict intensity (CI).

Figure 3-5 is now extended to include hypotheses h13, h14, and h15. The revised model is shown in Figure 3-6. Also, based on the fairness-heuristic explanation (see section 3.6), hypotheses 'h14' and 'h15' are extended as follows:

h14a Perceived procedural fairness (PFAIR) would mediate the relationship between perceived quality of treatment experienced (QTREAT) and contractors' potential to dispute (PDISPU).

h15a Perceived procedural fairness (PFAIR) would mediate the relationship between perceived quality of treatment experienced (QTREAT) and conflict intensity (CI)

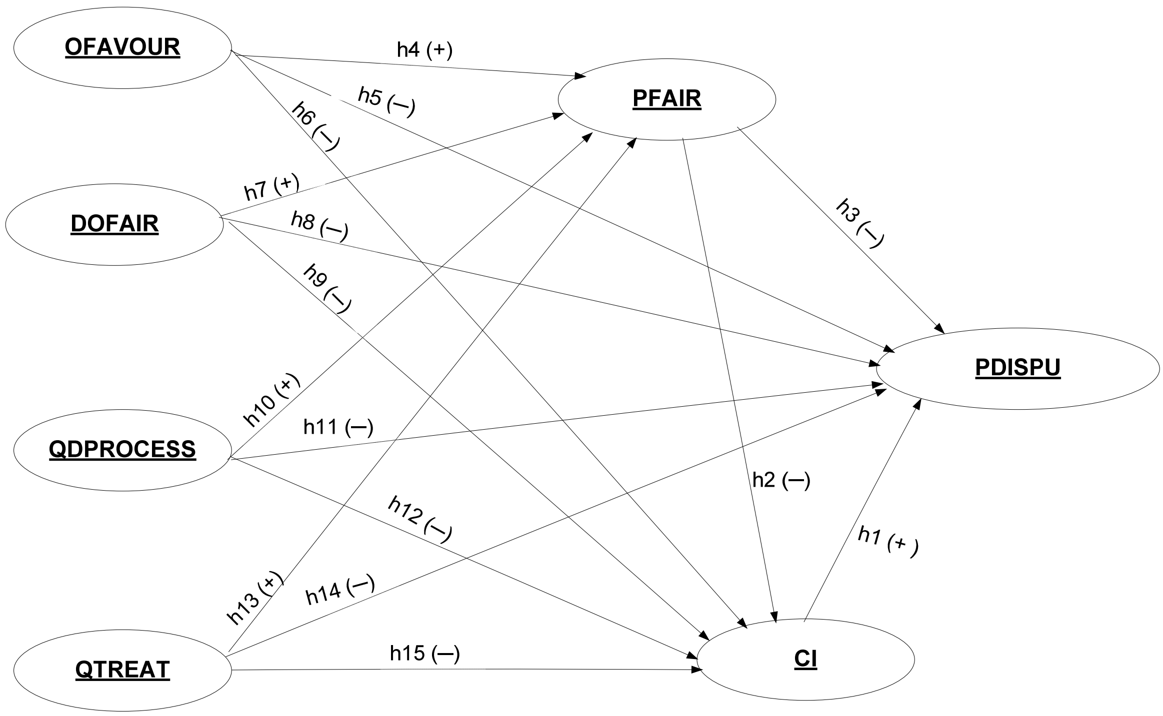


Figure 3-6 Revised model with Quality of treatment experienced

3.12 Control

3.12.1 Control Model of Procedural Justice

Thibaut and Walker (1975, 1978) developed a control-oriented model of what influences peoples' concern about procedural fairness (the theory of procedure). The model is based on the notion that people generally prefer to have a direct or indirect control over their outcome when dealing others. The model argued that people will make procedural fairness judgments by assessing their direct or indirect control within a procedure. According to Thibaut and Walker, people typically want to maximize their control over the decision-making process that determines their outcomes when interacting with others and this influence allows them to control decisions in a way that they feel will result in what they could consider a fair outcome. Hence, control over the various stages of any process for handling conflict is the most significant procedural characteristic shaping peoples views about the fairness of the process (Thibaut and Walker 1975, 1978).

Distribution of control combines two important and distinct elements of control as follows (Sheppard *et al* 1988; Sheppard, 1984; Thibaut and Walker, 1978):

(1) Type of control and the degree of the control

(2) Timing of control.

During each of the activities of any decision-making process, the parties may exercise the following types of control.

(1) Process control

(2) Content control.

"Process control" is any attempt to control how the parties interact (for instance allowing and ensuring that the contractor submits a master programme, and presents evidence to support claims as required under the contract). "*Content control"* is any attempt to manage the substance or quality of what is done during a given activity of a decision-making process (for instance, ensuring the correctness and adequacy of the master programme submitted by the contractor). Distribution of *'process'* and '*content'* control would determine the overall distribution of control among the participants; it therefore determines the essential character of the decision-making process (Sheppard et al, 1988). All changes in the process may be measured according to the effect of the distribution of control on this central control relationship (Thibaut and Walker, 1978).

Timing of control has to do with the stage at which the parties exercise process or content control. According to Thibaut and Walker (1978), parties in a conflict situation wants control – either '*process control'* or *'decision control'* – because they see control as instrumental to attaining fair outcomes they desire. Process control is important to the disputants because it assures that each party can see to it that the third party decision-maker receives correct information and thus allow the third party to use equity rules to resolve the dispute fairly. '*Decision control'* allows the disputants to accept only those decisions that they regard as desirable. Further, Brett (1986) suggests that '*decision control'* is one of the most important elements of fair dispute resolution procedure because people wish to maintain a feeling of control over what will happen to them once the conflict is resolved.

According to Vidmar (1990) and Leventhal (1976), people are motivated primarily by the desire to obtain favourable and fair outcomes hence *'decision control'* is valued as it allows unfavourable outcomes to be rejected while 'process control' allows for the opportunity to convince the decision-maker on what decision should be made. Studies have shown that people value 'process control' in situations in which they have low '*decision control'* (that is in situation where they have little or no influence on the decisions to be made by authority) (Kanfer et al, 1987; Tyler et al, 1985; Lind at al, 1983; Houlden, et al, 1978).

3.12.2 Control, Outcome Favourability, and Quality of Decision-making Process

In practice, contractors would typically have no direct 'decision' control on the claims certifier's decision on claims. However, there may be pre agreement between the parties at the outset of the project on the methodology for substantiating and assessing claims, and the method for project scheduling and content of the schedule, and pre agreement and clarity on rules of evidence for claims. The pre agreements imply that the contractor has some indirect control over the claims certifier's 'decision'. The reason is that pre-agreement reduces the subjectivity and ambiguity as to how claims would be assessed thereby shifting some “decision control” to the contractor.

Pre agreements on the methodology for substantiating and assessing claims would bring some level of certainty to the outcome of claims. Thus pre agreements may create a sense of indirect ‘decision’ control since there is an pre agreed upon framework on how claims would be assessed. This reduces the claims certifier’s discretion on claims assessment. Based on these viewpoints, it is likely that control could increase outcome favorability, decision outcome fairness and perceived quality of the decision-making process. Thus the following hypotheses are set out:

h16 Perceived control (CTROL) would have a positive effect on outcome favourability (OFAVOUR).

h17 Perceived control (CTROL) would have a positive effect on perceived decision outcome fairness (DOFAIR).

h18 Perceived control (CTROL) would have a positive effect on perceived quality of decision-making process (QDPROCESS).

Hypotheses h16, h17, and h18 are now added to the model in Figure 3-6 and the revised model is presented in Figure 3-7.

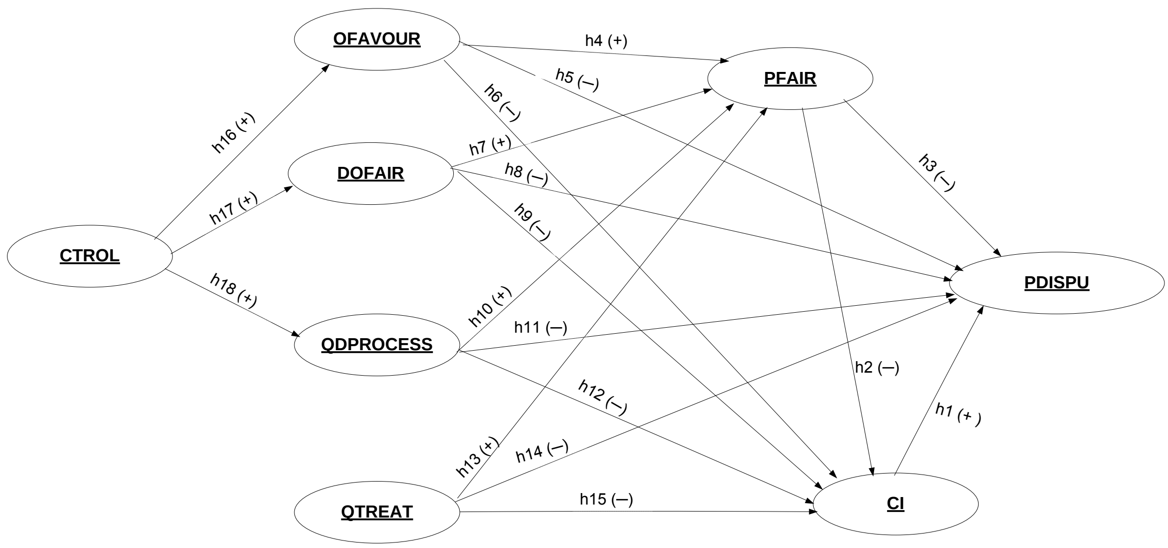


Figure 3-7 Revised model with Control

3.13 Relationships between Outcome Favourability, Decision Outcome Fairness, Quality of Decision-making Process and Quality of Treatment Experienced

Cropanzano et al (2001) suggested that distributive, procedural, and interactional justice elements may affect one another. This is consistent with Hauenstein et al's (2002) meta-analysis which suggests that justice criteria tend to be correlated. For instance, a decision-making authority characterized by interactional unfairness (poor quality of treatment) might be more likely to be seen as distributive unfair as well. Similarly, it is likely that perceived distributive fairness may be influenced by the belief that authority is enacting what is perceived to be a good quality decision-making process. Further, favourable outcome may lead to higher levels of perceived decision outcome fairness. Based on these assumptions, it is further hypothesised as follows:

h19 Perceived outcome favourability (OFAVOUR) has a positive effect on the perceived decision outcome fairness (DOFAIR).

h20 Perceived quality of decision-making process (QDPROCESS) has a positive effect on the perceived decision outcome fairness (DOFAIR).

h21 Perceived quality of treatment experienced (QTREAT) has a positive effect on the perceived quality of decision-making process (QDPROCESS)

h22 Perceived quality of treatment experienced (QTREAT) has a positive effect on the perceived decision outcome fairness (DOFAIR)

Finally, Figure 3-7 is now extended to include hypotheses h19, h20, h21 and h22 and the resulting model is shown in Figure 3-8.

3.14 The Research Model

Based on the sub-hypotheses formulated (h1 to h22), Figure 3-8 shows the final analytical model developed to address the main hypotheses (specified in Section 1.4) of the research. The models represent the structural relationships between perceptions about fairness, conflict intensity and contractors' potential to dispute claims.

3.15 Interactive effects of Procedural Fairness and Outcome Favorability on Conflict Intensity and on Potential to Dispute

3.15.1 Previous studies

This section develops interactive effect hypotheses to address objective number 3 and 4 which are to explore whether the outcome received, from claims, by a contractor and the contractor's perceptions about procedural fairness and quality of decision-making process would interact to influence conflict intensity, and the contractor's potential to dispute the outcome.

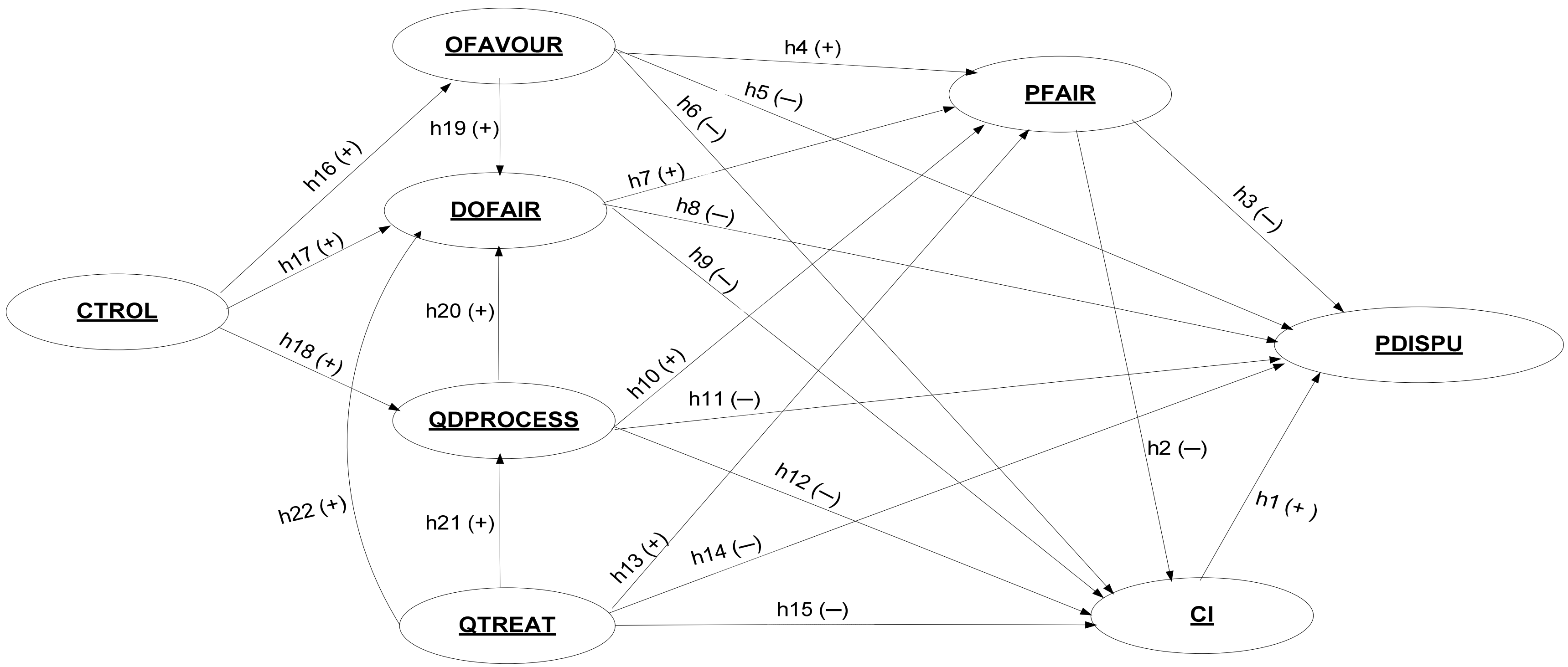


Figure 3-8 Research Model

Social and economic exchange theorist postulates that the greater the perceived favourability of the outcomes (outcome favourability) people receive from their group's decision-making, which may be material (i.e. additional benefit in term of money, profit etc) or social/psychological (feelings of respect, support, acceptance etc), the more likely they will reciprocate in form of cooperation, and acceptance of decision-made without contesting such decisions (Blau, 1964; Adams, 1965). Procedural fairness researchers suggest that people's behaviour in a decision-making will not only depend on outcome they receive but also on their perceptions about the fairness of the procedure used to arrive at the decision outcome (Thibaut and Walker, 1975; Lind and Tyler, 1988). Thus, people react to what happens (outcome) and how it happens (procedural fairness) (Brockner et al, 2000). Further, research has documented that outcome favourability and procedural fairness both work together to influence people's attitude and behaviour (Cropanzano and Folger, 1991).

In the context of voluntary professional organizations, with regard to their relationship with members, Ehlen, et al. (1999) examined the interactive effects of outcome favourability and procedural fairness in organizational decision-making on members' commitment and resentment towards the organization. In their study, the focal interaction emerged on resentment such that members had particularly high resentment when outcome was unfavourable and procedures were unfair. But they did not find interaction of outcome favourability and procedural justice on organizational commitment.

An unfair procedure is highly unlikely to produce a fair outcome since a good and effective process is to ensure that a fair outcome is achieved (NADRAC, 1997).

Halaby (1986) examined the antecedents of employees' willingness to accept an offer from another company (employee turnover) as a function of general procedural justice evaluation of organization. In the study, the author found that, controlling for the general favourability of the rewards they received from their organizations, people are more willing to entertain an offer from another company if they felt that their company lacks formal procedures that protected them from arbitrariness, and if they perceive the promotion procedure as unfair. Halaby (1986) concluded that where procedures are generally and consistently believed to be unfair, negative reaction to unfavourable outcome is expected.

Brockner et al (1990) found that procedural fairness of employee lay-offs interacted with outcome favourability to affect organizational commitment. Cropanzano and Folger (1989) found that participants who had a choice as to which tasks should be used to determine a performance-based reward (index of fair procedure) reported less resentment and anger when they failed to receive the reward for the task that counted (an unfavourable outcome) than those who did not have a choice (an index of unfair procedure). Folger and Martin (1986) found that participants who received an unfavourable outcome reported less resentment and anger if they were provided with reasons and or justification for the outcome (an index of fair procedure) than if no reasons or justification were provided (an index of unfair procedure).

Brockner and Weisenfeld (1996) examined the interactive effect of procedural justice and distributive justice. The authors suggest that procedural and distributive justice norms interactively combine to influence individuals' reaction to their encounters with other people, groups, and organizations. Their study showed that the level of procedural justice was more positively related to the individual's reaction when distributive justice perception was relatively low; and that the level of distributive justice was more positively related to the individual's reactions when procedural justice was relatively low.

Most of the studies in interactive effect of outcome and procedure on behaviour conclude that people have particularly negative reaction to situations where outcome are unfavourable and procedures are unfair. The pattern of such relationship has been summarized a follows (Ehlen et al, 1999):

- People have less negative reactions to unfavourable outcome when procedures are fair.
- People have less negative reactions to unfair procedures when outcomes are favourable.

These patterns imply that enhancing decision-making procedure could cushion the effect of negative outcome on the behaviour of recipients.

3.15.2 Explaining the interactive effect of Outcome and Procedure on behaviour

The interactive effect of procedural fairness and outcome favorability on behaviour may be attributed to the role of procedural fairness as a pre condition of trust in any exchange relationship (Brockner et al, 2000). The more a party in an exchange perceives the other party to be procedurally fair, the more likely that party will trust the other party and the more the actions of the other party will be interpreted positively (Konovsky and Pugh, 1994). The perception of the other party's trustworthiness, in turn, helps explain the interaction between outcome favourability and procedural fairness. If the other party is perceived to be trustworthy, then the party will attach less importance to, and hence be less influenced by, the favourability of the economic or tangible outcomes of the current exchange situation. However, when the other party is perceived to be relatively untrustworthy, as a result of unfair procedures, the recipient party will be more influenced by the favourability of the outcome received from the exchange relations with that other party. This phenomenon applies to a variety of decision-making contexts.

Further, referent cognition theory (RCT) (Folger, 1986; Brockner and Wiesenfeld, 1996) provides a possible explanation for the interactive effect of procedural fairness and outcome favorability on behaviour. In a decision-making, those who receive unfavourable outcome may assess more critically the fairness of the procedure and process by which the decision (outcome) was established when compare to those who receive favourable outcome. Based on RCT postulations, those who perceive procedure to be unfair or less fair would conceive of a more favourable outcome they would have if the procedure had been fair or fairer. The gap between the outcome received and what should have been received could be a source of conflict and dispute behaviour.

However, Folger (1977) postulates that in contexts where the decision-making authority has a vested interest in the decision to be made, the interactive effect of procedural fairness and outcome favourability on behaviour may not be present due to 'frustration effect'. Cohen (1985) suggests that frustration effects occurs when recipients of an allocation recognize that the allocator has a vested interest in the allocation, prompting the recipients to believe that the apparently fair opportunity allowed for them to voice their views, express their position and participate in the decision process (elements of procedural fairness) is being used to seduce them into accepting a self–serving allocation by the allocator. The implication of frustration effect is that enhancement of procedure would not produce any positive behavioural changes. However, Lind and Tyler (1988) argued that the evidence of 'frustration effect' is not common in previous empirical studies and that the infrequency of genuine frustration effects is a strong reason to believe that, even under conditions of severe conflict of interest between allocator and the recipient, any relatively strong procedural justice difference will produce high satisfaction despite negative outcome.

3.15.3 Interactive effect of outcome and procedure on behaviour in construction

The pattern of interaction between outcome and procedure, and its effect on behaviour has not been tested in the context of construction. The pattern of the interaction is not yet clear. Theoretically, it is likely that 'frustration effect' would be present in decision-making processes in construction. The reason is that, a building and engineering contract is fundamentally different from contexts where previous studies have been conducted. Construction contract is a commercial exchange relationship among economically independent parties; consequently, tangible or economic outcome received by contractors is likely to be an important determinant of their behaviour. Enhanced decision-making procedure may not cushion contractors' reactions to negative outcome because project management team who are responsible for administering contract are typically in a severe conflicting interest situation in that they are agents of the employer (project owner) and also have to make decisions including those relating to their own errors or mistakes (Nicklisch, 1990). Thus, enhanced procedure could be interpreted by the contractors as being used by the project management team to seduce them into accepting the outcome of a decision-making that s targeted at to favouring the employer.

Although the success stories of partnering provide some anecdotal evidence to suggest that outcome and procedure could interact to influence cooperative behaviour in construction, it has not been systematically tested. However, based on Lind and Tyler's (1989) argument of infrequency of frustration effect in previous research, it is assumed that the moderating effect of procedural justice would be applicable to the process for handling claims. Based on these conceptualizations, it is likely that procedural fairness would moderate the relationship between distributive fairness and conflict intensity, and between distributive fairness and potential for dispute such that under conditions of unfavourable outcome, there would be lower intensity of conflict where procedure for claims is perceived to be fair than where it is perceived to be unfair. Also, under conditions of unfavourable outcome, contractors would show lower potential to dispute where procedure for claims is perceived to be fair than where it is perceived to be unfair. Specifically, the negative relationship between outcome favourability and potential to dispute; and between outcome favourability and conflict intensity (h5 and h6 respectively) are extended as follows:

h5b Perceived procedural fairness (PFAIR) would moderate the relationship between outcome favourability (OFAVOUR) and contractors' potential to dispute (PDISPU)

h6b Perceived procedural fairness (PFAIR) would moderate the relationship between outcome favourability (OFAVOUR) and conflict intensity (CI).

Based on the concept discussed in this section, hypotheses h5 and h6 were further extended by hypothesizing the interactive effect of quality of decision-making process and outcome favourability on potential to dispute; and on conflict intensity as follows:

h5c Perceived quality of decision making process (QDPROCESS) would moderate the relationship between outcome favourability (OFAVOUR) and contractors' potential to dispute (PDISPU)

h6c Perceived quality of decision making process (QDPROCESS) would moderate the relationship between outcome favourability (OFAVOUR) and conflict intensity (CI).

3.16 Interactive effect of Control and Outcome Favourability on Decision outcome fairness

Control in terms of pre agreements on methods for substantiating and assessing claims and on rules of evidence for claims is expected to introduce some objectivity and bench mark against which claims would be assessed and decided. Because of the increase in perceived objectivity, unfavourable decision would be less likely to be perceived as unfair. Thibaut and Walker (1978) found that respondents' perceived control over procedures made their outcomes seem fairer and more acceptable even when these outcomes were not favourable. Hence it is likely that the relationship between outcome favourability (OFAVOUR) and decision outcome fairness (DOFAIR) would be moderated by control (CTROL). Based on this, hypothesis h19 which postulates a negative positive relationship between outcome favourability (OFAVOUR) and decision outcome fairness (DOFAIR) is extended as follows:

h19a Perceived control (CTROL) would moderate the relationship between outcome favourability (OFAVOUR) and perceived decision outcome fairness (DOFAIR).

Control is instrumental and it creates in parties, a sense that they have some degree of influence over the decision outcome of the claims process before the decision is made. This sense of control consequently influences parties' perception of fairness. However, previous studies suggest that the quality of the decision-making process (such as decision-makers display of impartiality) and quality of treatment (such as providing explanation for decisions, opportunity for claims to be discussed freely at site meetings) would affect the influence of control on perception of fairness (Bies and Moag, 1986). Tyler (1987) suggested that the relationship between control and perceived fairness was more positive where respondents were allowed to express their views freely (quality of treatment). However, allowing contractors to express views (a form of 'process control') or providing explanations for decisions made (QTREAT) may not necessarily enhance perception of fairness should the claims certifier fail to decide claims within the ambit of the pre agreed framework and methodology or fail to decide claims based on the facts but rather on the employer's concern for time and cost overrun (aspects of QDPROCESS). Hence, in the handling of claims the moderating effect of quality of the decision-making process (QDPROCESS) on the relationship between control (CTROL) and decision outcome fairness would be more relevant. Based on these theoretical considerations, it is hypothesised as follows:

h17a Perceived quality of decision-making process (QDPROCESS) would moderate the relationship between control (CTROL) and perceived decision outcome fairness (DOFAIR)

3.17 Differences between Quality of Decision-making Process and Quality of Treatment Experienced

Quality of decision-making and quality of treatment differ. For instance, Bies and Moag (1986) identified four aspects of interpersonal treatment of importance to job candidates: honesty, courteous treatment, timely feedback, and respect for their rights. They found that these evaluations of quality of treatment were made independently of traditional procedural evaluations. Interactional justice (operationalised as quality of treatment construct) was also found to have influence on trust in management, and withdrawal behaviour (Barlings and Phillips, 1993) while procedural justice (operationalised as a quality of decision-making construct) was only related to trust in management. Tyler and Bladder (2000) found that both quality of decision-making process and quality of treatment experienced explain 79% of the variance in procedural justice judgments. Their study also indicates that decision-making process and quality of treatment experienced each explain an almost equivalent amount of unique variance in procedural justice judgments (10% for quality of decision-making, and 8% for quality of treatment).

Tyler and Bladder's (2000) findings suggest that quality of decision-making process and quality of treatment are both similar in their contribution to overall procedural fairness evaluation. The result reinforces their theoretical view that treatment experienced and quality of decision-making process should be considered as separate and distinct components of procedural justice. Tyler and Bladder (2000) further observed that while some research has suggested that treatment may be more important than the decision-making process (Moorman, 1991), other research (Vermunt et al, 1993) has found evidence contrary to this. Tyler and Bladder (2000) found that quality of decision-making process shows some greater influence on procedural justice.

Construction contract relationship is an economic transaction. Assuming that quest for profit is more important to contractors; hence it is likely that quality of decision-making process (QDPROCESS) would be a more important predictor of procedural fairness (PFAIR) than quality of treatment experienced (QTREAT). Based on this assumption, it is further hypothesized as follows:

h23 The relationship between perceived quality of decision-making process (QDPROCESS) and perceived procedural fairness (PFAIR) is stronger than the relationship between perceived quality of treatment experienced (QTREAT) and perceived procedural fairness (PFAIR).

3.18 The role Organizational justice in Conflict and Dispute: A review of two litigated cases

An exploratory investigation of the role of organizational justice in construction claims, conflict and dispute was conducted by reviewing two litigated cases. The goal was to discover the likely pattern of events and issues (underlying components of organizational justice) that could escalate conflict and pre-condition dispute when administering claims on a project. Content analysis was conducted by synthesising the evidence and facts elicited by the court during the proceedings in each case. The facts elicited by the court were obtained from the decision transcripts of the cases.

According to Babbie (1992), content analysis is an unobtrusive method of research that may involve examination of written documents. Content analysis starts by developing the operational definition of the key variables of the enquiry. Based on the operational definition of the constructs as developed in section 3.3 and section 3.4, the analysis was directed at identifying the events which led to the court proceedings in each of the cases. References made by the judge to the various events, actions and inactions of the parties which influenced norms of fairness and appeared to have escalated conflict and motivated the court action were noted. Particular attention was paid to the history of the projects in the tow cases, history of the claims and the dispute, references by the judge to actions relating to perceived or actual bias and partiality in the assessment and decision-making on claims, independence of the claims certifier, ways in which the contract mechanism for claims was operated, why decisions arising out of the claims process was rejected by the contractor, and reasons for actions and inactions by the parties as inferred by the judge from evidence before the court.

3.18.1 Selection of Cases

Two criteria were used in selecting the cases reviewed as follows: (1) need for extreme and deviant cases (Patton, 1990) (2) public availability of information (Turner and Pidgeon, 1997). First, the research problem addresses fairness, conflict and dispute in construction claims process. A litigated claim where the contractor's case focused on issues of fairness would provide a useful source of information which would help to understand the research problem and issues involved and would help in operationalising the constructs of the study in the context of construction. Based on public availability criterion recommended by Turner and Pidgeon (1997) for selecting materials for exploratory analysis, this study conducted a search of lexis.com – a legal database of judicial decision transcripts of litigated cases. In order to ensure contextual homogeneity of the cases, the search was directed at decided cases in Commonwealth jurisdictions. This is because of the communality in the legal system across the commonwealth jurisdictions and thereby relative similarities in the practices and normative rules for claims administration (Nicklish, 1990).

By looking at the headnote of each transcript, cases relating to disputed delays and disruption claims by main contractors were identified and selected for two reasons: (1) they involve time and or money claims and (2) because of their complexity. From the preliminary review, five cases were initially selected. However, from a further review, the transcripts of two of the selected cases were finally chosen as they involve issues of fairness and contained relatively detailed information that could provide relevant insight into the research problem. The two cases are *Bernhard Rugby Landscapes Ltd v. Stockley Park Consortium Ltd* (1998) (hereinafter referred to as 'BRL' case) and *John Barker Construction Ltd. v. London Portman Hotel Ltd.*

(1995) (hereinafter referred to as 'JBC' case).

3.18.2 Background of the Cases

3.18.2.1 Case 1 – 'BRL' Case

Overview of the claims and dispute

In *Bernhard Rugby Landscapes Ltd v. Stockley Park Consortium Ltd (1998) 14 Const. L.J. 329* (hereinafter referred to as 'BRL' case), the project made use of Institution of Civil Engineers Conditions of Contract (ICE) 5th edition with the construction managers given the powers which the engineer usually exercises under the ICE conditions. The construction manager was the designated claims certifier under the contract (*hereinafter the construction manager would be referred to as 'the claims certifier')*. The works were delayed by the employer-related events and by variation orders. The claims certifier did not make early assessment and certification of the contractor's claims. In addition, the claims certifier and the employer consistently rejected the contractor's claim prior to any objective assessment. The contractor lost confidence in the contractual machinery for claims and dispute resolution and as a result referred the claims to the court for a resolution.

Contractor's arguments and the employer's defense

The contractor, among other things, argued that the contract machinery for resolving claims had broken down and that the clause relating to dispute resolution had become inoperable as a result of the claims certifier's failure to administer the contracts properly and to give decisions on the disputed claims. On the other hand, the employer argued that the court had no jurisdiction to entertain the contractor's claims because the contractor had not allowed the claims certifier to decide on the claims before referring the matter to litigation.

3.18.2.2 <u>Case 2– 'JBC' Case</u>

<u>Overview of the claims and the dispute</u>

The contract in the *John Barker Construction Ltd. v. London Portman Hotel Ltd. (1995) 50 Con LR 43* (hereinafter referred to as 'JBC' case) case made use of JCT 1980 standard terms but clause 41 (the arbitration clause) was deleted and replaced by the words '*the proper law of the agreements shall be English law and the English courts shall have jurisdiction*'. The works were carried out under two contracts. The dispute in the case is in respect of the second contract.

The contract documents provided for the completion of the project in phases as follows: floors nine to eleven by 16 July 1994, floors five to eight by 30 July 1994 and floors two to four by 14 August 1994. By the end of 1994 there had been delays and it was apparent to all participants involved that the contractor was entitled to some extension of time, the exact amount of which was open to argument.

There were negotiations and it was orally agreed on 7 July 1994 between the contractor's managing director and the employer's project manager, subject to the approval by the employer project manager's superiors, that in summary the block B contract works were all to be completed by 14 August 1994 (acceleration agreement), subject to snagging and commissioning works to be completed by 26 August 1994, and that the contractor would be paid additional sums of £20,000. Under the acceleration agreement, the contractor waived any claims for extension of time, which they had as at Monday 11 July 1994. All outstanding information as at Friday 8 July

1994 was to be provided to the contractor by the end of Tuesday 12 July 1994.

On 20 July 1994 the contractor's managing director sent the employer's project manager a document recording the agreed terms of the negotiation. At the trial, the employer's project manager accepted in evidence that he was satisfied that the document sent to him accurately represented the agreement made, though he had expressed reservations about the wording of the provision about payment of £20,000 and that he may have subsequently mentioned that to the contractor's managing director. Nevertheless, evidence showed that the parties proceeded on the basis that the document was unchallenged.

After the acceleration agreement, there were further delays and further instructions to the contractors from the Architect (who is the designated claims certifier under the contract and hereinafter the architect would be referred to as 'the claims certifier'). On 7 September 1994 (about 3 weeks after the works were supposed to have been completed) the contractor's managing director wrote a letter to the project manager enclosing a schedule of variations that had taken place since the acceleration agreement was made. The contractor's managing director stated in the letter that if the contractor had known that there was going to be a high level of variations, it would not have committed itself to the dates in the acceleration agreement. By the letter, the contractor gave notice of intention to seek an extension of time.

On 23 November 1994 the claims certifier certified that practical completion of all sections of the block B contract had taken place on 23 September 1994 (about 6 weeks beyond the contract completion time). By a letter dated 23 January 1995 the claims certifier sent to the contractor notices giving extension of time for floors two to eight until 2 September 1994 and for floors nine to eleven until 4 September 1994. The claims certifier's decision implied that the contractor was liable to payment of liquidated damages of about 5 weeks. The contractor was not satisfied with the decision of the claims certifier and as result sought redress at litigation.

<u>Contractor's arguments and the employer's defense</u>

The contractor claimed that it was entitled to a longer extension of time than was granted by the claims certifier. The contractor also argued that the claims certifier decisions were not fair and reasonable. The contractor contended that in purporting to fix revised completion dates, the claims certifier failed in the proper discharge of his duties and that he ought to have extended the time for completion until the date on which practical completion was in fact achieved. However, the employer argued that the claims certifier's decision on the contractor's claims for extension of time was conclusive and that the court had no jurisdiction to inquire into it.

3.18.3 Pre conditions of dispute in the 'BRL' and 'JBC' cases

There are differences in the immediate manifest reasons for the court actions in 'JBC' and 'BRL' cases. In the 'JBC' case, the basis of the contractor's action was as a result of dissatisfaction with the claims certifier's decision on claims while in the 'BRL' case it is dissatisfaction with the process for handling claims. These are now discussed in more detail.

3.18.3.1 The "BRL" case

The "BRL" case typifies an instance where process-based judgment pre-conditioned escalation of conflict and contractor's disputing behaviour. In the case, the contractor referred the claims to litigation prior to the claims certifier's decision on its claims. Hence, the main point of defence by the employers was that the contractor had not allowed the claims certifier to decide on the claims before seeking legal remedy. However, the contractor argued that it had lost confidence in the contract machinery for resolving claims due the failure of the claims certifier to administer the contracts properly and to give a timely decision on the disputed claims. The case shows that decision to pursue claims beyond the onsite machinery for claims may be precipitated by concern over the ways in which the formal procedure for handling claims is operated.

Previous studies have suggested that both formal and informal aspects of any decision-making process are critical for enhancing perceived fairness and for motivating positive attitude (Bies and Moag, 1986; Korsgaard et al., 1998; Tyler and Bladder, 2000). Informal aspect of operating a formal procedure could communicate information on the quality of decision-making process and hence the perceived quality of decision made and accordingly positive or negative behavioural response to match perceived fairness or injustice. The findings in the "BRL" case are indicative of the following: (1) quality of decision-making process (QDPROCESS) – Section 3.12; and (2) quality of treatment experienced (QTREAT) – Section 3.13. The findings suggest and illustrate the following hypothesised path of the research model presented in Figure 3-8 (see Sections 3.14):

h11: QDPROCESS → PDISPU; h12: DPROCESS→ CI h14: QTREAT→ PDISPU; h15: QTREAT→ CI

h21: QTREAT→ QDPROCESS

5.18.3.2 The 'JBC' case

In the JBC case, the contractor's claims were assessed and decided by the claims certifier prior to the court action. But, the contractor was dissatisfied with the claims certifier's decision. The quantum of the contractor's claims which were allowed by the claims certifier fell short of what the contractor presented. The contractor argued that a greater amount should have been allowed than what was allowed by the claims certifier. Thus unlike the BRL case, the contractor's action was motivated by outcome-based judgment rather than process-based judgment. Apparently, the claims certifier's decision was favorable but the contractor was not satisfied with favorability of the decision. Although the contractor's actions might have been precipitated by the contractor's liability for liquidated damages, the contractor's avenue for pursuing and contesting the claims certifier's decision at litigation do provide useful insight into how perceptions of fairness are formed and how they influence conflict intensity and disputing behavior. The 'JBC' case indicates the two outcome-based criteria of perception of fairness identified in the theoretical framework: (1) outcome favorability (OFAVOUR) and (2) decision outcome fairness (DOFAIR) (see section 3.4.2, Table 3-1)

At the proceedings, the contractor demonstrated the discrepancy between the amounts of claims which were allowed by the claims certifier and the amounts that should have been allowed. This suggests that the contractor had expectations on what amount of the claims should have been allowed. Hence comparison between what was expected and what was allowed led to the perceived lack of fairness and consequently the court action. This is consistent with findings in the literature. For example, comparison between expected outcome and actual outcome; and between actual outcome and what is perceived to be deserved has been identified as criteria people use in a conflict when evaluating fairness of outcome (DOFAIR) they receive from the conflict resolution process (Folger and Konovsky, 1989; Tyler and Bladder, 2000). Based on the findings, the contractor's basis for court action is indicative of the following hypothesized paths of the analytical framework presented in Figure 3-8 (see Sections 3.14):

h5: OFAVOUR → PDISPU; h6: OFAVOUR → CI

h8: DOFAIR → PDISPU; h9: DOFAIR → CI

h19: OFAVOUR → DOFAIR

3.18.4 The Roles of Procedural Fairness as a pre-condition of disputing behaviour in 'JBC' and 'BRL' cases

The manifest reason for the court action in the 'JBC' case is that the contractor was dissatisfied with the quantum of claims certified while in the 'BRL' case the contractor was dissatisfied with the way claims were handled by the claims certifier. The inferences suggest that the court actions in the BRL and JBC cases were as a result of process-related and outcome-related concerns respectively. However, the contractor's pleadings and arguments in both 'BRL' and 'JBC' cases suggest that overall flaws in the way claims were assessed and decided (procedural fairness) is the central avenue used by the contractors to institute court action. Based on this, it is reasonable to assume that overall perception of procedural fairness would mediate the relationship between other criteria of perceptions of fairness and each of (1) conflict intensity (2) potential to dispute. The finding is consistent with hypotheses h5a, and h6a (see section 3.8.1); h8a, and h9a (see section 3.9.4). The basis for the inference is discussed next.

3.18.4.1 The 'JBC' case

The 'JBC' case typifies an instance where perceived or actual procedural flaws were used by the contractor to plead its case. Beyond the unfavourable outcome and perceived decision outcome fairness, the following process-related issues influenced the dispute: (1) the claims certifier's approach and methodology for assessing and deciding the claims (2) the claims certifier's conduct. This is consistent with findings in organizational justice literature that where decision outcome is unfavourable, people look for procedural information as criteria to evaluate decisions made and as the basis for responding to the decisions that affect them (Lind and Tyler, 1988).

The central role of procedural fairness in the 'JBC' case thus illustrate the theoretical assumption that high level of outcome favourability (OFAVOUR) and high levels of perceived fairness of decision outcome (DOFAIR) would be associated with high levels of perceived procedural fairness (PFAIR) evaluation (illustrating hypothesis h4 and h7 of the research model (Figure 3-8); section 3.8.2 and 3.9.3 respectively).

3.18.4.2 The 'BRL' case

Similar to the JBC case, the BRL case also indicates that perceived procedural flaws in the handling of claims were the avenues used by the contractor to pursue its claims and plead its case. The contractor argued that the contract machinery for resolving the claims had broken down and that the clause relating to dispute resolution had become inoperable. In order to determine the case, the court applied *fairness test* by considering in detail the conduct of the claims certifier, and the manner in which the claims certifier had operated the procedure for claims. The judge concluded that the claims certifier's conduct did not show that he was exercising his duties fairly. The claims certifier's conduct, the judge opined, had potential to constitute injustice to the contractor. Hence, the judge declined to refer the claims back to the claims certifier for a decision, as pleaded by the employer.

3.19 Events influencing Perceived Fairness in 'JBC' and 'BRL' Cases

In this section, a detailed review and analyses of the patterns of events and their dominant components that pre-conditioned the court actions in both 'JBC' and 'BRL' cases are presented. The events are synthesized into categories. In the two cases, there are differences and similarities in the precise patterns of the events and their dominant components leading to the court action. The differences and similarities do indicate combination of factors upon which perceptions of fairness might be framed. The categories of events and their components are now discussed.

3.19.1 Unjustifiable delays in claims assessment

In the 'BRL' case, one of the events underlying the contractor's disputing reaction is that there were unjustifiable delays regarding the assessment of the contractor's claims. During the trial, evidence showed that the claims certifier had remained passive regarding the contractor's application for extension of time and additional cost claims even though the claims certifier had initially agreed in principle to the contractors' entitlements. The contractor's claims were not certified until after the court proceeding had already commenced (about 5 years after substantial completion of the project). The trial judge found that the claims certifier had enough time to decide on the contractor's claims before the court proceedings.

The claims certifier stated that the claims were assessed late because the contractor did not supply adequate information to substantiate its claims. Nevertheless, at the proceedings, the claims certifier was unable to demonstrate what information was missing in the contractor's claims. Thus, there were no justifiable reasons for the delays in the assessment of the claims. The procrastinating attitude of the claims certifier stands out as one of the forces that influenced the contractor's concern regarding the fairness of the claims handling process. This was exacerbated by the fact that the contractors wrote so many correspondences but with a passive response from the claims certifier. Akin to 'BRL' case, late assessment and decision on claims featured in the 'JBC' case. The claims certifier's decision on extension of time was not made until after practical completion. The decision was less favourable to the contractors in that the extension of time allowed rendered the contractor liable for the payment of liquidated damages (LD). The lateness of the claims certifier's decision coupled with its commercial implication for the contractor provides wide latitude for perceived lack of fairness, anger, hostility and rejection of decision and litigation.

3.19.2 Inconsistencies in decision-making

Beside unjustifiable delays in the assessment of claims, the 'BRL' case involved inconsistencies in claims certifier's attitude towards the contractor's claims. In the case, evidence showed that at the initial stage, it was apparent to all parties concerned including the claims certifier that the contractor was entitled to extension of time. However, at a later stage, as a result of the employer's influence, an attempt was made to reject the contractor's claims in totality. The inconsistencies in decision-making provide wide latitude for perceived bias – a component of quality of decision-making process (QDPROCESS) construct of the research model – section 3.11.2. Consistency in decision-making may indicate the quality of a decision-making process (QDPROCESS) hence the quality of decision made.

Inconsistency in decision-making also featured prominently in a Singapore case *Tropicon Contractors Pte Ltd v Lojan Properties Pte Ltd (1989).* In the case, the claims certifier attempted to reverse the decision made on the contractor's claims after 4 years. The purported attempt to reverse the decision was based on the employer's complaint that the contractors did not give notice of some of the delay events considered by the claims certifier. The purported revised decision potentially rendered the contractor liable for payment of liquated damages. The contractor instituted a court action. The learned judge described the claims certifier's action as unacceptable. Even though the employer's complaint may be justifiable, in a conflict of interest situation such as construction claims, revision of decision made from favourable to less favourable outcome for a party may pose questions of fairness and may lead to negative behavioural reaction.

3.19.3 Unjustifiable basis for decisions and claims certifier's lack of professional expertise

In the 'JBC' case, the claims certifier was unable to provide an effective explanation of the basis for decision made hence apparent display of lack of professional expertise. In the 'BRL' case, the court observed that the claims certifiers did not exercise professional expertise and personal qualities needed to hold the balance between the contractor and employer. Perceived or actual lack of professional and technical expertise could communicate information on the quality of decision-making and hence the quality of the decision itself. This provides wide latitude for perceived injustice and confrontation. The events indicating apparent display of lack of professional expertise in the 'JBC' case and implied display of lack of professional expertise in the 'BRL' case are now examined in more detail.

In the 'BRL' case, the claims certifier failed to assess the contractors' claims and failed to make its' own inquiries into the claims. The court observed that the failure might have been due to the inexperience of the claims certifier in administering a contract. Evidence revealed that the claims certifier had never acted under such a contract as a contract administrator. It was also revealed at the trial that prior to the commencement of the proceedings, the claims certifier in one of its correspondences sought direction from the employer on what action to take in respect of the dispute arising from the contractors' claims. In reply to the claims certifier request, the employer expressed disappointment in the claims certifier's inability to take appropriate steps necessary to resolve the claims and mitigate the conflict.

In the 'JBC' case, professional expertise also featured. The contractor contended that the claims certifier erred both in the allowance, which he made for some of the delay events, and in failing to make allowance for some other delay events. The contractor engaged an expert witness to demonstrate that the approach and methodology used by the claims certifier was incorrect. The court reviewed, in detail, the claims certifier's decision on some of the events. In particular, how the claims certifier generally approached the assessment of the contractor's claims was investigated. Based on the expert evidence and cross examination of the claims certifier, the court concluded that the claims certifier had made an impressionistic, rather than a calculated, logical and methodical assessment of the extension of time that the claims certifier thought was reasonable for the various delays events.

Further, in the 'JBC' case, the court found that there was little record by way of contemporaneous notes. The extension of time report prepared by the claims certifier gave no indication of how the claims certifier arrived at some of the extension of time granted for the delay events. The court fundamentally flawed the claims certifier's assessment of the extension of time. It was found that no calculated, logical analysis in a methodical way had been conducted. The claims certifier had not considered the impact of the delay events on the contractor's programme. Where the claims certifier allowed extension of time for relevant events, the allowance made bore no logical or reasonable relation to the delay caused. The court also found that the claims certifier misapplied the contract provisions in some instances. In addition, because of the claims certifier unfamiliarity with the Standard Method of Measurement, 7th edition, the claims certifier did not pay sufficient attention to the contents of the bills, which was vital for claims assessment in the case of JCT contract with quantities.

Evidence further showed that one of the members of the employer's project management team had noted that the extension of time granted by the claims certifier did not address the specific points raised by the contractors in his application for an extension of time, and that the claims certifier had considered items not raised by the contractors. Evidence at the proceedings revealed that the mistake was reported to the employer and it was planned that the mistake would be rectified in such a way as to analyze the contractor’s claim in a methodical way, taking into account the contractor’s stated programme, the progress of work at the time and the effect of the incidents on any subsequent works. However, the employer did not seek to have detailed analysis of the contractor’s claims despite the employer’s awareness of the claims certifier’s mistake.

In a conflicting evidence, the claims certifier said that he had done an analysis of the contractor’s claim in a methodical way, taking into account the contractor's stated programme, the progress of the works at the time and the effect of the relevant events on subsequent works. However, there was no documentary evidence to support the claims certifier’s evidence that such an exercise was conducted or to indicate what form it took. When it came to the details of individual delay events, the claims certifier was in difficulty in recalling how he assessed and determined some of the extension of time granted. This indicated that the assessment of the claims was based on subjective evaluation rather than objective assessment. This finding supports the view that the claims certifier made little effort towards accurate assessment of claims hence violating norms of fair decision-making. Other decisions of the claims certifier thoroughly reviewed by the court were found to be illogical and inconsistent.

In the ‘JBC’ case, the contractor’s case was supported by an expert witness, who produced charts demonstrating the logical links between the various activities shown in the programme prepared at the time of the acceleration agreement and further charts seeking to show the effect on those programmes of the subsequent variations. Evidence showed that the contractor wrote to the claims certifier enclosing various bar charts and an accompanying narrative, suggesting that the effect of the instructions issued after acceleration agreement on the contractor's planned programme of work was such as to justify an extension of time of about six weeks. The contractor also submitted, in support of their claim, lists, or copies of architects' instructions (AIs) and confirmations of verbal instructions (CVIs). It appeared that the contractor demonstrated stronger expertise in presenting and justifying its claims, while the claims certifier demonstrated a weak professional and technical expertise in its assessment and decision on the contractor's claims.

The claims certifier's display of weak professional expertise and lack of technical understanding of the claims appear to have impaired the claims certifier's ability to effectively provide explanation for the basis of the decision made. It also appeared to have forced the claims certifier to decide the claims based on subjective criteria rather than on the technical merit of the contractor's claims. This provides wide latitude for confrontation. It also weakens the claims certifiers' effectiveness in resolving the conflict prior to the court action.

This finding is consistent with previous studies on fairness in organizations. For example, the following has been identified as factors that may indicate quality of decision-making process (ODPROCESS) – a construct of this study:

(1) Level of a decision-maker's expertise in diagnosing conflict making an objective decision (Thibaut and Walker, 1978; Tyler and Schuller, 1990; Tyler and Degoey, 1996)

(2) Making effort toward accuracy in decision-making (Tyler and Bladder, 2000).

(3) Providing effective explanation for decision made (Tyler and Bladder, 2000; Leventhal, 1976; Adams, 1976).

(4) Making decision based on objective criteria (such as facts) rather personal bias.

3.19.4 Problem with records and discrepancies between methods of substantiating and assessing claim

In the 'BRL' case, evidence showed that the claims certifier did not use the powers under the contract to require the contractor to keep contemporaneous records. The claims certifier also failed to make inquiries into the contractors' claims. The evidence at the trial further revealed that the claims certifier had informed the contractor that the presentation and substantiation of the claims were unsatisfactory. Consequently, the claims certifier demanded that the contractor must substantiate every amount claimed for, and suggested that whether that substantiation required a 'history of resources' was a matter up to the contractor to decide.

The claims certifier's failure to exercise contractual powers to require the contractor to keep contemporaneous record suggests that there was no control over the type and the relevance of information kept and used to substantiate claims. That, in part, appears to have led to the claims certifier's inability to diagnose and make an objective assessment of the contractor's claims. The claims certifier's demand that the contractor must substantiate each and every amount claimed for, and the assertion that whether that substantiation required a 'history of resources' was a matter up to the contractors to decide. This suggests that there were no clear agreement between the parties at the outset of project on methodology for substantiating and assessing claims and on rules of evidence of claims in terms of type of information required. There were no common benchmarks against which the contractor's claims could be substantiated and assessed.

The lack of clarity on records, methodology and rules of evidence for claims imply that the contractor exercised compete control over the gathering of information relating to the claims while the assessment of the claims depended solely on claims certifier subjective judgement of the contractor's submissions. As discussed in section 2.4, construction claims are complex involving conflict of interest, and available methodologies for analysing them would generate markedly different result in the same situation and hence conflict and dispute.

3.19.5 Claims Certifier's inadequate knowledge of the history of contractor's claims

In the 'BRL' case, there was a high turnover of claims certifier throughout the duration of the project. Shortly before the commencement of the court proceeding, the employer engaged the services of a claims consultant to assess the contractor's claims. The claims consultant was from a different organization from that of the claims certifier appointed from the outset of the project. The claims consultant had little knowledge of the events and circumstances surrounding the contractor's claims. This appeared to have also influenced inconsistencies in the decision-making process.

Other employer's project management team personnel who assisted the claims consultant in the assessment of the contractors' claims were in some instances appointed after the commencement of the court proceedings. They were not familiar with the course of the project and the events leading to the project delays and claims. The lack of thorough understanding of the contractors' claims appeared to have influenced the contractor's perception of the credibility of the decision-making process, leading to the contractor's dissatisfaction. Coupled with the delays in the assessment of the claims, the conduct of the claims certifier, the high turnover of the claims certifier's personnel appeared to have influenced the perceived quality of the decision-making process (QDPROCESS) and hence disputing behaviour.

3.19.6 Impartiality, neutrality and independence of claims certifier

In the 'BRL' case, the claims certifier was not acting independently hence partial and biased in the assessment of the contractor's claims. In the JBC case, the claims certifier was acting independently but the claims certifier was partial in the assessment and decision made on the contractor's claims. These inferences are examined in detail in the rest of this section.

In the 'BRL' case, the court found that the claims certifier was unduly subservient to the wishes of the employer; hence, the claims certifier's counter approach and attitude towards the contractors' claims. It was found that there were certain terms in the claims certifier's contract of engagement, which limited the claims certifier's authority. The contractor, until it was disclosed during the proceedings, was not aware of the terms. In particular, one of the terms stipulated that the claims certifier had no authority to grant any extension of time or agree to accept any financial claim of any kind without having first consulted the design team leader and reported to the employer. These terms were found to have fettered the claims certifier's control over the decision stage of the claims. The trial judge found that the limiting terms affected the attitude and conduct of the claims certifier during the assessment of the contractor's claims as a result of which the contractual machinery for the claims was not operated as it ought to have been operated. Evidence further revealed that the claims certifier engaged in a behaviour that operated to the disadvantage of the contractor. By the claims certifier's attitude, the trial judge opined that there was no sign that the claims certifier was truly performing the duties assigned under the contract, including exercising discretion fairly as between the employer and the contractor.

The claims certifier had adopted a procrastinating and avoiding behaviour towards the contractor's claims while the employers had adopted forcing and avoiding behaviour. At the initial stage, the claims certifier was of the opinion that the contractor has a cause for extension of time and additional cost claims; later the claims certifier changed his position on the claims, arguing that the contractor did not give contemporaneous notice and adequate details of claims. The trial judge found that the claims certifier's contradictory view of the contractor's claims was as a result of the employer's trenchant views that the claims were illegitimate, as expressed in the employer's letter to the claims certifier. The letter indicated clearly the employer's intention to reject the claims completely. The evidence also showed that the claims certifier thereafter consistently rejected the contractor's claims before any proper assessment had even been attempted. The employer also wrote to the contractor, rejecting the validity of the contractor's claims prior to any objective assessment by the claims certifier. The case demonstrates claims certifier's display of lack of neutrality and independence.

In the JBC case, the court heard evidence to determine the claims certifier's conduct in the handling of the contractor's claims. Some of the claims certifier's conduct appeared to have violated what may be perceived as norms of fair decision-making. It was found that the claims certifier discussed the proposed award with the employer and gave the employers the opportunity to comment on it. However, as agreed in evidence by the claims certifier at the trial, the same opportunity was not given to the contractors. The court opined that this conduct was inappropriate in that it violates norms of impartiality of the claims certifier. Although, the claims certifier is not contractually obliged or bound to discuss his/her decisions with either party, the judge opined that since the claims certifier had discussed with the employer, it would have been appropriate if the claims certifier had given the same opportunity to the contractor. The claims certifier's asymmetric attitude in relation to the employers and the contractors appeared to have contributed to the contractors' perceived injustice of the claims decision process. The problem was exacerbated by the architect's lack of professional and technical expertise in the assessment of the claims. Exercise of professionalism could have offset the architect's unequal treatment of the employer and the contractor (Walton, 1969).

3.19.7 Conflict Strategy and Breach/Revision of Agreements

In the BRL case, it was found that at a time the claims certifier had reopened certain agreements on the contractor's claims which were reached during the progress of the work. Some of the promises made by the employer were also not fulfilled. At a time the contractor expressed concern over this attitude. Unfulfilled promises and claim certifier's attempt to review the agreements appeared to have contributed to the contractor's distrust in the decision-making process and consequently the court action. This is coupled with the claims certifier's procrastinating and avoiding behaviour towards the contractors' claims and the employers forcing and avoiding behaviour.

Deutsch (2002) identified false promises, disinformation, suspicion, and impaired communication as characteristics of forcing behaviour.

Further, during the proceedings, the contractor argued that if the powers available to require a contractor to keep records are not exercised at the time when they should be used, then it is not open to call for them at a later stage. The contractor also argued that the contractor cannot be required to produce proof of its case such as the production of a 'critical path network' and that a decision had to be made on the basis of the information available. Although the court accepted the contractor's arguments, the arguments demonstrated breakdown in cooperation between the parties. It also demonstrates counter behaviour against perceived injustice or directed at taking advantage of the claims certifier's failure to exercise properly its powers under the contract.

3.20 Implications of the findings from the case review for theory

The review and analysis of the two cases is exploratory in nature; but by bringing together all of the factors and events reviewed in the cases, it may be suggested that the kinds of conditions influencing judgment of fairness may be a combination of the following factors:

1. Unjustifiable delays in claims assessment.
2. Inconsistencies in decision-making.
3. Problem with records and discrepancies between methods of substantiating and assessing claims.
4. Unjustifiable basis for decisions
5. Claims certifier's lack professional expertise.

6. Claims certifier's inadequate knowledge of the history of contractor's claims.
7. Perceived partiality and lack of neutrality, and independence of claims certifier.
8. Conflict handling strategy and Unfulfilled promises.

The above items provide useful direction and information for instrumentation of the main constructs of this study and they are included as indicators of relevant constructs of the research model (see section on instrumentation of constructs presented in section 4.5.1. The rest of this section presents a further examination and discussion of the identified factors.

3.20.1 Delay in Assessment of Claims

Unjustified delays in assessing claims may imply lack of concern and respect for the contractor's contractual right. The literature suggests that in any conflict situation, the respect and concern of parties for one another's rights is as an indicator of treatment (Tyler and Bladder, 2000) and may determine behavioural reaction. Delay in claims assessment may significantly influence perception of fairness where the contractor had supplied what it considered adequate information to substantiate the claims. The more unnecessary the delay in the assessment of claims and in giving a decision, the more suspicious the decision-making process and the decision appears (Stein and Hiss, 2003). In construction, early decision on the claims prior to practical completion may be important to contracting parties in that it would provide opportunity for the parties to be aware of their liabilities so that means of reducing their liability can be devised (based on Conlon and Fasolo, 1990). For example, the employer may direct the contractor to accelerate the project while the contractor may consider re-scheduling of activities or bring additional resources in order to speed up the works and meet up with contract completion time to avoid payment of liquidated damages to employer (*Aoki Corporation v Lippoland (Singapore Pte Ltd).*In a New Zealand case *Fernbrook Trading Co. Ltd v Taggart*, the learned judge stated as follows:

> "I think it must be implicit in the normal extension clause that the contractor is to be informed of his new completion date as soon as is reasonably practicable. If the sole cause is the ordering of extra work then in the normal course the extension of time should be given at the time if ordering so that the contractor has a target for which to aim. Where the cause of delay lies beyond the employer……the extension should be given a reasonable time after the factors…….have been established".

Hence, delays in assessment of EoT claims may prejudice the opportunity for the contractor to plan towards a new completion date and perhaps mitigate potential loss (Wallace, 1995).

Smith (2002) suggests that because of the complexities of claims events, it is sometimes not possible to ascertain the impact of the events until the end of a project or until after the events have ceased to operate. Delay events arising from variation orders require early determination of extension of time to enable the parties to consider the financial consequences associated with costs and payment. However, where the delay is caused by 'neutral' event like weather, determination may be from time to time (Wallace, 1995; Chow, 2004) after the events have seized to operate.

Further, hasty decision-making prior to any objective assessment of claims may also reduce the perceived fairness of the decision-making process (Conlon and Fasolo, 1990). Hasty decision may imply that the decision is based on personal opinions and bias of the claims certifier rather than thorough consideration of the information provided and relevant facts (Conlon and Fasolo, 1990). It is important to allow the parties opportunity to explain and justify the position during claims resolution (Bies and Shappiro, 1987). Having adequate opportunity and time to justify claims, and express views, and opinions, may make parties more amenable to the decision-maker's suggestion and decision (Conlon and Fasolo, 1990).

The findings and the theoretical considerations suggest that there is need for reasonableness in the time within which claims are assessed and decided. Hence, in this study 'perceived reasonableness of time taken to assess and decide claims' was included as an indicator to measure the quality of treatment experienced (QTREAT) (see Table 4-3, section 4.5.1). In addition, 'perceived level of respect and concern shown for contractor's rights' was also included as one of the indicators of QTREAT.

3.20.2 Inconsistencies in decision-making

Inconsistencies or revision of decision from favourable to less favourable outcome for a party may influence the perception of the quality of decision-making and may pose questions of fairness and consequently disputing behaviour (*Tropicon Contractors Pte Ltd v Lojan Properties Pte Ltd., 1989).* There is need for improved communication among parties during the process for administering claims. Prompt, adequate and transparent communication between the employer, contractor and the claims certifier is essential. This would allow the parties to raise any objection and clarify doubts early in the decision-making process. Because of the conflict of interest involved in construction claims, lateness in lodging complaints may lead to inconsistencies in decision-making. Any attempt to reverse initial decision rendered by claims certifier may provide latitude for dispute; even if the complaint is justifiable and accurate.

The findings suggest that coupled with other factors, disputing behaviour may be precipitated by inconsistencies in decision-making. Hence, in this study, the perceived extent to which the claims certifier demonstrated consistency in assessing and deciding claims was included as an indicator to measure quality of decision-making process constructs (QDPROCESS) (see Table 4-3, section 4.5.1).

3.20.3 Problem with Records and discrepancies between methods of substantiating and assessing claims

In order to alleviate the problem, at the outset of project, it may be helpful for parties to agree on rules of evidence for claims, and methodology for substantiating and assessing claims. As explained in section 3.12, pre agreements may provide some certainty to the outcome of the claims process by providing some instrumental framework within which claims would be substantiated and assessed thereby reducing ambiguity, subjectivity and areas of differences. Pre agreements would provide a common understanding on how claims would be substantiated and assessed.

The contractor would substantiate claims with the pre agreed method, and based on the pre agreed rules of evidence while claims certifier would also assess claims with a pre agreed method. To a contractor, pre agreements may therefore imply some level of control (CTROL) over the decision outcome of claims. Consequently, it may reduce the level of claims as it would deter submission of baseless, unjustifiable and illegitimate claims since claims that do not fall or that is not submitted within the ambit of the pre agreed methods are potentially invalid. It may also reduce differences in expectation on the type and form of information for substantiating claims. Further, it may improve the quality of record keeping and may increase perceived quality of decision-making process (QDPROCESS) and hence fairness of the decision made. Pre agreements may also increase outcome favourability (OFAVOUR) since a contractor is likely to submit only claims that are at least justifiable. Pre agreements would also enhance the clarity of the basis for decisions made thereby enhancing perceived decision outcome fairness (DOFAIR) and consequently reducing disputing behaviour.

Further, because of the pre agreements, unfavourable decisions may be less perceived as unfair. Hence, the pre agreements (control – CTROL) could moderate the relationship between outcome favourability (OFAVOUR) and decision outcome fairness (DOFAIR) such that under conditions of low outcome favourability, contractors could perceive the decision outcome as fair where there is high level of pre agreements than where there is lower level of pre agreements.

3.20.4 Unjustifiable basis for decisions

Research on fairness in organizations has shown that justification of decisions made through effective explanation is related positively to procedural fairness perception and, in turn, to behavioral reaction of people affected by the decision (Daly and Geyer, 1994). Literature has also demonstrated that people are more likely to accept decisions, even unfavourable ones, when given an adequate and genuine reason for them (Brockner et al., 1990; Brockner and Wiesenfeld, 1993). Provision of an explanation for decisions is a key component of the interactional and treatment aspects of justice (Tyler and Bies, 1990). Hence, it would be expected that provision of an explanation would positively influence fairness judgment (Schaubroeck et al. 1994). Based on the findings and theory, the following indicators were included to measure quality of treatment experienced (QTREAT) aspects of perception of fairness: (1) whether explanation and reasons were provided for the decisions made on claims (2) frequency to which the contractor agreed with explanation and reasons provided for the decisions.

3.20.5 Claims certifier's professional expertise

Professional competence has been described as an important aspect of professional ethics needed to facilitate business decision-making (Carey and Doherty, 1968). Lack of professional expertise could hinder effective communication of the basis for decision made and could influence perceived fairness, escalate conflict, and influence disputing attitude. While claims may be complex, ambiguous and difficult to ascertain, it is necessary that the claims certifier be seen to be demonstrating professionalism and making effort towards objectivity and accuracy in the assessment of the contractor's entitlement (Tyler and Bladder, 2000). The words 'fair and reasonable' used in many standard contracts to describe the claims certifier's duty to grant extension of time suggest that the assessment of an extension of time is not an exact science. However, effort must be made towards objective assessment of the contractor's claims. On this, the learned judge in the 'JBC' case stated as follows:

> 'I recognise that the assessment of a fair and reasonable extension involves exercise of judgments, but that judgment must be fairly and rationally based … although there was no bad faith or excess of jurisdiction on the path of the architect [claims certifier], his determination of the extension of time due to the plaintiff was not a fair determination, nor was it based on a proper application of the provisions of the contract, and it was accordingly invalid'.

In deciding claims, records such as charts, graphs, schedule, are important, but it is helpful if the claims certifier had adequate understanding of why the event occurred, how it occurred, and what effect the occurrence of the event had. It would also be helpful if the claims certifier is able to show with understandable logic the basis for the decisions made. Demonstrating this ability should reduce perceive lack of fairness. Clark (1990) opined that this ability could develop from long experience in construction claims administration. This is consistent with the JBC case where the claims certifier had never acted in the capacity of contract administrator. This finding suggests the importance of experience when appointing professionals at the early phase of project development.

The findings indicate that perceived fairness may be sustained by enhancing contractor's perceived level of claims certifier's expertise in diagnosing and deciding claims. Based on the findings, perceived level of claims certifier's professional expertise was included as one of the indicators of perceived quality of decision-making (QDPROCESS).

3.20.6 Claims certifier's inadequate knowledge of the history of contractor's claims

Literature suggests that in any conflict situation, third party decision-maker's prior knowledge of the history of the conflict would ensure that the third party's decision would be on target, enhance the third party's credibility with the conflicting parties and increase the likelihood that the third party's decision would be perceived as fair and would be accepted (Walton, 1969). Where the claims certifier has no or little knowledge of the history of claims, the assessment of contractor's entitlement may become hypothetical rather than based on facts. This could raise concerns of fairness, escalate conflict and hence influence disputing behaviour. This may be more problematic where project documentation is poor.

Those who understand the claims and the course the project had taken are more likely able to explain and have common understanding of the facts. Consistent with this finding, this study included the 'percentage turnover of employer's personnel' as one of the indicators of quality of decision-making process (QDPROCESS).

3.20.7 Partiality, lack of neutrality, and independence of the claims certifier

Pearl et al (2005) conducted a pilot study on professional ethics in South Africa. In their study, contractors opined that professionals act with bias when influenced by clients. The problem of perceived neutrality, independence and impartiality are not likely to be easily solved in construction claims. Normatively, the common law requires the employer-appointed claims certifier to act fairly, impartially and in good faith. But this requirement seems difficult to accomplish in practice (Stein and Hiss, 2003). The interdependency of the various roles of the employer-appointed claims certifier on a project makes the requirement difficult to fulfill.

In the traditional contracting system, the claims certifier may be the designer of the project. Typically, the design professional contracts with the owner and would strive to satisfy the project owner (employer) and may not want to make any decision against the employer's interest. The problem may be exacerbated by the fact that the claims certifier may be dependent on the employer for future jobs. This is more likely in public projects where the claims certifier may be an officer in the employer's organization. For instance, in *Perini v. Commonwealth of Australia [1969] 2 N.S.W.L.R. 530,* Perini Corporation contracted with the Department of the Postmaster-General to construct the Redfern Mail Exchange. During the project, the contractor claimed a number of extensions of time, some of which were granted, some of which were refused, and some of which were granted but not to the full extent claimed. As was common at the time, the work was administered on behalf of the Commonwealth of Australia by the Department of Works. The Superintendent (the claims certifier) under the contract was the Director of Works of Commonwealth Department of Works. The Superintendent refused the contractor an extension of time on the basis of the policy of the Commonwealth Department of Works. This led to contractual dispute.

Another difficulty is that as the designer of the project, the claims certifier may be responsible for the claims event through variation orders arising from design errors and discrepancies. The conflicting interest may influence the claims certifier's approach and attitude towards the contractor claims and may pose questions of partiality and lack of neutrality. In the JBC case, evidence showed that the delays were as a result of the claims certifier's (also the architect) design errors.

In the 'JBC' case, the claims certifier discussed its assessment of the claims with the employer without giving the contractor the same opportunity to comment on the assessment prior to final decision. Although the claims certifier is not contractually obliged to discuss decisions to be made with any of the parties, once the opportunity had been given to the employer, the contractor should have been given the same opportunity. However, claims certifier's decision should be made based on the merit of the information and facts elicited from the parties' explanations and submissions. In a case, *Hiap Hong & Co Pte Ltd v Hong Huat Development (2001)*, the learned judge stated that in exercising the function as a claims certifier, under a building contract, the employer appointed claims certifier "is not subject to directions or instructions of either party although he must listen to both parties before he arrives at his own decision".

Although it is difficult for the employer appointed claims certifier to be dispassionately objective and fair in the discharge of his certification duties, the impartiality is demanded of him if the underlying intent of the parties, particularly the contractor who submits to be regulated by the certification machinery, is not to be defeated (Lord Hofffmann, cited in Chow, 2004). Regardless of the pressures, the claims certifier must be perceived to have tried hard to treat the employer and contractor equally and fairly in deciding claims. The claims certifier must be perceived to be deciding claims based on technical merits. In the traditional contracting system, the claims certifier may have the tendency to decide claims based on the employers concern of time and cost overrun. The claims certifier needs to show and make efforts towards impartial, neutral and independent assessment of claims.

3.20.8 Conflict handling Strategy and Unfulfilled promises

According to Senior (1997), "avoiding behaviour gives rise to frustration, if a party thinks the issue is important while the other party does not". Rather than procrastinating or avoiding the assessment of claims, joint investigation, transparent discussion and mutual agreement between the parties could be helpful to avoid the litigation (Zack, 1993). Open and truthful communications throughout the project life and in the handling of claims could enhance perceived quality of treatment, enhance perceived interaction justice hence reduce disputing behaviour. In resolving claims, even where the decision made is unfavourable to the contractor, continuous open and truthful communication between the parties from onset of the claims process coupled with dignified treatment by the personnel could reduce perceived interactional injustice and enhance willingness to accept the decision made on claims. Combination of low level of perceived outcome justice and low interpersonal sensitivity is likely to amplify perceptions of unfairness (Brockner and Wiesenfeld, 1996).

Based on the findings, the following indicators were used to measure ‘quality of treatment experienced’ (QTREAT) construct of the theoretical framework: (1) ‘extent to which the employer’s project management follow through decisions and agreements reached during the course of the project’; (2) ‘perceived frequency to which claims were tabled for open discussion at meetings’; (3) ‘extent to which respect and concern was shown for the contractor’s contractual rights’, and (4) extent to which contractor’s personnel were treated with politeness and dignity’. Further, unfulfilled promises and procrastinating behaviour could result in breakdown of trust in the relationship. Deutsch (2002) identified false promises, disinformation, suspicion, impaired communication, and break down of trust as characteristics of forcing behaviour. As conceptualized in the theoretical framework (Tyler and Bladder, 2000), keeping to promises builds trust in decision-making authority and enhances the perception of fairness. In the conceptual framework, trustworthiness is also an element of the construct ‘quality of treatment experienced’ - QTREAT.

3.21 Summary

This Chapter fulfils objective 1 of the study by developing a conceptual relationship between perceptions about fairness in the process for administering claim, conflict intensity and contractors’ potential to dispute claims certifiers’ decisions. The theoretical review shows that outcome favourability, perceived decision outcome fairness, perceived quality of decision-making process, perceived quality of treatment experienced, control and overall procedural fairness evaluation are distinct constructs of perceptions of fairness that could directly or indirectly influence conflict intensity and contractors' potential to dispute. Quality of decision process, outcome favourability, and decision outcome fairness would be influenced by control. Further, the influence of outcome favourability, decision outcome fairness, quality of decision-making process, and quality of treatment experienced on conflict intensity and on contractors' potential to dispute would be mediated by perceived procedural fairness.

Based on the conceptual relationships established from theory, a theoretical model has been developed (see Figure 3-8) to address objective one of the study (see section 1.3). To address objective number 3 and 4, the theoretical framework for the interactive effects of procedural fairness and outcome favourability, and also the interactive effect of quality of decision-making process and outcome favourability on conflict intensity, and on contractors' potential to dispute were also developed.

Two cases were reviewed to provide some conceptual understanding of the role of organizational justice in construction conflict and dispute. The review also provide some preliminary understanding of the underlying variables of organisational justice constructs, how they interact and how they influence conflict intensity and potential to dispute in construction claims. The findings of the review provides useful information and direction for operationalisation of the constructs of this study (see Figure 3-8) by suggesting some indicators for the measuring the constructs

The next chapter presents the research methodology employed to empirically study the hypothesized relationships and the interaction effects hypotheses.

CHAPTER FOUR

RESEARCH METHODOLOGY

4.1 Introduction

This chapter describes the research methodology adopted. The first section presents a review of various types of research design. It discuses the suitability of non experimental and cross-sectional sample survey research design for this study. The second section describes the sampling frame. The third, fourth and fifth sections discuss the data collection approach; instrumentation of constructs; questionnaire design and pilot study respectively. In the sixth section, the problems associated with self-report data used in this study are presented including a discussion of how the problems were minimized. Finally, the chapter presents a discussion of the data analysis strategy.

4.2 Research Design

A research design is the strategy, plans and steps needed to answer a research question (Tan, 2002). It involves two major aspects as follows: specifying precisely what is to be studied and determining the best way to do it (Babbie, 1992). The type of research design determines the amount of control a researcher has over the research environment and guides the decisions as to what or whom to observe, how and how often to observe, how to analyze the data and what types of statistical techniques to use (O'Sullivan and Rassel, 1995). Figure 4-1 presents the research process for this study. The research commenced with a preliminary review of the literature and identification of the research problem.

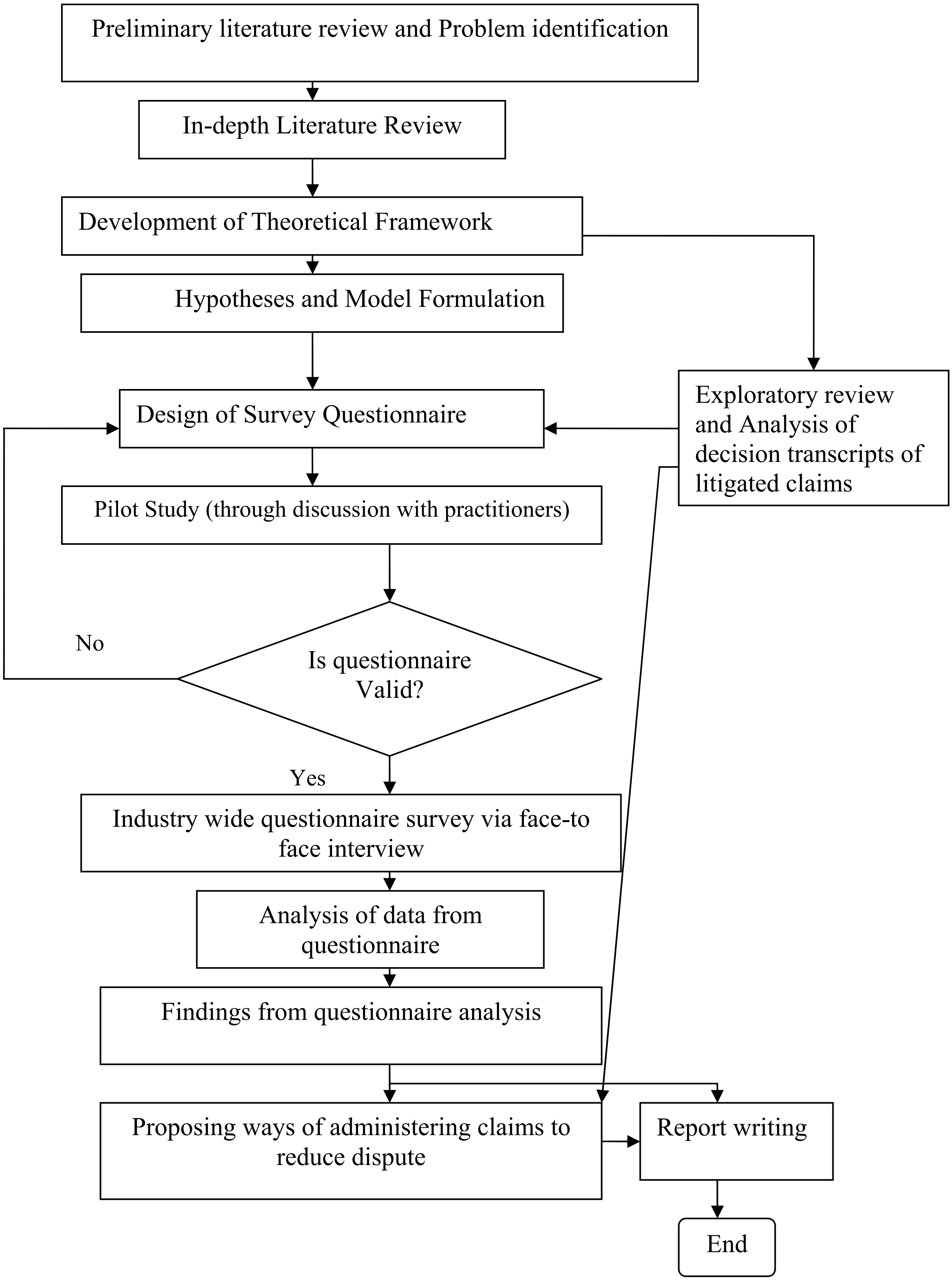


Figure 4-1 Flow-chart of the Research Process

An in-depth literature review was then conducted and a theoretical framework was developed to address the research problem. This was followed by a review and content analyses of decision transcripts of two litigated claims. Based on the literature (previous studies in other contexts) and the content analyses, the constructs of the theoretical model were operationalised and developed into a questionnaire. Because some of the questions were developed based on existing studies in other contexts, the questionnaire was validated by a pilot study through a discussion with selected experienced practitioners.

Five experienced industry practitioners were contacted. Three of them are quantity surveyors and have practiced in the construction industry for over 25 years. The remaining two are directors of construction firms in the A1 category of the Singapore BCA Contractor’s Registry. They also have over 25 years of experience in construction. The practitioners provided feedback on the wordings, terminologies and relevance of the questions to the problem of claims in the construction industry. Thereafter, the questions were modified. The pilot study was followed by an industry wide survey using structured questionnaire administered via face-to-face interviews. Thereafter, the data obtained from the survey were analyzed. Based on the findings, ways of administering claims to reduce conflict and contractors’ potential to dispute were proposed. Finally, the research report was prepared.

There are different classes of research design. Thus, choice among them had to be made. The choice of research design for this study is now examined.

4.2.1 Experimental, quasi-experimental and non experimental Research design

In general terms, research design can be categorized as follows: (1) Experimental (2) Quasi-experimental and (3) Nonexperimental.

4.2.1.1 Experimental Research

In experimental research, the researcher has direct control over the research environment through randomization and manipulation (Kerlinger, 1973). Experimental design allows the researcher to manipulate and control selected independent variables to determine their effects on the dependent variable. Experimental design includes social sciences studies conducted in the laboratory environment where human subjects are used. The researcher has flexibility of manipulating the conditions to test different alternative hypotheses. However, the use of hypothetical scenario, instead of real life cases may cast doubts on the external validity of the results of experimental research (Cook and Campbell, 1979).

Generalizing the findings of experimental research to the real world poses a serious problem (Babbie, 1992). Babbie noted that experimental designs are suitable for research involving relatively limited and well defined concepts and propositions. In this study, experimental design was considered inappropriate for three reasons. First, parties' interactions in a construction process are complex and difficult to model in the laboratory. Second, the concept of fairness is multi faceted and yet to be well defined in the context of construction. However the conceptual model developed has been adapted from other decision-making and organizational contexts where the subject of 'fairness' has been well researched. Finally, because of complexities involved in human interaction in construction, a study of this nature would require real life investigation rather than laboratory experiments.

4.2.1.2 Quasi-experimental design

Quasi-experimental design involves experimental research without random assignment of subjects to groups or different conditions (Dooley, 2001). Hence the researcher has less control over the independent variables than in experimental design. For the reason stated in the preceding section on experimental research, quasi-experimental design was also considered unsuitable for this study.

4.2.1.3 Nonexperimental design

In nonexperimental research, the researcher has little direct control over the environment. It does not allow the researcher to manipulate and control selected independent variables to determine their effects on the dependent variable. According to Kerlinger (1973), nonexperimental research often is the only way to study many real world organizational phenomena. Survey research and case study are common examples of nonexperimental research design. According to Babbie (1992), sample survey research is probably the best method available to social sciences related studies requiring the collection of original data for describing a population too large to observe directly. Careful probability sampling provides a group of respondents whose characteristics may be taken to reflect those of the larger population, and carefully constructed standardized questionnaires provide data in the same form from all respondents. Specifically, Babbie (1992) asserted that surveys are an excellent vehicle for measuring attitudes and orientations in a large population.

The strength of survey research design lies in its suitability for research questions about self-reported beliefs, attitude and patterns of past behaviours (Neuman, 1994). In addition, survey has advantage in terms of economy, speed, and possibility of anonymity, and privacy to encourage more candid responses on sensitive subjects such as the one addressed in this study. However the weakness of survey lies in its vulnerability to systematic bias, nonresponse rate, social desirability response in which respondents tend to give socially desirable response that makes them look good or that is in line with what the researcher is looking for (Babbie, 1992).

This study employs a survey research design. The problems of systematic bias, nonresponse rate, social desirability response were controlled by methods described in section 4.6. It was considered that survey would allow investigation of how people form perception of fairness in construction and how their perception could precondition conflict escalation and potential to dispute in a real life situation.

Case study research design was not used because in an on-going project, it is very difficult to secure access to data regarding an ongoing dispute. Moreover, this study focused on completed projects and how dispute were handled. Additionally, it is difficult to generalize research findings based on a small number of cases studies.

4.2.2 Cross-sectional and Longitudinal research

Based on the time dimension of data collection, research designs may also be categorized into (1) Cross-sectional research and (2) Longitudinal research (Babbie, 1992). Cross-sectional design collects data on the relevant variables at one time, whereas longitudinal research collects data over an extended period. Longitudinal research is suitable for describing a process that occurs over time. According to O'Sullivan and Rassel (1995), cross-sectional research design is suitable for studies that involve collecting data on many variables, from a large group of subjects, and from subjects who are geographically dispersed.

Further, Babbie (1992) suggests that in designing a study, the explicit and implicit assumption made about time must be examined in deciding whether to adopt longitudinal or cross-sectional design. For example, the researcher may have to question whether the research is interested in describing a process that occurs over time or simply to describe what exists now. In order to describe a process that exists over time, the researcher may need to consider the possibility of making observations at different points in the process or if this is not possible, the possibility of approximating such observations by drawing inferences from observations made at one time. This study used cross-sectional research design for the following reasons:

First, because of time constraints, longitudinal research was not used. Second, the predictive effect of perception about fairness on conflict intensity and potential to dispute may be described as a relationship that would occur over time. However, a construction project may involve many claims. A contractor may have different encounters and experience across all the claims. A single encounter of perceived lack of fairness may or may not determine contractors' overall conflict and disputing behaviour. Contractors' behaviour would depend on their overall global evaluation of all encounters regarding claims on a project (Lind et al., 1993). Therefore, on the overall, the contractor may perceive the process for handling claims on a project as fair regardless of a few instances of perceived lack of fairness. Also, the process for handling claims may also be perceived as unfair based on a few encounters of perceived lack of fairness. Thus, it is likely that contractors' conflict behaviour and potential to dispute claims would depend on the overall evaluation of how claims have been administered on the project. In view of this assumption, data may be collected at one time (cross-sectional) by asking respondents to recall their overall experience on the process for administering claims on a project they have been involved in and which has been completed. Data capturing contractors' overall perception of fairness would provide useful information needed for the analysis. It may provide a complete picture of contractors' experience and whether the experience is a precondition of the level of conflict experienced on the project or their potential to dispute. Thus this study employed a cross-sectional research design.

4.3 Sampling Frame

4.3.1 Unit of Analysis

The best way to determine fairness in a conflict resolution is to examine the perceptions of participants involved (Ross, 1977). In this study, main contractors in Singapore have been selected as the main sample frame. The reason is that main contractors are central when considering the issues of fairness and dispute in the process for administering project claims. A sample of contractors operating in Singapore was randomly selected from the contractor's registry of the Singapore BCA – the BCA is an authoritative source documenting the names and addresses of most construction contractors in Singapore. The BCA directory comprises contractors serving the procurement needs of government departments, statutory bodies and other public-sector organisations in Singapore. The public sector is a major client of the Singapore construction industry.

The contractors on BCA's list are those considered by BCA as having sufficient resources, experience and technical expertise to undertake contracts of the nature and size defined by the BCA's registration heads and grades. For the purpose of this study, 200 contractors belonging to the grades A1, A2 and B1 under the Construction WorkHeads CW01 – General Building and CW02 – Civil Engineering categories were selected for the data collection. The grades A1, A2 and B1 are classified based on the tendering limit as follows: A1 – unlimited, A2 – S$65 million and B1 – S$30 million respectively. It was considered that the contractors in categories A1, A2 and B1 are big players having the technical and management expertise with sufficient experience required to provide information needed to address the research problem. Thus, the contractors in the registration grades B2, C1, C2 and C3 (with tender limit of S$10 million and below) were not considered. Although attempt was made to include these smaller contractors with tendering limit of S$10 million and below, despite assurance of anonymity and confidentiality, those contacted declined to participate.

One of the experienced interviewees shared that most of the contractors in B2, C1, C2 and C3 do not have an in-house claims management team and in most cases have to depend on external claims consultants. The breakdown of 200 contractors surveyed is shown in Table 4-1. The figures under Construction WorkHead CW02 – Civil Engineering were determined from the BCA registry by taking into account contractors who were also registered under the Construction WorkHead CW01 – General Building. This ensured that there was no duplication in the sample surveyed.

Table 4-1 Breakdown of Contractors Surveyed

Category (BCA WorkHead)	Grade (Tendering Limit - $)	Sample Frame
CW01 – General Building	A1 – Unlimited	32
	A2 – S$65 million	22
	B1 – S$30 million	52
	Total	**166**
CW02 – Civil Engineering	A1 – Unlimited	6
	A2 – S$65 million	6
	B1 – S$30 million	22
	Total	**34**

4.3.2 Unit of Observation

Contractors' contract managers or quantity surveyors responsible for claims were the target for the data collection exercise. This is consistent with empirical evidence which have shown that fairness perception applies to the individual – a corporate executive (organization's representative), deciding whether to accept or reject an arbitrator's nonbinding judgment on an interorganizational dispute (Lind et al, 1993).

4.4 Data Collection Procedure

4.4.1 The Questionnaire

The constructs of the theoretical model (figure 3-8) were operationalised into measurable indicators. Information on each indicator must be obtained to enable the testing of the model. Thus, a structured questionnaire was designed to elicit relevant information from the respondents. Respondents were required to answer questions in respect of a claims handling process on a selected project in which they have been involved and has been completed. The questions relate to all the indicators of the constructs of the model.

Depending on the nature of the question, respondents were asked to indicate their answers on a categorical scale, or a seven-point Likert scale. Nomenclatures were also assigned to the response options based on the nature of each question. Additionally, questions relating to the general particulars of respondents and respondents' companies were also asked. For example, the designation of respondents, years of experience in the industry, numbers of projects handled or involved with up to date, turnover of the company, status of the company (whether local or foreign), and main business of the company, and the value of the project selected by respondent. A sample of the questionnaire used is presented in Appendix 1.

4.4.2 Administering Survey Questionnaires

4.4.2.1 Choice of Method

Generally, the methods of administering questionnaires may include self-administered questionnaires, interview survey and telephone survey. In a self-administered questionnaire survey, respondents are asked to complete the questionnaires themselves. This may be achieved by: (1) mailing questionnaires to respondents accompanied by a letter of explanation and self-addressed, stamped envelope for returning the questionnaire or (2) by gathering the respondents together in a group at the same time and at the same place (Babbie, 1992). Interview survey may be conducted where the researcher asks questions and records the respondent's answers (Babbie, 1992). This study employed interview survey, but the respondents recorded the answers by themselves. The rationale for choosing this method is now discussed:

The information required for testing the analytical model is extensive, involving many questions, hence using self administered questionnaire through postal survey may yield very low response. Low response rate from postal questionnaire survey is typical of studies in the Singapore construction industry. Indeed Babbie (1992) reported that one reason for not returning questionnaire is the complaint that it seems like much trouble.

In this study, the problem of low response rate was initially encountered. The data collection started by using postal questionnaire survey. However, even after a series of follow-up telephone calls, there was still no response. The author then decided to adopt interview survey strategy which yielded a better response rate (see section 4.4.2.2). Out of 200 contractors contacted, 41 responded representing a response rate of 20.5%.

An initial concern with the use of interview survey is the problem of anonymity and confidentiality. The subject addressed by this study is a problematic and sensitive area of the construction process and it was envisaged that contractors may be reluctant to provide information that suggests that they are claims conscious or litigious. Although using self-administered questionnaire could guarantee complete anonymity and hence enhance the reliability of the responses in that parties would be more candid in their responses (Babbie, 1992) it was considered that interview survey could also provide the required level of anonymity in that the respondents were not required to provide their names nor the names of their companies.

Overall, it was considered that an added advantage in the use of interview survey is that it would allow for note-taking of additional information provided by the respondents on contextual issues mentioned by the respondents. Another advantage of the chosen method is that respondents were able to clarify questions hence enhancing the reliability of their responses. Further, the use of interview survey minimized the problem of missing data.

4.4.2.2 Data Collection Procedure

In conducting the interview survey, the first step taken was to draw up a list and contact addresses of the 200 main contractors selected from the Singapore Registry of Contractors (see section 4.3.1 for details of how they were selected). The second step involved telephone calls to the selected firms in order to intimate them of the research subject and seek their permission for interviews. During the call, an opportunity to interview the contracts manager or quantity surveyor in charge of claims on any of the company's projects was particularly requested.

In some cases, permission to conduct the interview was granted directly by the particular project personnel while in some other cases, the researcher was asked to send a sample of the questions before permission could be considered and granted. In some other cases, the request was turned down on the ground that the company was not interested in any research regardless of the subject matter. Yet, in some cases, securing the permission of the respondents took some time as some of the respondents needed to obtain permission from their companies' management before agreeing to the interview.

During the interview, steps were taken to ensure that respondents were not under compulsion or in a hurry to dispense with the interview exercise as fast as they could as this could influence the validity of their responses. To reduce this problem, first, effort was made to ensure that the interview was conducted when the respondents were relaxed such as during lunch period or after respondents had officially finished their work for the day. Second, where this is not possible, the respondent's disposition and readiness was taken note of before proceeding with the interview. For instance, it was observed that some respondents agreed to the interview despite the fact that they were preparing for meeting. In these instances, the interviews were postponed so as to reduce the potential for invalid responses.

4.5 Operationalisation of Constructs and Validation

The research model (Figure 3-8) comprises unobservable constructs (latent variables) which must be inferred from measurable or observable indicators (manifest variables). Accordingly, a latent variable design with multiple indicators for each constructs was chosen. This form of design accommodates the research approach by allowing constructs to be represented by combination variables that can be measured.

Based on the instrument development and validation procedure recommended by Straub (1989), a three-step approach was adopted in order to develop a valid research instrument. First, the questionnaire was developed. Second, the validity of the questionnaire items was confirmed by discussion with industry practitioners and by a review of 2 litigated claims. Finally, the items were tested for their reliability.

4.5.1 Development of Instruments and Validation

Measurement items were adapted from previously validated instruments in organizational justice literature, and were modified in the context of construction where relevant (as shown in Tables 4.2 and Table 4.3). Exploratory review and content analysis of judicial decision transcripts of two litigated construction claims (chapter 5) validated some of the measurement items. Finally, the validity of the items was enhanced by a discussion with experienced industry practitioners (see section 4.2). The instrumentation of the constructs may be grouped into two (1) Endogenous constructs – those constructs (latent variables) influenced by at least one other construct in the model and (2) Exogenous constructs – those constructs that are not influenced by any other construct in the model. Tables 4-2 and Table 4-3 show the constructs and the questionnaire items (manifest variables or measurement items or indicators) used to measure them. In order to facilitate data collection and analysis, response options and item codes were assigned to each item as shown in Tables 4.2 and Table 4.3.

4.5.2 Reliability Test and Trimming of Items

Prior to data analysis, the scales of the items used to measure each construct were tested for reliability in order to confirm their internal consistency. The software used for the data analysis (PLS-Graph 3.0) included reliability test as part of the output (the results are presented and discussed in detail in section 6.4). The reliabilities of the scales were also confirmed by Cronbach's alpha values which were estimated using Statistical Package for Social Sciences (SPSS) version 13.0. Based on the results, some items were removed as valid measures of constructs they were assumed to be measuring and were not used in the analysis of the conceptual model.

Table 4-2 Measurement of Endogenous Constructs

Construct	Item Code and number on questionnaire	Measurement Item	Source	Response options
Procedural Fairness (PFAIR)	PF1 (Q33.1)	Overall fairness of procedure for claims	Kanfer et al (1987); Lind et al (1991); Lind and Lissack, (1985); Tyler and Bladder (2000).	“not fair at all” (1) to “very fair” (7)
	PF2 (Q34.1)	Overall satisfaction with procedure for assessing and deciding EoT claims	Kanfer et al (1987); Lind and Lissack, (1985); Musante et al (1983)	“very dissatisfied” (1) to “very satisfied” (7)
	PF3 (Q34.2)	Overall satisfaction with procedure for assessing and deciding cost claims	Kanfer et al (1987); Lind and Lissack, (1985); Musante et al (1983)	“very dissatisfied” (1) to “very satisfied” (7)
	PF4 (Q35)	Whether claims certifier tried hard to be fair	Tyler and Bladder (2000)	“not at all” (1) to “tried very hard” (7)
	PF5 (Q33.2)	Whether claims were decided fairly	Tyler and Bladder (2000).	“not fair at all” (1) to “very fairly” (7)
Conflict Intensity (CI)	CI1 (Q37)	Frequency of disagreement with the handling of claims	Diekman et al (1994); Exploratory review of litigated cases	“never” (1) to “very often” (7)
	CI2 (Q38)	Severity of disagreement with the handling of claims	Diekman et al (1994); Exploratory review of litigated cases	“not severe” (1) to “very severe” (7)
	CI3 (Q39)	The extent to which disagreements influence working relationship	Diekman et al (1994); Exploratory review of litigated cases	“not much” (1) to “a lot” (7)
Potential to Dispute (PDISPU)	PD1 (Q41)	Extent to which decision outcome of claims would have been rejected	Tyler and Bladder (2000); Tyler and Schuller (1990); MacCoun, et al (1988)	“not at all” (1) to “to a great extent” (7)
	PD2 (Q42)	Extent to which claims could have been disputed using formal dispute resolution process	Tyler and Bladder (2000); Tyler and Schuller (1990);	“not at all” (1) to “to a great extent” (7)

Table 4-2 (Contd.) Measurement of Endogenous Constructs

Construct	Item Code and number on questionnaire	Measurement Item	Source	Response options
Potential to Dispute (PDISPU) (CONTD.)	PD3 (Q40.1)	The nature of final solution to claims	Self developed; Discussion with practitioners; Exploratory review of litigated cases	'mutually agreed upon' (1) "forced and imposed upon us" (2) "compromise" (3)
	PD4 (Q43)	Extent to which another claims certifier would be preferred on future projects if there is opportunity to choose.	Exploratory review of litigated cases	"very little" (1) to "a lot" (7)
Quality of Decision-making Process (QDPROCESS)	QDP1 (Q28.1)	Whether decision made on EoT claims was based upon facts, and not personal biases of the claim certifier.	Tyler and Bladder (2000)	"strongly disagree" (1) to "strongly agree" (7)
	QDP2 (Q28.2)	Whether decision made on cost claims was based upon facts, and not personal bias of the claim certifier.	Tyler and Bladder (2000)	"strongly disagree" (1) to "strongly agree" (7)
	QDP3 (Q28.3)	Whether claims were decided without favouritism	Tyler and Bladder (2000)	"strongly disagree" (1) to "strongly agree" (7)
	QDP4 (29.2)	Whether claims certifier showed consistency in deciding claims	Tyler and Bladder (2000)	"strongly disagree" (1) to "strongly agree" (7)

Table 4-2 (Contd.) Measurement of Endogenous Constructs

Construct	Item Code and number on questionnaire	Measurement Item	Source	Response option
Quality of Decision-making Process (QDPROCESS) (CONTD.)	QDP5 (Q31.1)	Perceived level of claims certifier's expertise in diagnosing and assessing of claims	Tyler and Degoey (1996); Tyler and Schuller (1990); Mishra (1992); Thibaut and Walker (1978); Walton (1969); Exploratory review of litigated cases	"very low level" (1) to "very high level" (7)
	QDP6 (Q31.2)	Perceived level of claims certifier's expertise in deciding claims	Tyler and Degoey (1996); Tyler and Schuller (1990); Mishra (1992); Thibaut and Walker (1978); Walton (1969); Exploratory review of litigated cases	"very low" (1) to "very high" (7)
	QDP7 (Q36.2)	Perceived frequency to which claims were decided based on employer's concern for time and cost overrun	Discussion with practitioners	"Never" (1) to "always" (7)
	QDP8 (Q32)	The % of employer's project management who were acquainted with the history of claims but left the project before the claims were assessed and decided	Developed by author based on Walton (1969)	Percentage (Objective measure)
Decision Outcome Fairness (DOFAIR)	DOF1 (Q16.1)	EoT allowed relative to what was expected	Folger and Konovsky (1989); Tyler and Bladder (2000); Lind, MacCoun et al (1990)	'much worse than expected" (1) to "about what was expected" (4) to "much better than expected" (7)

Table 4-2 (Contd.) **Measurement of Endogenous Constructs**

Construct	Item Code and number on questionnaire	Measurement Item	Source	Response option
Decision Outcome Fairness (DOFAIR) (CONTD.)	DOF2 (Q16.2)	Cost claims allowed relative to what was expected	Folger and Konovsky (1989); Tyler and Bladder, (2000); Lind, MacCoun et al (1990)	'much worse than expected" (1) to "about what was expected" (4) to "much better than expected" (7)
	DOF3 (Q18.1)	EoT allowed compared with what contractor perceived it deserved	Folger and Konovsky (1989); Tyler and Bladder, (2000);	'much less than deserved" (1) to "as much as deserved" (4) to "much more than deserved" (7)
	DOF4 (Q18.2)	Cost claims allowed compared with what contractor perceived it deserved	Folger and Konovsky (1989); Tyler and Bladder, (2000)	'much less than deserved" (1) to "as much as deserved" (4) to "much more than deserved" (7)
	DOF5 (Q19.1)	Perceived fairness of EoT allowed	Folger and Konovsky (1989); Tyler and Bladder, (2000)	"not fair at all" (1) to "very fair" (7)
	DOF6 (Q19.2)	Perceived fairness of cost claims allowed	Folger and Konovsky (1989); Tyler and Bladder, (2000)	"not fair at all" (1) to "very fair" (7)
	DOF7 (Q20.1)	EoT allowed compared with other similar projects executed by the contractor in the past or at that time	Tyler, Casper and Fisher (1989)	'much worse than in other projects" (1) to "as in other projects" (4) to " much better than in other projects" (7)

Table 4-2 (Contd.) Measurement of Endogenous Constructs

Construct	Item Code and number on questionnaire	Measurement Item	Source	Response option
Decision Outcome Fairness (DOFAIR) (CONTD.)	DOF8 (Q20.2)	Cost claims allowed compared with similar projects executed by the contractor in the past or at that time	Tyler, Casper and Fisher (1989)	‘much worse than in other projects” (1) to “as in other projects” (4) to “ much better than in other projects” (7)
Outcome Favourability (OFAVOUR)	OFA1 (Q15.2)	Actual Percentage of % cost claims allowed	Kumaraswamy (1997)	Percentage (objective measure)
	OFA2 (Q15.1)	Actual Percentage of % EoT claims allowed	Kumaraswamy (1997)	Percentage (objective measure)
	OFA3 (Q15.4)	Perceived level of favourability of cost claims allowed	Tyler and Schuller (1990)	“very unfavourable” (1) to “very favourable” (7)
	OFA4 (Q15.3)	Perceived level of favourability of EoT claims allowed	Tyler and Schuller (1990)	“very unfavourable” (1) to “very favourable” (7)
	OFA5 (Q21.1)	Satisfaction with losses and wins on cost claims	Developed by author; Discussion with practitioners	“very dissatisfied” (1) to “very satisfied” (7)
	OFA6 (Q21.2)	Satisfaction with losses and wins on EoT claims	Self developed; Discussion with practitioners	“very dissatisfied” (1) to “very satisfied” (7)

Table 4-3 Measurement of Exogenous Constructs

Construct	Item Code and number on questionnaire	Measurement Item	Source	Response option
Quality of Treatment Experienced (QTREAT)	QTE1 (Q28.6)	Whether claims certifier provided explanations and reasons for the quantum of claims allowed	Tyler and Bladder (2000); Exploratory review of litigated cases; Discussion with practitioners	"strongly disagree" (1) to "strongly agree" (7)
	QTE2 (Q29.1)	Frequency to which contractor agreed to explanations and reasons provided by the claims certifier	Tyler and Degoey (1995b)	"rarely" (1) to "always" (7)
	QTE3 (Q27.1)	Perceived reasonableness of the average time taken to assess cost claims	Tyler and Bladder (2000); Exploratory review of litigated	"very unreasonable" (1) to "very reasonable" (7)
	QTE4 (Q27.2)	Perceived reasonableness of the average time taken to assess EoT	Tyler and Bladder (2000); Conlon and Fasolo (1990); Exploratory review of litigated cases	"very unreasonable" (1) to "very reasonable" (7)
	QTE5 (Q30.2)	Treatment of contractors' personnel with politeness, courtesy and dignity	Messick et al (1985); Mikula et al (1990); Tyler (1988); Bies and Moag (1986)	"strongly disagree" (1) to "strongly agree" (7)
	QTE6 (Q30.2)	Whether respect and concern was shown for the contractor's contractual rights	Tyler and Bladder (2000); Janssen and van de Vliert (1996);	"strongly disagree" (1) to "strongly agree" (7)
	QTE7 (Q29.3)	Frequency of discussion on claims at site meetings	Tyler and Bladder (2000); Lind, et al (1991).	"rarely" (1) to "always" (7)
	QTE8 (Q30.3)	Whether employer's project management team follow through most decision made and agreements reached during the course of the project	Tyler and Bladder (2000); Exploratory review of litigated cases.	"strongly disagree" (1) to "strongly agree" (7)

Table 4-2 (Contd.) Measurement of Exogenous Constructs

Construct	Item Code and number on questionnaire	Measurement Item	Source	Response option
Control (CTROL)	CTR1 (Q22.1)	Extent of pre agreement and clarity on methodology for quantifying claims	Exploratory review of litigated cases; Discussion with practitioners	"not at all" (1) to "to a great extent" (7)
	CTR2 (Q22.2)	Extent of pre agreement and clarity on methodology for project scheduling	Exploratory review of litigated cases; Discussion with practitioners	"not at all" (1) to "to a great extent" (7)
	CTR3 (Q22.3)	Extent of pre agreement and clarity on rules of evidence for claims	Exploratory review of litigated cases; Discussion with practitioners	"not at all" (1) to "to a great extent" (7)

4.6 Minimizing Problems with Self-Report Data

Using self report data was considered appropriate for this study. The reason is that perception of justice and expression of satisfaction and consequent reaction represent unique responses of people involved (Miceli et al, 1991). In this study, respondents were asked to report their past experience on a project in terms of their perceptions of about the claims process, their attitudinal response and their behavioural propensities (potential to dispute) arising from their experience. Respondents also provided information on the claims certifiers' style of handling claims. Also, all the information obtained from each respondent are in respect of a completed project. The disadvantage of self-reporting survey is that there is no direct means of verifying the information provided (Podsakoff and Organ, 1986). There is no means of cross-validating people's description of their feelings and behavioural intentions. Also, responses from the same source may increase concern for the problem of common method variance (Campbell and Fiske, 1982) (see section 4.6.2). This concern may arise in that any defect in that source contaminates all the measures.

Further, in a perception and attitude survey, the respondents may have the urge to maintain a consistent line of response in a series of questions, or at least what they regard as a consistent line of response. Podsakoff and Organ (1986) described this as '*consistency motif*'. This may occur where information on several variables is obtained from a single respondent at one sitting. The respondents may be influenced by their moods and may introduce artifactual bias across their responses.

Gupta and Beehr (1982) pointed out that despite the problems in the use of self-report measures their practical utility makes them virtually indispensable in many research contexts. Ways of reducing the problems of self-reporting have been suggested in the literature. This study employed two approaches to reduce the problem (Podsakoff and Organ, 1986): (1) Scale reordering method – procedural method and (2) Harman's one-factor test – statistical method. These are now discussed.

4.6.1 Scale Reordering and Interview Procedure

In the questionnaire, questions measuring independent variables were placed before those measuring dependent variables. During the interview survey, the mood of the respondents was closely observed and appropriate steps taken to reduce the problem of '*consistency motif*'. For instance, in one case, it was observed that the respondent warmly welcomed the author (having fixed the time for the interview) but at the same time was preparing for an impromptu meeting. Yet the respondent requested that the interview be conducted. However, after completing section A of the questionnaire (general particulars), the mood of the respondent suggested that he may not be cognitively alert in responding to the other questions. The author's request to postpone the interview was enthusiastically accepted by the respondent – confirming the author's concern. The interview was then rescheduled and was conducted at a later date. Hence during each interview, attention was paid to each respondent's mood in order to ensure that they are in the best frame of mind to respond to the questions. After conducting a number of interviews and gaining some experience, the author requested for possibility of conducting the interview during the lunch period when the respondent were likely to be relaxed.

4.6.2 Harman's one-factor test

Harman's one-factor test was used to assess the presence of common method variance (Schriesheim, 1979). If common method variance were a serious problem in the study, it is expected that a single factor would emerge from a factor analysis or one general factor would account for most of the covariance in the independent or criterion variables (Podsakoff and Organ (1986). Hence, prior to data analysis aimed at estimating the model developed, all the measures were entered into SPSS version 13.0 and a principal component factor analysis was performed on the subjective items measuring procedural fairness, decision outcome fairness, outcome favourability, quality of decision-making process, quality of treatment experienced, and control. The result of the unrotated factor solution was examined. The results showed that more than one factor can be extracted. Also, no one general factor accounts for the majority of covariance in the measurement items. These suggested that common method variance was not a problem.

4.7 Data Analysis Strategy

4.7.1 Justification for using Structural Equation Modeling (SEM) Approach

There are different methods of analyzing relationship between variables including (Norman and Streiner, 2003):

(1) Multiple Regression Analysis (MRA)

(2) Path analysis (PA)

(3) Factor analysis (FA)

(4) Structural equation modeling (SEM)

Each of these is now discussed and compared with SEM to clarify reasons for selecting SEM.

4.7.1.1 Multiple regressions

Simple and multiple regression analyses (SRA and MRA) are statistical tools for dealing with research problem involving a single measured dependent variable (for SRA) or more than one measured independent variables (for MRA). The Pearson correlation (in SRA) and the multiple correlation coefficients (in MRA) describe the strength of the relationship between the variables. SRA and MRA assume that the sample data used for the analysis comes from normally distributed population and is itself normally distributed. SRA and MRA also assume that the dependent and independent variables are easy to measure and are directly observable during data collection (Abdi, 2003). Further, in MRA there must be no linear relationship (multi-collinearity) among the explanatory (independent) variables in the model. Multi-collinearity overfits a MRA model because of redundancy of information since some independent variables are correlated and are providing the same information (Dirk and Bart, 2004).

4.7.1.2 Factor Analysis

Factor analysis (FA) is a technique that can be used to explore data for patterns or reduce many variables to a more manageable number. It is used to detect the underlying factors within a number of variables. It explores the interrelationships among the variables to discover these factors. The basic assumption of FA is that it may be possible to explain the correlation among two or more variables in terms of some underlying "factor" (Norman and Streiner, 2003). For example, "intelligence" is a constructs that cannot be directly observed but can be inferred or indicated by observable variables such as grade, time taken to respond to questions and accuracy in response to questions. If a number of people are tested and analysis shows that these measures are correlated then it may be concluded that they were attributable to an underlying factor "intelligence".

FA is thus a technique that may be used to determine whether measured variables can be explained by a smaller numbers of factors (factors may also be referred to as constructs or latent variables). The variables can be individual items on a questionnaire or the scores on a number of questionnaires (Norman and Streiner, 2003).

4.7.1.3 Path Analysis

Path analysis (PA) is an extension of multiple regression. While multiple regression allows examination of one dependent variable at one time, PA allows examination of more than one dependent variable at a time and allows for variables to be dependent with respect to some variables and independent with respect to others (Norman and Streiner, 2003). PA relies on visual diagram called path diagram as shown in Figure 4-2 to visualize the relationship between the variables.

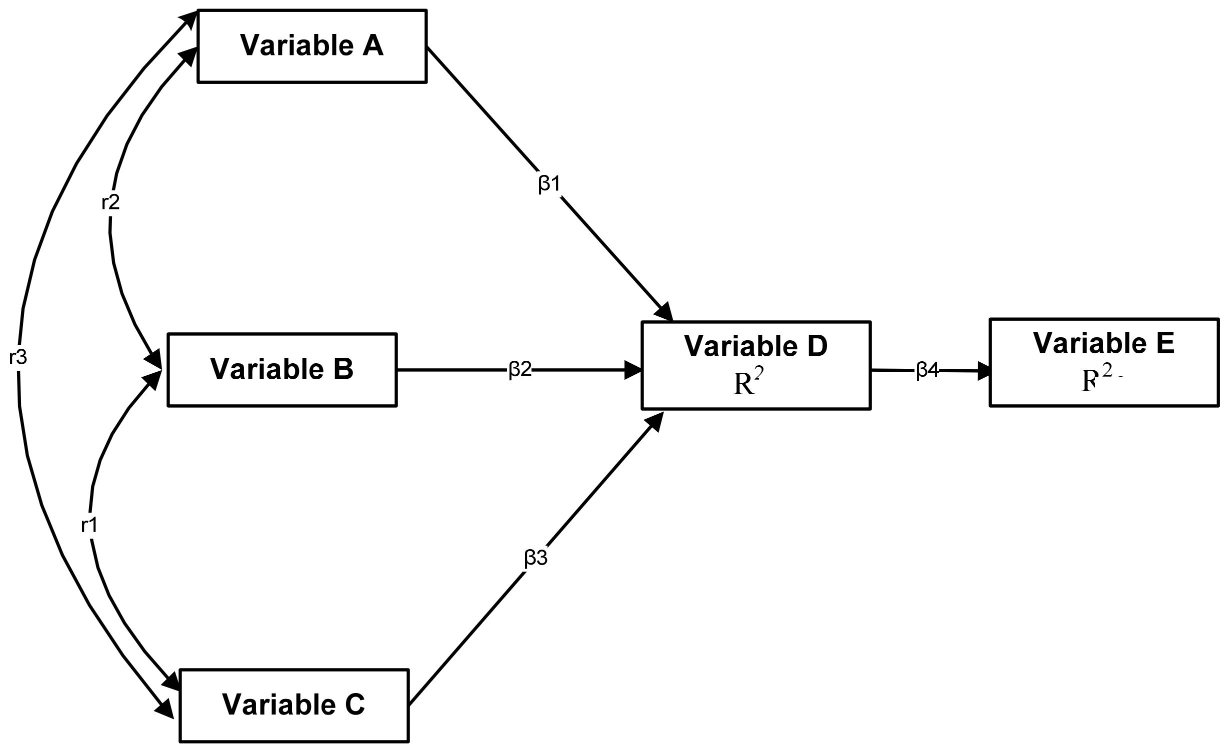


Figure 4-2 Hypothetical Path Diagram

In Figure 4-2, the straight arrow between each variable (with an arrow head at the end) represents the paths (β) of the model. The predictor variables at one end are joined by curved lines with arrow head at both ends. The curve arrows represent the correlation (r) among the variables.

The variables A, B and C are exogenous variables (corresponds to independent variable in multiple regression). Variable D and E are endogenous variables (corresponds to dependent variable in multiple regression). Variable D is endogenous (dependent) variable with respect to variables A, B and C. At the same time, variable D is also exogenous (independent) variables with respect to E. After running the path analysis, the result would yield standardized path coefficients (β1, β2, β3 and β4), which corresponds to beta weights in regression; correlations (r1, r2, r3) among exogenous variables; and squared multiple correlations (R^2) for each endogenous variables which corresponds R^2 in regression. Test of model fit is then conducted by a test of significance of the paths coefficients and looking at the signs of the paths. PA assumes that the variables A, B, C, D and E are observable (Norman and Streiner, 2003). Similar to MLR, PA is also sensitive to normality of data.

4.7.1.4 Structural Equation Modeling

Structural equation modeling (SEM) extends path analysis by looking at complex interrelationships among latent variables (Berman, 1999). Latent variable (LV) is a factor in factor analysis (see section 4.7.1.2). A factor or latent variables is an unseen construct that is responsible for the correlation among the measured variables. SEM is a multivariate method that allows the simultaneous examination of the relationships among the exogenous (independent) at latent variable and endogenous (dependent) latent constructs within a model (Kilne, 1998). SEM modeling approach may be used to test the model by estimating errors in the measurement of constructs and errors in the hypothesized relationships (the paths). Figure 4-3 shows a hypothetical SEM model.

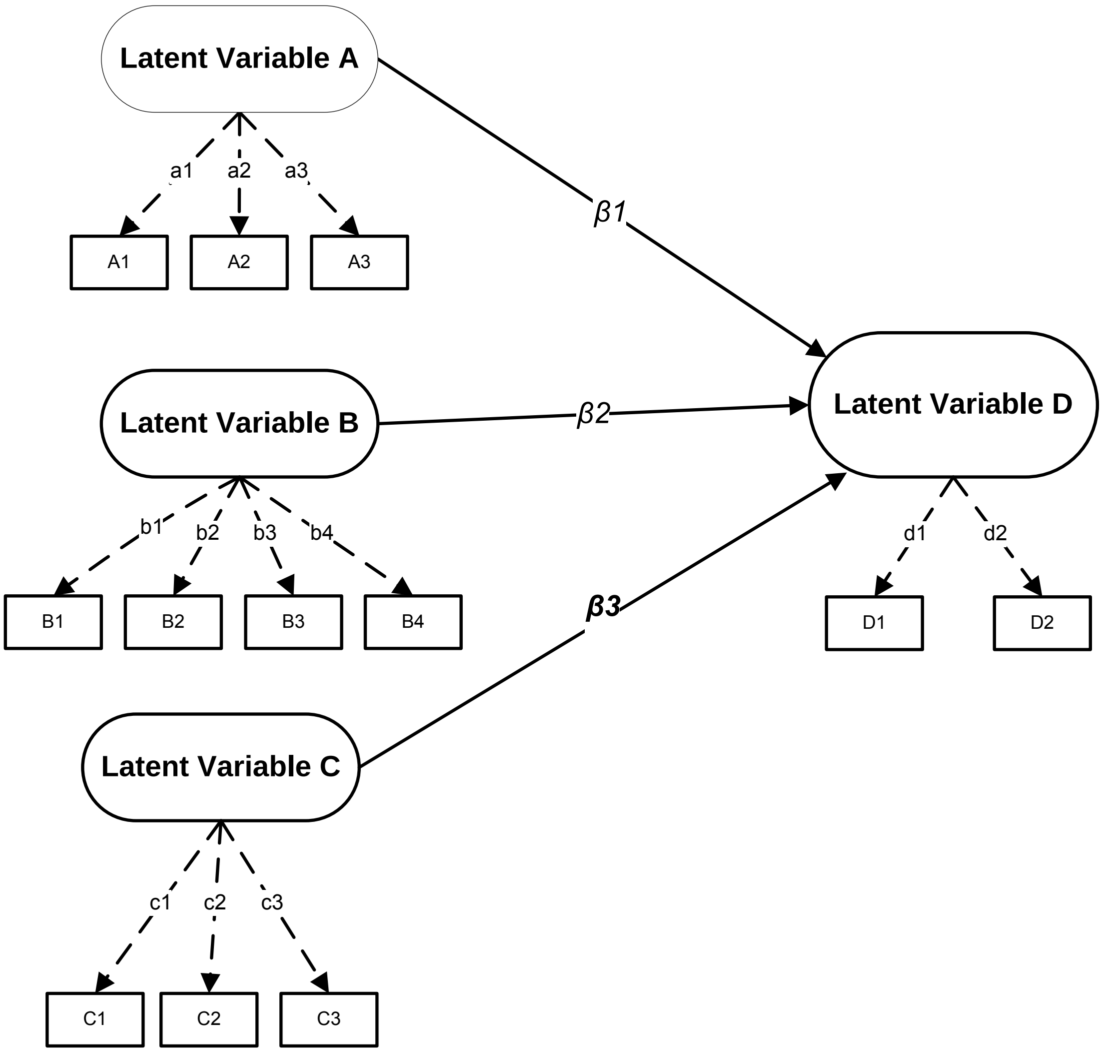


Figure 4-3 Hypothetical SEM model

In the figure, the paths (straight arrows between LVs) are the hypothesized relationships between the LVs. The path coefficients (β1, β2, β3) are similar to the path coefficient in PA. The rectangular boxes represent the observed variables (also known as manifest variables) or indicators or measurement items, which may be individual items on a questionnaire. Latent variable A is measured by 3 measurement items (a1, a2, and a3); B is measured with 4 measurement items (b1, b2, b3 and b4); C is measured with 3 items while D is measured with 2 items. The dotted lines with one arrow head linking measurement items to the LVs represent the relationship between each of the measurement items and the LV it measures. The relationships on the dotted line, for example a1, a2, a3, b1, b2 etc. are similar to factor loading in FA. Before any inference could be made on the paths of the SEM, there is need to ensure that the construct have been appropriately measured with minimum error level. This involves ensuring that the measurement items are reliably measuring the constructs they are hypothesized to measure. SEM would involve 5 steps including (Norman and Streiner, 2003):

- Model specification (MS) which involves specifying the relationship among the LVs and determining how each LV will be measured (model specification is what is presented in figure 4-2). MS may be achieved based on experience in the particular field, review of theory and the literature.
- Model identification (MI) which involves ensuring that redundant paths are not included in the model. This may be achieved by leaving out paths that are not postulated by theory.
- Model estimation (ME) involves estimation of the parameters of the theoretical model.
- Test of fit (TF) which tests the validity of the model. The purpose is to ascertain whether the predicted values from the model are likely to accurately predict the responses on another sample.
- Model Respecification or modification (MrS) which attempts to improve the model to get a better fit. An unfit model may be as a result if be important latent variables have been omitted in during MS. Thus model re specification may require the need for further data collection. MrS may be

avoided by comprehensive review of the literature and theory to ensure that the theoretical model captures the important information.

4.7.1.5 SEM Estimation Approach

SEM estimates parameters for both the link between measurement items with their respective LVs (loadings) and the link between different LV (i.e. path coefficients). By this estimation approach, the results of SEM may be described and interpreted as a combination of two models (1) measurement model – also known as factor or outer model; and (2) structural model – also known as path model or inner model (Norman and Streiner, 2003):

- The measurement model defines how each block of measurement items relates to its latent variable (construct). It measures the validity of the LVs in terms of whether the LVs are measured with satisfactory accuracy. It shows whether the pattern of loadings of the measurement items corresponds to the theoretically anticipated factors. Thus each LV is a mini factor analysis (FA- see 4.7.1.2).
- The structural model: After deriving a set of measurement items that have the level of desired measurement properties, the structural model is then assessed to test how well it fits the data. The structural model depicts the relationship among latent variables (constructs). It is used to test and analyze the hypothesized relationships.

4.7.1.6 Reasons for choosing SEM

In this study, SEM is a way of dealing with the kind of research problem addressed by simultaneously assessing the reliability and the validity of the manifest variables (measurement items) of the theoretical constructs (LVs) and estimating the relationships among the LVs constructs (Barclay et al, 1995; Kilne, 1998). Fornell (1982) termed the SEM 'second generation' of multivariate analysis. SEM approaches incorporate multiple dependent constructs, explicitly recognize error terms, and explicitly integrate theory with empirical data (Fornell, 1982, Pedhazur, 1982). Thereby they provide the capability to advance understanding by combining theoretical with empirical knowledge to an extent not possible with first generation multivariate analysis such as multiple regressions, factor analysis, path analysis, and MRA.

The research problem addressed by the study comprise theoretical and hypothesized network of latent variables (See Figure 3-8, Chapter 3) which must be measured with observable or measurement items. In testing such model, there is need for a methodology that recognises latent variables in their theoretical networks, gain meaning from their definition, the specific theoretical context in which they are embedded, and from their manifest variables (Chin, 1998). The methodology should be able to handle 'systems' nets of constructs, handle error in measurement, and recognize error in theory such as surplus meaning in constructs and unexplained variance. Thus there is need to understand, and simultaneously examine the relationships among exogenous and endogenous LVs and also the relationship between the LVs and the measurement items.

Based on sections 4.7.1.1 to 4.7.1.3, factor analyses (FA), MRA and path analysis (PA) are not suitable for the following reasons: MRA deals with relationship between single dependent variables and many independent observable variables. MRA does not provide any test on validation or reliability for measuring latent variables and cannot analyse the relationships amongst the latent variables (Lehman, 1991). This study deals with more than single dependent variables. PA and MRA deal with observed variable rather than LV and assume that the data used is normally distributed. The data for this study involves perceptive rating which is of unknown distribution.

MRA requires that independent variables must not be correlated (multicollinearity) whereas in this study, the independent LVs are correlated. FA could detect underlying LVs from manifest variables and could provide information on the relationships (loadings) between the detected LVs and their corresponding observed variables forming them (equivalent to the loadings of the measurement items in the SEM measurement model). However, FA would provide no information about the relationship among the LVs detected (the structural model). SEM has many benefits because it allows researchers to perform the following (Chin, 1998):

(1) Model the relationships among multiple predictor and criterion variables

(2) Construct unobservable latent variables

(3) Model errors in measurement for observed variables

(4) Statistically test a priori substantive/theoretical and measurement assumptions against empirical data (confirmatory analysis).

4.7.1.7 Use of SEM in construction management research

SEM has been employed extensively in psychology, sociology, neuroimaging, medicine, strategic management and marketing research. Molenaar, et al. (2000) observed that despite the distinct advantages of SEM, it has been underutilized in construction engineering and management research. However, there is a gradual increase in the use of SEM in construction management and engineering research. Molenaar, et al. (2000) presents the results of a structural equation model for describing and quantifying the fundamental factors that affect contract disputes between owners and contractors in the construction industry. The purpose of their model is to explain how and why contract related construction problems occur. The authors stated that their study is intended to illustrate the potential impact of SEM analysis in construction engineering and management research.

Using data obtained from 116 companies (38% response rate), Jin et al. (2007) used SEM technique to investigate the relationship-based factors that affect performance of general building projects in China. Wong and Cheung (2005) used SEM to test the hypothesis that partners' trust level is positively related to their performance, permeability, and relational bonding and can be system based. Their analysis is made use of 51 valid responses representing a rate of 42.5%.

With a total of 68 usable responses (representing a response rate 12.3 percent), Sarker et al. (1998) employed SEM to study the role of relational bonding in inter-organizational collaboration. Leung et al (2005) examined the relationships amongst the stressors or stress factors and their effects (stress) using used structural equation modeling. Their study made use of a total of 87 completed questionnaires representing a response rate of (36%). Using 52 responses (61% response rate), Islam and Faniran (2005) developed a SEM model for describing and quantifying the influence of situational factors in project environments and organizational characteristics of performing organizations on project planning effectiveness.

Mohammed (2002) used SEM to examine the relationship between the safety climate and safe work behaviour in construction site environments. The analysis is based on 68 responses received from nine construction sites in Queensland.

4.7.2 SEM Approaches

There are two multivariate analysis approaches that may be used in SEM (Haenlein, 2004):

(1) Covariance-based structure analysis (as implemented by the LISREL and AMOS software programs) (hereafter referred to as covariance based SEM)

(2) Component-based analysis (as implemented by PLS-Graph 3.0 software program) (hereafter referred to as PLS-SEM)

From the two main approaches, a decision has to be made on which of the two should be employed to test the conceptual model of this study. This is discussed next.

4.7.3 Justification for using PLS-SEM

This study made use of component-based structural analysis with PLS-Graph (herein referred to as PLS-SEM). PLS-SEM was developed by Wold (1975; 1980) and Joreskog and Wold (1982). PLS is a structural path estimation approach (Chin, 1998) that is becoming a tool of choice in the social sciences as a multivariate technique for non-experimental and experimental data (Mcintosh, et al., 1996). Similar to covariance-based SEM, it is used to model the relationships among multiple latent variables (LV). It has the capability of working with unobservable latent variables and can account for measurement error in the development of latent variable constructs (Chin, 1998). PLS-SEM was selected because of a combination of many factors. In this section, the justification for using PLS-SEM is highlighted by comparing covariance based SEM and PLS-SEM around 4 issues.

4.7.3.1 Estimation Assumptions

Covariance-based SEM approach calculates path coefficients by minimizing the differences between the sample covariance and those predicted by the theoretical model. Thus model fit in covariance based SEM make use of maximum likelihood estimation approach. Similar to MRA and PA, they are sensitive to deviation from normality so that the results may not be an accurate reflection of the actual relationships among variables (Norman and Streiner, 2003). Thus covariance-based SEM approach assumes multivariate normality (Fornell and Bookstein 1982). In this study, most of the measurement items (see Table 4-2 and 4-3) are perception-based measured on a Likert scale and are of unknown distribution. Since normality cannot be demonstrated, covariance-based approach was not considered.

On the other hand, PLS-SEM uses a component-based approach, similar to principal components factor analysis (Compeau, et al., 1999). Thus, PLS does not presume any distributional form of measured variables (Wold, 1982; Chin, 1998). PLS is distribution-free hence suitable for data from non-normal or unknown distributions (Frank and Miller, 1988). In this study, since most of the measurement items (see Table 4-2 and 4-3) are perception-based measured on a Likert scale and are of unknown distribution, and since normality cannot be demonstrated, PLS-SEM was considered a preferable approach to covariance-based SEM.

4.7.3.2 Measurement assumptions

In PLS-SEM, the nature of the link between the measurement items and their constructs can be of two types as follows: (1) reflective and (2) formative (Hulland, 1999). Reflective indicators are created under the perspective that they all measure the same underlying phenomenon (i.e. they measure latent variable). Formative measurement items are viewed as cause variables that provide conditions under which the latent variables they are connected to is formed (Chin, 1998). Covariance-based SEM assumes that the measurement items are reflective in nature. This means that all measurement items are affected by the same concept (i.e. same LV) (Chin, 1998). PLS approach can allow the use of both reflective and formative indicators. All indicators used in this study are assumed to be reflective measurement items. Thus, covariance-based SEM may also be used. However, considering the estimation assumption (4.7.3.1) PLS-SEM was preferable. Also, PLS-SEM was preferable because covariance-based SEM assumes that observed measures have random error variance and measure-specific variance components, which are not of theoretical interest and are excluded from the measurement model (Anderson and Gerbing, 1988). Whereas, PLS-SEM assumes that the explanation of all observed measure variance is useful.

4.7.3.3 Estimation information and Model complexity

Covariance-based SEM approach can provide the most efficient parameter estimates and an overall test of model fit and is theory-oriented confirmatory analysis. Thus in covariance-based SEM, the theoretical model must be based on established theory in order to prevent model re specification (section 4.7.1.4) which may be difficult should relevant information be omitted from the specified model. PLS estimates parameters with limited theoretical information such as where theory has not been well developed Also, PLS is primarily intended for predictive analysis in situations of model complexity but less strict statistical assumption (Wold, 1982). Thus PLS-SEM is better suited for explaining complex relationships with large numbers of indicators (Fornell and Bookstein, 1982) where research is relatively new or changing and where theoretical models are not well formed (Jöreskog and Wold 1982). In this study, the research model is based on organizational justice concept which is an established but also changing concept (Hauenstein, 2002).

Further, the interaction among constructs of perception of fairness and their influence on behaviour and reaction would differ across different decision-making contexts (Hauenstein, 2002). The model (Fig. 3-8) in this study is relatively new in the context of construction. The theorization (chapter 3) was adapted in the context of construction. Some of the measurement items identified in the socio psychology literature may not be directly applicable. Hence some of the measures used were adapted and developed based on review and analysis of litigated claims coupled with a discussion with practitioners (see Table 4-2 and 4-3). Certain interrelationships are not yet theoretically clear. For example, the moderating effect of experience and number of projects executed in together in the past on the relationship between outcome favorability and conflict intensity, and between outcome favorability and contractors' potential to dispute (objective 5 of the study) is not yet clear. Thus, PLS was considered preferable in that it not only tests hypothesized relationships but also allows the researchers to explore where relationships may exist in the model hence enabling advancement of theory (Chin, 1998).

4.7.3.4 Sample Size

Covariance-based SEM approach is sensitive to sample size. A smaller sample size will reduce the statistical power. Moreover, when the sample size is small, normality assumption which is required by covariance-based approach (see section 4.7.3.2) might not be strictly demonstrated. On the hand, with a large sample size, covariance-based approach may over-fit (Norman and Streiner, 2003). Muthén and Kaplan (1992) show that the usual χ^2 test statistics for covariance-based structural equation models would depart from a χ^2 distribution under the conditions of a small and a larger model. Two hundred (200) is proposed as a critical sample size from which to make accurate assessments of model fit in covariance-based SEM (Hoelter, 1983).

PLS estimates the model parameters using the original sample. However, to statistically validate the estimated model, PLS make use of resampling method to determine the confidence interval of the model parameters. Resampling are methods of validating models by using random subsets of data (Jack, *et al.* 2001; Chin, 1998) such as bootstrapping. Bootstrapping is a robust alternative to statistical inference based on parametric assumptions (such as normality) when those assumptions are in doubt (Mooney and Duval 1993). Hence, PLS is suitable where the sample size is relatively small (Fornell and Bookstein, 1982). Lohmoller (1982) presents examples where a model with 96 indicators, and 26 constructs was appropriately estimated with 100 data cases.

4.7.4 Steps in PLS-SEM Analysis

4.7.4.1 Model Estimation and Interpretation

PLS uses a combination of principal component analysis, path analysis, and regression to simultaneously evaluate theory and data (Pedhazur, 1982). PLS takes each latent variable as an approximation of its respective block of measurement items. Hence latent variable component scores are created based on the weighted sum of their measurement items. In the first stage of PLS estimation, an iterative scheme of simple and or multiple regressions contingent on the particular model is performed until a solution converges on a set of weights used for estimating the latent variables scores. Once latent variables estimates are obtained, stages 2 and 3 are simple non-iterative applications of Ordinary Least Square (OLS) regression for obtaining loadings, path coefficients, and mean scores and location parameters for the latent variables and measurement items (Chin, 1998).

The PLS model estimation and interpretation may be described as a two-step approach. First, the measurement model which is evaluated to determine the validity and reliability of the measurement (see 4.7.1.5). The measurement model is evaluated by examining the individual loading of each item, internal composite reliability, and discriminant validity (Chin, 1998). Second, after adjustment of items and acceptance of the measurement model, the structural model is evaluated to assess the relationships of constructs (see 4.7.1.5). Thus the structural model represents the relationships among the constructs. In the structural model, the hypotheses are tested by assessing the path coefficients "which are standardized betas" (Compeau, et al., 1999, p.152). Thus the path coefficients are standardized correlation a dependent and independent latent variable in the model.

4.7.4.2 Model validation using PLS Bootstrapping

In PLS-SEM, the estimated structural model of the interrelationships among variables is validated to ascertain whether the predicted values from the model are likely to accurately predict the responses on future sample. Model validation may be achieved by resampling method to test the significance of the t-value of the path coefficients of the structural model using nonparametric tests of significance known as bootstrapping or Jackknifing (Chin et al. 1998; Hair et al. 1998). Both Bootstrapping and Jackknifing estimate the variability of that statistic between sub-samples rather than from parametric assumptions (Chin, 1998).

Bootstrapping is an inferential statistical method for estimating sampling distribution by drawing randomly with replacement from the original sample with the purpose of deriving robust estimate of confidence intervals of a population parameter. The population parameter in this study is the path coefficient in the estimated theoretical model. Bootstrapping is useful for conducting hypothesis tests and it is a robust alternative to statistical inference based on parametric assumptions when those assumptions are in doubt such as sample mean for small samples (Mooney and Duval 1993). Thus bootstrapping is useful when traditional distributional assumptions are violated such as in data with non normal distribution (for example, as in this study with perceptive data of unknown distribution). According to Jack, *et al.* (2001), bootstrapping is a versatile tool that enables estimation of the distribution of any statistic for any type of distribution.

Jackknifing is similar to bootstrapping. It is also an inferential technique that assesses the variability of a statistic by examining the variability of the sample data rather than using parametric assumptions (Chin, 1998). Rather than computing confidence interval with a replacement from the original sample, jackknifing re computes the statistics estimates leaving out one observation at a time from the sample (Chin, 1998). Chin (1998) stated that jackknife can be considered as an approximation of the bootstrap. In this study, bootstrapping function of PLS-Graph 3.0 software was used to validate the theoretical model.

4.8 Criteria for Moderator and Mediator Effects

In this study, some moderation (also known as interaction effect) and mediation hypotheses have been developed (see chapter 3). Moderator and mediator variable are different and cannot be used interchangeably. Thus for the purpose of clarity and guide for data analysis, the conceptual and statistical nature and differences between a moderator and mediator variable, and the conditions for their presence is presented in this section.

4.8.1 The Nature of and Condition for Mediation Effect

Woodworth's (1928) S-O-R (stimulus-organism-response) model is the most generic formulation of mediation hypothesis. It posits that an active organism intervenes between stimulus and response. The central idea in this model is that the effects of stimuli on behaviour are mediated by various transformational processes internal to the organism. Hence mediator variable are intervening variable between a predictor and an outcome or dependent variable. An example of the use of mediation effect hypothesis in the context of construction is presented by Lingard and Francis (2005). They tested whether work–family conflict mediates the relationship between job stressors and burnout among male construction professionals, managers and administrators.

A given variable may be said to function as a mediator to the extent that it accounts for the relation between the predictor and the outcome variable. Mediator variable explains why and how effects of a variable on another variable occur. Figure 4-4 depicts the model of the property of a mediator variable. The model assumes a three-variable system such that there are two paths feeding into the outcome variable: the direct impact of the independent variable (Path c) and the impact of the mediator (Path b). There is also a path from the independent to the mediator (Path a).

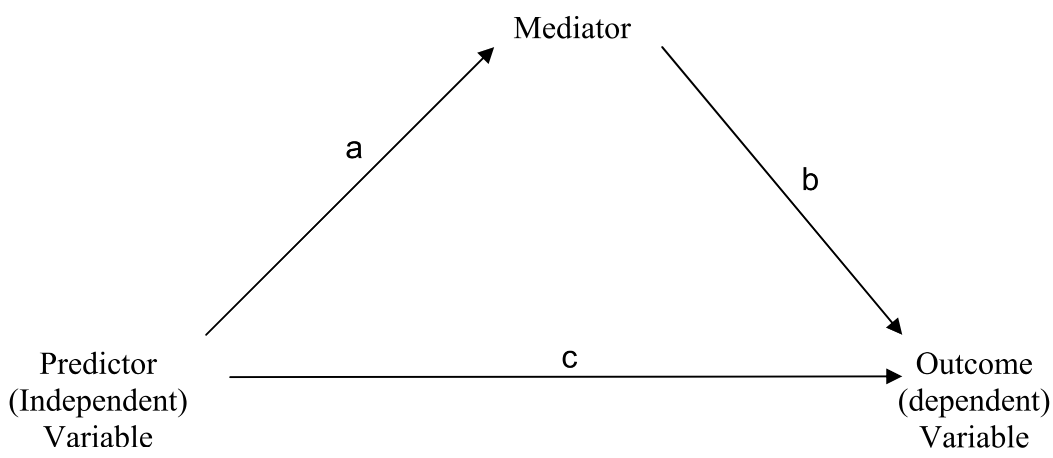


Figure 4-4 Mediator Model
Source: Baron and Kenny (1986)

A variable functions as mediator when it meets the following conditions (Baron and Kenny, 1986; Judd and Kenny, 1981):

(a) Variations in levels of the predictor or independent variable significantly account for variations in the presumed mediator. (i.e Path a must be significant)

(b) Variations in the mediator significantly account for variations in the dependent or outcome variable (i.e. Path b must be significant) and

(c) When Paths a and b are controlled, a previously significant relationship between the predictor or independent and dependent or outcome variable is no longer significant (i.e. Path c must be insignificant) or the strengthen of the Path c must be weaker than Path a.

Rather than using regression analysis, mediation effect can be identified from estimate of latent-variable structural modeling (Baron and Kenny, 1986). This study made use of latent-variable structural model technique. Thus estimates of the path coefficients of the model provide a basis for checking for the above 3 conditions when testing for mediating effects. Mediation hypothesis are therefore identified and interpreted in relevant sections of Chapter 7.

4.8.2 The Nature of and Conditions for Interaction Effect

Interaction effect or moderation implies that the relationship between two variables changes as a function of the moderator variable. A moderator is variable that affects the direction and or strength of the relation between an independent or predictor (exogenous) variable and a dependent (endogenous) variable (Baron and Kenny, 1986). Moderator effect may also be said to occur where the direction of the relation between independent or predictor (exogenous) variable and a dependent (endogenous) variable changes as a result of the moderator. Thus a moderator may increase, reduce or reverse the relation between independent variable and a dependent variable. Moderator variable specify when certain effects will hold whereas mediator variable explain why and how effects occur. A common framework for capturing both correlation and experimental views of a moderator variable is possible by using a path diagram as both a descriptive and an analytic procedure. Using path diagram the property of a moderator variable is summarized in Figure 4-3.

The model (Figure 4-3) has three paths that feed into the outcome variable: the impact of predictor variable (Path a), the impact of the moderator variable (Path b) and the interaction or the product of predictor and moderator (Path c). The moderator hypothesis is supported if the interaction (Path c) is significant. There may also be significant main effects for the predictor and the moderator (Paths a and b) but these are not directly relevant conceptually to testing moderation hypothesis (Baron and Kenny, 1986).

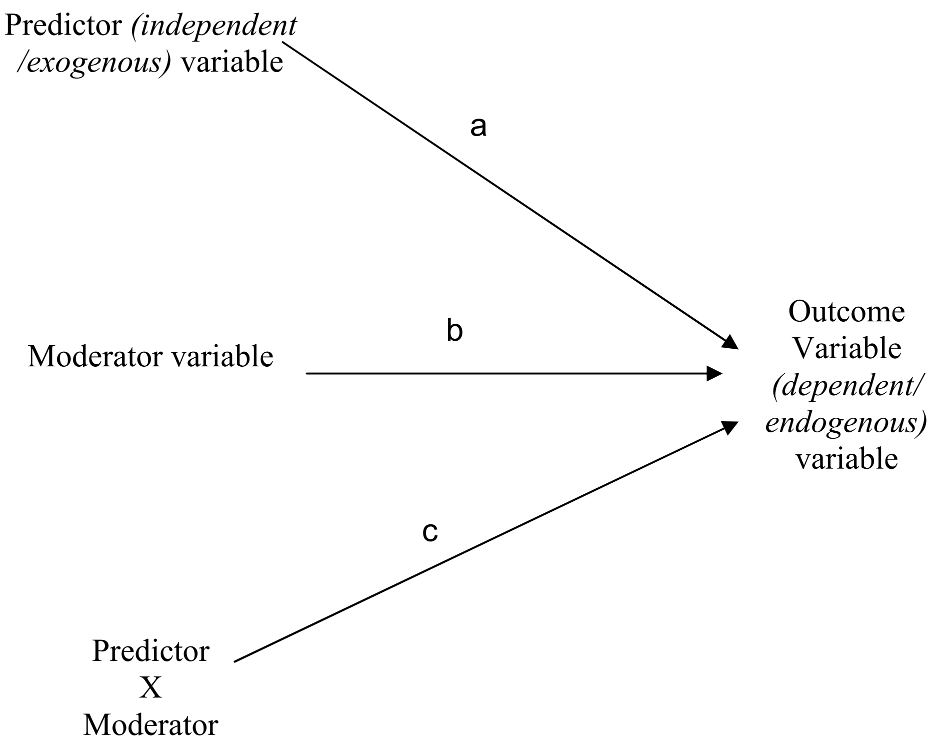


Figure 4-5 Moderator Model
Source: Baron and Kenny (1986)

From Figure 4-5, moderator variable is on the same level with the predictor variable as regards its role as a variable antecedent to the outcome variable. Thus a moderator may also function as independent variable. Unlike mediator effect, the path estimates generated from latent-variable structural modeling are not enough to detect moderator effect. Analysis is needed to check the significance of interaction effects. Thus analyses of interactive effect hypotheses are conducted in Chapter 8. There are alternative approaches for testing interactive effects (to detect moderation). The choice of approach used in this study is discussed in section 8.2.

4.9 Summary

This study employed cross-sectional sample survey research design. Data were obtained through face-to-face interviews with the aid of a structured questionnaire administered on the main contractors' contracts managers and quantity surveyors in Singapore who have experience with handling of claims. The questions for the survey were the measurement items designed to measure the main constructs of the research hypotheses. The measurement items were trimmed during data analysis to ensure their validity and reliability hence potentially minimising error in the parameter estimates needed to test the hypothesised relationships of the theoretical framework.

In the questionnaire, the respondents reported their past experience, perceptions, attitudes and attitudinal propensities in the process for administering claims on a project of their choice. All the questions on each project regarding the dependent and independent constructs of the study were answered by a single respondent. In order to minimise problems such as common method variance and consistency motif, which may be associated with such self-reported data, questions addressing the main independent constructs of the research – constructs of fairness perception were placed before the questions addressing the main dependent constructs – conflict intensity and potential for dispute. Also, prior to data analysis, Harman one-factor test was also conducted to assess whether common method variance was a serious problem.

After considering the research problem, model estimation process, estimation assumptions, measurement assumptions, estimation information, model complexity and sample size, PLS-SEM was selected as the data analysis method in lieu of covariance-based SEM approach.

As pointed out in section 4.5.1, some of the items used in measuring the constructs of the study were validated and others developed based on the exploratory review and analysis of judicial decision transcript of two litigated construction claims (see section 3.18).

CHAPTER FIVE

PROFILE OF RESPONDENTS AND PROJECTS, CLAIMS AND CONFLICT

5.1 Introduction

This Chapter presents the analysis of the data on the general particulars of respondents, and the projects upon which the responses were based. The Chapter presents the profile of respondents, respondents' organizations, profile of projects selected by respondents, and level of claims and conflict on the projects. The Chapter also presents the result of the analysis of conflict issues, mode by which conflicts were ended; information regarding the frequencies of construction programme update, analysis of time taken to assess and decide claims and time taken to resolve disagreements after decision on claims were made.

5.2 Sample Characteristics

5.2.1 Response

Out of 200 contractors contacted (sampling frame – see section 4.3.1), 41 participated representing a response rate of 20.5%. Of the 41, analysis of question 6 (appendix 1) shows that 65.9% (27) are grade A1 (with unlimited tendering limit) on the BCA's contractors register while 7.3% (3) are grade A2 (with S$65 million tendering limit) and 26.8% (11) belong to the B1 grade (with S$30 million tendering limit). The results indicate that the majority of the respondents are from the largest contracting firms in Singapore with unlimited tending limit and with turnover of over S$150 million and above. Thus it is understood that the contractors sampled are those with technical and construction management expertise. Hence they are likely to have experience in managing claims.

5.2.2 Profile of Respondents

Analysis of question 1 of appendix 1 shows that the majority of the respondents are quantity surveyors and cost experts (see Table 5-1).

Table 5-1 Respondents' designation on the projects surveyed

Category	Frequency	Percent
Contract Manager	17	41.5
Site Manager/Project Manager	7	17.0
Quantity Surveyor	17	41.5
Total	**41**	**100**

Table 5-2 presents the analysis of question 2 shows that 71% of the respondents have over 11 years experience in construction.

Table 5-2 Respondents' years of experience

Category	Frequency	Percent
Up to 5 years	2	4.9
6 - 10 years	10	24.4
11 - 15 years	10	24.4
16 - 20 years	5	12.2
21 - 25 years	6	14.6
Over 25 years	8	19.5
Total	**41**	**100.0**

Question 3 relating to numbers of projects executed by respondents in the past shows that 66% of the respondents have been involved in over 11 projects in the past that (Table 5-3). A large proportion of the respondents – 44 % have handled over 25 projects in the past.

Table 5-3 Numbers of projects respondents have handled

Category	Frequency	Percent
Up to 5 projects	5	12.2
6 - 10 projects	9	21.9
11 - 15 projects	7	17.1
16 - 20 projects	2	4.9
Over 25 projects	18	43.9
Total	**41**	**100.0**

As the majority of the respondents are those who are involved with administration of contracts and have handled many projects, it is understood that they are well experienced on the subject matter and in the position to provide reliable information.

5.2.3 Profile of respondents' organisations

Table 5-4 shows the analysis of question 7 and information obtained during the interview regarding the nationality of the respondents' firm. The results show that 32% of the respondents' organisations are foreign construction companies operating in Singapore while 68% are local companies. Further, Table 5-4 also shows that 71% of the respondents' organisations have been operating for more 11 years and on the average, have 22 years of operation in Singapore construction industry

Table 5-4 Profile of the respondents' organisations

	Category	Frequency	Percent
Status	Foreign	13	31.7
	Local	28	68.3
	Total	**41**	**100**
Years of operation in construction	Up to 5 years	2	4.9
	6 - 10 years	10	24.4
	11 - 15 years	10	24.4
	16 - 20 years	5	12.2
	21 - 25 years	6	14.6
	25 and above	8	19.5
	Total	**41**	**100.0**

During the survey, the researcher sought information on the nationality of the respondents as an additional information. One of the respondents is a German while the remaining 40 are Singaporeans.

Table 5-5 (addressing questions 4 and 5) shows that 76% of the respondents' organisations have a turnover of over S$50 million. The majority of the respondents' firms – 59% have a turnover of over S$150 million. Further, 41% of the organisations have over 150 staff while on the overall 71% of them have over 50 staff.

Table 5-5 Respondents organizations' Turnover, Number of Staff, and Registration categories

	Category	Frequency	Percent
Turnover	Less than S$50 million	10	24.4
	S$50m – S$150 million	7	17.1
	S$150 million and above	24	58.5
	Total	41	100.0
Number of Staff	Less than 50	12	29.3
	50 –150	12	29.3
	150 and above	17	41.5
	Total	41	100.0

As the majority of the firms have a turnover of over S$150 million, with over 50 staff, they are big players with technical and management expertise. Also, it is understood that they are companies with expertise in construction management and will have experience on claims. Additionally, since the participating companies are big players, it may have reduced the problem of social desirability response.

5.2.4 *Profile of projects selected by respondents*

Table 5-6 shows that majority of the projects selected by the respondents upon which responses were provided are building project (representing 63%).

Table 5-6 Profiles of the projects selected by the respondents

Profile	Category	Frequency	Percent
Project Type	Building Projects	26	63.4
	Civil Engineering Projects	15	36.6
	Total	**41**	**100.0**
Client Type	Public Client	21	51.2
	Private Client	20	48.8
	Total	**41**	**100.0**
Standard form of contract used	Public Sector Standard Conditions of Contract	21	51.2
	Singapore Institute of Architect Conditions Contract	20	48.8
	Total	**41**	**100.0**
Project value	Less than 500,000	3	7.3
	S$500,000 – S$1 million	0	0
	S$1 million – S$3 million	3	7.3
	S$3 million – S$10 million	3	7.3
	S$10 million – S$30 million	6	14.7
	S$30 million – S$65 million	8	19.5
	Above S$65 million	18	43.9
	Total	**41**	**100.00**
Year of Commencement of Project	1997	2	4.9
	1998	3	7.3
	1999	8	19.5
	2000	10	24.4
	2001	7	17.1
	2002	4	9.8
	2003	5	12.2
	2004	2	4.9
	Total	**41**	**100.00**
Year of Completion of Project	2000	1	2.4
	2001	7	17.1
	2002	7	17.1
	2003	10	24.4
	2004	7	17.1
	2005	9	22
	Total	**41**	**100.00**

Further, Table 5-6 shows the results of questions 8, 9, 10, 11 and 12. There is about an equal spilt between projects procured by the public sector and private sector (51% and 49% respectively) and between projects procured under the Public Sector Standard Conditions of Contract – PSSCOC (51%) and the Singapore Institute of Architect Conditions Contract – SIA (49 %). Thus the projects are from the public and private sector, and procured with both SIA and PSSCOC. The average project value stands at S$97.8 million. Table 5-6 also indicates that about 60% of the projects were commenced between 2000 and 2004 while 100% of the projects were completed between 2000 and 2005.

The profile of the projects suggests that the projects are large and complex and, potentially, claims are likely to be an important issue. Thus, the projects are good arena for a study of claims, conflict and dispute. Further, there is equal representation of civil and building projects, project procured by private and public clients, and projects procured with two major standard forms of contracts in Singapore (SIA and PSSCCOC). Approximately, the projects were awarded and completed within the same time frame and thereby are procured under relatively similar market condition. This provides a similar basis for comparison and analysis.

5.3 Analysis of the of claims, Conflict levels, Potential to dispute and Mode of ending of conflicts

5.3.1 Level of claims made by respondents

Table 5-7 addresses question 14. It shows that in 68% of the projects, the EoT claims requested were 10% or more of the original contract duration while in about 40% of the projects the additional cost requested by the contractors were more than 10% of the original contract sum.

Table 5-7 Level of extension of time (EoT) and additional cost claims requested

% of contract Duration/ Sum	EoT claims requested			Additional cost claims requested		
	Frequency	Percent	Cumulative Percentage of projects	Frequency	Percent	Cumulative Percentage of projects
40% and above	4	9.8	9.8	3	7.3	7.3
30% and up to 39.99%	1	2.4	12.2	3	7.3	14.6
20% and up to 29.99%	7	17.1	29.3	2	4.9	19.5
15% and up to 19.99%	5	12.2	41.5	3	7.3	26.8
10% and up to 14.99%	11	26.8	**68.3**	5	12.2	**39.0**
5% and up to 9.99%	3	7.3	75.6	13	31.7	70.7
0.1% and up to 4.99%	10	24.4	100	12	29.3	100
Total	41	100		41	100	

5.3.2 Level of claims awarded/granted by employers

In Table 5-8, the data obtained regarding the level of claims granted (questions 15.1 and 15.2) is analyzed. The results show that in about 56% of the projects, the EoT claims granted were 60% or more of the amount requested. 60% or more of the additional cost claims requested were granted in 42% of the projects. The outlook is that in more than half of the projects surveyed, the contractors were awarded 60% or more of the amount of EoT claims requested while 60% or more of the additional cost claims requested were awarded to the contractors in less than half of the projects (42%). Success rate for EoT claims surpass that of additional cost claims. During the survey, some of the respondents provided additional information that in many cases they were awarded EoT on the condition that they will abandon their claims for additional costs.

Table 5-8 Level of extension of time (EoT) and additional cost claims awarded

% of amount requested	EoT claims awarded			Additional cost claims awarded		
	Frequency	Percent	Cumulative Percentage of projects	Frequency	Percent	Cumulative Percentage of projects
90% and up to 100%	12	29.3	29.3	4	9.8	9.8
75% and up to 89.99%	9	22.0	51.2	6	14.6	24.4
60% and up to 74.99%	2	4.9	**56.1**	7	17.1	**41.5**
45% and up to 59.99%	6	14.6	70.7	6	14.6	56.1
30% and up to 44.99%	1	2.4	73.2	1	2.4	58.5
15% and up to 29.99%	2	4.9	78.0	8	19.5	78.0
0.1% and up to 14.99%	9	22.0	100	9	22.0	100
Total	41	100		41	100	

5.3.3 Cost Claims paid by the employer

Table 5-9 presents the analysis of question 17 (appendix 1) which measures the percentage of approved cost claims which was finally paid by the employer.

Table 5-9 Cost Claims Paid by Employer

% of certified claims paid	Additional cost claims awarded		
	Frequency	Percent	Cumulative Percentage of projects
90% and up to 100%	40	97.56	97.56
75% and up to 89.99%	0	0	97.56
60% and up to74.99%	0	0	97.56
45% and up to 59.99%	0	0	97.56
30% and up to 44.99%	0	0	97.56
15% and up to 29.99%	0	0	97.56
0% and up to14.99%	1	2.44	100
Total	41	100	

The results show that in 98% of the projects, 90% or more of the cost claims approved were finally paid by the employer. During the interview, one respondent reported that the employer refused to pay despite the fact that the cost claims were certified. At the time of the interview, the case was still under negotiation. However, the respondents indicated that if negotiation fails, formal dispute resolution would be pursued.

5.3.4 Conflict Issues

This section analyses question 44 (Appendix 1). The mean of the scores assigned by the respondents to each of the nine conflict issues was calculated and ranked. The results (Table 5-10) show that quantum of claims is the most frequent issue responsible for disagreements. This is not surprising when one considers the fact that construction contracts are commercial transactions and parties may desire to maximize returns (Williamson, 1975, 1985).

Table 5-10 Mean Score and Ranking of Conflict Issues

Issue	Mean Score	Rank
The quantum of contractor's entitlements	5.4	1
Criticality of delays	5.2	2
Responsibility for delays	4.7	3
Whether or not the works giving rise to claims was required by the contract or was extra work	4.7	4
The type and amount of information used in substantiating claims	4.6	5
Whether or not the contractor actually incurred added cost	4.5	6
Contract interpretation	4.3	7
Concurrency of Delays	4.2	8
The methodology and technique used in substantiating and assessing claims	3.9	9

Note: Scale 1 – 7 (1 = least often; 7 = most often)

The question of criticality of delay is the next most frequent issue of disagreements (2nd). In a delays claims process, a contractor's entitlement to EoT would depend on the question of whether the delay event is on the critical path and whether it contributes to the overall project delays (Perlman, 1984). The question of criticality could be an area of argument especially where the construction programme is not progressively and consistently updated and monitored (Pickavance, 1997).

Following disagreements on criticality of delays, disagreement regarding responsibility for the event causing the claims ranked third. This is not surprising because when claims event occur, liability for the event are typically allocated to the party responsible for the event. Given the complex nature of construction activities, interdependency of roles and responsibilities and the high conflict of interest among the parties in a construction contract, arguments relating to responsibility for claims events are likely to be an area of frequent disagreements (Sykes, 1990).

Disagreements on whether the works giving rise to the claims was required by the contract or was extra work was ranked 4^{th}. This is also an important aspect of claims process which is needed to determine the validity of contractor's claims and the quantum of the entitlements (Perlman, 1984). Incomplete documentation is likely to generate variations, thus this frequency of such disagreement may depend on the level of completeness of contract documents prior to the execution of contract agreement.

Disagreements on type and amount of information ranked fifth. This was followed by disagreement on whether or not additional cost was incurred, issues of contract interpretation, and concurrency of delays. The problem with methodology/approach used in calculating claims ranked lowest. The use of different information and methodology by the contractor and claims certifier to substantiate and assess claims respectively would produce different results and conclusion

(Kumaraswamy and Yogeswaran, 2003; Zack, 2002) and thereby high potential for conflict and dispute.

5.3.5 Frequency and Severity of disagreements

This section analyses question 37 and 38 (Appendix 1). A one sample t test was conducted to determine the overall intensity of conflict (measured by two items as follows: the overall frequency of disagreements and the severity of disagreements) and whether the mean score of the two items were significantly different from 4 (midpoint representing "moderately frequent" and "moderately severe" on the Likert scale of 1 to 7; 1= never/not severe; 7= very often/very severe). The results (Table 5-11) show that disagreements happened in significant frequency (p = 0.006) but these disagreements are moderately severe (p= 0.920).

Table 5-11 Results of One-Sample t test for intensity of conflict (test value = 4)

Items	Mean	t value	Sig. (2-tailed)
Frequency of disagreement	4.7	2.901	p = 0.006
Severity of disagreement	4.0	0.101	p = 0.920

The results imply that there were very frequent disagreements in the handling of claims on the projects, and the disagreements were moderately severe. Thus, the projects are very good arena for studying conflict and disputes. A simple correlation analysis further shows that the higher the frequency of disagreement, the higher the severity of disagreements ($r = 0.725$, $p<0.01$). Also, the higher the severity of disagreements, the higher the level of damage to the parties' working relationship ($r=0.362$, $p<0.05$).

Similarly, the higher the severity of disagreements, the higher the contractors' indicated tendencies to formally dispute claims ($r=0.398$, $p<0.01$). These results suggest that it is more productive to prevent conflict in construction as frequent conflict could be severe, damage working relationship and the severity of the conflict could lead to formal dispute resolution. These results appear to support the preventive approach to construction conflict management (Fellows et al. 1994; Kumaraswamy, 1997) as opposed to encouraging conflict (Hughes, 1994; Pascale, 1991).

5.3.6 Resolution of conflicts

Data relating to the question of how most of the conflicts were finally ended was analyzed (question 40, appendix 1). Table 5-12 shows that in 41.5% of the projects, conflicts were resolved by mutually agreed upon solution while in 43.9% of the cases the contractor gave-in (one-sided compromise) so as not to start a dispute and to protect its reputation. Most of the decisions on claims were forced on the contractor in 14.6% of the projects.

Table 5-12 Resolution of Conflicts

Mode of conflict resolution	Number of cases	% of total
Most of the solutions were mutually agreed upon	17	41.5
In most cases the contractor gave in (one-sided compromise) its position so as not to engage in dispute.	18	43.9
Most of the decisions were imposed (forced) on the contractor	6	14.6

The result suggests that in most of the projects, conflicts were resolved by two dominant modes namely: one-sided compromise by the contractor and mutual agreement between the parties. The dominance of one-sided compromise mode (43.9%) may be due to the size of the Singapore construction market and cultural influences. Although Singapore been an open economy has been tremendously influence by western management philosophy, it is likely that the influence if Chinese culture and traditional values is still present. Chinese culture tends to avoid conflict in the belief that maintaining relationship is necessary for sustaining good will and ensuring future cooperation (Cheung and Chuah, 1999) and for securing future job.

5.3.7 *Effect of conflict resolution on contractors' attitudinal propensities and relationship with employer*

It is likely that the impact of disagreements on the working relationship, the contractor's potential to reject the outcome of claims and the contractor's potential to dispute the outcome of claims would vary across the three modes by which conflict were ended (see Table 5-12). T test (Table 5-13) was conducted to check if the mean scores of each of these items were significantly different from the mid-point of 4 on a Likert scale of 1 to 7 (1 = "not much", 7 = "a lot", for impact of disagreements on working relationship; 1= "not at all", 7 = "to great extent" for potential to reject outcome of claims and for potential to dispute). The results show that whichever way conflicts were resolved, there is no significant impact on the working relationships between the employers and the contractors.

Table 5-13 Results of one-sample t test for the effect of conflict resolution modes

Conflict termination Mode	Impact of disagreement on working Relationship (1 = not much, 7 = a lot)	Contractor's potential to reject decision 1= not at all, 7 = to great extent	Contractor's potential to dispute 1= not at all, 7 = to great extent
By mutual agreement (n= 17)	Mean score = 3.41 t value = -1.661 p = 0.116	Mean score = 3.88 t value = - 0.243 p = 0.811	Mean score = 3.71 t value = - 0.582 p = 0.569
By contractor's one-sided compromise (n= 18)	Mean score = 4.50 t value = 1.40 p = 0.177	Mean score = 5.05 t value = 3.12 p = 0.006	Mean score = 5.05 t value = 2.491 p = 0.023
Solution imposed on the contractor (n= 6)	Mean score = 4.83 t value = 1.38 p = 0.177	Mean score = 5.50 t value = 4.39 p = 0.007	Mean score = 4.67 t value = 1.195 p = 0.286

Note: Test value = 4

When conflict was resolved by mutual solution and mutual agreement, negative attitudinal propensities were also moderate (for potential to reject the outcome, the mean = 3.88, p = 0.811; for potential to dispute, the mean = 3.71 with p value of 0.569). This is not surprising in that when parties adopts a culture of seeking mutually agreed upon solution to disagreement on claims, it is likely to lead to a win-win solution for both parties hence little potential for dispute (Zack, 1993).

On projects where contractors gave-in (one-sided compromise) their position so as not to engage in further dispute, they indicated significantly high negative attitudinal propensities (for potential to reject the outcome the mean = 5.05, with p value of 0.006; and for potential to dispute the mean = 5.05 with p = 0.023).

Where solution was imposed on contractors, they indicated a significantly high potential to reject the outcome (mean = 5.50, p = 0.007) but moderate potential to dispute (mean = 4.67, p = 0.286). This result was unexpected as forced decision is expected to impact working relationship more negatively and generate a very high potential to dispute. However, the result might be because of the small number of projects (n=6) used in computing the mean values.

Put together, the results suggest that that when conflict arises, their impact on negative attitudinal propensities of parties involved may be reduced by finding a settlement which is mutually acceptable and which focuses on the needs of all parties involved – rather than a one sided-compromise by one of the parties or imposition or forcing of a decision on a party. Although some contractors may compromise their interests and position so as to avoid conflict in the belief that maintaining harmonious relationship is necessary for sustaining good will and ensuring future cooperation

(Cheung and Chuah, 1999) and for securing future jobs, the results of this study suggest that adopting the compromise mode to resolve a conflict may be counterproductive. One-sided compromise for the sake of reputation or a relationship is a win/lose situation that makes the compromising party to ignore its won needs in order to meet the need of the other party. The compromising party may suffer a loss and become dissatisfied. This may generate a very high propensity for negative attitude; and may encourage adversarial culture in future contract relationships. Mutual settlement focuses on parties' respect for one another's interests. It leads to win/win solution and could lead to long lasting relationship (Zack, 1993). Attempt to impose or force a decision on a party is a win/loose approach, one sided, adversarial, threatening and aggressive in nature. It may lead to rejection of the decision and negative attitudinal propensities.

5.3.8 Employers' participation in the claims process

This section analyse question 36 (1) which addresses the extent to which the employers participated in the claims process. A one sample t test was conducted by calculating the mean score for the item and whether the mean score is significantly different from 4 (midpoint) on the Likert scale of 1 to 7; 1 = never and 7 = always). The result shows that the mean level of employers' participation in the claims process is 4.19. A one sample t test analysis shows that the mean is not significantly different from the mid-point - 4 ($p = 0.539$) hence the extent of employers' direct participation in the claims process is not significant – implying that they rarely or occasionally participated.

5.3.9 Frequency of Schedule Update

Question 24 which addresses the frequency of schedule update on the projects was analysed. The result (Table 5-14) shows that in about half of the projects (49%), the construction programme was updated every 3 months and above.

Table 5-14 Frequency of programme update

Frequency	Number of cases	% of total
1 month	15	36.6
2 months	6	14.6
3 months and above	20	48.8

This reinforces the result in Table 5-10 which shows that criticality of delays and allocation of responsibility for delays are the 2nd and 3rd most frequent issues of disagreement. Lack of proper and timely update of construction programme might lead to difficulties in tracking whether or not the delay is on critical path of the construction programme and might also make it difficult to allocate responsibility for delay events (Sykes, 1990; Pickavance, 1997).

5.3.10 Satisfaction with information used in assessing claims

Questions 23 (1) and (2) (appendix 1) asked the respondents to rate from 1 to 7 (1 = rarely; 7 = always) the frequency to which they were satisfied that the information they supplied was sufficiently considered by the claims certifier when assessing and deciding their claims. The results (Table 5-15) show that the mean frequency of contractors' satisfaction with the extent to which information for substantiating claims was sufficiently considered by the claim certifier stands at 4.09 and 3.60 for EoT claims and cost claims respectively.

Table 5-15 One-Sample t test for contractor's satisfaction with consideration of information

Items	Mean	t value	Sig. (2-tailed)
Contractor's satisfaction with the extent to which information supplied was sufficiently considered by the claim certifier in assessing and deciding EOT	4.09	0.404	0.688
Satisfaction with the extent to which information supplied was sufficiently considered by the claim certifier in assessing and deciding cost claims	3.60	-1.615	0.114

Note: Test value = 4

One same t test shows that the means are not significantly different from mid point – 4, (p= 0.688 and p = 0.114 respectively). This implies that the frequency to which the contractors were satisfied that the information they supplied was sufficiently considered by the claims certifier when assessing and deciding their claims is insignificant implying that the contractors are sometimes/occasionally satisfied. This potentially may lead to dissatisfaction and hence conflict and dispute.

A simple correlation analysis revealed that higher levels of satisfaction with the extent to which claim certifier considered information for substantiating EoT claims were associated with lower levels of contractors' potential to dispute (r= -0.49, p= 0.01). Also, higher levels of satisfaction with the extent to which claim certifier considered information for substantiating cost claims were associated with lower severity of disagreement (r= 0.436, p= 0.01), lower potential to reject the claims certifier's decision (r= - 0.382, p= 0.05), and lower levels of potential to dispute (r= -0.317, $p<0.05$).

6.3.11 Time taken to assess, decide and resolve claims

Analyses of questions 25 (3), 25(4), 26 and 27 (appendix 1) was conducted to evaluate the average time taken to assess EoT and additional cost claims; and the average time taken to resolve disagreements and agree on the claims after they had been assessed.

Table 5-16 Average time taken for claims certifier to assess claims

Time taken	EoT claims			Additional cost claims		
	Frequency	Percent	Cumulative Percentage of projects	Frequency	Percent	Cumulative Percentage of projects
More than 6 months	14	34.2	**34.1**	19	46.3	**46.3**
5 - 6 months	2	4.9	39.0	2	4.8	**51.1**
4 – 5 months	0	0	39.0	1	2.4	53.5
3 – 4 months	3	7.3	**46.3**	6	14.7	68.2
2 – 3 months	13	31.7	78.0	6	14.7	82.9
1 – 2 months	8	19.5	97.6	6	14.7	97.6
0 – 1 months	1	2.4	100	1	2.4	100
Total	41	100		41	100	

The results (Table 5-16) suggest that on about half of the projects (46.3%), the EoT claims were assessed on the average of 3 months or more after the claims were presented by the contractor. Also, on a relatively large proportion of the projects (34%), the EoT claims were assessed on the average of 6 months or more. When the contractors were asked to rate whether the time average time taken for assessing EoT may be considered reasonable relative to the complexities of the issues involved, the result produced a mean rating of 3.24 on a Likert scale of 1 to 7 (1= very unreasonable , 7= very reasonable). One sample t test showed that the mean is significantly different from the midpoint - 4 (p= 0.000). This implies that the contractors considered the time taken to assess EoT unreasonable. Further, on about half of the projects (51.1%), additional cost claims were assessed on the average of 5 months or more after they were presented by the contractor (Table 5-14). However, on relatively large proportion of the projects (46%), cost claims were assessed on the average of 6 months or more after they were presented. Relative to the complexity of the claims, contractors consider this average time taken to assess cost claims as unreasonable (mean= 3.04, on a Likert scale of 1 to 7, and one sample t test shows that the mean is significantly different from mid-point of 4 - p= 0.000).

Table 5-17 Average time taken resolve disagreements on claims

Time taken	EoT claims			Additional cost claims		
	Frequency	Percent	Cumulative Percentage of projects	Frequency	Percent	Cumulative Percentage of projects
More than 6 months	14	34.1	34.1	13	31.7	31.7
5 - 6 months	2	4.9	**39.0**	3	7.3	**39.0**
4 – 5 months	0	0	39.0	1	2.4	41.4
3 – 4 months	5	12.2	**51.2**	5	12.2	**53.6**
2 – 3 months	4	9.8	61.0	4	9.8	63.4
1 – 2 months	7	17.1	78.1	9	22.0	85.4
0 – 1 months	9	21.9	100	6	14.6	100
Total	41	100		41	100	

Table 5-17 indicates that on about half of the projects (51.2%), disagreements on EoT claims were resolved within an average of 3 months or more after the claims were assessed. However, on a relatively large proportion of the projects (39%), disagreements on EoT claims were resolved on the average of 5 months or more after they were assessed. Relative to the complexities of the issues involved, the time average time taken to resolve disagreement on EoT claims was considered unreasonable (mean = 3.17, p= 0.003, using a t test value of 4). Further, on about half of the projects (53.6%), disagreements on additional cost claims were resolved on the average of 3 months or more after they were assessed (Table 5-15). However, on a relatively large proportion of the projects (39%), disagreements on cost claims were resolved on the average of 5 months or more after they were assessed. Relative to the complexity of the claims, the average time taken to resolve cost claims was considered very unreasonable by the contractors (mean= 2.92, p= 0.003 using a test value of 4). These results indicate that there were difficulties in assessing and in reaching agreements on EoT and additional cost claims on the projects. From the contractors' perspective, assessing and resolving claims took longer time than necessary. This further reinforced the appropriateness of the sample projects as an arena to study conflict and dispute.

5.4 Summary

The Chapter presents the general information on the profile of respondents, respondents' organizations, and profile of projects selected by respondents, level of claims and conflict on the projects, and how conflicts were resolved. The majority of the respondents are from the largest contracting firms in Singapore with unlimited tendering limit and with turnover of over S$150 million and above. Their firms have average of 22 years working experience in Singapore construction industry. Thus they are big players with technical and management expertise.

About half of the projects upon which the responses were based are building projects while the others are civil engineering projects. Half were procured by the public sector and another half by the private sector. The numbers of the projects procured under the Public Sector Standard Conditions of Contract – PSSCOC is approximately equal to the numbers procured by the Singapore Institute of Architect Conditions Contract. The average project value stands at S$97.8 million. The project were commenced and completed within the same time frame hence under the same market condition. The majority of the respondents are quantity surveyors and cost experts. They have over 11 year of experience in construction and have handled over 25 projects.

In about half of the projects, the construction programme was updated on the average of 3 months and above. The EoT and cost claims were assessed on the average of 6 months or more on a relatively large proportion of the projects. Contractors considered the time taken to assess claims as unreasonable. On the average it took 6 months or more to resolve claims on a relatively larger proportion of the projects. The employer occasionally or sometimes directly participated in the resolution of the claims. Disagreements on the claims were very frequent and they were moderately severe. Quantum of claims was the most frequent issue responsible for disagreements, and was followed by the question of criticality of delay and disagreement regarding responsibility for the event causing the claims.

On a relatively large proportion of the projects, disagreements on EoT and cost claims were resolved on the average of 5 months or more after they were assessed. In most of the projects, conflicts were resolved by two dominant modes namely: one-sided compromise by the contractor and mutual agreement between the parties. On projects where most of the conflicts were resolved by mutually agreed upon solution, working relationships were moderately affected while negative attitudinal propensities, such as the contractor's potential to reject the outcome and the potential to dispute were also moderate. However, on projects where most of the conflicts were resolved by one-sided compromise or by employers' imposition of a decision on the contractor, working relationships were moderately affected and the contractors indicated a very high level of negative attitudinal propensities. In the end, the success rate for EoT claims surpasses that of additional cost claims.

CHAPTER SIX

DATA ANALSYIS

6.1 Introduction

The Chapter presents the analysis of the data obtained from the survey. It addresses objective 2 by analysing the relationship between a contractor's perceptions about fairness, conflict intensity and the contractor's potential to dispute. The analysis section indicates the steps and criteria for interpreting and assessing the results. The rest of the chapter explains and interprets the results of the hypothesised relationships, including reasons why the results either support or contradict earlier research.

6.2 Model Testing Using PLS-SEM

This section addresses objective 2 by testing the conceptual model developed (Figure 3-8) and by identifying the underlying critical process of how perceptions of fairness influence conflict intensity and potential to dispute. The model is tested using PLS-SEM (see Section 4.7 for a detailed discussion and justification). In PLS, parameters for both the links between measures and constructs i.e. loadings (measurement model) and the links between different constructs i.e. path coefficients (structural model) are estimated at the same time (Hulland, 1999). The measurement model can be expressed as follows:

$$y = \wedge_y \eta + \in$$
$$x = \wedge_x \xi + \delta \quad \text{.......................... Equation 6.1}$$

where y = (p x 1) is a vector of endogenous indicators, x = (q x 1) is a vector of exogenous indicators, $\wedge_y$ = (q x n) is a matrix of regression coefficients of ξ on x, and $\in$ = (p x 1) and δ = (q x 1) are vectors of measurement error for the endogenous and exogenous variables respectively.

The structural model can be expressed as follows:

$$\beta\eta = \Gamma\xi + \zeta \quad \text{..Equation 6.2}$$

where η = (m x 1) is a vector of latent endogenous variables, ξ = (n x 1) is a vector of latent exogenous variables, β = (m x m) is a matrix of endogenous variable coefficients, Γ = (m x n) is a matrix of exogenous variable coefficients, and ζ = (m x 1) is a vector of residuals.

In PLS, it is assumed for estimation purposes that the latent variables (constructs) are specified as linear combination of their respective indicators and for convenience, that all indicators are standardized (mean of zero and variance of one) (Hulland, 1999, Chin, 1998).

6.3 Assessing PLS Model

A PLS model is usually analyzed and interpreted sequentially in two stages: (1) the assessment of the reliability and validity of the measurement model (relationship between each constructs and items measuring them) followed by (2) assessment of the structural model (relationship among the constructs) (Hulland, 1999). The sequence ensures that the reliability and validity of measures of constructs are ascertained before attempting to draw conclusions about the nature of the relationships among the constructs. The results of the assessment of measurement model and structural model for this study are now presented.

6.4 Results of Assessment of Measurement Model

The adequacy of measurement model (representing the model of relationship between the latent variables and the items measuring them – see section 4.7.4) in PLS was evaluated by the follows: (1) reliability of the questionnaire items – individual item reliability; (2) convergent validity of the measures associated with individual constructs (Cook and Campbell, 1979); and (3) discriminant validity (Campbell and Fisk, 1959) of the research instruments (Gefen *et al.*, 2000).

6.4.1 Individual Item Reliability

Individual item reliability is defined as the extent to which measurements of the constructs taken with multiple-item scale on the questionnaire reflects mostly the true score of the constructs relative to the error (Hulland, 1999). It is the correlations of the items with their respective constructs (individual item reliability). To evaluate individual item reliability the standardized loadings (or simple correlation) were assessed. A rule of thumb employed by many researchers is to accept items with loadings of 0.7 or more, which implies that there is more shared variance between the construct and its measure than error variance (Carmines and Zeller, 1979). Since the loadings are correlations, this implies that more than 50% of the variance in the observed variables (i.e., the square of the loadings) is due to the construct (Hulland, 1999). Nunnally (1976) suggested that items with low loadings should be reviewed, and perhaps dropped since they would add very little explanatory power to the model and therefore biasing the estimates of the parameters linking the constructs.

According to Hulland (1999), in general terms, items with loadings of less than 0.4 (a threshold commonly used for factor analysis results) or 0.5 should be dropped. Fornell and Larcker (1981) recommended a cut-off point of 0.70 while Chin (1998) recommended a cut-off of 0.707. Where scales are adapted from other settings and some are new scales, a loading of 0.5 may be used as a cutoff point (Chin, 1998). Barclay *et al*. (1995) also opined that in cases where the instrument is developed under a specific context and applied to a different context, the loadings cutoff point may become lower.

In this study, the scales used were adapted from studies on organizational justice in other settings. The scales have not been tested before in the context of construction. It is possible that some of the items are not applicable across all contexts and or settings. Also, some of the items are newly developed (see for example, CTR1 and CTR3 in Table 4.3) based on an exploratory review of judicial decision transcripts of litigated construction claims (Chapter 3) and discussion with practitioners. Hence, in order to as much as possible limit errors in measurement, enhance precision and validity of the scales and explanatory power of the model developed, a conservative value of 0.70 was used as the cutoff point. Nevertheless, prior to removal, the potential practical significance of items with loadings lower than 0.70 was carefully evaluated.

Based on the 0.70 rule of thumb for removal of items, iterative assessment of item loadings was conducted using PLS-Graph 3.0 software. Items with loading of less than 0.70 were removed in sequence after each run. This is achieved by entering all the items into the model developed in chapter 3 and set out in the software. The model is then run and the loading of individual items on their respective construct are checked. The item with the lowest loading below 0.7 is then removed. Thereafter the remaining items are entered again and the item with lowest loading below 0.7 is removed. This was performed in an iterative process until no item is found to have a loading of below 0.7. After this iterative process, the items dropped are listed in Table 6-1 while Table 6-2 shows the items used in the model testing.

The loadings and the statistical significance of all items used in the final model are also presented in Table 6-3. These items all have loadings above 0.70. This implies that less than half of an item's variance is due to error. All the items included demonstrate satisfactory level of individual item reliability. In addition, Table 6-3 shows that the loadings are all statistically significant.

6.4.2 Convergent Validity

When multiple items are used to measure an individual construct, Hulland (1999) stated that the researcher should be concerned not only with the reliability of the individual measurement items, but also with the extent to which the measures demonstrate convergent validity. Convergent validity is the measure of the internal consistency. It is estimated to ensure that the items assumed to measure each construct measures them and not measuring another construct. Convergent validity may also be referred to as the homogeneity of the constructs. In PLS, two tests can be used to determine the convergent validity of the measured constructs (Fornell and Larker, 1981): (1) Composite reliability scores (ρ_c) and Cronbach's Alpha for the constructs; and (2) Average variance extracted (*AVE*).

Table 6-1 Items Dropped during Exploratory Analysis

Construct	Item Code	Item
Outcome Favourability (OFAVOUR)	OFA2	Actual Percentage of % EoT claims allowed
	OFA4	Level of favorability of decision made on EoT claims
	OFA6	Satisfaction with losses and wins from EoT claims
Decision Outcome Fairness (DOFAIR)	DOF1	EoT claims allowed relative to what was expected
	DOF3	EoT claims allowed relative to what was perceived to be deserved
	DOF5	Perceived fairness of EoT allowed
	DOF7	EoT claims allowed compared with what was allowed on similar projects
	DOF8	Cost claims allowed compared with what was allowed on similar projects
Quality of Treatment Experienced (QTREAT)	QTE1	Whether explanation and reasons were provided for the decision made on claims
	QTE3	Perceived reasonableness of the average time taken to assess and decide cost claims
	QTE4	Perceived reasonableness of the average time taken to assess and decide EoT claims
	QTE5	Treatment of personnel with politeness, courtesy and dignity
Control (CTROL)	CTR2	Extent of pre agreement and clarity on methodology for project scheduling
Quality of Decision-Making Process (QDPROCESS)	QDP7	Perceived frequency to which claims were decided based on employer's concern for time and cost overrun
	QDP8	The % of employer project management who were acquainted with the history of claims but left the project before the claims were assessed and decided
Potential for Dispute (PDISPU)	PD3	The nature of final resolution of claims
	PD4	Extent to which another claims certifier would be preferred on future projects
Procedural Fairness (PFAIR)	PF2	Overall Satisfaction with procedure for assessing and deciding EoT claims

Table 6-2 Items Used in Model Estimation

Construct	Item	Description
Outcome Favourability (OFAVOUR)	OFA1	Actual Percentage of % cost claims allowed
	OFA3	Perceived level of favourability of cost claims allowed
	OFA5	Extent of satisfaction with losses and wins on cost claims
Decision Outcome Fairness (DOFAIR)	DOF2	Cost Claims allowed relative to what was expected
	DOF4	Cost claims allowed compared with what contractor perceived it deserved
	DOF6	Perceived Fairness of cost claims allowed
Quality of Treatment Experienced (QTREAT)	QTE2	Frequency to which contractor was provided with explanations and reasons for decision made on claims
	QTE6	Perceived extent to which respect and concern was shown for the contractor's contractual rights
	QTE7	Frequency to which claims were tabled for discussion at site meetings
	QTE8	Perceived extent to which employer's project management follow through agreements during claims negotiation
Control (CTROL)	CTR1	Extent of pre agreement and clarity on methodology for substantiating and assessing claims
	CTR3	Extent of pre agreement and clarity on rules of evidence for claims
Quality of Decision-Making Process (QDPROCESS)	QDP1	Perceived extent to which decisions made on EoT claims were based upon facts, and not personal biases
	QDP2	Perceived extent to which decisions made on cost claims were based upon facts, and not personal biases
	QDP3	Perceived extent to which claims were decided without favouritism
	QDP4	Perceived extent to which claims certifier showed consistency in deciding claims
	QDP5	Perceived level of claims certifier's expertise in diagnosing and assessing of claims
	QDP6	Perceived level of claims certifier's expertise in deciding claims
Procedural Fairness (PFAIR)	PF1	Perceived level of fairness of procedure for handling claims
	PF3	Overall satisfaction with procedure assessing and deciding cost claims
	PF4	Perceived extent to which claims certifier tried hard to be fair
	PF5	Perceived extent to which claims were decided fairly
Conflict Intensity (CI)	CI1	Frequency of disagreement with the handling of claims
	CI2	Severity of disagreement with the handling of claims
	CI3	Perceived extent to which the disagreement influenced working relationship
Potential for Dispute (PDISPU)	PD1	Extent to which decisions on claims would have been rejected
	PD2	Extent to which claims would have been disputed beyond onsite claims process

Table 6-3 Loadings and Statistical Significance of Items

Construct	Item	Loading	T-Statistic	Significance Level
Outcome Favourability (OFAVOUR)	OFA1	0.87	6.773	0.000
	OFA3	0.86	6.745	0.000
	OFA5	0.81	13.20	0.000
Decision Outcome Fairness (DOFAIR)	DOF2	0.91	36.507	0.000
	DOF4	0.92	39.189	0.000
	DOF6	0.88	23.194	0.000
Quality of Treatment Exerienced (QTREAT)	QTE2	0.75	8.806	0.000
	QTE6	0.82	9.490	0.000
	QTE7	0.79	12.131	0.000
	QTE8	0.76	7.819	0.000
Control (CTROL)	CTR1	0.91	14.606	0.000
	CTR3	0.90	14.121	0.000
Quality of Decision-Making Process (QDPROCESS)	QDP1	0.76	9.478	0.000
	QDP2	0.78	14.203	0.000
	QDP3	0.76	10.324	0.000
	QDP4	0.76	6.644	0.000
	QDP5	0.80	8.177	0.000
	QDP6	0.87	12.114	0.000
Procedural Fairness (PFAIR)	PF1	0.85	13.205	0.000
	PF3	0.89	25.844	0.000
	PF4	0.72	6.053	0.000
	PF5	0.95	62.555	0.000
Conflict Intensity (CI)	CI1	0.75	4.249	0.000
	CI2	0.89	7.824	0.000
	CI3	0.69	3.763	0.000
Potential for Dispute (PDISPU)	PD1	0.93	28.232	0.000
	PD2	0.83	7.071	0.000

6.4.2.1 Composite Reliability Scores and Cronbach's Alpha

Cronbach's alpha is the coefficient of reliability (or consistency). It measures how well a set of items (or variables) measures a single one-dimensional latent construct. When data have a multidimensional structure, Cronbach's alpha will usually be low. Cronbach's alpha may be estimated by (Cronbach, 1951):

$$\propto \frac{N-\bar{r}}{1+(N-1)-\bar{r}}$$ .... Equation 6.3.

Where N is equal to the number of items and $\bar{r}$ is the average inter-correlation among items (average of all Pearson correlation coefficients between the items).

The formula for calculating composite reliability score is (Werts et al. 1974, Chin, 1998):

$$\rho_c = \frac{(\sum \lambda_i)^2}{(\sum \lambda_i)^2 + \sum_i \operatorname{var}(\varepsilon_i)} \quad \text{....................Equation 6.4}$$

Where ρ_c is the composite reliability score and λ_i is the component loading of each item to a latent construct and $\operatorname{var}(\varepsilon_i) = (1 - \lambda_i^{\,2})$

Composite reliability score is superior to Cronbach's Alpha measure of internal consistency since it uses the item loadings obtained within the theoretical model (Fornell and Larker, 1981). Cronbach's Alpha weighs all items equally without considering their factor loadings. Nonetheless, the interpretation of composite reliability score and Cronbach's Alpha is the same. Nunnally (1978) suggests 0.7 as a benchmark for 'modest' composite reliability. However, Churchil (1979) suggest that a Cronbach's Alpha value of 0.6 is acceptable. In this study, the composite reliabilities generated as part of PLS-Graph 3.0 output are presented in Table 6-4. Using SPSS 13.0, the Cronbach's Alpha for the constructs were also determined and are indicated in Table 6-4. Using Nunnally's 0.7 benchmark for composite reliability, all the constructs demonstrate acceptable level of convergent validity. Applying Churchil's (1979) benchmark for Cronbach's Alpha, all constructs showed good reliability. Hence the measurement items are appropriate for their respective constructs.

Table 6-4 Composite Reliabilities (ρ_c) Scores and Cronbach's Alpha of Constructs

Construct	**Item**	**Composite Reliability (from PLS graph) (ρ_c)**	**Cronbach's Alpha (from SPSS)**
Outcome Favourability (OFAVOUR)	OFA1 OFA3 OFA5	0.883	0.819
Decision Outcome Fairness (DOFAIR)	DOF2 DOF4 DOF6	0.932	0.890
Quality of Treatment Exerienced (QTREAT)	QTE2 QTE6 QTE7 QTE8	0.862	0.786
Control (CTROL)	CTR1 CTR3	0.901	0.781
Quality of Decision-Making Process (QDPROCESS)	QDP1 QDP2 QDP3 QDP4 QDP5 QDP6	0.907	0.878
Procedural Fairness (PFAIR)	PF1 PF3 PF4 PF5	0.915	0.874
Conflict Intensity (CI)	CI1 CI2 CI3	0.825	0.682
Potential for Dispute (PDISPU)	PD1 PD2	0.880	0.740

6.4.2.2 Average variance extracted (*AVE*)

Further, the average variance extracted (AVE) (Fornell and Larker, 1981) was used to assess the internal consistency of the constructs. AVE measures the amount of variance that a construct captures from its indicators relative to the amount due to measurement errors. AVE can be calculated as follows:

$$AVE = \frac{\sum \lambda_i^2}{\sum \lambda_i^2 + \sum_i \operatorname{var}(\varepsilon_i)} \quad \text{..........................Equation 6.5}$$

where AVE is the average variance extracted

λ_i is the component loading of each item to a latent construct and

$\mathrm{var}(\varepsilon_i) = (1 - \lambda_i^{\,2})$

Fornell and Larcker (1981) stated that AVE should be higher than 0.5. This means that at least 50 % of measurement variance is captured by the construct. The *AVE*s generated by PLS-Graph 3.0 are above 50% for all constructs (Table 6-5) suggested by Fornell and Larker.

Table 6-5 Average Variance Extracted for Constructs

Construct	Item	Average variance Extracted (AVE)
Outcome Favourability (OFAVOUR)	OFA1	0.716
	OFA3	
	OFA5	
Decision Outcome Fairness (DOFAIR)	DOF2	0.820
	DOF4	
	DOF6	
Quality of Treatment Exerienced (QTREAT)	QTE2	0.609
	QTE6	
	QTE7	
	QTE8	
Control (CTROL)	CTR1	0.820
	CTR3	
Quality of Decision-Making Process (QDPROCESS)	QDP1	0.620
	QDP2	
	QDP3	
	QDP4	
	QDP5	
	QDP6	
Procedural Fairness (PFAIR)	PF1	0.731
	PF3	
	PF4	
	PF5	
Conflict Intensity (CI)	CI1	0.614
	CI2	
	CI3	
Potential for Dispute (PDISPU)	PD1	0.791
	PD2	

The results in Table 6-4 and 6-5 demonstrate that there is convergent validity and good internal consistency in the measurement model. This implies that the measurement items of each constructs measures them well and are not measuring another construct.

6.4.3 Discriminant Validity

After assessing the individual item reliability and convergent validity of the measurement model, the discriminant validity of the measurement was evaluated next. Discriminant validity indicates the extent to which a given construct is different from other constructs in the same model (Hulland, 1999). To assess discriminant validity, two tests were conducted (Chin, 1998):

(1) Analysis of cross-loadings and

(2) Analysis of average variance extracted (AVE).

6.4.3.1 Analysis of Cross-Loading

The analysis of cross-loading was conducted by following the rule that items should have a higher correlation with the construct that they are supposed to measure than with any other constructs in the model (Chin, 1998). A cross-loading check was performed using PLS-Graph 3.0 and SPSS 13.0. First, PLS-Graph 3.0 was used to generate the latent variable scores for all the latent constructs and standardized items. The latent variable scores and standardized items were then entered into SPSS 13.0. and Pearson's correlation coefficients for all the standardized items against the latent variable scores were computed. The Pearson correlation results are presented in Table 6-6. The Table shows that all items loaded higher on the construct they were theoretically specified to measure than any other construct in the model. The cross-loading thus indicates that all the 27 items loaded distinctly on the specified construct they measured hence demonstrating discriminant validity of the constructs.

Table 6-6 Cross-Loading Analysis

	OFAVOUR	DOFAIR	QTREAT	CTROL	QDPROCESS	PFAIR	CI	PDISPU
OFA1	**0.851**	0.464	0.331	0.278	0.394	0.462	-0.076	0.194
OFA3	**0.850**	0.466	0.336	0.280	0.397	0.460	-0.074	0.193
OFA5	**0.824**	0.703	0.737	0.370	0.587	0.702	-0.333	0.588
DOF2	0.642	**0.916**	0.681	0.179	0.544	0.693	-0.301	0.607
DOF4	0.588	**0.927**	0.700	0.260	0.530	0.653	-0.253	0.514
DOF6	0.644	**0.872**	0.704	0.280	0.784	0.765	-0.367	0.444
QTE2	0.427	0.668	**0.768**	0.250	0.479	0.572	-0.295	0.516
QTE6	0.583	0.615	**0.821**	0.628	0.686	0.653	-0.281	0.425
QTE7	0.508	0.575	**0.784**	0.349	0.593	0.545	-0.399	0.512
QTE8	0.446	0.535	**0.747**	0.437	0.581	0.621	-0.500	0.369
CTR1	0.350	0.215	0.465	**0.919**	0.335	0.343	-0.234	0.441
CTR3	0.349	0.266	0.506	**0.892**	0.292	0.333	-0.156	0.173
QDP1	0.407	0.511	0.548	0.228	**0.758**	0.567	-0.229	0.379
QDP2	0.553	0.764	0.788	0.390	**0.848**	0.806	-0.513	0.602
QDP3	0.290	0.345	0.387	0.127	**0.763**	0.623	-0.472	0.165
QDP4	0.474	0.470	0.452	0.142	**0.757**	0.509	-0.292	0.387
QDP5	0.444	0.477	0.627	0.336	**0.795**	0.642	-0.410	0.214
QDP6	0.514	0.534	0.604	0.325	**0.868**	0.707	-0.441	0.185
PF1	0.500	0.592	0.584	0.277	0.666	**0.847**	-0.530	0.427
PF3	0.647	0.814	0.794	0.359	0.730	**0.879**	-0.447	0.581
PF4	0.514	0.403	0.484	0.375	0.628	**0.730**	-0.409	0.189
PF5	0.678	0.794	0.724	0.285	0.821	**0.950**	-0.503	0.496
CI1	-0.180	-0.218	-0.285	-0.173	-0.444	-0.376	**0.743**	-0.176
CI2	-0.202	-0.264	-0.437	-0.233	-0.422	-0.505	**0.885**	-0.349
CI3	-0.173	-0.301	-0.352	-0.106	-0.350	-0.396	**0.706**	-0.479
PD1	0.556	0.646	0.639	0.367	0.456	0.555	-0.364	**0.935**
PD2	0.182	0.320	0.346	0.228	0.287	0.304	-0.472	**0.836**

6.4.3.2 Analysis of Average Variance Extracted (AVE)

In PLS, another criterion for adequate discriminant validity is that a construct should share more variance with its measures than it shares with other constructs in the model. For evaluating discriminant validity, Fornell and Larker (1981) suggest that the average variance extracted (AVE) of the constructs should be greater than the variance shared between the construct and other constructs (that is the squared between two constructs). This indicates that more variance is shared between the construct and its indicators than with another construct representing different sets of indicators. In this study, the rule that the square root of AVE of each construct should be larger than the correlation of two constructs (Staples, et al., 1999; Chin, 1998) was followed. To demonstrate this rule, in the correlation matrix for the constructs, the diagonal of the matrix is the square root of the AVE; and for adequate discriminant validity, the diagonal elements should be greater than the off-diagonal elements in the corresponding rows and columns (Hulland, 1999).

Table 6-7 presents the correlation matrix for the constructs. There was no correlation between any two latent constructs larger than or even equal to the square root AVEs of these two constructs (see Table 6-7). Hence discriminant validity test does not reveal any serious problem and this shows that all constructs are different from each other.

Table 6-7 Comparisons of correlations between latent constructs and square root of AVE

	AVE	OFAVOUR	DOFAIR	QTREAT	CTROL	QDPROCESS	PFAIR	CI	PDISPU
OFAVOUR	0.716	**0.846**							
DOFAIR	0.820	0.686	**0.905**						
QTREAT	0.609	0.620	0.767	**0.780**					
CTROL	0.820	0.383	0.267	0.539	**0.905**				
QDPROCESS	0.620	0.577	0.688	0.751	0.346	**0.787**			
PFAIR	0.731	0.682	0.785	0.769	0.371	0.835	**0.855**		
CI	0.614	-0.231	-0.339	-0.471	-0.217	-0.512	-0.551	**0.783**	
PDISPU	0.791	-0.464	-0.593	-0.593	-0.339	-0.442	-0.523	0.451	**0.889**

*Note: the highlighted diagonal values are the square root of AVE of each construct. Off diagonal elements are the correlations between constructs.

6.4.4 Final Measurement Model

Based on the results in sections 6.4.1 to 6.4.3, the measurement model has good individual item reliability, convergent validity and discriminant validity. Figure 6-1 shows the measurement model with the loading of the individual items on their respective construct. The results show that the constructs are within acceptable level of error. Therefore, the measurement model demonstrates sufficient robustness needed to test the relationship among the constructs (the structural model).

6.5 Explanatory Power of the Structural Model and Test of research hypotheses

With satisfactory robustness of the measurement model, the structural model was assessed next to determine the explanatory power of the model developed and to test the research hypotheses. The result of the structural model generated by PLS-Graph 3.0 is presented in Figure 6-2. However, prior to interpretation of the results, a test for model re estimation was considered.

6.5.1 Test for Model Re-estimation

Falk and Miller (1992) suggested that a variable that explains less than 1% of the variance of an endogenous variable should be eliminated as a predictor and the parameters of the mode re estimated. They argued that the elimination of paths, followed by the re estimation of the model, is the most inductive approach to model trimming and is justified by grounded theory approach, which is defined as discovery of theory from data (Glaser and Strauss, 1967). Heise (1975) stated that those path relationships that are zero should be eliminated from a theoretical model.

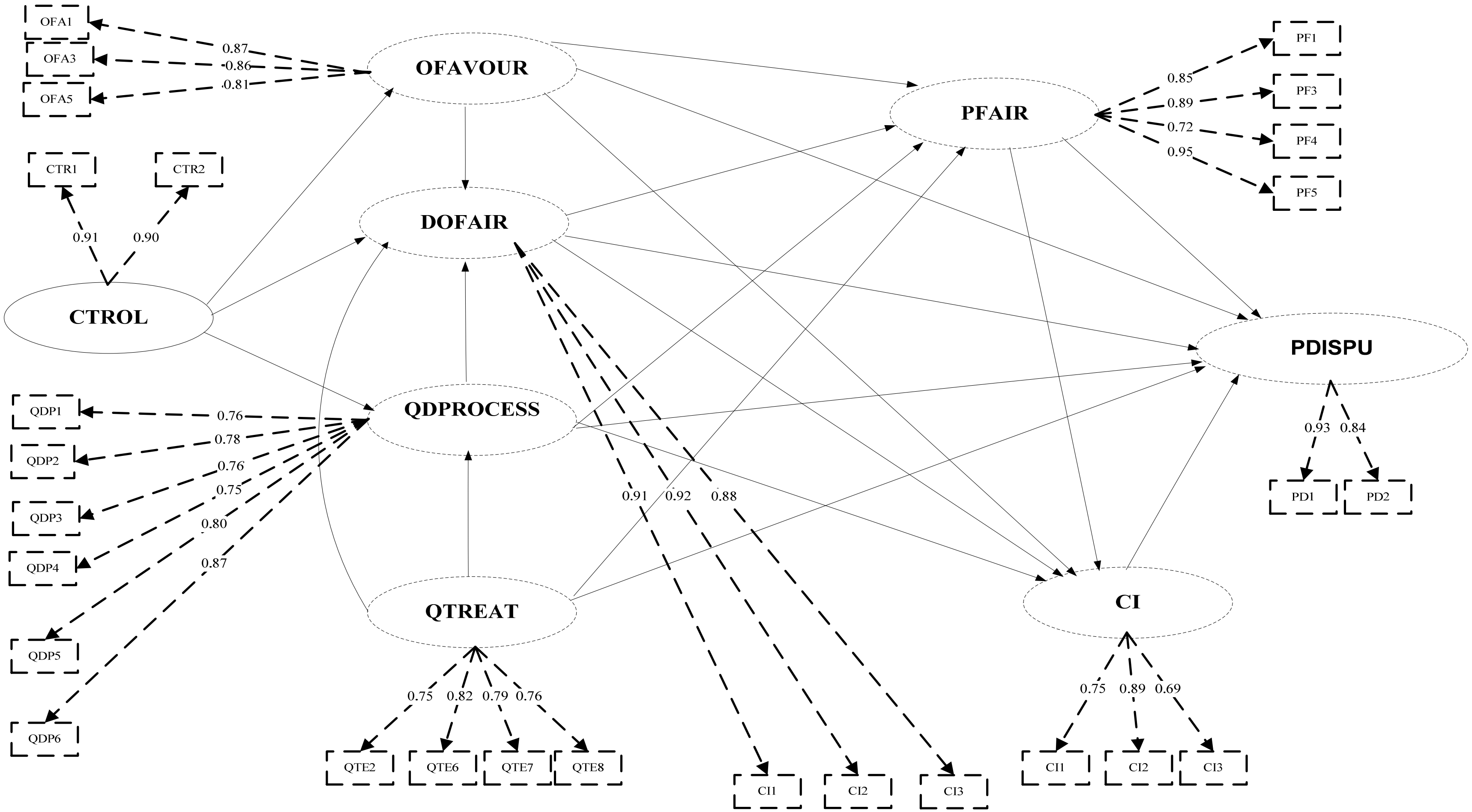
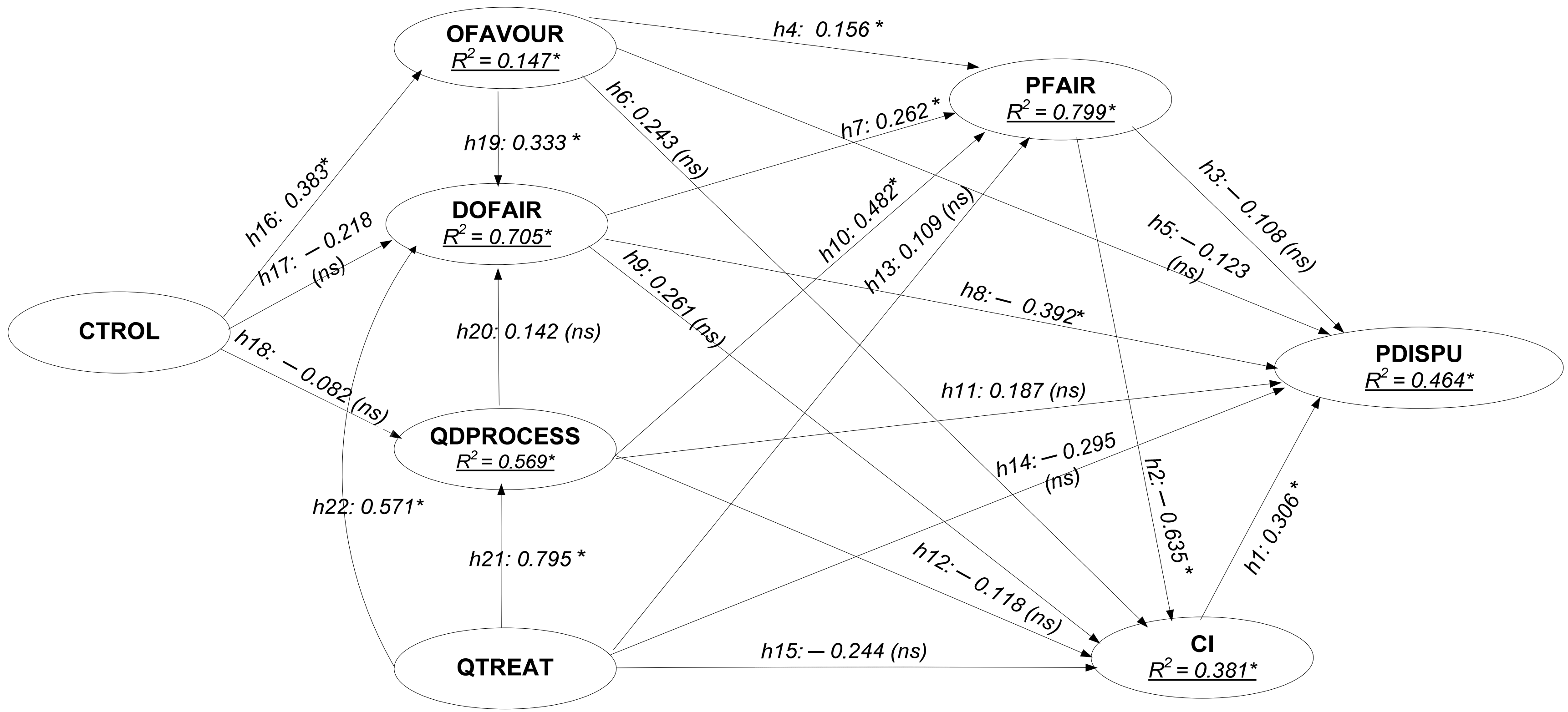


Figure 6-1 Measurement model showing loadings of measurement items



* Significant, ns – not significant (Significance of R^2 is for endogenous constructs tested in Table 7-9)

Figure 6-2 Results of research model and hypotheses testing

According to Falk and Miller (1992) there is no statistical test to determine which path coefficients are close enough to zero in order to decide which path should be eliminated from the model.

Falk and Miller (1992) suggested that before paths are eliminated, their theoretical significance should be considered. A predictor variable may contribute little to the understanding of the variance in a predicted variable but because of its theoretical significance or researcher's interest, it may be desirable to allow the influence of the predictor variable to be represented in the final model (Falk and Miller, 1992). This is consistent with Glaser and Strauss (1967) work on the grounded theory research approach which suggested that weak associations may be highly theoretically relevant. Falk and Miller (1992) opined that given a theoretically formulated model, it is best to report all the paths, noting those making substantial contributions as well as those that are not substantiated by the data. They argued that this is consistent with deductive approach to theory construction.

The aim of this study is to analyse the conceptual relationship and how a contractor's perceptions about fairness in the process for administering claims influence conflict intensity and the contractor's potential to dispute claims certifier's decisions. There is little research on this subject in the context of construction hence the model developed is in its early stage. The purpose is to understand the complex interrelationship between constructs of perception of fairness and their antecedents (measurement items), and conflict and dispute. A descriptive, but prediction oriented approach is most suitable for such research problem (Chin, 1998). Thus understanding the formation of individual constructs and their relationships among each other is of greater value than just a parsimonious prediction (Chin, 1998). However, to accommodate the rule of parsimony, Falk and Miller's (1992) rule was adopted in order to identify paths that may need to be eliminated and whether there is need for model re estimating before interpreting of the results. To achieve this, the percentage of variance in predicted constructs accounted for by each of the predictor constructs were estimated using the following expression (Falk and Miller, 1992):

$Pv_{\exp lained} = (\beta \times r) * 100$ ………………………..Equation 6.6

Where $Pv_{\exp lained}$ = percentage of variance explained by a predictor construct.

β = path coefficient of the path between the predictor and predicted construct.

r = Correlation between the predictor and predicted construct.

Table 6-8 shows the estimated percentage of variance in predicted constructs explained by each of the corresponding predictor constructs in the structural model.

The results in Table 6-8 show that all the predictor constructs explained more than 1.5% of variance in their respective predicted constructs. The results indicate that all the predictor constructs in the structural model met Falk and Miller's (1992) criterion. Hence none of the paths was removed from the model and model re estimation was not considered. Since no path was considered for removal in the theoretical model, and no re testing of the model was necessary, the results of the explanatory power of the model and test of hypotheses (Figure 6-2) is presented and interpreted next.

Table 6-8 Result of Percentage of Variance in Predicted Constructs Explained by Predictor Constructs

Predicted Construct	Predictor Construct	Hypothesis number	Path Coefficient (β)	*Correlation of Predictor and Predicted Construct (r)	$Pv_{explained}$ (%)
OFAVOUR **R^2 = 0.147**	CTROL	h16	0.383	0.383	14.67
DOFAIR **R^2 = 0.705**	OFAVOUR	h19	0.333	0.686	22.81
	CTROL	h17	− 0.218	0.267	5.80
	QDPROCESS	h20	0.142	0.688	9.76
	QTREAT	h22	0.571	0.767	43.74
QDPROCESS **R^2 = 0.569**	CTROL	h18	− 0.082	0.346	2.84
	QTREAT	h21	0.795	0.751	59.70
PFAIR **R^2 = 0.799**	OFAVOUR	h4	0.156	0.682	10.64
	DOFAIR	h7	0.262	0.784	20.54
	QDPROCESS	h10	0.482	0.835	40.25
	QTREAT	h13	0.109	0.769	8.38
CI **R^2 = 0.381**	PFAIR	h2	− 0.635	− 0.551	34.99
	OFAVOUR	h6	0.243	− 0.231	5.61
	DOFAIR	h9	0.261	− 0.339	8.85
	QDPROCESS	h12	− 0.118	− 0.512	6.04
	QTREAT	h15	− 0.244	− 0.471	11.49
PDISPU **R^2 = 0.464**	PFAIR	h3	− 0.108	− 0.523	4.65
	OFAVOUR	h5	− 0.123	− 0.464	5.71
	DOFAIR	h8	− 0.392	− 0.593	23.25
	QDPROCESS	h11	0.187	− 0.442	8.27
	QTREAT	h14	− 0.295	− 0.593	17.49
	CI	h1	0.306	0.451	13.80

* See Table 6-7 for correlations between constructs

6.5.2 Explanatory power of the structural model

Figure 6-2 shows the parameters of the structural model estimated by PLS-Graph 3.0. Unlike covariance-based SEM where there is a single goodness of fit metric for the entire model, the structural model in PLS-SEM is assessed by looking at the explanatory power of the structural model and the path coefficients. According to Chin (1998) models with single goodness of fit may still be considered poor based on other measures such as R-squares and factor loadings. The fit measure only relate to how well the parameter estimates are able to match the sample covariance. They do not relate to how well the latent variables or item measures are predicted. Models with low R-squares and/or low factor loadings can still yield excellent goodness of fit. Therefore pure reliance on single goodness of fit metric for the entire model would ignore the effect sizes of independent construct on dependent constructs. Instead of goodness of fit, attention should be paid to the predictive or explanatory power of the model.

The explanatory power of the structural model can be evaluated by examining the amount of variance in the endogenous constructs which can be explained by the model. PLS-Graph 3.0 provided the squared multiple correlations (R^2) for each endogenous construct in the model. The R^2 computed by PLS-graph 3.0 is similar to the traditional regression (Chin, 1998). According to Breiman and Friedman (1985), the criterion, R^2 or variances explained is critical in evaluating a structural model.

An examination of the significance of the R^2 value for all endogenous constructs was conducted next. This was achieved by F test of significance for all the R squares. F test of significance recommended by Falk and Miller (1992) was used as follows:

$$F = R^2 / m \;\; / \;\; (1 - R^2)/(N - m - 1) \qquad \text{................Equation 6.7}$$

Where N is the total number of the sample size, m is the numbers of predictors of the construct and F is distributed as a distribution with degrees of freedom m and $(N - m - 1)$ degrees of freedom.

The results of F test are summarized in Table 6-9. The results show that R-squares for all endogenous constructs are significant ($p \leq 0.05$). The significance of F (Table 6-9) show that the explanatory power of the model developed is statistically significant.

Table 6-9 Results of F-test for Significance of R^2

Endogenous (Dependent) Construct	R^2	F	Significance Level
OFAVOUR	0.147	6.721	0.05
DOFAIR	0.705	21.508	0.000
QDPROCESS	0.569	25.084	0.000
PFAIR	0.799	35.776	0.000
CI	0.381	4.309	0.01
PDISPU	0.464	4.506	0.000
Average R^2	**0.51**		

To further reinforce the explanatory relevance of the model, as a rule of thumb, Falk and Miller (1992) recommended that the R-squares, for endogenous variables should be ≥ 0.10. They suggest that interpreting R-squares of less than 0.10, even if statically significant provide little information and substantively meaningless. Also, when 10% of the variance is accounted for and many variables are required to achieve that 10%, the hypothesized relationships are uninformative (Falk and Miller, 1992). All R^2 values in the model (Figure 6-2) are above 10% indicating that 10% or more of the variance in endogenous variables is accounted for by the exogenous variables. The results suggest that all the hypothesized relationships are informative in the model. Only one is marginally above 10% (R^2 for OFAVOUR which is 0.147); nevertheless, the construct – OFAVOUR is predicted by only one independent construct – control (CTROL). Thus, the influence of CTROL on OFAVOUR is also relevant and useful in the model.

The structural model was also assessed by exploring the change in R^2 to see whether the impact of a particular independent (exogenous) construct on a dependent (endogenous) construct has substantive impact (Chin, 1998). The effect size f^2 can be calculated as follows:

$$f^2 = R^2{}_{included} - R^2{}_{excluded} \Big/ 1 - R^2{}_{included}$$ ….Equation 6.8

Where $R^2 included$ and $R^2 excluded$ is R^2 provided on the dependent construct when the predictor construct is used or omitted in the structural equation respectively.

The effect of a predictor is *small* at the structural level if f^2 is 0.02; *medium* if f^2 is 0.15 and *large* if f^2 is 0.35 (Cohen, 1988). The summary and inference on f^2 estimate for independent (exogenous) constructs across the model is presented in Table 6-10. The significance of f^2 statistic was also examined. Pseudo F test for testing the significance of f^2 statistic was employed by calculating F as follows (Chin et al, 2001):

$F = (f^2)(N - m - 1)$ ……………………………..Equation 6.9

Where N is the total number of the sample size, m is the numbers of predictors of the construct and F is distributed as a distribution with degrees of freedom 1 and $(N - m)$.

The result of F test for significance f^2 is also shown in Table 6-10.

The result of F test for significance f^2 shows that the effect size of CTROL on OFAVOUR is significance. Of the 4 predictors of DOFAIR, the effect sizes of OFAVOUR, CTROL, and QTREAT are significant. QTREAT also showed a significant effect size on ODPROCESS. Also, out of the 4 predictors of PFAIR, only QDPROCESS showed a significant effect size. Similarly, only PFAIR casts a significant effect size on CI whereas the effect sizes of all the predictors of PDIPU are insignificant.

Table 6-10 Results of Effect Size (f^2) Analysis

Dependent Construct	Independent Construct	R^2 Included	R^2 Excluded	Effect Size (f^2) of independent constructs	Inference	F	Sig. Level
OFAVOUR **R^2 = 0.147**	CTROL	0.147	0.000	0.172	Medium Effect	6.721	0.013
DOFAIR **R^2 = 0.605**	OFAVOUR	0.705	0.641	0.217	Large Effect	7.810	0.008
	CTROL	0.705	0.673	0.108	Medium Effect	3.90	0.05
	QDPROCESS	0.705	0.696	0.031	Small Effect	1.098	0.301
	QTREAT	0.705	0.605	0.339	Large Effect	12.203	0.001
QDPROCESS **R^2 = 0.572**	CTROL	0.569	0.565	0.009	Small Effect	0.352	0.556
	QTREAT	0.569	0.120	1.042	Large effect	39.587	0.000
PFAIR **R^2 = 0.799**	OFAVOUR	0.799	0.787	0.060	Small Effect	2.149	0.151
	DOFAIR	0.799	0.776	0.114	Medium Effect	4.119	0.049
	QDPROCESS	0.799	0.711	0.438	Large Effect	15.761	0.000
	QTREAT	0.799	0.795	0.020	Small Effect	0.716	0.402
CI **R^2 = 0.382**	PFAIR	0.381	0.300	0.131	Medium Effect	4.579	0.039
	OFAVOUR	0.381	0.353	0.045	Small Effect	1.583	0.216
	DOFAIR	0.381	0.361	0.032	Small Effect	1.130	0.294
	QDPROCESS	0.381	0.379	0.003	Small Effect	0.113	0.738
	QTREAT	0.381	0.362	0.031	Small Effect	1.074	0.307
PDISPU **R^2 = 0.442**	PFAIR	0.464	0.441	0.002	Small Effect	0.061	0.806
	OFAVOUR	0.464	0.437	0.011	Small Effect	0.366	0.549
	DOFAIR	0.464	0.406	0.066	Small Effect	2.258	0.141
	QDPROCESS	0.464	0.433	0.018	Small Effect	0.610	0.440
	QTREAT	0.464	0.415	0.050	Small Effect	1.709	0.199
	CI	0.464	0.411	0.063	Small Effect	2.136	0.152

From the results, while some of the explanatory variables individually cast insignificant effect size on the dependent variables; however, the results of F test of significance for all the R^2 indicate that the model significantly explain the variance in the dependent variables.

6.5.3 Test of research hypotheses

The hypotheses of the study were tested next by statistical validation of the structural model. Each hypothesis corresponds to a path in the structural model (see Figure 3-8). Test of hypotheses was achieved by looking at the sign, size, and statistical significance of the of the path coefficients between constructs in the structural model. Path coefficients (ß) indicate the strength of the relationship between the two constructs (Wixom and Watson, 2001). The higher the path coefficient, the stronger the effect of the independent (exogenous) construct on the dependent (endogenous) construct of a path.

The significance of the hypothesized relationships was tested by checking the significance of the t value for each of the path coefficients. The significance of the t values associated with each path was tested using the bootstrap (see section 4.7.4.2) function of the PLS-Graph 3.0 with 500 resample. Table 6-11 shows the summary of the path results (also see Figure 6-2) and the corresponding t values and estimated p value associated with each t value. The basis for supporting or not supporting a hypothesis is based on the significance of the t values. For all the hypotheses, a one tail t test was used. According to Churchill (1987) a one tailed t-test is deemed appropriate when there is a preferred direction in the relationship.

Table 6-11 Results of Hypotheses Testing

Hypothesis and Path	Expected sign	Path Coeff. (ß)	t-value (one tail)	Sig.	Inference
h1: CI → PDISPU	+	+ 0.306	1.615	0.057	**Marginally Supported**
h2: PFAIR → CI	–	– 0.635	1.6893	0.049	**Supported**
h3: PFAIR → PDISPU	–	– 0.108	0.4008	0.34	Not Supported
h4: OFAVOUR → PFAIR	+	0.156	2.1945	0.017	**Supported**
h5: OFAVOUR → PDISPU	–	– 0.123	0.8281	0.20	Not Supported
h6: OFAVOUR → CI	–	0.243	1.3068	0.09	Not Supported
h7: DOFAIR → PFAIR	+	0.262	1.9411	0.02	**Supported**
h8: DOFAIR → PDISPU	–	– 0.392	1.6096	0.057	**Marginally Supported**
h9: DOFAIR → CI	–	0.261	1.088	0.14	Not Supported
h10: QDPROCESS → PFAIR	+	0.482	3.3826	0.00	**Supported**
h11: QDPROCESS → DISPU	–	0.187	0.8825	0.19	Not Supported
h12: QDPROCESS → CI	–	– 0.118	0.4837	0.31	Not Supported
h13: QTREAT → PFAIR	+	0.109	1.0740	0.14	Not Supported
h14: QTREAT → PDISPU	–	–0.295	1.4447	0.07	Not Supported
h15: QTREAT → CI	–	– 0.244	1.0800	0.14	Not Supported
h16: CTROL → OFAVOUR	+	0.383	3.1604	0.00	**Supported**
h17: CTROL → DOFAIR	+	– 0.218	1.8512	0.03	Not Supported
h18: CTROL → QDPROCESS	+	– 0.082	0.8392	0.20	Not Supported
h19: OFAVOUR → DOFAIR	+	0.333	2.8942	0.00	**Supported**
h20: QDPROCESS → DOFAIR	+	0.142	1.0194	0.15	Not Supported
h21: QTREAT → DPROCESS	+	0.795	10.1052	0.00	**Supported**
h22: QTREAT → DOFAIR	+	0.571	2.9253	0.00	**Supported**

In this study, the directions of the relationships among constructs have already been established in the theoretical model thus a one-tail test was used to test the path significance. The exact p values (probability value) associated with the t values of each path coefficient were estimated using application program developed by Baker (2000). P value reflects the strength of the evidence against the null hypothesis (Fisher, 1925). According to Lane et al (2006), the approach is more suitable where the researcher is not interested in a yes or no decision but interested in assessing the weight of the evidence. In interpreting the results of t test, hypotheses were considered supported based on the conventional significance level of 0.05.

Table 6-11 shows that 8 out of 22 sub hypotheses were fully supported, Two were marginally supported ($p = 0.057$ – h1; and $p = 0.057$ – h8). The results are now interpreted and discussed.

6.6 Interpretation and Discussion of the Results of Explanatory Power of the Structural Model and Test of Research Hypotheses

From 6-9, the mean R^2 for the six endogenous constructs in the model is 0.51. This indicates that about 51% of the variance in endogenous variables can be accounted for by the structural model (Falk and Miller, 1992). All the R-squares are fairly high and are statistically significant (Table 6-9). Their values also exceeded Falk and Miller's (1992) criteria ($R^2 \geq 0.10$). Thus the model is relevant for understanding of the relationship between perception of fairness, conflict intensity and potential to dispute. All the constructs used have a place in the model. The interpretation for each endogenous construct is now presented.

6.6.1 Predictors of OFAVOUR

From Table 6-9 and Figure 6-2, 15% of the variances ($R^2 = 0.147$) in outcome favourability (OFAVOUR) can be explained by its predictor – control (CTROL). Table 6-10 shows that in terms of substantive effects, control (CTROL) has a medium and significant effect size on outcome favorability (OFAVOUR). This means that control (in form of pre-construction discussion, agreement and clarity and on methodology for substantiating and assessing claims (CTR1), and on rules of evidence for claims(CTR3) has a predictive relevance when attempting to understand the level of favourable outcome received by a contractor from claims. This is reinforced by the result of F test for significance of R^2 (Table 6-9) – which showed that the amount variances (15%) in outcome favorability which is accounted for by control is significant ($p < 0.05$). The positive influence control on outcome favourability is consistent with Thibaut and Walker's (1975) findings that control is something that people value primarily because of the desire to shape the favourability or fairness of their outcomes.

Further, the path coefficient of the hypothesised path (h16) linking CTROL to OFAVOUR was positive and statistically significant ($p = 0.00$) thus supporting hypothesis h16 which predicted a positive and direct relationship between CTROL and OFAVOUR (Table 6-11). The result implies that CTROL is likely to increase outcome favourability. It is possible that pre construction discussion, agreement and clarity on methodology for substantiating and assessing claims (CTR1) and also on rules of evidence for claims (CTR3) (indicators of control) would motivate the contractor to present and substantiate claims within the pre agreed framework. This potentially limits submission of unjustified claims. Also, the pre agreements could motivate the claims certifier to assess claims within the pre agreed framework thus limiting subjective decision-making on the contractor's entitlements.

Based on these discussions, higher the levels pre construction discussion, agreement and clarity on methodology for substantiating and assessing claims (CTR1) and also on rules of evidence for claims (CTR3) the lower the levels of claims that are likely to be submitted. Also, the higher the level of pre agreements, the higher the level of claims allowed. A simple correlation analysis was conducted to further test these propositions (Table 6-12).

The results in Table 6-12 indicates that as theoretically speculated, pre-construction discussion, agreement and clarity on methodology for substantiating and assessing claims (CTR1) is likely to pre condition a reduced level of cost claims request by the contractor ($r = - 0.401$; $p= 0.009$). Also, outcome favourability in term of contractor's satisfaction with the losses and wins on cost claims (OFA5) had positive and significant association with both CTR1 and CTR3 [(0.346, $p = 0.026$) and (0.324, $p = 0.039$) respectively.

Table 6-12 Correlation analysis of measurement items of control (CTROL) with level of claims requested and outcome of claims

Questionnaire Number (see Appendix 1)	Item	Pearson Correlation	Level of pre construction discussion, agreements and clarity on methodology for substantiating and assessing claims (CTR1)	Level of pre construction discussion, agreements and clarity on rules of evidence for claims (CTR3)
Q14	Level of Cost Claims requested	Coefficient	-0.401	-0.255
		Sig. (2-tailed)	0.009	0.108
Q14	Level of EoT requested	Coefficient	-0.055	-0.097
		Sig. (2-tailed)	0.734	0.547
Q15	Level of Cost claims allowed	Coefficient	0.245	0.264
		Sig. (2-tailed)	0.122	0.096
Q15	Level of EoT allowed	Coefficient	0.095	0.197
		Sig. (2-tailed)	0.554	0.216
Q21	Satisfaction with losses and wins on cost claims	Coefficient	0.346	0.324
		Sig. (2-tailed)	0.026	0.039

The results indicate that CTROL could lead to overall satisfaction with losses and wins from claims (indicator of outcome favourability) on a project.

6.6.2 Predictors of DOFAIR

Figure 6-2 and Table 6-9 shows that quality of decision-making process (QDPROCESS), control (CTROL) and outcome favorability (OFAVOUR) and quality of treatment experienced (QTREAT) accounted for 71% of the variances (R^2 = 0.705, p = 0.000) in perceived decision outcome fairness (DOFAIR). In Table 6-10, both OFAVOUR and QTREAT had large and significant effect size on DOFAIR (p = 0.008 and p = 0.001 respectively) while CTROL had a medium and insignificant effect size on DOFAIR (p = 0.05). The effect size of QDPROCESS on DOFAIR was small and insignificant. The result indicates that quality of treatment experienced (QTREAT) had the largest and significant predictive relevance to perceived decision outcome fairness (DOFAIR) and was followed outcome favourability (OFAVOUR). The direct predictive relevance of QDPROCESS and CTROL in explaining DOFAIR is not clear.

Of the four paths predicting DOFAIR (represented by hypotheses h17, h19, h20, and h22) two were supported (Table 7-11) as follows:

- Hypothesis h19 which suggested that there is a direct and positive relationship between OFAVOUR and DOFAIR (ß = 0.333, t -value = 1.8942, p = 0.00).
- Hypothesis h22 which suggested that there is a direct and positive relationship between QTREAT and DOFAIR (ß = 0.571, t -value = 2.9253, p = 0.00).

The path between CTROL and DOFAIR (hypothesis h17) and between QDPROCESS and DOFAIR (hypothesis h20) are insignificant. These results are now examined in more detail.

6.6.2.1 The impact of OFAVOUR on DOFAIR

The proposed direct and positive relationship between outcome favourability (OFAVOUR) and the perceived decision outcome fairness (DOFAIR) was supported by the data (h19). The path was positive as expected and statistically significant ($p = 0.00$). The result shows that when the outcomes of claims are more favourable to the contractor in terms of the percentage of claims allowed (OFA1), the perceived level of favourability of the outcome (OFA2) and satisfaction with loss and win from claims (OFA5), it is likely that the contractor would perceived the outcome as fair.

6.6.2.2 The impact of QTREAT on DOFAIR

The proposed positive relationship between the perceived quality of treatment experienced (QTREAT) and the perceived decision outcome fairness (DOFAIR) was supported (hypothesis h22). The path is positive and significant. The result shows that the higher the quality of treatment experienced in terms of provision of adequate explanation for decision made (QTE2), showing concern and respect for contractual rights (QTE6, allowing claims to be discussed at meetings (QTE7), and following through agreements reached during claims negotiation (QTE8), the higher the perceived decision outcome fairness. This is consistent with previous studies which found that poor quality of treatment might be more likely to be seen as lack of decision fairness (Cropanzano et al, 2001). Thus, where a contractor perceives a proper treatment, the decision arising from the claims process is more likely to be seen and perceived as fairer than where improper treatment is perceived.

6.6.2.3 The impact of CTROL and QDPROCESS on DOFAIR

Hypothesis (h17) which proposed a positive relationship between control (CTROL) and decision outcome fairness (DOFAIR) was not supported by the data. Although the path is significant (p = 0.03), instead of a positive sign as hypothesized, the path is negative suggesting that the higher the control the lower the decision outcome fairness. The result is inconsistent with Thibaut and Walker (1975) model which suggest that control is something that people value primarily because of the desire to shape the fairness of their outcomes. In the context of this study, control was measured by levels of pre construction discussion and agreement on methodology for substantiating and assessing claims (CTR1) and on rules of evidence for claims (CTR3). Thus higher levels of control would imply that at the pre construction stage the parties, including the contractor, are able to bring their input on methods of substantiating and assessing claims, and rules of evidence for claims thus exercising control over claims process. It is expected that decision arising from such using pre agreed methods and rues should be seen as fair. Hence the result is inconclusive.

The results of the model (Figure 6-2) were explored to check for indirect impact of CTROL on DOFAIR. From the figure, the fact that the links between CTROL to OFAVOUR and between OFAVOUR to DOFAIR (see sections 6.6.1 and 6.6.2.1 respectively) were significant and are stronger than the path between CTROL and DOFAIR (see Table 6-11) shows that OFAVOUR mediates the relationship between CTROL and DOFAIR. This suggests that when CTROL was high, contractor received favourable outcome and those who received favourable outcome perceived the decision made on their claims (DOFAIR) to be fair. Based on these findings, it is proposed as follows:

Proposition 1: The relationship between control (CTROL) and decision outcome fairness (DOFAIR) is mediated by outcome favourability (OFAVOUR).

Further, hypothesis h20 which proposed a direct and positive relationship between perceived quality of decision-making process (QDPROCESS) and perceived decision outcome fairness (DOFAIR) was not supported by the data. This indicates that quality of decision-making process does not increase the perceived decision outcome fairness.

6.6.3 Predictors of QDPROCESS

The results (Figure 6-2 and Table 6-11) show that control (CTROL) and quality of treatment experienced (QTREAT) accounted for about 57% of the variance (R^2 = 0.569) in quality of decision-making process (QDPROCESS). The R^2 is statistically significant (p = 0.000) (Table 6-9). The effect size of control (CTROL) on quality of decision-making process (QDPROCESS) was small and insignificant whereas the effect size of quality of treatment experienced (QTREAT) on QDPROCESS was large and significant (Table 6-10). Thus, quality of treatment experienced (QTREAT) has predictive relevance to quality of decision-making process (QDPROCESS). The relevance of control is questionable. The result implies that QTREAT is important for understanding changes in QDPROCESS.

Of the two hypothesised paths predicting QDPROCESS (represented by hypotheses h18 and h21), one of them was significant as follow (Table 6-11):

- Hypothesis h21 which suggested that there is a direct and positive relationship between QTREAT and QDPROCESS (ß = 0.795, t -value = 10.1052, p = 0.000).

The path linking CTROL to QDPROCESS (hypothesis h18) was not significant. The results are now discussed.

6.6.3.1 The impact of QTREAT on QDPROCESS

It is observed that the path coefficient between QTREAT and QDPROCESS the largest (0.795) in the structural model (Figure 6-2). Quality of treatment experienced increased the perceived quality of decision-making process. It is possible that when people are treated well, they may perceive decision-making authority as neutral and unbiased (indicators of quality of decision-making) since unbiased decision making is generally associated with higher quality decisions (Tyler and Bladder, 2000).

The results also suggest that the perceived quality of decision making process increases when there is increase in the following conditions: concern is shown for the contractor contractual rights (QTE6), the contractor is provided with adequate and effective explanations and reasons for the decision reached on claims (QTE2), claims are made subject of discussion at site meetings (QTE7), promises made and agreement reached on during claims negotiation are adhered to and fulfilled (indicators of treatment) (QTE8).

6.6.3.2 The impact of CTROL on QDPROCESS

The result shows that the path linking CTROL to QDPROCESS is not significant (Table 6-11). Thus hypothesis h18 which proposed a direct and positive relationship between CTROL and QDPROCESS was not supported. This implies that increase in pre construction discussions and agreement and clarity on methodology for claims (CTR1) and on rules of evidence for claims (CTR3) do not increase the perceived quality of decision-making process. This result is surprising in that control is expected to provide a clear and common framework for substantiation and assessment of claims hence reducing areas of differences in expectations. The results may be that: while pre construction discussion and agreements are instrumental framework that could enhance quality of decision-making, their effectiveness would depend on how the pre agreements are handled and implemented during the process for administering claims and whether or not parties conform to the agreements.

6.6.4 Predictors of PFAIR

The results in Figure 6-2 and Table 6-9 show that about 80% of the variance (R^2 = 0.799) in perceived procedural fairness (PFAIR) can be explained by its predictors: outcome favorability (OFAVOUR), decision outcome fairness (DOFAIR), quality of decision-making process (QDPROCESS) and quality of treatment experienced (QTREAT). Table 6-10 shows that QDPROCESS had a large and statistically significant effect size on PFAIR ($p = 0.000$), which is above and beyond the contributions provided by OFAVOUR, DOFAIR, and QTREAT. This was followed by DOFAIR with a medium and significant effect size on PFAIR ($p = 0.049$). Relatively QDPROCESS had 4 times as large as the effect size of DOFAIR on PFAIR. The effect sizes of OFAVOUR and QTREAT on PFAIR are small and insignificant. The results suggest that only DOFAIR and QDPROCESS are of direct predictive relevance to PFAIR while the direct predictive relevancies of OFAVOUR and QTREAT to PFAIR are questionable. Further, the result indicates that QDPROCESS and DOFAIR are of direct relevance when attempting to understand changes in perception of procedural fairness (PFAIR).

Of the four hypothesised paths predicting PFAIR (represented by hypotheses h4, h7, h10, and h13) three were significant as follows (Table 6-11):

- Hypothesis h4 which suggested that there is a direct and positive relationship between OFAVOUR and PFAIR (ß = 0.156, t -value = 2.1945, p = 0.017).
- Hypothesis h7 which suggested that there is a direct and positive relationship between DOFAIR and PFAIR (ß = 0.262, t -value = 1.9411, p = 0.020).
- Hypothesis h10 which suggested that there is a direct and positive relationship between QDPROCESS and PFAIR (ß = 0.482, t -value = 3.3826, p = 0.000).

The path linking QTREAT to PFAIR (hypothesis h13) was not significant. The results are now discussed.

6.6.4.1 The impact of OFAVOUR and DOFAIR on PFAIR

The results show that there is a significant positive relationship between OFAVOUR and PFAIR and thus hypothesis h4 is supported. This implies that the higher the level of outcome favourability the higher the perceived procedural fairness. This result is consistent with Tyler and Bladder (2000) which found correlation between outcome favourability and procedural justice. Further, the higher the perceived decision outcome fairness (DOFAIR) the higher the perception of procedural fairness (PFAIR). This implies that increase in perceived decision outcome fairness is likely to increase perceived procedural fairness. This is also in line with previous studies which show a positive relationship between procedural fairness and decision outcome fairness (Lissak and Sheppard, 1983; Kanfer et al., 1987). In a meta-analysis, Hauenstein (1997) found a strong positive relationship between procedural justice and decisions outcome fairness. The results suggest that the more favourable and fairer the outcome received from claims are perceived, the more the procedure for administering the claims would be perceived as fair.

Decision outcome fairness (DOFAIR) showed a stronger predictive influence on procedural fairness than did outcome favourability (OFAVOUR). This is reflected by the size of coefficients of the path linking outcome favourability to procedural fairness (ß = 0.156; p= 0.017) and the path linking decision outcome fairness to procedural fairness (ß = 0.262; p= 0.02). This suggests that when making evaluation of fairness of procedure for administering claims, contractors' concerns would go beyond receiving just a favourable outcome, but they would be more concerned with fairness of the decision outcome in terms of what is deserved (DOF4), and what is expected (DOF2) and perception of what is fair (DOF6). Significant discrepancy between amount of damage suffered and quantum of claims allowed is likely to increase perceived lack of procedural fairness despite a favourable decision. The implication of these is that there the need for employers' project management team to use, as much as possible, an objective approach to decision-making on contractors' claims. Subjective approach could result in legitimate claims being rejected and thereby lead to increase perceived lack of decision outcome fairness. In the JBC case (see section 3.18.2.2 and 3.20.4), discrepancy in the amount of contractor's entitlement and the amount of claims allowed by the contractor administrator was as a result of subjective evaluation of claims by the contractor administrator. The discrepancy led to the contractor's perceived lack of fairness of the contractor administrator's decision (see section 3.18.2.2) and thereby conflict and dispute.

Further, the path coefficients also reveal that the impact of outcome favourability (OFAVOUR) on procedural fairness (PFAIR) is also mediated by decision outcome fairness (DOFAIR). This is reflected by the relative strength of the path linking outcome favourability to decision outcome fairness (0.333, p = 0.00) when compared with the direct path from outcome favourability to procedural fairness (0.156, p = 0.017). This suggests that those contractors, who received favourable outcome, perceived the decision on their claims to be fair while those contractors, who perceived the decision on their claims to be fair, also perceived the procedure for administering their claims to be fair. The mediating effect of perceived decision outcome fairness suggests that the predictive impact of outcome favourability on procedural fairness is relevant; but the impact is indirect through decision outcome fairness.

<u>6.6.4.2 The impact of ODPROCESS on PFAIR</u>

As predicted, quality of decision-making process (QDPROCESS) is likely to increase procedural fairness (PFAIR) (h10). The result suggests that the perceived extent to which decisions made on EoT and cost claims were based upon facts, and not personal biases (QDP 1 and QDP2), perceived extent to which claims were decided without favouritism (QDP3), perceived extent to which claims certifier showed consistency in deciding claims (QDP4), and professional expertise of the claims certifier (QDP5 and QDP6), and the deciding claims (QDP6) are pre conditions that could enhance perceived fairness of the procedure for administering claims.

Of the 4 predictors of procedural fairness, quality of decision-making process had the largest and significant predictive effect on procedural fairness above and beyond contributions provided by the other predictors of procedural fairness (OFAVOUR, DOFAIR, and QTREAT). In fact the effect of quality of decision - making process on perceived procedural fairness is larger than the combined effect of outcome favourability and decision outcome fairness. This is consistent with Lind *et al's* (1993) study which shows that the effect of process impressions on perceived procedural fairness would be greater than the effect of outcome evaluations on perceived procedural fairness. It is also consistent with Tyler and Bladder (2000) which shows that after controlling for outcome favorability and decision outcome fairness, dimensions of quality of decision-making has the most significant influence on procedural fairness.

The dominance of impression about the process used in administering the claims (quality of decision-making process) over outcome favourability and perceived decision outcome fairness as a predictor of procedural fairness confounds the self interest-seeking assumption of people in any exchange [the tenet of transaction cost economics (TCE) explanation of conflict and dispute] which assumes that people are only motivated by material gains they receive during their interactions with others. Going by the TCE assumption, outcome favourability and outcome fairness should cast a stronger influence on procedural fairness than do QDPROCESS. The results of this study find otherwise suggesting that, in construction, parties' satisfaction and motivation goes beyond the outcome received from a decision making process but also the nature of the process used to make the decisions.

Also the result of this study also supports hypothesis h23 which proposed that the relationship between the perceived quality of decision-making process (QDPROCESS) and the perceived procedural fairness (PFAIR) is stronger than the relationship between the perceived quality of treatment experienced (QTREAT) and the perceived procedural fairness (PFAIR). This is reflected in the fact that the direct path linking QDPROCESS to PFAIR is significant (p= 0.000) whereas the direct path linking QTREAT to PFAIR is insignificant (p=0.14) (see Table 6-11).

6.6.4.3 The impact of QTREAT on PFAIR

No support was found for the predicted positive relationship between quality of treatment (QTREAT) and procedural fairness (PFAIR) (h13). This is contrary to Leventhal *et al* (1980) who argued that procedures are evaluated, at least in part, by the degree to which people receive good treatment. Youngblood et al (1992) also found that treatment alongside quality of interaction was the most important determinant of overall fairness. The contrary findings may reflect the contextual differences between this study and previous studies.

Previous studies are conducted in the context of individuals evaluating decision-making authority whereas this study involve inter organizational decision-making involving corporate individuals acting on behalf of their organizations. In such situation, good treatment may be accorded lesser importance when assessing the fairness of procedure. Dimensions of QDPROCESS such as the perceived extent to which decisions made on EoT and cost claims were based upon facts, and not personal biases (QDP 1 and QDP2), perceived extent to which claims were decided without favouritism (QDP3), perceived extent to which claims certifier showed consistency in deciding claims (QDP4), and professional expertise of the claims certifier (QDP5 and QDP6), and the deciding claims (QDP6) are likely to be more important to decision-making affecting organizations. This further explains the support for hypothesis h23 which proposed that the relationship between quality of decision-making process (QDPROCESS) and procedural fairness (PFAIR) is stronger than the relationship between quality of treatment experienced (QTREAT) and procedural fairness (PFAIR) – see section 6.6.4.2.

Although the results show that QTREAT has no direct influence on PFAIR, the paths were examined to check for possible indirect effect of treatment on perceived procedural fairness. This is presented next.

6.6.4.4 The indirect impact of QTREAT on PFAIR

The path coefficients in the model (Figure 6-2) suggest that the impact of quality of treatment on procedural fairness is indirect in two ways:

1. Indirect path 1: QTREAT may impact PFAIR indirectly through QDPROCESS
2. Indirect path 2: The impact of QTREAT on PFAIR may be indirect through DOFAIR.

Looking at path coefficients (see Figure 6-2), the significance of the path linking QTREAT to QDPROCESS and the insignificance of the direct path liking QTREAT to PFAIR suggest that the influence of good treatment on procedural fairness is mediated by quality of decision-making process (indirect path 1). Also, the significance of the path linking QTREAT to DOFAIR and the insignificance of the path linking QTREAT to PFAIR suggest that, the influence good treatment on procedural fairness may also be mediated by perceived decision outcome fairness (indirect path 2).

However, the indirect impact of QTREAT on PFAIR through QDPROCESS (indirect path 1) is stronger than the indirect path through DOFAIR (indirect path 2).

This is because the path between QTREAT and QDPROCESS ($\beta = 0.795$, $p = 0.00$) is stronger than the path between QTREAT and DOFAIR ($\beta = 0.570$, $p=0.00$). This finding further reflects the central importance of quality of decision-making in the context of construction. Overall, the findings suggest that although QTREAT has no direct impact on PFAIR, it is an important pre condition of PFAIR but its impact is mediated by QDPROCESS. Based on this finding, it is proposed as follows:

> *Proposition 2: The relationship between the perceived quality of treatment experienced (QTREAT) and the perceived procedural fairness (PFAIR) is mediated by the perceived quality of decision-making process (QDPROCESS).*

It is possible that a claims certifiers, who shows concern for the contractor's claims and entitlements, explains the reason for the decision made on claims, and who allows claims to be discussed openly (aspects of quality of treatment), may be perceived by the contractor as unbiased, and independent (dimension of quality of decision-making) and thereby may be perceived as operating a procedurally fair claims process. The result is consistent the discussions by interaction justice researchers which argues that people have concern about fairness of interpersonal relations when implementing formal procedure (Bies and Moag, 1986). The finding also supports Staw (1991) who argued that organizational roles are sufficiently weak and vague that people do not put aside their psychological makeup when they act as corporate decision-makers. The findings indicate that, in construction, people's behaviour is not only motivated by material gain of their company (i.e. money or profit etc) but also by social/psychological aspects (feelings of respect, trustworthiness of others, support, acceptance etc). Diekman et al (1994) appeared to support this view when they concluded that people issues are the most significant aspects that could influence disputes on projects.

6.6.5 Predictors of CI

In Figure 6-2 and Table 6-9, thirty eight percent (38%) of the variance ($R^2 = 0.381$, $p = 0.01$) in conflict intensity (CI) during the process for handling claims is accounted for by: perceived procedural fairness (PFAIR); outcome favorability (OFAVOUR); decision outcome fairness (DOFAIR); quality of decision-making process (QDPROCESS); and quality of treatment experienced (QTREAT). From Table 6-10, of the 5 predictors of CI only PFAIR had a medium and statistically significant ($p = 0.039$) effect size on CI which is above and beyond the contributions provided by the other predictors. OFAVOUR, DOFAIR, QDPROCESS and QTREAT had small and insignificant substantive effect size on CI. The result suggests that only PFAIR is of direct predictive relevance when attempting to understand the changes in CI.

The result was further corroborated by the results of hypotheses testing (Table 6-11). Of the 5 hypothesised paths predicting CI (represented by hypotheses h2, h6, h9, h12 and h15) only one was significant as follows:

- Hypothesis h2 which suggested that there is a direct and negative relationship between PFAIR and CI ($ß = -0.635$, t -value = 1.6893, $p = 0.049$).

The paths linking OFAVOUR, DOFAIR, QDPROCESS, and QTREAT to CI (hypotheses h6, h9, and h15 respectively) were not significant. The results are now discussed.

<u>6.6.5.1 The impact of PFAIR on CI</u>

The result shows that there is a negative relationship between procedural fairness and conflict intensity. This implies that the higher the perceived procedural fairness (PFAIR), the lower the intensity of conflict. The result also implies that when responding to a claims certifier's decisions on claims, parties would not only be concerned with the decision outcome but also how the decision is reached.

Higher levels of perceived procedural fairness in the handling of claims are likely to be associated with fewer reports of conflict and greater harmonious working relationship during project execution. The result corroborates prior empirical research in organizational justice which showed that unfair procedures led to more anger and complaints (Alexander and Ruderman, 1987; Sheppard and Lewicki, 1987).

6.6.5.2 The impact of OFAVOUR, DOFAIR, QDPROCESS, and QTREAT on CI

The insignificance of the paths linking OFAVOUR, DOFAIR, QDPROCESS, and QTREAT to conflict intensity (CI) (h6, h9, h12 and h15 respectively) indicate that outcome favourability, perceived procedural fairness, quality of decision making process and quality of treatment do not have direct influence on conflict intensity.

The insignificant and positive effect of OFAVOUR on CI and of DOFAIR on CI is unexpected as it is contrary to self-interest perspective of what motivate people's behavior [the tenet of Transaction cost economics (TCE) concept] in an economic exchange. TCE argued that people interact with others as part of an exchange of resources and they would be motivated to maximize their gain in resources (Williamson 1979, 1985). Thus higher levels of outcome favourability should reduce conflict intensity and also higher levels of perceived decision outcome fairness should reduce conflict intensity. However, it is possible that regardless of the extent of favourable outcome received or perceived fairness of decision, parties in construction may engage in conflict behaviour and may disagree with the ways claims were handled thus increasing conflict intensity. This is likely where parties adopt a competing style of conflict behaviour. Parties may use complaints and disagreements as a means of securing higher levels of favourable and what they perceive as fair outcomes. It is also possible that where parties adopted avoiding style of conflict behaviour, they may not engage in conflict related behaviour.

The result for QDPROCESS and QTREAT also shows that there is no direct relationship between quality of decision making process and intensity of conflict and also between quality of treatment and conflict intensity. Although OFAVOUR, DOFAIR, QDPROCESS, and QTREAT do not directly influence CI, indirect influence may exist. This is examined next.

6.6.5.3 The indirect impact of OFAVOUR, DOFAIR, QDPROCESS, and QTREAT on CI

An examination of the significant paths in the model (Figure 6-2) suggests that rather than a direct impact, outcome favourability impacts conflict intensity indirectly in two ways: (1) via decision outcome fairness and thereafter through procedural fairness and (2) via procedural fairness. Of the two indirect effects, the former is more important than the latter. This inference is revealed by first, the fact that the coefficient of paths OFAVOUR →DOFAIR (+0.333; p = 0.00) is greater than that of path OFAVOUR →PFAIR (+0.156, p = 0.017) and coupled with the significance of the path from DOFAIR to PFAIR (+0.262; p = 0.02) and PFAIR→CI (- 0.635; p = 0.049). The result supports hypothesis h6a which proposed that perceived procedural fairness (PFAIR) would mediate the relationship between outcome favourability (OFAVOUR) and conflict intensity (CI) (see section 3.8.1). The result implies that those contractors, who received favourable outcome on their claims, perceived the procedure for deciding the claims as fair, and those contractors, who perceived procedure for claims as fair, did not engage in conflict.

Also, the perceived decision outcome fairness (DOFAIR) has an indirect predictive impact on conflict intensity (CI) via procedural fairness (PFAIR) (Figure 6-2). This is reflected by the significance of the path PFAIR → CI (- 0.636, $p = 0.049$) and coupled with the fact that the path from DOFAIR → PFAIR (+0.262; $p = 0.02$) is relatively more substantial and is significant in comparison with the insignificance of the path DOFAIR→CI (+0.261, $p = 0.14$). The result supports mediating hypothesis h9a which proposes that perceived procedural fairness (PFAIR) would mediate the relationship between decision outcome fairness (DOFAIR) and conflict intensity (CI) (see section 3.9.4). The result implies that those contractors, who perceived that the decisions made on their claims was fair, perceived that the procedure for deciding the claims was fair, and those who perceived that the procedure for claims was fair did not display conflict behaviour.

The results further show that the quality of decision-making process (QDPROCESS) does have indirect predictive impact on conflict intensity via procedural fairness (Figure 6-2). The indirect impact is reflected by the significance of the path PFAIR → CI (- 0.636) and coupled with the relative weakness and insignificance of the direct path QDPROCESS→CI (-0.118, $p = 0.31$) in comparison with the significant and more substantial path QDPROCESS→PFAIR (+0.482; $p = 0.00$). The result supports mediating hypothesis h12a which proposes that perceived procedural fairness (PFAIR) would mediate the relationship between quality of decision-making process (QDPROCESS) and conflict intensity (CI) (see section

3.10.1). The result suggests that those contractors, who perceived there was good quality of decision-making process, perceived that the procedure for claims was fair, and those who perceived that procedure for claims was fair did not display conflict behaviour.

The mediating effect of procedural fairness on the relationship between OFAVOUR and CI, and between DOFAIR and CI and also between QDPROCESS and CI offer a considerable support for one of the major findings of Lind and Tyler (1998) which postulates that general fairness perceptions about procedure are used as a heuristic from which perceptions of fairness are generated, and from which people determine their behaviour (fairness heuristic theory – see section 3.6). The result suggests that in the context of construction, people use fairness judgments to summarise their experience in decision-making and to guide their reactions. The finding also confirms the result of a number of studies which suggest that procedural fairness judgments are probably the type of fairness judgment that is most important in determining people's reactions such as conflict behaviour (Lind and Tyler, 1988; Tyler and Lind, 1992).

Looking at the impact of QTREAT on CI, Figure 6-2 suggests that the impact of QTREAT on CI is indirect in two ways: (1) via QDPROCESS and thereafter through PFAIR and (2) via DOFAIR and thereafter through PFAIR. Mediating hypothesis h15a which proposed that perceived procedural fairness (PFAIR) would mediate the relationship between perceived quality of treatment experienced (QTREAT) and conflict intensity (CI) was therefore not supported. The beta coefficients show that the indirect effect via QDPROCESS is stronger (+0.795; p =

0.00). The findings suggest that contractors, who perceived that they received proper treatment, perceived that the claims certifier was implementing a higher quality decision-making process. Those contractors, who perceived that the quality of decision-making process was good, perceived that the procedure used in deciding their claims was fair and, those who perceived fair procedure did not display conflict behaviour.

6.6.6 Predictors of PDISPU

Figure 6-2 and Table 6-9 shows an R^2 of 0.464 (p=0.00) for potential to dispute (PDISPU), indicating that 46% of the variance in potential to dispute is accounted for by the following predictors: procedural fairness (PFAIR); outcome favorability (OFAVOUR); decision outcome fairness (DOFAIR); quality of decision-making process (QDPROCESS); quality of treatment experienced (QTREAT); and Conflict Intensity (CI). However, the effect sizes of each of the predictors were small and statically insignificant (Table 6-10). The result implies that although all the predictors when put together account for a significant variance in PDISPU. In terms of relative contribution, none of the predictors stands out as the most dominant predictor to the variance in PDISPU, nevertheless the statistical significance of R^2 for potential to dispute of (p= 0.00) suggests that the combined contributions of OFAVOUR, DOFAIR, QDPROCESS, QTREAT, PFAIR, and CI predicted significant variance in PDISPU.

Looking at the results of hypotheses testing (Table 6-11), of the 6 hypothesised paths predicting PDISPU (represented by hypotheses h1, h3, h5, h11, h8 and h14), two are marginally supported:

- Hypothesis h1 which suggested that there is a direct and positive relationship between conflict intensity (CI) and potential to dispute (PDISPU) (ß = + 0.306, t -value = 1.615, p = 0.057).

- Hypothesis h8 which suggested that there is a direct and negative relationship between decision outcome fairness (DOFAIR) and potential to dispute (PDISPU) (ß = − 0.392, t -value = 1.6096, p = 0.057).

The paths linking PFAIR, OFAVOUR, ODPROCESS and QTREAT to PDISPU (hypothesis h3, h5, h11 and h14 respectively) were not significant. The results are now discussed.

6.6.6.1 The impact of CI on PDISPU

The result suggest that the higher the conflict intensity, the higher the likelihood of contract dispute. This is consistent with Yiu and Cheung's (2005) study which found that in construction conflict, when tension level reaches a threshold, the conflict level would be high; and if the tension level subsides, the conflict may not return to the original level. Thus, on projects experiencing frequent and severe conflicts, contractual disputes requiring settlement by a third party may be inevitable.

In this study, the positive relationship between conflict intensity and potential for dispute provides further clarification and lends support to the view that conflict should be reduced in the construction process and should not be encouraged as it may not subside but rather may increase potential for formal dispute hence counterproductive. In the construction literature, there are two opposing views on conflict management. First, some authors have portrayed conflict as undesirable and must be reduced or eliminated from the construction process (Latham, 1994). Second, others have argued that conflicts are inevitable hence they distinguished between functional and dysfunctional conflict (Hughes, 1994; Gardiner and Simmons, 1995; Hancock and Root, 1996). They argued that the challenge is to harness the potential good in conflict rather than attempting to reduce or eliminate it. In other words they advocate that the industry should look into ways of managing conflict constructively.

Loosemore et al. (1999) investigated the merits of encouraging conflict in the construction industry. They found that contractors' attitudes are receptive (although not strongly) to constructive conflict management but the attitudes exist in an inconducive socio-structural environment. The study concluded that the call for the encouragement of conflict may be premature and potentially counterproductive in the context of construction. Loosemore *et al*. (1999) provided some evidence that there is justification for emphasis on conflict reduction in the construction industry but they recommended further research on this issue. The result of this study supports the need for conflict reduction.

These results should be accepted with caution as there is reason to believe that the path between conflict intensity and potential to dispute may be positive under some circumstances and negative under others. For instance, it is possible that where parties adopt avoiding style of conflict management, there may be low conflict intensity; but it may be also be counter productive in the long term as the tensions which are the source of the dispute remain latent until they grow to a point where they result in a dysfunctional crisis (Rahim, 1983). Thus, low conflict intensity may also result in high potential to dispute. However, the data for this study shows that the higher the conflict intensity the higher the potential to dispute. This finding is expected where parties adopt competing style of conflict management. The high conflict intensity indicates the extent of contractors' response to perceived lack of fairness during course of the project.

6.6.6.2 The impact of DOFAIR on PDISPU

Looking at the impact of DOFAIR on PDISPU (Figure 6-2 and Table 6-11), the result shows that perceived decision outcome fairness has a direct and negative relationship with potential to dispute (marginally supported, $p = 0.057$). It implies that the higher the perceived decision outcome fairness, the lower the contactors' potential to dispute. The perception that a decision outcome is fair can increase satisfaction with decision-making and hence reduce potential to dispute (Alexander and Ruderman, 1987). Prior empirical research such as Youngblood et al (1992) found evidence that besides procedural fairness, perceived lack of decision outcome fairness were cited frequently by the respondents as reasons for initiating wrongful-termination lawsuits. The insignificant effect of PFAIR on PDISPU shows that the relationship between DOFAIR and PDISPU is not mediated by PFAIR. Thus hypothesis h8a (section 3.9.4) is not supported.

6.6.6.3 The impact of PFAIR, OFAVOUR, QDPROCESS and QTREAT on PDISPU

The insignificance of paths linking PFAIR, OFAVOUR, QDPROCESS and QTREAT to PDISPU (hypothesis h3, h5, h11 and h14 respectively) indicate that overall procedural fairness, outcome favourability, quality of decision making process and quality of treatment do not directly determine potential to dispute significantly.

The insignificant relationship between procedural fairness and potential to dispute, and the significance of the relationship between decision outcome fairness and potential to dispute (see section 6.6.6.2) do not support previous studies (Tyler and Lind, 1992) which state that procedural fairness judgments are probably the type of fairness judgment that is most important in determining people's reactions. The findings of this study suggest that although process impressions are probably the type of fairness judgment that is most important in determining conflict intensity, decision to formally dispute claims are likely to be influenced more directly by outcome judgments rather procedural fairness judgment.

The result for QTREAT's insignificant relationship with PDISPU (h14) is also contrary to studies in social psychology where feelings of fair treatment have been found to lead to a positive attitude (Brewer and Kramer, 1986); lead to acceptance of organization decision-making (Turner et al, 1987); and collaborative behaviour (Tyler and Bladder, 2000). Also, the level of favourability of the outcome received from claims (OFAVOUR) did not influence potential for contract dispute (h5). This result is unexpected because in social and economic exchange people are viewed as motivated to maximize their gain in resources for themselves and minimize their loss (Homans, 1961; Blau, 1964; Thibaut and Kelly, 1959).

Further, quality of decision making process (QDPROCESS) has no direct predictive influence on potential to dispute. The result suggests that quality of decision-making in terms of the perceived extent to which decisions made on EoT and cost claims were based upon facts, and not personal biases (QDP 1 and QDP2), perceived extent to which claims were decided without favouritism (QDP3), perceived extent to which claims certifier showed consistency in deciding claims (QDP4), and professional expertise of the claims certifier (QDP5 and QDP6), and the deciding claims (QDP6) may not necessarily influence the likelihood of contract dispute. This is contrary to prior empirical study which indicate that quality of decision-making have strong influence on employees' deference in terms of willingness to accept organization decisions (Tyler and Bladder, 2000). Although the results show that PFAIR, OFAVOUR, QDPROCESS and QTREAT do not directly influence PDISPU, indirect influence may exist. This is examined next

6.6.6.4 The indirect impact of PFAIR, OFAVOUR, QDPROCESS and QTREAT on PDISPU

Figure 6-2 suggests that PFAIR impacts PDISPU indirectly through conflict intensity. This is reflected by the fact that the path from PFAIR to CI and the path from CI to PDISPU is significant coupled with the fact that the direct path from PFAIR to PDIDPU is insignificant. This result support hypothesis h3a which proposed that Conflict intensity (CI) would mediate the relationship between procedural fairness (PFAIR) and potential for dispute (PDISPU). Those contractors, who perceived unfair procedure, engaged in conflict and those, who engaged in conflict, reported higher potential to dispute. It is possible that in conditions where perceived lack of procedural fairness is challenged, higher conflict intensity may be generated. As conflict escalates, parties' position may harden and might ultimately lead to contractual dispute. Thus perceived lack of procedural fairness (PFAIR) might mediate the influence of procedural fairness on contractual dispute as postulated by sub-hypotheses h3a.

The relationship between OFAVOUR and PDISPU was not mediated by PFAIR as proposed by hypothesis h5a. This is as a result of the insignificance of the path from OFAVOUR to PDISPU. Rather than an indirect impact of OFAVOUR on PDISPU through PFAIR, the results (Figure 6-2) show that the indirect impact of

OFAVOUR on PDISPU is through PFAIR and then via CI. This suggests that those contractors, who received favourable outcome, perceived that the procedure for administering their claims was fair, and those who perceived that the procedure for administering their claims was fair, did not display conflict behaviour. Those contractors, who did not display conflict behaviour, reported low potential to dispute.

Similar to OFAVOUR, Figure 6-2 shows that the impact of QDPROCESS on PDISPU is indirect through PFAIR and thereafter via CI. Thus hypothesis h11a which proposed that PFAIR would mediate the relationship between QDPROCESS and PDISPU was not supported. This implies that higher perceptions of quality of decision-making is likely to increase the perception of fairness of the procedure for claims and the perceived fairness of the procedure would reduce conflict intensity thereby reducing potential to dispute. Also, the results indicate that QTREAT would impact PDISPU indirectly in two ways: (1) through DOFAIR (2) through DOFAIR via PFAIR and thereafter through CI. Thus hypothesis h14a which proposed that procedural fairness (PFAIR) would mediate the relationship between the quality of treatment experienced (QTREAT) and potential to dispute (PDISPU) is not supported. Rather, the result implies that those contractors, who perceived that they were treated poorly, also perceived that the claims certifiers' decision was unfair and they indicated a high potential to dispute.

6.7 Summary

The chapter fulfills objective number 2 of this study by analyzing the conceptual relationship developed (Figure 3-8). The measurement of the model has good individual item reliability, convergent validity and discriminant validity. Therefore, the measurement model demonstrates sufficient robustness needed to test the relationship among the constructs (the structural model).

PLS does not generate a single goodness of fit metric for the entire model. Instead the explanatory power of the model is evaluated by examining the amount of variance in the endogenous constructs which can be explained by the model (R^2). The average R^2 for the model stands 0.51. The R^2 for all the endogenous variables in the model are statistically significance demonstrating the predictive relevance of the model. Of importance, thirty eight percent (38%) of the variance ($R^2 = 0.381$, $p = 0.01$) in conflict intensity (CI) during the process for handling claims is accounted for by the model while 46% of the variance in potential to dispute is accounted for by the model ($R^2 = 0.464$, $p = 0.000$).

The research sub hypotheses were tested by looking at the sign, size, and statistical significance of the of the path coefficients between the constructs in the structural model. Test for statistical significance of the paths coefficients was achieved by using bootstrapping technique. Out of 22 sub-hypotheses regarding direct relationships among the constructs, 8 were fully supported ($p < 0.05$) while 2 were marginally supported ($p= 0.057$). Out of the nine mediating sub hypotheses regarding the indirect relationships among the constructs, four were supported. The next chapter addresses objectives number 3, 4 and 5 of this study by exploring various interaction effect hypotheses.

CHAPTER SEVEN

ANALYSIS OF INTERACTION EFFECTS

7.1 Introduction

This chapter addresses objectives 3 and 4 by exploring whether the outcome received by contractor from claims and the contractor's perceptions about fairness of the procedure for administering claims interact to influence conflict intensity and the contractor's potential to dispute the outcome, and whether the outcome received by contractor from claims and the contractor's perceived quality of decision-making process interact to influence conflict intensity and the contractor's potential to dispute the outcome, and in that regards identify the pattern of the interactions. Next, the Chapter also addresses objective 5 by exploring whether the number of projects executed together by parties in the past interacts with the outcome received by contractors from claims to influence conflict intensity and the contractors' potential to dispute the outcome; and whether the respondents' years of experience in construction interacts with the outcome received from claims to influence conflict intensity and potential to dispute.

7.2 Testing Interaction Effects

Interaction effect or moderation implies that the relationship between two variables changes as a function of another (moderator) variable. To test for interaction effect, the statistical analysis must measure and test the differential effect of the independent variable on the dependent variable as a function of the moderator (Baron and Kenny, 1986). For the discussion it is assumed that a variable C moderates the relationship between exogenous (independent) variable A and endogenous (dependent) variable B. Assessing the interactive effect of A and C on B may be achieved in three ways which are now discussed (Jöreskog, 1998).

7.2.1 Multi-group approach

When moderating variable C is observed and categorized (nominal or ordinal), the total sample can be divided into multiple groups, depending on the category of moderating variables. For example, the categories may be gender (female and male), different age groups, different sizes of organization and nationalities. Interaction effects can be assessed by comparing path differences of the respective groups. The model may then be estimated separately for each category. This multi-group approach is the simplest and most straightforward, if the moderating variable can be used to form some "natural" groups (e.g. gender) (Jöreskog, 1998). But, there may be two problems with this method. When the moderating variable C is a latent construct, it is not easy to separate sample cases into different groups.

Also, if the cases are simply divided into two groups by the mean of C, one group may lose some variance on A and B, which can influence the result. Further, a large sample size is required. Each group needs enough cases in order to make the modeling of the relationship between A → B possible. In this study, dividing the sample size of 41 into further categories for analysis would result into too few cases than needed for estimating the theoretical model developed. As a result, this approach is not feasible for this study.

7.2.2 Product indicator approach

When the moderating variable C is a latent variable, a product indicator can be used to test interactions (Kenny and Baron, 1986; Chin, 1996; Schumacker, 2002). The multiplicative interaction effect A*C was developed by multiplying the values of all items measuring variable A with values of all items measuring variable C. After that, A, B, C and A*C were all specified in the structural model in the form shown in Figure 7-1.

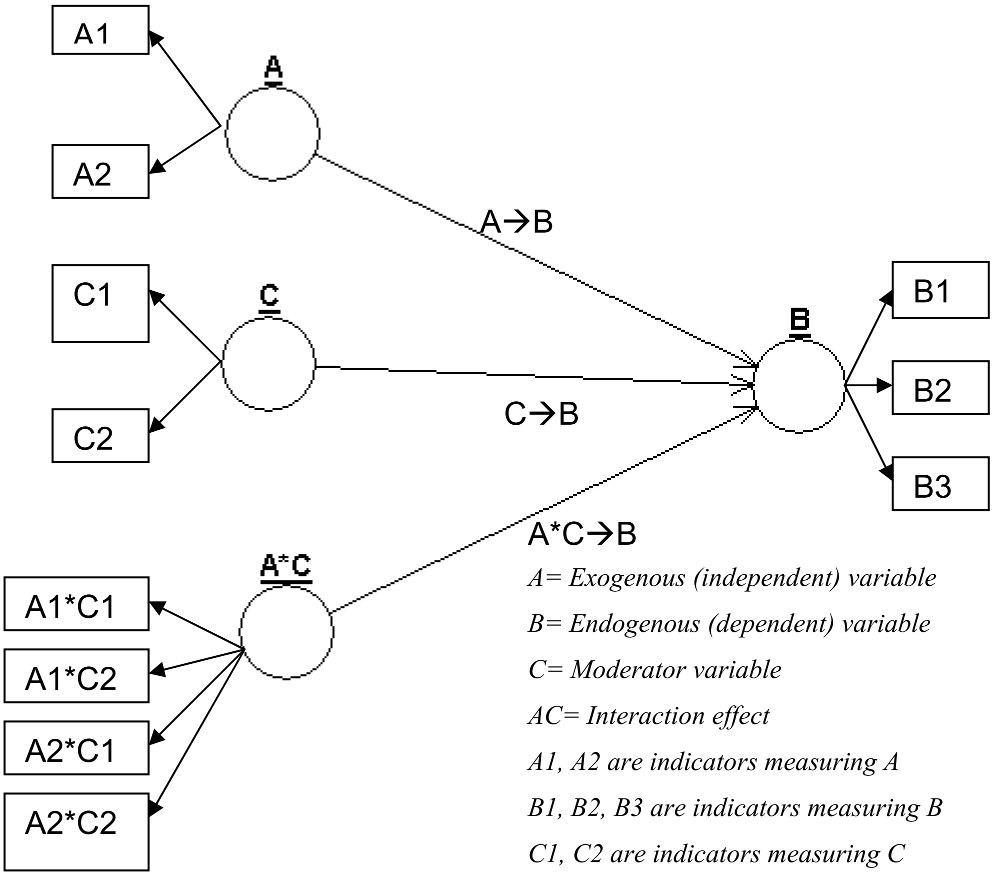


Figure 7-1 Sample structural model for testing interaction effects using product indicator approach.

Assuming that exogenous variable A was measured by 2 items A1 and A2, moderator variable C was measured 2 items C1 and C2 and endogenous variable B was measured by B1, B2, and B3. The multiplicative interaction effect A*C was created by multiplying values of all items measuring variable A with values of all item measuring variable C. Thus product indicators A1*C1, A1*C2, A2*C1, and A2*C2 are created to represent the interaction (Chin, 1996). The structural model (Figure 7-1) is then calculated. Prior to analysis, the values of all indicator items are standardized in order help to avoid computational errors by lowering the correlation between the product indicators and their individual components (Smith and Sasaki, 1979).

The interaction effect can be assessed by examining the significance of paths between A*C and B (path A*C →B). The interactive effect hypothesis is supported if path A*C →B (the interaction) is significant (Kenny and Baron, 1986). This method has proven to effectively assess the interaction effect (Chin, 1996). However, in the use of this approach, difficulty may arise when variables A and C both have more than seven measures. The interaction effect construct (A*C) will have more than fifty items. When the number of items becomes large (Jöreskog, 1998), the error terms will be undermined significantly, which will compromise the ability to perform an accurate data analysis. Also, creating too many product indicators would imply the need for increased sample size.

7.2.3 Two-step constructs score approach

The latent variable score approach can also be used to assess an interaction effect. It is also known as the two-step procedure (Bollen, 1995; Chin, 1996; Jöreskog, 1998). In the first step, for all cases, variable scores or factor scores are created and are used as indicators of the exogenous (A), endogenous (B), and moderator (C) as specified in the example provided in the model in Figure 8-1. In the second step, interaction variable A*C is created by multiplying the variable or factor score of A and C for each case. Then, the significance of path coefficient between interaction variable A*C and B (path A*C→B) indicates the presence of interactive effect.

7.2.4 Testing interaction effects: Choice of Approach

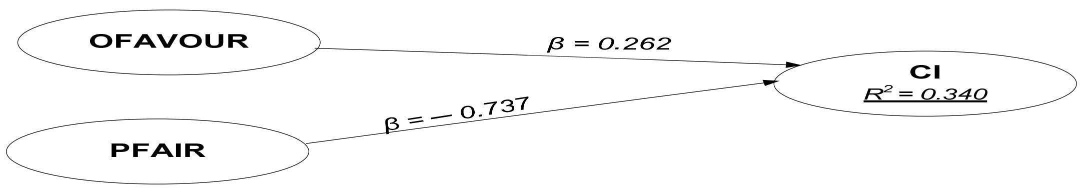
Multi-group approach was considered not feasible because dividing the data into groups is problematic as there would be too few cases to enable meaningful analysis (see section 7.2.1). Although the two-step approach is easier to implement, it was also not used because (1) by combining the indicators of each variables into factor score assumes that the variances in measurement are the same. Also, creating interaction variable A*C by multiplying the latent score of A and C for each case assumes that the variances in the measures of both constructs A and C are the same. However, data obtained through perceptive rating are more than likely to be measured with error and differences in variance; (2) it made use of moderated multiple regression which also assumes that the measures used to predict the dependent variable are without error. These problems could introduce bias into the result and can have substantial impact on the conclusions (Chin, 1996). To eliminate these problems, the study made use of the product indicator method using PLS to test for interaction effects. Schumacker (2002) applied the product indicator and two-step procedure approach on the same data set and compared the results. He found that the results were almost the same.

8.3 Interactive effect of outcome favourability and procedural fairness on conflict intensity

The section explores the interactive effect hypothesis (h6b – section 3.15.3) which states perceived procedural fairness (PFAIR) would moderate the relationship between outcome favourability (OFAVOUR) and conflict intensity (CI). The result of the main effect and interaction effect model is shown in Figure 7-2. The results give a standardized beta (β) of – 0.124 from OFAVOUR to CI, – 0.976 from PFAIR to CI, and interaction effect of 0.600 with total R-square of 0.367.

The result implies that one standard deviation increase in procedural fairness (PFAIR) will not only impact CI by 0.976 but it would also increase the impact of OFAVOUR to CI from – 0.124 to 0.476 (– 0.124 + 0.600). The main effect model results in slightly higher standardized beta (β) for OFAVOUR-CI and slightly lower standardized beta (β) for PFAIR-CI with smaller R-square of 0.340. The interaction effect also produced an effect size (f^2) of 0.04 on CI which is between small and medium effect (Cohen and Cohen, 1983).

Results of the main effects model



Results of the interaction effect model

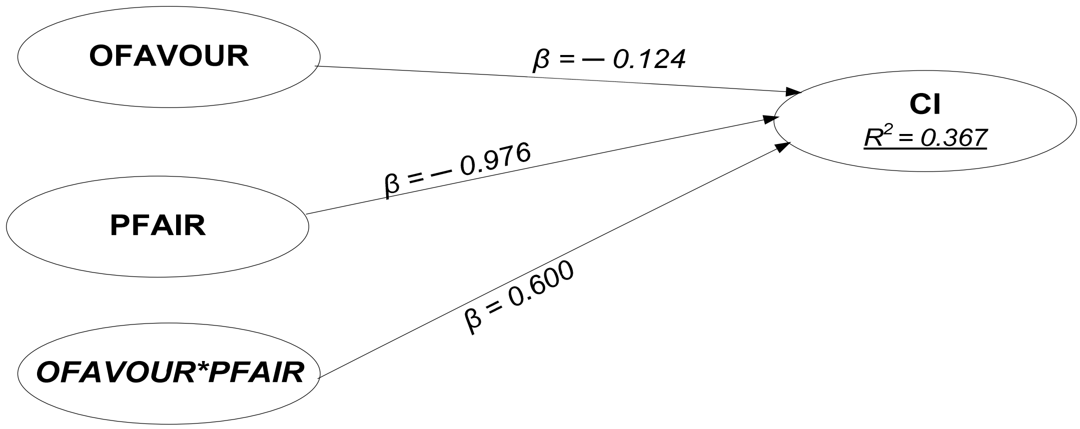


Figure 7-2 Interactive effect of outcome favourability and procedural fairness on conflict Intensity

The significance of the interaction effect was assessed by bootstrap with 500 resample (Chin, 1998). The result showed that the interaction effect is significant at 0.05 level ($t = 1.718$, $p = 0.04$). This result was used to evaluate hypotheses H6b which states that: perceived procedural fairness (PFAIR) would moderate the relationship between outcome favourability (OFAVOUR) and conflict intensity (CI).

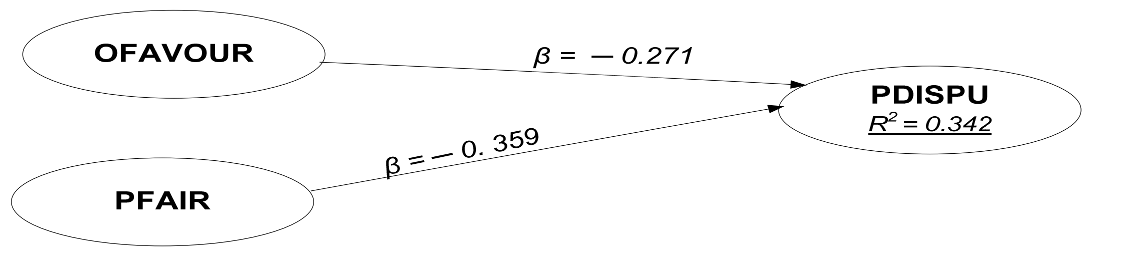
The hypothesis is supported in that the interaction effect is significant. The result shows that when contractor receives unfavourable outcome on claims, there would be lower conflict intensity when the procedure for administering the claims is perceived to be fair than when it is perceived to be unfair. This implies that fair procedure could cushion the effect of low outcome by lowering conflict intensity. Consistent with previous evidence from other contexts (Folger et al, 1983; Brockner et al, 1994), this result supports the argument that outcome favourability and procedural fairness work together to influence attitudes and behaviour.

8.4 Interactive effect of Outcome favourability and procedural fairness on potential to dispute.

The section explores the interactive effect hypothesis (h5b – section 3.15.3) which states that perceived procedural fairness (PFAIR) would moderate the relationship between outcome favourability (OFAVOUR) and contractors' potential to dispute (PDISPU). The results of the main effect and interaction effect model are shown in Figure 7-3. The results interaction effect model give a standardized beta (β) of -0.673 from OFAVOUR to PDISPU, -0.623 from PFAIR to PDISPU, and interaction effect of 0.650 with total R-square of 0.359. The result implies that one standard deviation increase in procedural fairness (PFAIR) will not only impact PDISPU by 0.623 but it would also decrease the impact of OFAVOUR to PDISPU from $-$ 0.673 to $-$ 0.023

(─ 0.673 + 0.650). The main effect model results in lower standardized beta (β) for OFAVOUR-PDISPU and lower standardized beta (β) for PFAIR-PDISPU with smaller R-square of 0.342. The interaction effect produced an effect size (f^2) of 0.03 on PDISPU which is a small effect (Cohen and Cohen, 1983).

Results of the main effects model



Results of the interaction effect model

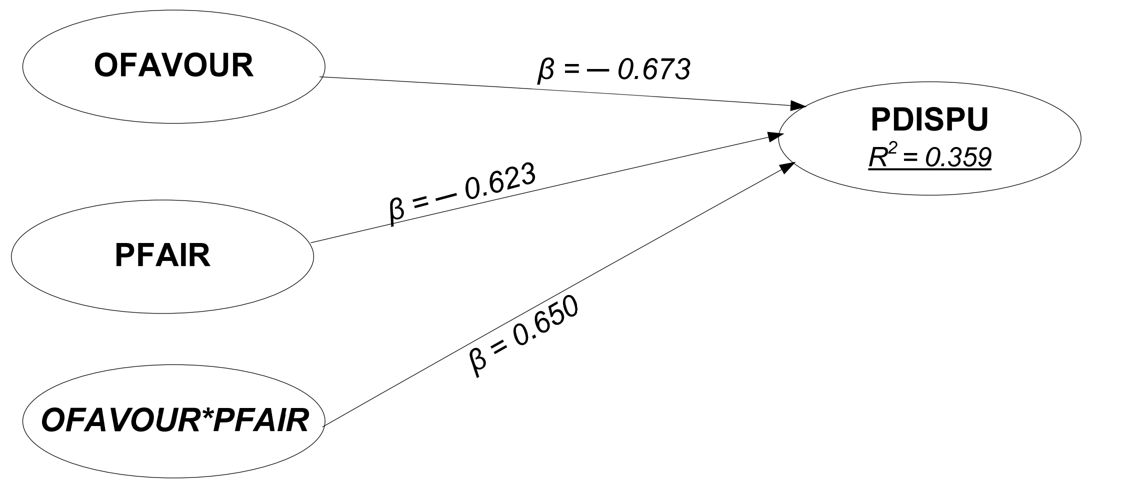


Figure 7-3 Interactive effect of outcome favourability and procedural fairness on potential to dispute

The significance of the interaction effects was assessed by bootstrap with 500 resample. The result showed that the paths of interaction effect is significant (t = 2.016, p = 0.02). This result supports hypotheses h5b which states that: perceived procedural fairness (PFAIR) would moderate the relationship between outcome favourability (OFAVOUR) and contractors' potential to dispute (PDISPU). This suggests that when contractors received unfavourable outcome, potential to dispute was lower when procedure was perceive to be fair that when procedure was perceived to be unfair. In other words, when the outcome received by a contractor from project claims is unfavourable, the contractor is unlikely to engage in dispute when the procedures for administering the claims are perceived to be fair than when they are perceived to be unfair. Fair procedure could cushion the effect of unfavourable outcome.

7.5 Interactive effect of Outcome favourability and Quality of Decision-making Process on Potential to dispute.

The interactive effect hypothesis (h5c – section 3.15.3) which states that quality of decision-making process (QDPROCESS) would moderate the relationship between outcome favourability (OFAVOUR) and contractors' potential to dispute (PDISPU) was explored using product indicator approach (section 8.8.2). The results of the main effect and interaction effect model are shown in Figure 7-4.

The results give a standardized beta (β) of − 0.837 from OFAVOUR to PDISPU, − 0.607 from QDPROCESS to PDISPU, and interaction effect of 0.775 with total R-square of 0.358. The result implies that one standard deviation increase in perceived quality of decision-making process (QDPROCESS) will not only impact PDISPU by 0.607 but it would also decrease the impact of OFAVOUR on PDISPU from – 0.837 to − 0.062 (− 0.837 + 0.775). The main effect model result in lower standardized beta (β) for OFAVOUR-PDISPU and lower standardized beta (β) for QDPROCESS-PDISPU with smaller R-square of 0.328. The interaction effect also produced an effect size (f^2) of 0.05 on PDISPU which is between small and medium effect (Cohen and Cohen, 1983).

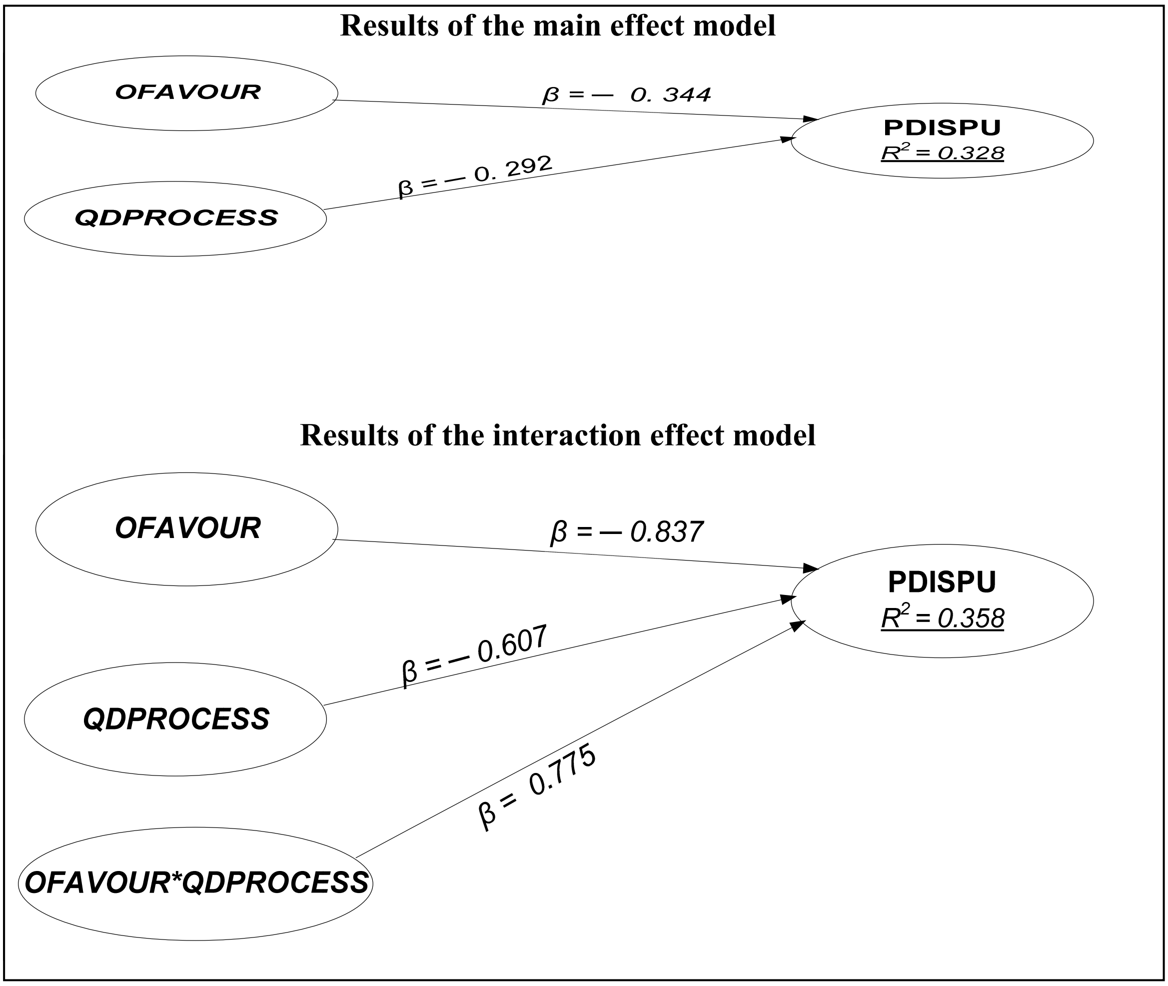


Figure 7-4 Interactive effect of outcome favourability and quality of decision-making process on potential to dispute

The significance of the interaction effect was assessed. The result showed that the interaction effect is significant at 0.05 level (t = 2.04, p = 0.02). Thus hypothesis h5c was supported. This implies that when the contractors receives unfavourable outcome (OFAVOUR), there would be lower potential to dispute (PDISPU) the outcome when they perceived good quality of decision-making than when they perceive poor of quality of decision-making. This implies that quality decision-making could cushion the effect of low outcome.

7.6 Interactive effect of Outcome favourability and Quality of Decision-making Process on Conflict Intensity

The section explores the interactive effect hypothesis (h6c – section 3.15.3) which states that quality of decision-making process (QDPROCESS) would moderate the relationship between outcome favourability (OFAVOUR) and conflict intensity (CI). The results of the main effect and interaction effect model are shown in Figure 7-5. The results give a standardized beta (β) of ─ 0.001 from OFAVOUR to CI, ─0.641 from QDPROCESS to CI, and interaction effect of 0.136 with total R-square of 0.294.

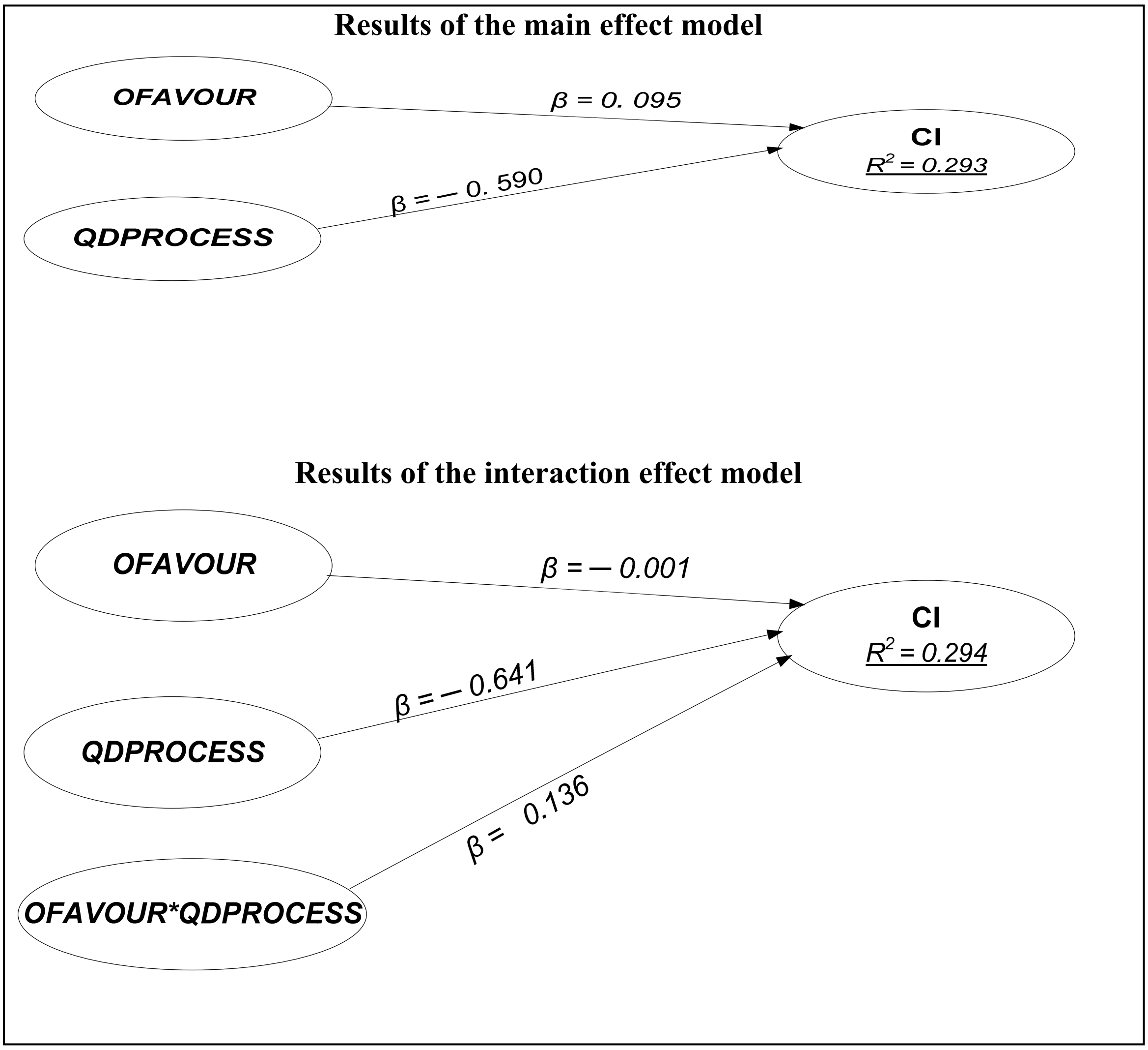


Figure 7-5 Interactive effect of outcome favourability and quality of decision-making process on conflict Intensity

The result implies that one standard deviation increase in perceived quality of decision-making process (QDPROCESS) will not only impact CI by 0.641 but it would also decrease the impact of OFAVOUR on CI from 0.001 to 0.000 (– 0.001 + 0.136). The main effect model results in higher standardized beta (β) for OFAVOUR-CI and lower standardized beta (β) for QDPROCESS-CI with smaller R-square of 0.293. The interaction effect also produced an effect size (f^2) of 0.002 on CI which is a small effect (Cohen and Cohen, 1983). The significance of the interaction effect was assessed by bootstrap with 500 resample. The result showed that the interaction effect is insignificant ($t = 0.373$, $p = 0.35$). Thus hypothesis h6c was not supported implying that quality process did not reduce the impact of unfavourable outcome on conflict intensity.

7.7 Discussion of results of the moderation effect of procedural fairness and quality of decision-making process

The findings show the interactive effect of outcome favorability and procedure fairness on conflict intensity, and on potential to dispute (sections 7.3 and 7.4). Also, the findings show the interactive effect of outcome favorability and quality of decision-making process on potential to dispute (sections 7.5). The results indicate that contractors reported lower conflict intensity and potential to dispute against unfavourable outcome when the procedure for administering their claims was perceived to be fair than when procedure was perceived to be unfair. Also, contractors indicated lower potential to dispute against unfavourable outcome when the quality of the decision-making process for claims was perceived to be good than when it was perceived to be poor. In addition, the findings suggest that when procedure was perceived to be fair, there was relatively low intensity of conflict and relatively low potential to dispute regardless of whether the outcome was favourable or unfavourable. Similarly, when the quality of decision-making process was perceived to be good, there was relatively low potential to dispute regardless of whether the outcome was favourable or unfavourable.

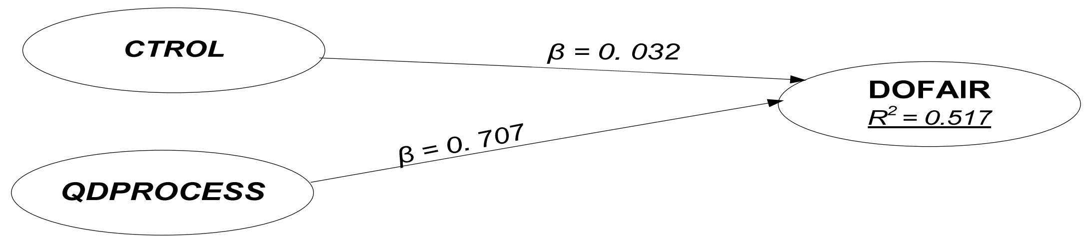
Referent cognition theory (RCT) (Folger, 1986; Brockner and Wiesenfeld, 1996) (section 3.15.2) provides a plausible explanation for these interaction effects. It may be that contractors who received unfavourable outcome may have assessed more critically the fairness of the procedure and the quality of the process by which the decision (outcome) on their claims was established when compared to contractors who received favourable outcome. Based on RCT postulations, contractors who perceive procedure to be unfair and decision-making process to be of poor quality conceived of a more favourable outcome they would have if the procedure had been fair or fairer or if the quality of process used in reaching decision on their claims had been good.

The gap between the outcome received and what should have been received could be a source of conflict and dispute behaviour. Also, an unfair procedure and poor quality decision-making is unlikely to yield a fair and favourable outcome. Hence, contractors who perceived an unfair procedure may have engaged in conflict behaviour by intense disagreement with contract administrator's decision-making, perhaps to enhance the chances of securing a favourable outcome. Also contractors who perceived poor quality of decision-making process may have reported a high potential to engage in formal dispute resolution to secure a favourable outcome they could have received had the quality of decision-making been good.

7.8 Interactive effect of Control and Quality of decision-making process on Decision outcome fairness

The interactive effect hypothesis (h17a – section 3.16) which states that perceived quality of decision-making process (QDPROCESS) would moderate the relationship between control (CTROL) and perceived decision outcome fairness (DOFAIR) was explored. The results of the main effect and interaction effect model are shown in Figure 7-6. The results give a standardized beta (β) of − 0.311 from CTROL to DOFAIR, 0.503 from QDPROCESS to DOFAIR, and interaction effect of 0.469 with total R-square of 0.529.

Results of the main effect model



Results of the interaction effect model

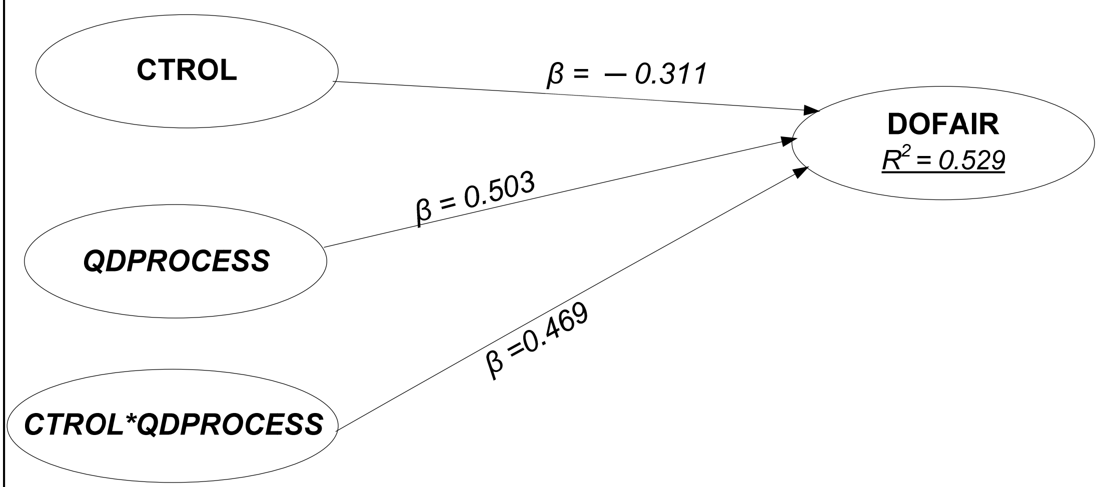


Figure 7-6 Interactive effect of control and quality of decision-making process on decision outcome fairness

The result implies that one standard deviation increase in perceived quality of decision-making process (QDPROCESS) will not only impact DOFAIR by 0.503 but it would also decrease the impact of CTROL on DOFAIR from – 0.311 to 0.158 (– 0.311 + 0.469). The main effect model result in lower standardized beta (β) for QDPROCESS-DOFAIR and lower standardized beta (β) for QDPROCESS-DOFAIR with smaller R-square of 0.517. The interaction effect also produced an effect size (f^2) of 0.03 on DOFAIR which is a small effect (Cohen and Cohen, 1983).

The significance of the interaction effect was assessed by bootstrap with 500 resample. The result showed that the interaction effect is insignificant ($t = 1.227$, $p = 0.11$). Hence, the hypothesis was not supported.

7.9 Interactive effect of Outcome Favourability and Control on Decision Outcome Fairness

Hypothesis h19a (section 3.16) states that perceived control (CTROL) would moderate the positive relationship between outcome favourability (OFAVOUR) and perceived decision outcome fairness (DOFAIR). The hypothesis was tested using the product indicator approach (section 7.2.2). The results of the main effect and interaction effect model are shown in Figure 7-7. The results give a standardized beta (β) of 0.101 from CTROL to DOFAIR, 0.726 from OFAVOUR to DOFAIR, and interaction effect of ─ 0.123 with total R-square of 0.457.

The result implies that one standard deviation increase in control (CTROL) will not only impact DOFAIR by 0.101 but it would also decrease the impact of OFAVOUR on DOFAIR from 0.726 to 0.603 (0.726 - 0.123). This implies that when contractors received unfavourable outcome, perceived decision outcome fairness was lower when control was higher than when control was lower. The main effect model result in lower standardized beta (β) for OFAVOUR-DOFAIR and lower standardized beta (β) for CTROL-DOFAIR with smaller R-square of 0.456. The interaction effect produced an effect size (f^2) of 0.03 on DOFAIR which is a small effect (Cohen and Cohen, 1983).

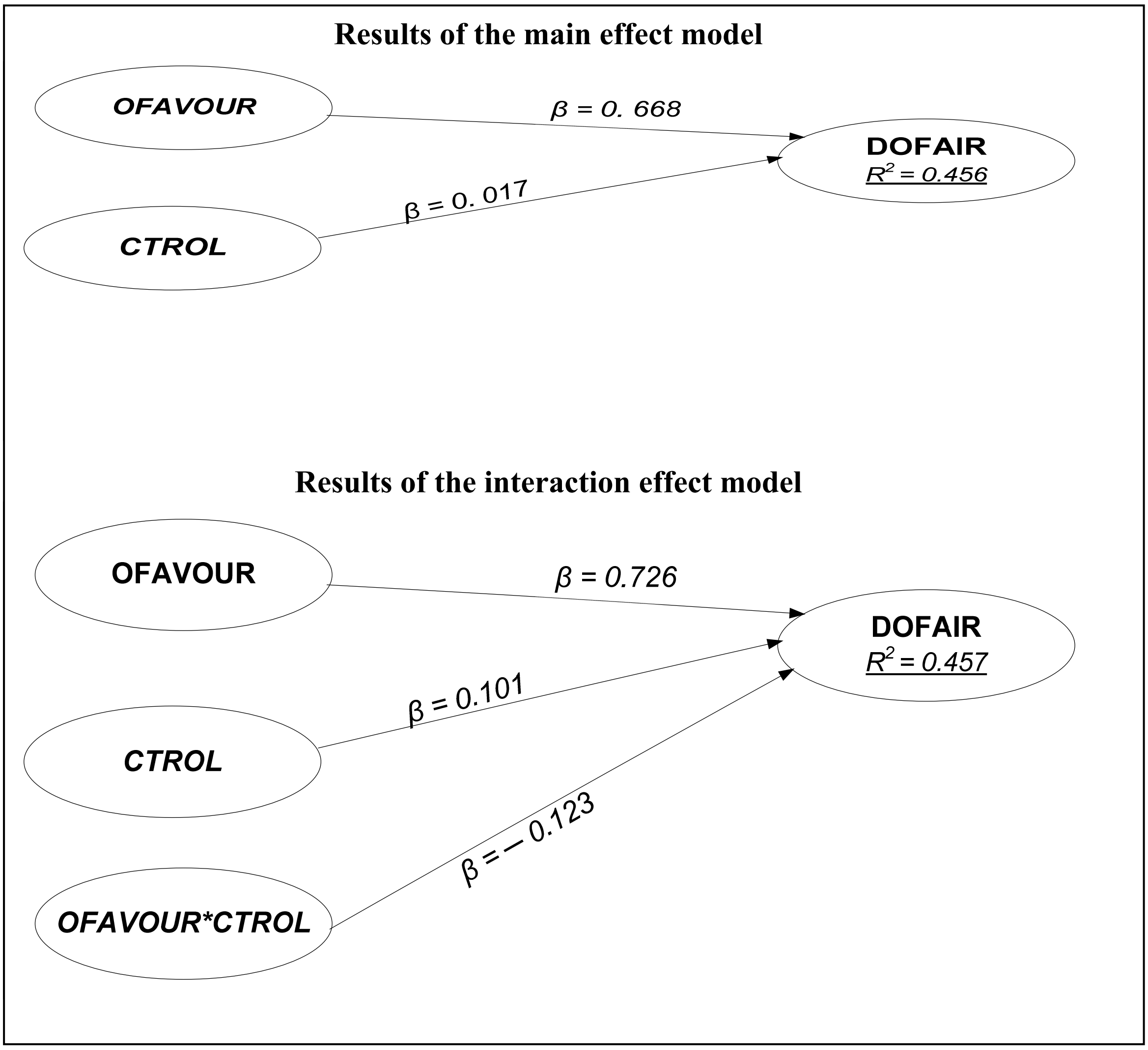


Figure 7-7 Interactive effect of outcome favourability and control on decision outcome fairness

The significance of the interaction effect was assessed by bootstrap with 500 resample. The result showed that the interaction effect is insignificant (t = 0.465, p = 0.32). Thus hypotheses h19a was not supported. This implies that when the contractors received unfavourable outcome, their perception of the fairness of the claims certifiers' decision was not higher when there was higher level of control than when there was lower level of control.

7.10 Moderating Effects of Number of Projects executed Together in the Past

If parties have worked together in the past, this may moderate the interaction between outcome favourability and conflict intensity and between outcome favourability and potential to dispute. Hence, the following interactive effect hypotheses were explored using product indicator approach:

(a) The number of projects executed together in the past by parties (NPTP) would moderate the relationship between outcome favourability (OFAVOUR) and conflict intensity (CI).

(b) The number of projects executed together in the past by parties (NPTP) would moderate the relationship between outcome favourability (OFAVOUR) and potential to dispute (PDISPU).

The results are presented next.

7.10.1 Interactive effect of Number Projects executed Together in the Past by parties and OFAVOUR on CI

The results of the main effect and interaction effect models of numbers of projects together in the past (NPTP) on OFAVOUR-CI relationship are shown in Figure 7-8. The results give a standardized beta (β) of 0.646 from OFAVOUR to CI, ─ 0.358 from NPTP to CI, and interaction effect of 0.646 with total R-square of 0.304. The result implies that one standard deviation increase in the number of projects executed together by parties in the past (NPTP) will not only impact CI by ─ 0.358 but it would also decrease the impact of OFAVOUR on CI from - 0.646 to 0.00 (–0.646 + 0.646).

The main effect model result in lower standardized beta (β) for OFAVOUR-CI and lower standardized beta (β) for NPTP-CI with the lower R-square of 0.098. Hence, the interaction effect produced an effect size (f^2) of 0.296 on CI which is between medium and large effect (Cohen and Cohen, 1983).

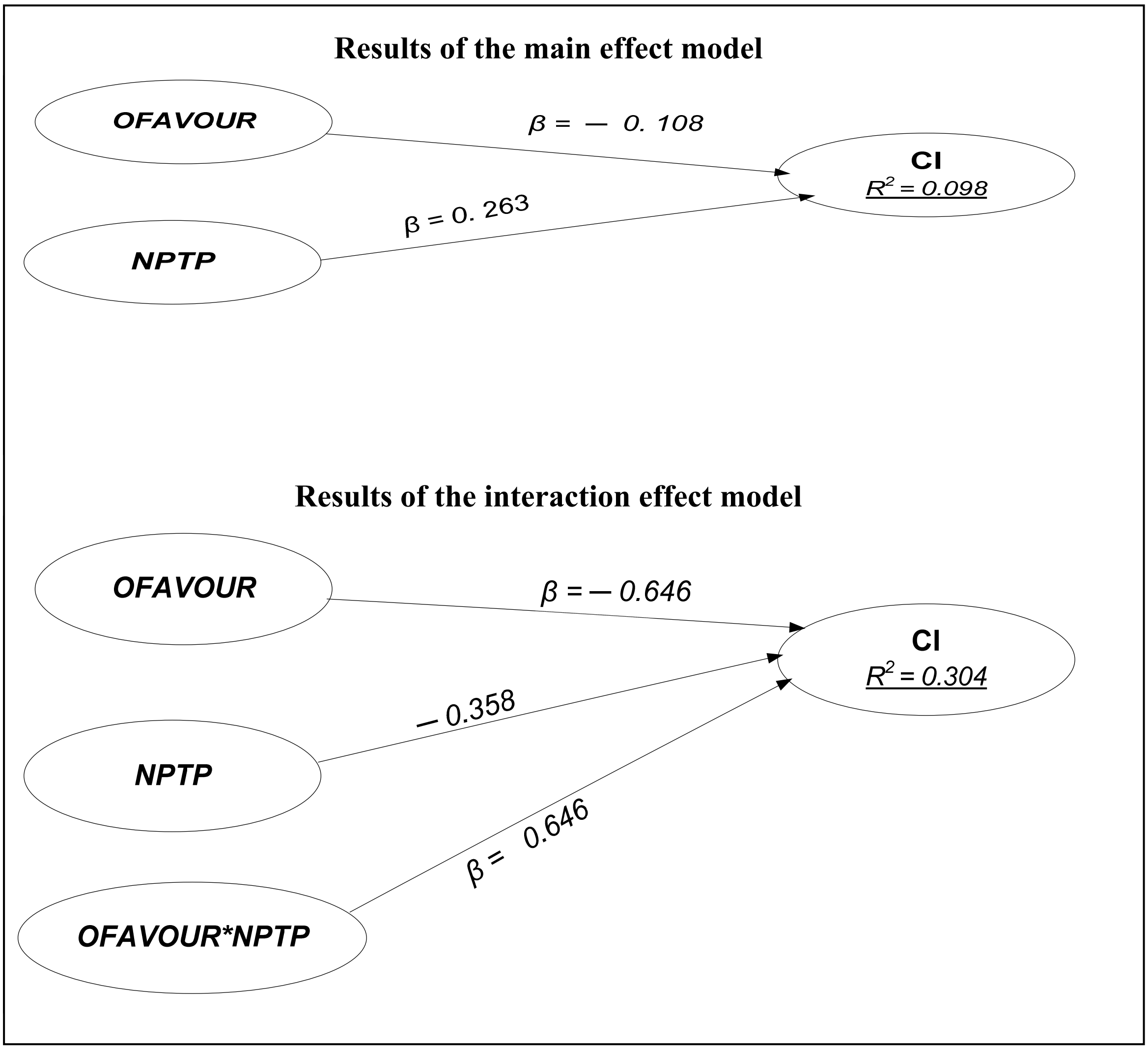


Figure 7-8 Interactive effect of outcome favourability and number projects executed together in the past by parties on conflict intensity

The significance of the interaction effect was assessed by bootstrap with 500 resample. The result showed that the interaction effect was significant at 0.01 level (t = 2.5184, p = 0.00) supporting the hypothesis. This indicates that the number of project handled together by the parties in the past would moderate the relationship between OFAVOUR and CI such that when contractor receives unfavourable outcome, conflict intensity would be lower where the contractor has been involved in many projects together in the past with the employer and project team than when the contractor has been involved in fewer projects. This implies that a contractor's reaction to unfavourable outcome may depend on the numbers of previous projects handled together with the same employer and project team. This finding lends credence to Lyons and Mehta's (1997) argument that long-term experience of parties with one another and satisfaction with performance are significant elements of trust building in order to generate cooperation in business relations.

7.10.2 Interactive effect of Number of Projects executed Together in the past by the parties and OFAVOUR on PDISPU

The results of the main effect and interaction effect models of number of projects together in the past (NPTP) on OFAVOUR-PDISPU relationship are shown in Figure 7-9. The results give a standardized beta (β) of ─ 0.711 from OFAVOUR to PDISPU, ─ 0.068 from NPTP to PDISPU, and interaction effect of 0.516 with total R-square of 0.486.

The result implies that one standard deviation increase in the number of projects executed together by parties in the past (NPTP) will not only impact PDISPU by – 0.068 but it would also decrease the impact of OFAVOUR on PDISPU from – 0.711 to – 0.195 (– 0.711 + 0.516). The main effect model results in lower standardized beta (β) for OFAVOUR-PDISPU and lower standardized beta (β) for NPTP-PDISPU with the lower R-square of 0.295. Hence, the interaction effect produced an effect size (f^2) of 0.37 on PDISPU which is a large effect (Cohen and Cohen, 1983).

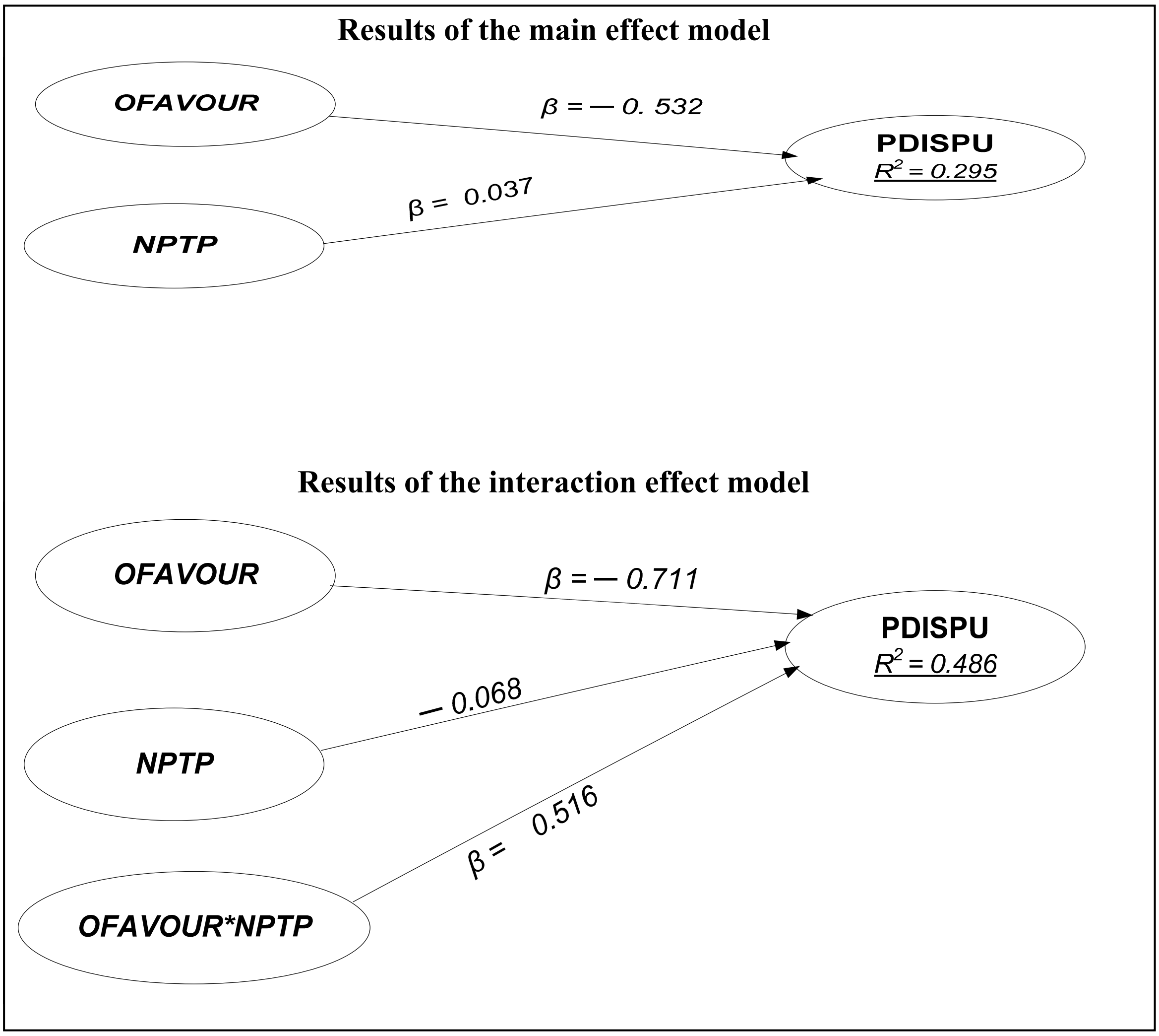


Figure 7-9 **Interactive effect of outcome favourability and number projects executed together in the past by parties on potential to dispute**

The significance of the interaction effect was assessed by bootstrap with 500 resample. The result showed that the interaction effect was significant ($t = 2.15$, $p = 0.01$). The hypothesis was supported. The result indicates that the number of project handled together by the parties in the past would moderate the relationship between OFAVOUR and PDISPU such that when contractor receives unfavourable outcome, potential to dispute would be lower when the contractor personnel has been involved in many projects together in the past with the employer and project team than when the contractor personnel has been involved in few projects together in the past with the employer and project team.

7.11 Tests for Moderating Effects of Respondents' Years of Experience

The moderating effects of respondents' years of experience in construction (YEX) on the relationship between outcome favourability (OFAVOUR) and conflict intensity (CI), and on the relationship between outcome favourability (OFAVOUR) and contractors' potential to dispute (PDISPU) were explored. The results are presented next.

7.11.1 Interactive effect of Respondents' years of experience in construction and OFAVOUR on CI

The moderation effect of respondents' years of experience in construction (YEX) on the relationship between OFAVOUR and CI was tested. The result of the main effect model and interaction effect model is shown in Figure 8-10. The results give a standardized beta (β) of − 0.005 from OFAVOUR to CI, 0.070 from years of experience to CI, and interaction effect of − 0.404 with total R-square of 0.187. The result imply that one standard deviation increase in respondents years of experience in construction will not only impact CI by 0.070 but it would also increase the impact of OFAVOUR on CI from − 0.005 to − 0.409. As expected the main effect model resulted in slightly lower R-square value (0.122) when compared with the interaction model (0.187). Based on the R-square values, the effect size of the interaction effect was estimated. The result shows that the interaction has an effect size of 0.08 which is between small and medium effect (Cohen and Cohen, 1983).

The path of the interaction effect was marginally significant ($t = 1.6045$, $p = 0.057$). Thus the interaction effect proposition was marginally supported. The result implies that when contractor receives unfavourable outcome, conflict intensity would be higher for respondents with many years of experience in construction than for respondents with fewer years of experience in construction.

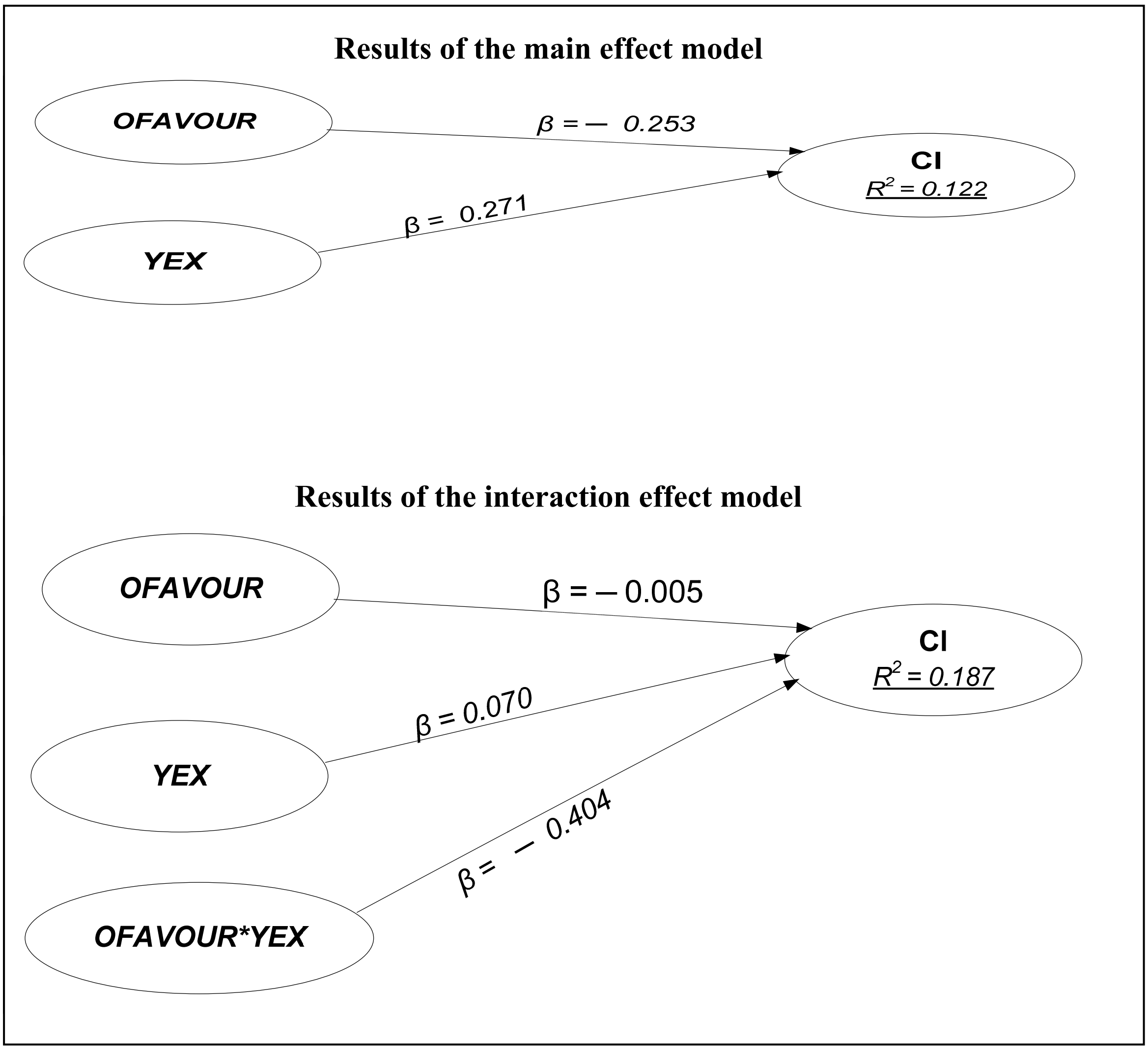


Figure 7-10 Interactive effect of outcome favourability and respondents' years of experience in construction on conflict intensity

7.11.2 Interactive effect of Respondents' years of experience in construction and OFAVOUR on PDISPU

The moderation effect of respondents' year of experience in construction (YEX) on the relationship between OFAVOUR and PDISPU was tested using product indicator approach. The result of the main effect model and interaction effect model is shown in Figure 7-11.

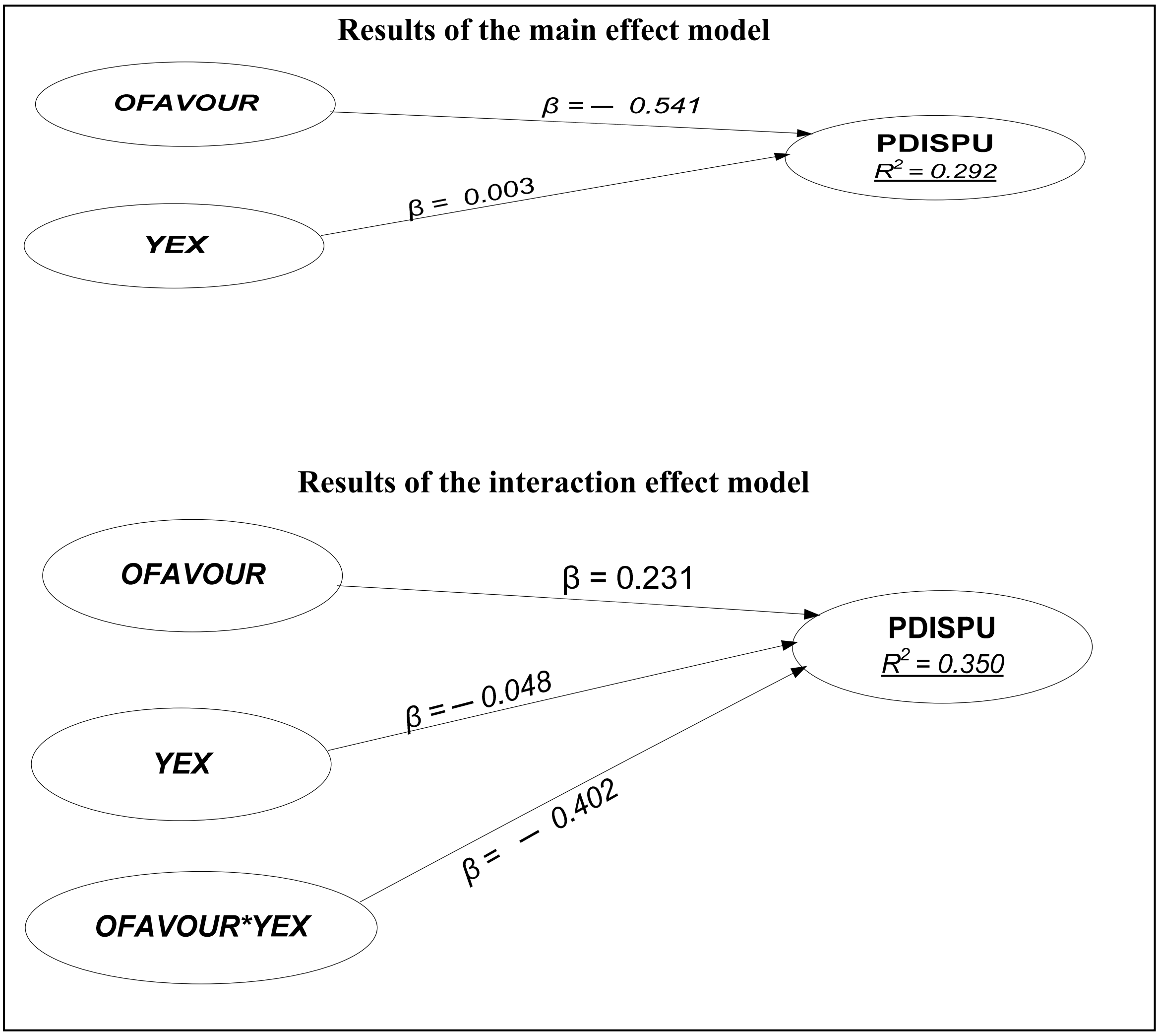


Figure 7-11 Interactive effect of outcome favourability and respondents' years of experience in construction on potential to dispute

The results give a standardized beta (β) of *0.231* from OFAVOUR to PDISPU, ─ 0.048 from years of experience to PDISPU, and interaction effect of ─ 0.402 with total R-square of 0.350. The results imply that one standard deviation increase in respondents years of experience in construction will not only impact PDISPU by ─ 0.048 but it would also decrease the impact of OFAVOUR on PDISPU from 0.231 to ─ 0.171.As expected, the main effect model resulted in slightly lower R-square value (0.292) when compared with the interaction model (0.350). The result shows that the interaction has an effect size of 0.09 which is between small and medium effect (Cohen and Cohen, 1983).

The path of the interaction effect was significant ($t = 2.2006$, $p = 0.01$). The result indicates that when contractor receives unfavourable outcome, potential to dispute would be lower for respondents with many years of experience in construction than for respondents with fewer years of experience in construction.

7.12 Summary

Chapter 7 fulfils objectives 3 and 4 of this study by exploring whether outcome favourability interacts with the contractor's perceptions about procedural fairness to influence conflict intensity, and to influence the contractor's potential to dispute the outcome and; whether outcome favourability interacts with the perceived quality of decision-making process to influence conflict intensity and the contractor's potential to dispute the outcome and how. It also fulfils objective 5 by exploring whether the number of projects executed together by parties in the past interacts with outcome favourability to influence conflict intensity, and the contractors' potential to dispute the outcome; and whether the respondents' years of experience in construction interacts with outcome favourability to influence conflict intensity and potential to dispute.

The results showed that when contractors received unfavourable outcome from claims, there was low conflict intensity and they indicated lower potential to dispute when they perceived that the procedure for administering the claims is fair than when they perceived it as unfair. Also, contractors indicated lower potential to dispute against unfavourable outcome when they perceived good quality of decision-making process than when they perceived poor quality decision-making process.

Further, there was lower intensity of conflict when control in the form of pre construction discussion and agreement on method for substantiating and assessing claims and on rules of evidence for claims was higher than when control was lower. Results further showed that when contractor received unfavourable outcome, conflict intensity was lower when the contractor have been involved in many projects together in the past with the employer and project team than when the contractor had been involved in few projects together in the past with the employer and project team. Moreover, when unfavourable outcome was received, conflict intensity was higher for respondents with many years of experience in construction than for respondents with few years of experience in construction, whereas potential to dispute was lower for respondent with many years of experience construction than for respondents with fewer years of experience. The next Chapter will evaluate the main hypotheses. It will present the conclusions and recommendations.

CHAPTER EIGHT

SUMMARY AND CONCLUSION

8.1 Introduction

The primary purpose of this study was to investigate the influence of contractors' perception about fairness in the process for administering project claims on conflict intensity and contractors' potential to dispute. From a review of the literature, a conceptual model of the interrelationship between perception of fairness, conflict intensity and contractors' potential to dispute was developed (see Figure 3-8). The interrelationship was analysed using data obtained from questionnaire survey. Prior to data collection, a preliminary review and content analysis of judicial decision transcripts of two litigated claims was conducted (see Section 3.18) thereby providing useful direction and information for the operationalisation of the constructs.

This chapter has three parts. The first section presents a summary of the findings of the study (section 8.2). The second section presents an evaluation of the main hypotheses of the study (section 8.3). Next, section 8.4 presents the implications of the findings for theory and for managing of claims on projects to reduce conflict and contractors' potential to dispute. Following this, section 8.5, presents recommendations to clients' consultants and claims certifier (contract administrator), contractors and drafters of construction contracts. Section 8.6 discusses limitations of the present study while section 8.7 suggests directions for future research.

8.2 Summary of Findings

Figure 9-1 shows the results of the analysis of the research model and hypotheses by highlighting the significant paths of the conceptual model. Table 9-1 shows the mediation hypotheses that were supported by the results of the model (Figure 9-1) while Table 9-2 presents a summary of key propositions arising from the study. Table 9-3 shows the interaction effects hypotheses that were supported (chapter 7) including the pattern of the interactions.

Table 8-1 Supported mediation hypotheses

Hypothesis	Inference
h3a: Conflict intensity (CI) would mediate the relationship between procedural fairness (PFAIR) and potential to dispute (PDISPU).	**Supported**
h6a Procedural fairness (PFAIR) would mediate the relationship between outcome favourability (OFAVOUR) and conflict intensity (CI).	**Supported**
h9a Procedural fairness (PFAIR) would mediate the relationship between decision outcome fairness (DOFAIR) and conflict intensity (CI).	**Supported**
h12a Perceived procedural fairness (PFAIR) would mediate the relationship between quality of decision-making process (QDPROCESS) and conflict intensity (CI).	**Supported**

Table 8-2 Key Propositions

Proposition 1: The relationship between control (CTROL) and decision outcome fairness (DOFAIR) is mediated by outcome favourability (OFAVOUR).
Proposition 2: The relationship between the perceived quality of treatment experienced (QTREAT) and the perceived procedural fairness (PFAIR) is mediated by the perceived quality of decision-making process (QDPROCESS).

Table 8-3 Supported interaction effect hypotheses and the patterns of interaction

Hypothesis	The Pattern of the Interaction
H5b:Procedural fairness (PFAIR) would moderate the relationship between outcome favourability (OFAVOUR) and potential to dispute (PDISPU).	When contractors received unfavourable outcome, the potential to dispute the outcome was lower when the procedure for administering claims was perceived to be fair that when the procedure was perceived to be unfair.
H6b:Procedural fairness (PFAIR) would moderate the relationship between outcome favourability (OFAVOUR) and conflict intensity (CI).	When the contractors received unfavourable outcome, there was lower conflict intensity when the procedure for administering the claims was perceived to be fair than when it was perceived to be unfair.
h5c:Quality of decision-making process (QDPROCESS) would moderate the relationship between outcome favourability (OFAVOUR) and potential to dispute (PDISPU).	When the contractors received unfavourable outcome, there was lower potential to dispute the outcome when they perceived good quality of decision-making process than when they perceive poor quality of decision-making process.
The number of projects executed together in the past by parties (NPTP) would moderate the relationship between outcome favourability (OFAVOUR) and conflict intensity (CI).	When the contractors received unfavourable outcome, conflict intensity was lower when the contractors' personnel have been involved in many projects together in the past with the employer and project team than when they have been involved in few projects.
The number of projects executed together in the past by parties (NPTP) would moderate the relationship between outcome favourability (OFAVOUR) and the potential to dispute (PDISPU).	When the contractors received unfavourable outcome, potential to dispute was lower when the contractors' personnel have been involved in many projects together in the past with the employer and project team than when they have been involved in few projects.
Years of experience in construction (YEX) would moderate the relationship between outcome favourability (OFAVOUR) and conflict intensity (CI).	When the contractors received unfavourable outcome, conflict intensity was higher for respondents with many years of experience in construction than for respondents with few years of experience in construction
Years of experience in construction (YEX) would moderate the relationship between outcome favourability (OFAVOUR) and the potential to dispute (PDISPU).	When the contractor received unfavourable outcome, potential to dispute was lower for respondents with many years of experience in construction than for respondents with few years of experience in construction

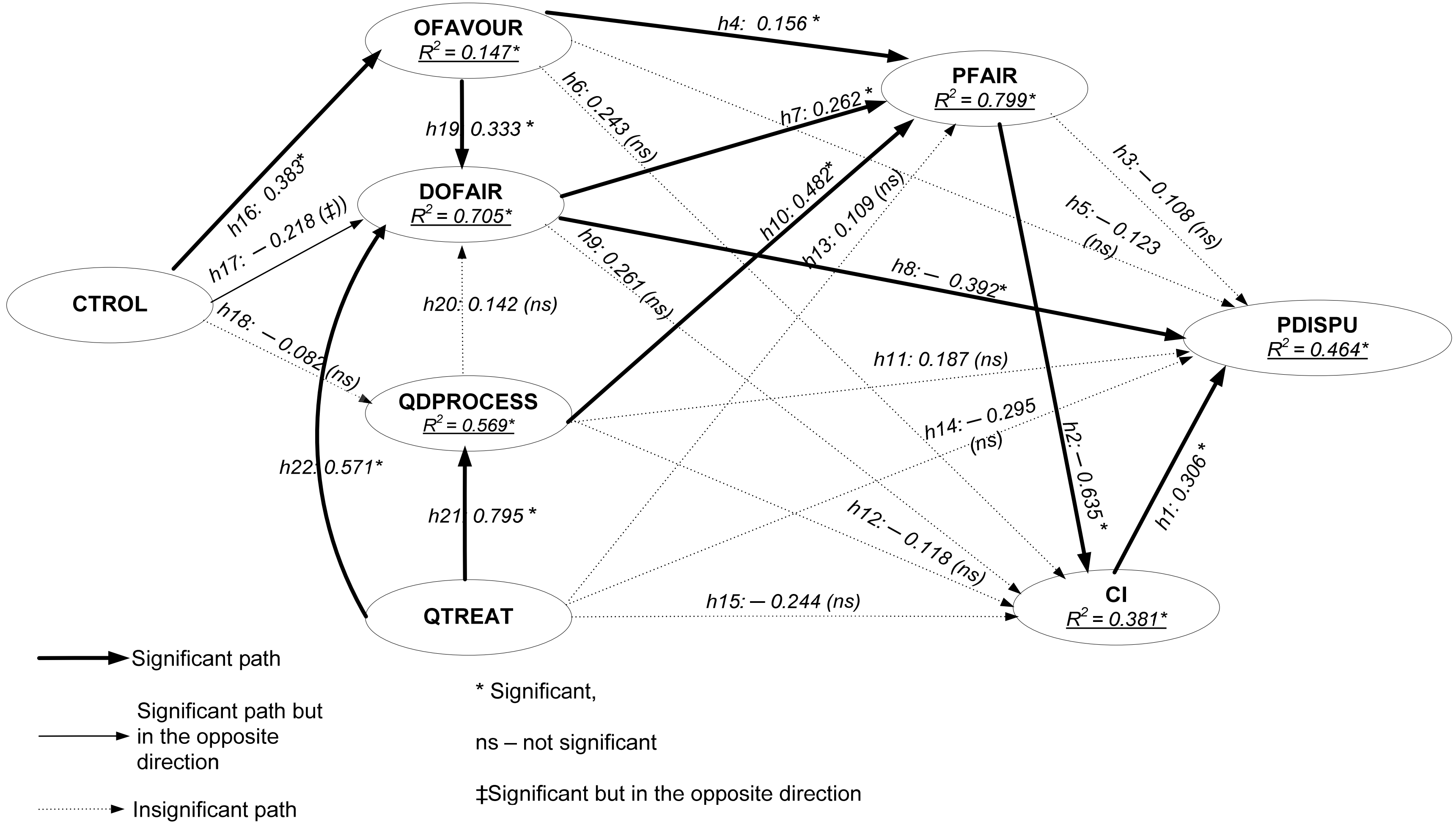


Figure 8-1 Research Model highlighting the significant paths

8.3 Evaluation of the Main Hypotheses

Eight main hypotheses (H1 to H8) (section 1.4) addressed the research questions (secton 1.2). Based on the findings of the test of sub hypotheses (Figure 8-1 and Table 8-1 and Table 8-3), the main hypotheses (H1 to H8) are now evaluated.

From Figure 8-1 four sub hypotheses (h4, h7, h10, and h13) addressed the main hypothesis H1 by proposing that outcome favourability, perceived decision outcome fairness, perceived quality of treatment experienced and perceived quality of decision-making process would directly influence the contractors' overall perception about procedural fairness. The four dimensions of fairness explained about 80% of the changes in perceived procedural fairness (PFAIR) (see section 6.6.4). Out of the four paths, three were significant thus partly supporting the main hypothesis H1. Of the four criteria, perceived quality of decision-making process had the largest and the most significant effect on procedural fairness. This was followed by the two outcome-based criteria of fairness – outcome favourability and decision outcome fairness. One of the major findings of this study is that the predictive effect of quality of decision - making process on perceived procedural fairness is larger than the combined effect of outcome favourability and decision outcome fairness. Also, the relationship between the quality of decision-making process and procedural fairness is stronger than the relationship between the quality of treatment experienced and procedural fairness. The influence of the perceived quality of treatment experienced on the perception of procedural fairness is mediated by the perceived quality of decision-making process (Table 8-2).

Outcome favourability, perceived decision outcome fairness, perceived quality of decision-making process, perceived quality of treatment experienced, and perceived procedural fairness were hypothesized as having directly influence on conflict intensity (hypotheses h2, h6, h9, h12, and h15) (Figure 9-1) thereby addressing the main hypotheses H2. The five dimensions of fairness predicted about 38% of the variance in conflict intensity (significant: $p=0.01$; see section 6.6.5). Of the five dimensions, only the direct path between procedural fairness and conflict intensity is significant (h2) (see section 6.6.5.1). Thus the main hypothesis H2 is partly supported.

Main hypothesis H3 proposed that outcome favourability, perceived decision outcome fairness, perceived quality of decision-making process, perceived quality of treatment experienced, perceived procedural fairness and conflict intensity would directly influence the contractors' potential for dispute (addressed by sub hypotheses h5, h8, h11, h15, h3, and h1). The six constructs put together accounts for about 46% of the variance in potential to dispute (see section 6.6.6). The main hypothesis H3 is partly supported in that the direct paths between conflict intensity and the contractors' potential for dispute, and between decision outcome fairness and the contractors' potential for dispute were marginally supported.

Turning to the main hypothesis H4, which proposed that outcome favorability, the perceived decision outcome fairness and the perceived quality of decision-making process would be directly influenced by the level of control (represented by sub hypotheses h16, h17 and h18 in Figure 8-1), the first observation is that control (CTROL) explained a significant amount of the variance in the levels of favourability of contractors' claims that were granted (outcome favourability – OFAVOUR)(R^2 =

0.14; p=0.05 – see section 6.6.1). The higher the control in terms of pre construction discussion and agreement and clarity on methodology for substantiating and assessing claims and on rules of evidence for claims, the higher the outcome favourability. Sub hypotheses h17 and h18 were not supported thus the main hypothesis H4 is partly supported.

Main hypothesis H5 proposed that outcome favourability, the perceived decision outcome fairness, the perceived quality of decision-making process, and the perceived quality of treatment experienced are interrelated. The hypothesis is partly supported in that out of the 4 sub hypothesis addressing H5 (h19, h20, h21, and h22), three were supported (h19, h21, and h22). The paths of the model (Figure 8-1) show that the higher the outcome favourability the higher the perceived decision outcome fairness (h19). The higher the perceived quality of treatment experienced, the higher the perceived decision outcome fairness. Also, the higher the perceived quality of treatment experienced, the higher the perceived quality of decision-making process.

Control, outcome favourability, the perceived quality of treatment (QTREAT), and quality of decision-making process (QDPROCESS) jointly predicted about 70% of the variance in the contractors' perceived fairness of claims certifiers' decision (DOFAIR). Of the four predictors, the perceived quality of treatment experienced was the most dominant predictor of the contractors' perceived fairness of claims certifier's decision and was followed by the level of favourable outcome received from claims (see section 6.6.2). Both control and contractors' perceived quality of treatment predicted about 57% of the variance in the perceived quality of decision-making process. Again, the quality of treatment experienced stood out as the most substantive important pre condition of quality decision-making (see section 6.6.3).

Out of the 4 sub hypotheses (h6a, h9a, h12a and h15a) regarding the indirect effect of outcome favourability, perceived decision outcome fairness, perceived quality of decision-making process, and perceived quality of treatment experienced on conflict intensity (addressing main hypothesis H6), three were supported (Table 8-1). Rather than a direct impact, the predictive influences of outcome favourability on conflict intensity and of decision outcome fairness on conflict intensity are mediated by procedural fairness (hypotheses h6a and h9a respectively). Also, the predictive impact of quality of decision-making process on conflict intensity is mediated by procedural fairness (hypothesis h12a). Thus the main hypothesis H6 is partly supported. Those who received a favourable outcome, perceived decision on claims to be fair, perceived a good quality of decision-making process also perceived the procedure for assessing claims to be fair and engaged in less conflict behaviour.

Four mediating effect sub hypothesis (h5a, h8a, h11a, and h14a) addressed the main hypothesis H7 which proposed that the influences of outcome favourability, the perceived decision outcome fairness, the perceived quality of decision-making process, and the perceived quality of treatment experienced on the contractors' potential to dispute would be mediated by the overall perception about procedural fairness. Thus hypothesis H7 is not supported in that none of the 4 mediating effect sub hypotheses was supported. However, as proposed by sub hypothesis h3a, predictive influence of contractor's overall perception about procedural fairness on potential to dispute is mediated by conflict intensity (see Table 8-1). Those who perceived the procedure to be unfair engaged in conflict and, those who engaged in conflict reported a higher potential to dispute.

Turning to the main hypothesis H8 (section 1.3), three sub hypotheses (h5b, h6c, h5c) out of the four sub-hypotheses (h5b, h6c, h5c, h6c) involving interactive effects of outcome favourability and procedural fairness, and of outcome favourability and quality of decision-making process on conflict intensity and, on potential to dispute were supported (h6b, h5b, and h5c) (see Table 8-1). Thus the main hypothesis H8 is partly supported. When the outcome of claims is unfavourable, there is likely to be a lower intensity of conflict and lower likelihood of dispute when the procedures used in administering claims are perceived to be fair than when the procedures are perceived to be unfair (see section 7.3 and section 7.4). When the outcome of claims is unfavourable, there would be lower likelihood of dispute when the quality of the process for assessing and deciding claims is perceived to be high than when it is perceived to be low (see section 7.5).

This study also discovers that under conditions of unfavourable outcome, conflict intensity was lower when parties have been involved in many projects together in the past than when they had been involved in few projects together (see section 7.10.1). Further, the number of projects executed together in the past by the parties moderated the effect of outcome favourability on potential to dispute such that when contractors received unfavourable outcome from claims, potential to dispute was lower where parties have been involved in many projects together than when they have been involved in few projects together in the past (see section 7.10.2).

Turning to the moderating effect of respondents' years of experience, it was found that when unfavourable outcome was received from claims, respondents with many years of experience in construction would display conflict behaviour when compare to respondents with few years of experience (see section 7.11.1) whereas respondents with many years of experience in construction reported a lower potential to formally dispute claims than respondents with few years of experience (section 7.11.2).

Also, a minor finding is that on projects where most of the conflicts were resolved by mutually agreed upon solution, working relationships were moderately affected (see section 5.3.7). Negative attitudinal propensities such as the contractor's potential to reject the outcome of claims and potential to dispute were also moderate. On projects where most of the conflicts were resolved by one-sided compromise or by employers' imposition of a decision on the contractor, impact on relationships was more serious. The contractor also indicated a very high level of negative attitudinal propensities (see Table 5.13, section 5.3.7).

8.4 Implications of the Study

This section discusses two main sets of implications of the study: theoretical and practical.

8.4.1 Contribution to theory

This study contributes to knowledge in construction management by applying a new theoretical framework developed from organizational justice concept to investigate and empirically demonstrate the influence of perceptions of fairness on conflict intensity and contractors' potential to dispute in the process for administering project claims. It offers a new plausible explanation for the factors influencing conflict and dispute in construction project delivery. This is the first known quantitative study in construction management literature to apply the concept of fairness to the study of claims, conflict, and dispute in construction procurement. The study provides empirical evidence to support a claims administration strategy based on principles of fairness when attempting to lessen conflict and dispute on projects.

Another contribution to theory is that it complements transaction cost economic (TCE) analysis of construction conflict and dispute (see section 2.6.2) in two ways: First, this study discovered that the perceptions of fairness of formal governance structure (e.g. procedure for claims) (which is the focus of TCE) could escalate conflict and perhaps generate further transaction cost. This shows that TCE approach should be modified to focus on the combined effect of formal structure and informal norms of justice to minimize transaction cost. Solely focusing on the design of governance mechanism (the tenets of TCE approach) to reduce transaction cost may be ineffective in that the way the governance structure is implemented could escalate conflict and dispute and consequently increase transaction cost if norms of fairness are lacking.

Second, this study found that the outcome received from claims is a determinant of contractors' conflict and disputing behaviour (supporting the self-interest seeking perspective or people as postulated by TCE) – see sections 6.6.5.3 and 6.6.6.4. However, this study also found when the contractors received low level of outcome from claims, conflict intensity and contractors' potential to dispute was lower when procedures for administering claims was perceived to be fair than when it was perceived to be unfair. Similarly, contractors' potential to dispute was lower when the quality of decision-making process was perceived to be good than when it was perceived to be poor. On top of that, the perceived quality of treatment was found to have the largest predictive impact on the quality of decision-making process and while the quality of decision-making process has the largest predictive impact on the perceived procedural fairness suggesting that informal aspects relating how decision-making procedures and processes are implemented and how people are treated also play important roles in conflict and dispute escalation. Thus this study complements TCE approach to research in construction conflict and dispute by showing that a self-interest explanation of conflict and disputing behaviour in construction is incomplete.

The reason is that organizational justice concept combines the effect of peoples' evaluation of outcome received from a decision-making (outcome favourability) and decision outcome fairness (self-interests aspect) and the effect of evaluation of formal and informal aspects of decision-making procedure (control, quality of decision-making process and quality of treatment experienced).

This study also contributes to knowledge by discovering the mediating role of perception about procedural fairness on the relationship between outcome favourability and conflict intensity, and on the relationship between the perceived decision outcome fairness and conflict intensity (section 6.6.5.3). This suggests that, in the context of construction, people use perception about fairness of procedure for claims (whether consciously or unconsciously) to summarize their experience during the process for handling claims and to guide their reaction to decisions on claims.

This implies that a single experience of lack of fairness does not necessarily determine conflict intensity or likelihood of dispute. Rather, conflict intensity and potential for dispute is determined by a summation of experiences during the administration of claims on a project. This offers empirical support for one of the major tenets of fairness heuristic theory (Lind and Tyler, 1998) (see section 3.6) which postulates that general perceptions about fairness of procedure are used as a heuristic from which perceptions of fairness are generated, and from which people determine their behaviour.

8.4.2 Practical Implications

The findings suggest some practical issues that construction industry stakeholders in Singapore and elsewhere should consider.

The first practical implication arises from the findings that evaluation of processes, procedures and treatment directly and or indirectly predicted conflict intensity and the contractors' potential to dispute (see sections 6.6.5 and 6.6.6). Indeed contractors' evaluation of processes, procedures and how they were treated cast stronger influence than their evaluation of outcome received from claims. The practical implication is that the design of formal contract processes and procedures is not enough when attempting to minimize claims, and reduce conflict and dispute. There is also a need to enhance a contractor's perception of fairness by paying greater attention to interaction and treatment, and the implementation of the procedures and processes for administering claims.

The moderating effects of procedural fairness on contractors' reaction to unfavourable outcome, and also the moderating effect of quality of decision-making process on contractors' reaction to unfavourable outcome (see sections 7.3 to 7.6 and section 7.7) are phenomena that provide another practical relevance. They provide information to the employer's project management personnel especially those who are appointed as claims certifiers, and whose actions of rejecting contractor claims can be easily misinterpreted as unfavourable and unfair and hence challenged. The phenomena further suggest that construction claims could be effectively managed by operating claims procedure in such ways that parties can perceive it as fair, and by using quality decision-making process, proper treatment of contractor, and by ensuring high quality interaction with the contractor and all the parties.

Interaction aspects of a procedure for claims are linked to the particular people (employer's project management personnel and consultants) administering the contract. Thus paying attention to process and procedure goes beyond having a formal contract mechanism, but more importantly, how the mechanism is implemented and operated by the employers' consultants and claims certifier and the quality of the contractor's interaction with the team.

Another major practical implication relates to the contractor's self-interest seeking behaviour in the process for administering claims. The present study showed that perceptions about process, procedure and treatment cast the most substantial direct and / or indirect predictive influence on conflict and dispute (see Figure 8-1). However, outcome favourability and the perceived decision outcome fairness also cast some significant predictive influence (see sections 6.6.5.3 and 6.6.6.4). These suggest that while proper treatment, good interaction, fair procedure, and good quality decision-making process are important for ensuring success of claims process, the role of self-interest of parties cannot be disregarded. Since, self-interest may influence the parties' strategies, behaviour and activities during claims process, parties would tend to justify their position, take advantage of one another (opportunism) and thus would desire that decision on claims favours their interests rather than an objective and appropriate decision.

However, the findings which show that fair procedure and good quality decision-making process would cushion the effect of unfavourable outcome (see sections 7.3 to 7.6 and section 7.7) suggest that designing and implementing claims procedure in fair ways, proper treatment of the contractor and ensuring good quality decision-making is likely to promote higher levels of mutual-interest seeking behaviour and thus lead to lower levels of opportunism. Another implication is that when procedure for claims is fair and the quality of decision-making is good, commitment by the employer management team to seeking mutually acceptable solution to claims, which focuses on the needs of all parties, would likely reduce opportunism and enhance the contractor's satisfaction with the resolution of claims even when they are unfavourable. Nevertheless, the significant predictive influence of outcome on conflict and dispute also suggest that legal safeguard by way enforcement terms in the contract is also important in managing claims. This would serve as recourse should interaction, proper treatment, quality decision-making process and fair procedure fail to reduce opportunism arising from contractors' self-interest seeking behaviour.

This study discovers that when the contractors received unfavourable outcome, conflict intensity was higher for contractor's personnel with many years of experience in construction than for those with fewer years of experience in construction whereas potential to dispute was lower for those with many years of experience in construction than for respondents with fewer years of experience (see sections 7.11.1 and 7.11.2). The practical implication is that employer's project management team should be aware that when working with contractors' personnel with only a few years of experience in construction, these junior staff may try to avoid conflict but their dissatisfaction with the handling of claims may fester beneath in the form of latent conflict. Consequently, the latent conflict could later generate dispute.

8.5 Recommendations

Objective 6 of this study is to propose ways of administering construction contractors' claims to lessen conflict and employers' exposure to dispute with contractors (see section 1.3). Based on the results and indicators of the constructs of the study (see Figure 6-1, 6-2 and Table 6-2), the following sub sections set out some recommendations for the attention of clients project management team (claims certifiers and other consultants), clients (employers), contractors, and designers of construction contracts.

8.5.1 Recommendations to clients' consultants and claims certifiers

The following recommendations are set out for those who act in the capacity of claims certifiers and clients' project management team:

1. The claims certifier should critically evaluate the contractor's claims. To avoid the feeling of unfair treatment, it is necessary that rejections of claims or parts

of claims are justified with logic, objectivity and methodical arguments and explanation that are convincing and acceptable. Record and documents used in claims analysis should be properly kept.

2. Treat the contractor's personnel with dignity and respect when assessing and conducting fact finding on claims. A claims certifier who treats the contractor personnel properly by being transparent in communication, showing concern for the contractor's contractual rights, providing opportunity for the contractor to voice its views during claims process before decisions are made, and providing the contractor with logical and methodical explanation for decisions may be perceived as making a fair decision.
3. Give timely decision on claims. Should there be a delay in making a decision, the reason should be made known to all parties. Speedy decisions unaccompanied by relevant facts and sufficient justification and explanation should also be avoided.
4. Avoid contradictory views on the contractor's claims. Views should be formed and communicated to contractors after the claims have been ascertained and verified against the facts.
5. Fulfill and ensure that the employer fulfills any agreement reached during claims negotiation. Should there be a need to re negotiate agreements, the reason should be clear and made known to the relevant parties.
6. As much as possible be neutral, impartial and unbiased. Attitudes and behavior that indicate asymmetry in the claims certifier's behaviour towards the employer and/or the contractor regarding claims could influence the parties' perception about fairness of the claims process.
7. The claims certifying and quasi-arbitral role of the claims certifier would

continue to be an area of concern to contractors. Although under the common law, the claims certifier is required to exercise his/her judgement fairly, this study suggests that the ultimate test of the claims certifier's effectiveness would depend on how the claims certification and decision-making duties are exercised in practice.

8. Be consistent when interpreting and applying contract provisions to assess and decide claims on a project. Inconsistencies may break down trust and hence increase perceived lack of fairness.
9. Demonstrate professional expertise when diagnosing and assessing claims. When contractors perceive a lack of professional expertise and experience, it could diminish their trust in the decision-making process or the decision itself. Thus it could increase the potential that the contractor will challenge the decision based on perceived or actual flaws in the decision-making process or the decision. Also, a high level of professional expertise from the onset of the project may reduce contractor's opportunistic behaviour.
10. Be transparent and open by allowing claims to be discussed at site meetings. Early non-adversarial opportunity for all parties to communicate issues relating to claims is essential as it encourages transparency and builds the contractor's confidence in the claims certifier' independence and neutrality.
11. Show concern for the contractor's contractual rights with respect to claims. Even if the contractor's claims initially appear to be unfounded, in order to accommodate the interest of the contractor, the claims certifier should be prepared to question his/her own beliefs, methods and approach, and listen to and adequately consider the views of the contractor.
12. Build competence for managing claims, conflict and dispute. Areas of

competence needed may include diagnostic skill, behavioural skill in breaking possible escalation of conflict or a deadlock in reaching agreement, and capacity to provide support and assurance to both parties. It is essential for a claims certifier to have adequate knowledge in construction, understand contract terms and their implications, and have ability to evaluate the contractor's claims and perhaps translate the decision made on claims into ways that are understandable by the contractor and employer.

13. Have pre construction meeting together with the contractor and employer to discuss and agree on methodology and approach for submitting and assessing claims, and on rule of evidence for claims. It may also be helpful to agree on the software for project scheduling and frequency for updating the schedule.

8.5.2 Recommendations to clients

Successful claims administration would depend on the skills and professionalism of the employer's project management team and how they exercise their duties in practice. Thus the employers and their advisors may want to consider these factors when appointing claims certifiers and consultants on their projects (Aibinu, 2004): professional expertise, experience in contract administration, personal qualities, and diagnostic skill. It is also essential that employers do not interfere with the claims certification role of the claims certifier either informally or formally by way of exclusion clauses in the contract of engagement (a major problem in the 'BRL' case – see section 3.20.6). Where there are exclusion clauses (if need be), it should be by mutual agreement with the contractor prior to execution of the contract.

When resolving claims, in order to ensure that information used are dependable and credible thereby enhancing perception about fairness, it is essential to retain (as much as possible) the claims certifier and other project management personnel who are involved in the project till the completion of the project and to the time when all claims and the accounts have been finalised. A claims certifier with prior knowledge of the nature of the contractor's claims and the course the project had taken would enhance the claims certifier's credibility with the contractor. Where project is divided into independent phases, changes in the employer's project management team to suit the anticipated project environment may be necessary. However, when it comes to the handling of claims, conflict and dispute on projects where project phases are interdependent, selecting a project management team to see the project completely through its lifecycle is essential.

Further, disagreements may be inevitable on best managed projects. However, the impact of disagreements on a contractor's propensity to reject the outcome of claims and potential to dispute may be reduced by finding a settlement which is mutually acceptable and which focuses on the needs of the contractor as well and the employer – rather than imposing or forcing a decision on the contractor or a one-sided compromise (see section 5.3.7).

The results of this study demonstrate that the experience of project management team with the contractor in terms of number of projects executed together in the past moderated the relationship between outcome favourability and conflict intensity and between outcome favourability and contractors' potential to dispute such that when claims was unfavourable, conflict intensity and contractors' potential to dispute was lower when parties had been involved in many projects together in the past than when they had been involved in few projects (see sections 6.6.1 and 6.6.3). Employers and their advisors may want to consider this when appointing consultants and selecting contractors for projects. Besides other considerations, a contractor with good previous working relationship with the appointed consultants should be preferred when evaluating tenders.

As mentioned earlier, the claims certifying and quasi-arbitral role of the employer-appointed contract administrator will continue to be an area of concern to contractors. Depending on the complexity of projects, employers and their advisors should consider the use of totally independent party or committee such as Claims Review Board to handle claims on construction projects. This could be similar to Dispute Review Board now in use in the United States and else where or the Dispute Resolution Adviser system in use in Hong Kong. It could comprise three individuals jointly appointed and paid by the employer and the contractor. The parties each could select a member of the committee and third member is selected by the two members. The committee could be involved from the outset of a project for the purpose of handling conflicts relating to claims before they escalate and generate dispute. The contractor can refer claims on the project to the board for negotiation and resolution when they are likely to generate dispute. Periodic meetings could be held for the purpose of reviewing disputed project claims. The choice of such approach should however depend on the project size.

8.5.3 Recommendations to Contractors

There is need for contractors to build competency for claims, conflict and dispute management. As a result of lack of relevant documents, records and information, a contactor can find it difficult to substantiate genuine claims. Rejection of such claims by the claims certifier may lead to loss and hence dissatisfaction, resentment and could encourage opportunistic behaviour and adversarial relationship when further claims arise in a project or in future transactions. In addition, when disagreements arise on claims, compromising by giving up contractual rights may be one-sided (Zack, 1993). The contractor may suffer a loss and thereafter become dissatisfied. This may generate a very high propensity for negative attitude and may encourage adversarial culture in future contract relationships (Abrahamson, 1984). It is more helpful if the contractor could adopt a proactive and early non-adversarial communication on its interests rather than withdrawal, avoiding or one-sided compromise attitude. Nevertheless, contractors need to be cautious in their responses towards a claims certifier's attitude. Frequent and repeated unfair responses to the claims certifier's actions and inactions may be a potential source of tension and conflicts in practice.

8.5.4 Recommendations to those who are involved in drafting contracts

The procedure for claim, its implementation, and the quality of interaction among parties are critical for enhancing the parties' perceptions of fairness and achieving a smooth claims resolution. On these, some of the pertinent issues include provision of clear and adequate explanations or justification for claims certifier's decision, treating of contractor's personnel with dignity and respect, timely decision, honesty and truthful communication, keeping to agreement reached during claims negotiation, claims certifier's neutrality, impartiality and unbiased attitude, claims certifier's consistency in deciding various claims on a project, claims certifier's demonstration of professional expertise in diagnosing and assessing of claims, allowing claims to be discussed at site meetings, showing of respect and concern for the contractor's contractual rights with respect to its claims, openness and transparency. While some of these would depend on the particular person operating the contract provision for claims, appropriate contract language could facilitate some of these aspects. For instance, contract language and provision that encourages participation of all parties including the employer may facilitate open and adequate communication, transparency, speedy action and response by parties at every stage of the claims process.

Turning to the issue of claims certifier's neutrality, impartiality and independence, in the Singapore Institute of Architects (1999) Articles and Conditions of Building Contract (SIA) and Public Sector Standard Conditions of Contract (PSSCOC) – two standard forms of contract used on the projects upon which the data for this study was obtained, the claims certifier is the employer-appointed contract administrator (who is the Architect in the SIA form and Superintending Officer in PSSCOC). Given the central role of claims certifier in ensuring that procedure and process for claims are operated in fair ways and coupled with contractual dual role played by the contract administrators under these standard forms, there is likely to be a continuing uncertainty and question on the extent to which fairness would be ensured in claims resolution.

In order to allay this uncertainty and reduce conflict and potential for dispute, there is need for contract provision to require the use of claims review board, which may be conditional based on project complexity and size. This have proven to be among the more effective methods of resolving conflict before it leads to costly and time consuming litigation or arbitration (Yates an Epstein, 2006). Contract provision and language could require the use of claims review boards. Elements of such specifications should include (Groton and Wildman 1992): mechanisms to select board members or mediators; number of board members; personnel who will represent the various parties; time frames; board involvement and activity during construction; and sanctions for failure to participate. The board would be responsible for reviewing claims during project life cycle. This could enhance the parties' perception of fairness since the board members are appointed by the agreement of both parties. It could also alleviate the problem associated with employer project management turnover in that it would help preserve evidence relating to claims throughout the project lifecycle.

8.6 Limitation of the Study

The limitations of this study are now discussed. The first is that the survey captured the opinions of contractors only, and this formed that basis of the results and discussion. Capturing the views of the employers and claims certifiers on the same projects selected by the respondents (contractors) would have provided a more holistic consideration of the results and the practical implications. But this was not possible because of the sensitive nature of the subject. For confidentiality reasons, contractors interviewed would not provide the name of the project selected, the name of the client and consultants involved. This limitation is not expected to nullify the findings of this study because perception of fairness would differ between employer, contractor and consultants. According to Spittler and Jentzen (1992) fairness is better understood by examining the attitudes and perceptions of participants affected by a decision-making process.

The second limitation is that the antecedents of perception about fairness and how the perception influences conflict and dispute could vary across different cultural settings (Brockner et al, 2000), forms of contract and across different types of procurement methods. The form and the degree of the relationship between constructs are likely to differ due to contextual differences. Although the results of this study provide vital information to the construction industry globally, its application could have some limitation in countries with different cultural background from Singapore. Also the data used are based on projects procured by traditional procurement methods and with SIA and PSSCOC standards forms of contracts. This study did not take account of the changes in the relationship between fairness, conflict and dispute that may be accounted for by procurement method and contract form.

The third limitation is that common method variance (see section 4.6) was not totally controlled in this research. While measures were taken in survey design to limit the effect of common method variance (see section 4.6), only one of the contractor's personnel responsible for handling claims responded to all the questions relating to both the dependent and independent variables. Therefore, the problem of common method variance remains. This limitation leads to future research possibilities discussed in the next section.

The fourth limitation of this study is that it was susceptible to social desirability bias in the completion of many of the self-reported measurement items used. In particular, respondents may have been inclined to answer the questions regarding conflict intensity and their potential to dispute in a socially desirable way.

Measures were taken to minimize the possibility of social desirability bias. Assurances of anonymity were provided in both the cover letter and directly to the respondents during the interview survey.

Lastly, the response rate (21%) for the study was not as large. The data was obtained from 41 personnel of 41 construction firms by face-to-face interviews using a structured questionnaire. The size of the sample placed restrictions on the ability to detect significant effects. However, the PLS-SEM used allows for statistical validation of the model and analysis shows that the response rate did not affect the validity of the results.

8.7 Recommendations for Future Research

This study lays the groundwork for future research on how fairness perception is formed and how it influences conflict and dispute in context of construction. As mentioned in the limitations, the result is based on the views of only one group of participants in the claims process – the contractors. For a more holistic insight, future study should attempt to capture, on the same set of projects, the views of employers and claims certifiers. This would reveal areas of differences and would provide information that should further improve the external validity of the conclusion and implications.

As mentioned earlier (see section 8.3), common method variance was not totally controlled in this study. In a future study, questions relating to the key independent and dependent variables could be obtained from more than one source. For example, questions relating to indicators of constructs of perceptions of fairness could be presented for evaluation by a contractor's personnel directly involved with claims while questions relating to conflict intensity and potential to dispute could be presented for evaluation by another contractor's personnel also involved with claims on the same project. The validity of the relationship among the variables may also be boosted by collecting data on perceptions of fairness and conflict intensity at different time. Alternatively, observational research techniques may be employed to measure conflict intensity and some other questionnaire items such as extent of pre agreement on methodology for claims, and extent to which claims were discussed at meeting. This approach might improve the external validity of the measurement of the variables.

The study is based on perceptions of 41 contractors in Singapore. Future research could be conducted with a larger sample in other countries, for the purpose of verifying the results and identifying differences in contractor's perception of fairness and orientation to claims across different contexts. For example, this study showed that when unfavourable outcome was received conflict intensity and the contractors' potential to dispute was lower when procedure was fair than when procedure was unfair. It is possible that in other contexts, the moderating effect of procedure may not be present.

Further, the data for this study are based on contractors' experience on traditional contracting method. It is likely that contractors' perception of fairness would differ across different procurement methods. Future research could examine how contractors' perception of fairness and reactions vary across different procurement methods. This is being suggested, given that the present study did not consider the impact of procurement method on the model in order to keep the scope of this study coherent and feasible, given the time constraint.

The recommendations of this study (see section 8.4) are set out based on the indicators used to measure the constructs of the hypotheses and on the data analysis. It will be useful if action research could be conducted to implement the recommendations on a real life project and monitored throughout the project life cycle by periodic interview with the parties (in particular the contractor) on their views regarding the way claims are being handled. The feedbacks to employer management team can be used as basis for further improvements where necessary. Upon completion of the project, the result could then be evaluated by examining the contractors' perception of fairness, the conflict and dispute level during the project, and the parties' level of satisfaction. Based on the outcome, new insights may be gained, and relevant improvements may be incorporated when procuring the next project. The action research could be an ongoing activity and could lead to ongoing improvements in strategies and practices for administering claims.

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APPENDIX 1: QUESTIONNAIRE

QUESTIONNAIRE FOR CONTRACTOR'S QUANTITY SURVEYOR OR PERSONNEL IN-CHARGE OF CLAIMS

SECTION A

Q1: Designation of person completing the questionnaire?

- Contract manager
- QS/Contract administrator
- Site manager/Project manager
- Others (please specify)……………………………………………………

Q2: Years of experience in construction?

- 0 – 5 years
- 11 – 15 years
- 21 – 25 years
- 6 – 10 years
- 16 – 20 years
- Over 25 years

Q3: In how many projects have you been involved in the past?

- 1 – 5 projects
- 11 – 15 projects
- Over 20 projects
- 6 – 10 projects
- 16 – 20 projects

Q4: Number of permanent staff (foreman and above) in 2003?

- less than 50
- 50 to 150
- Over 150

Q5: Annual Turnover (in S$ million) in 2003?

- less than S$50 million
- S$ 50 to S$150 million
- Over S$150 million

Q6: BCA Registration Grade (A1, A2, B1, B2 etc.)

- CW01 General building…………………………
- CW02 Civil engineering………………………

Q7: Your company has been operating for how many years?...

NOTE: Please kindly select a particular project of your choice which your company has completed and which involves claims
(the name of the project is not required). In respect of the selected project, please answer the questions in Section B.

SECTION B

Q8: When was the project commenced (year) ………………………………?

Q9: When was the project completed (year) ………………………………?

Q10: What was the approximate value of the project? S $...

Q11 Type of client for this project……………………………………………………….. (Public or private)

Q12: Indicate the Standard form of contract used on the selected project

- PSSCOC
- REDAS
- Other, please specify……………………………
- SIA
- FIDIC

Q13: In how many projects has your company been involved with the same employer? …………………………

Q14: Please indicate the extension of time (EoT) and additional cost claims requested (as a percentage of contract duration, and contract sum respectively)	0.1 up to 4.99%	5 and up to 9.99%	10 and up to 14.99%	15 and up to 19..99%	20% and up to 29..99%	30% and up to 39..99%	40% and above
Extension of time claim							
Additional cost claim							

Q15: Please indicate what percentages of claims were allowed and the corresponding perceived level to which they are favourable to you	1% up to 14..99%	15% up to 29.99%	30% up to 44.99%	45% up to 59..99%	60% up to 74..99 %	75% up to 89.99%	90% up to 100%
(1) % of extension of time claims allowed							
(2) % of additional cost claims allowed							

Q15: Perceived favourability of claims allowed	Very Unfavorable						Very favorable
	1	2	3	4	5	6	7
(3) Favourability of EoT claims							
(4) Favourability of cost claims							

Q16: When compared with your expectations claims allowed.	Much worse than Expected			About what was expected			Much better than expected
	1	2	3	4	5	6	7
(1) Extension of time allowed							
(2) Additional cost claim allowed							

Q17: Please indicate what percentage of the additional cost claims allowed was finally paid by the employer?	1% up to 14..99%	15% up to 29.99%	30% up to 44.99%	45% up to 59..99%	60% up to 74..99 %	75% up to 89.99%	90% up to 100%

Q18: In terms of what you deserved rate from 1 to 7 the extension of time and additional cost claim allowed by the consultant?	Much less than the deserved			As much as deserved			Much more than deserved
	1	2	3	4	5	6	7
(1) Extension of time allowed							
(2)Additional cost claim allowed							

Q19: Was the actual extension of time and additional cost allowed fair?	Not fair at all						Very fair
	1	2	3	4	5	6	7
(1) Extension of time allowed							
(2)Additional cost claim allowed							

Q20: When compared with claims that you presented on some other similar projects, how was the extension of time and additional cost claims allowed by the consultant?	Much worse than in other similar projects			As in other similar projects			Much better than in other similar projects
	1	2	3	4	5	6	7
(1) Extension of time allowed							
(2) Additional cost claim allowed							

Q21: On the overall, how satisfied are you with the losses and wins resulting from claims on this project?

	Very dissatisfied					Very satisfied	
	1	2	3	4	5	6	7
EoT claims							
Additional cost claims							

Q22: Please indicate by ticking (✓) in the space provided your response to each of the following question		Low						High
		1	2	3	4	5	6	7
1	At the outset of the project, to what extent to what extent did you agree and clarify the methodologies for quantifying claims (e.g. agreement on formulae for calculating overheads component of additional cost claims such as Hudson's formulae)?							
2	At the outset of the project, to what extent did you agree and clarify the software and formats for project scheduling and content of the schedule?							
3	At the outset of the project, to what extent did you agree and clarify rules of evidence for claims i.e. types information required for justifying claims?							

Q23: How often were you satisfied that the information and facts supplied to substantiate claims was sufficiently considered by the claims certifier when assessing and deciding claims?	Never						Always
	1	2	3	4	5	6	7
(1) EOT							
(2) Cost claims							

Q24: Please indicate how frequently you were required to update the master programme.

3 months and above	2 months	1 month

Q25: Please indicate the average time taken by the Consultant to **assess** claims (from the time they were presented)	0 –1 months	1- 2 months	2- 3 months	3- 4 months	4- 5 months	5- 6 months	More than 6 months
	1	2	3	4	5	6	7
Extension of time claims							
Additional cost claims							

Q26: Please indicate the average time taken to resolve disagreements on claims after they were assessed and decided)	0 –1 months	1- 2 months	2- 3 months	3- 4 months	4- 5 months	5- 6 months	More than 6 months
	1	2	3	4	5	6	7
Extension of time claims							
Additional cost claims							

Q27: Considering the complexity of the claims rate the following:		Very Unreasonable						Very reasonable
		1	2	3	4	5	6	7
1	From the time claims were presented the average time taken to assess Extension of time (EoT) claims was							
2	From the time claims were presented the average time taken to assess additional cost claims was							
3	From the time claims were decided, the average time taken to resolve disagreements on Extension of time claims was							
4	From the time claims were assessed the average time taken to resolve disagreements on additional cost claims was							

Q28: Please indicate by ticking (✓) the number that represent your response to the following:		Strongly disagree						Strongly agree
		1	2	3	4	5	6	7
1	The extensions of time (EoT) claims allowed are based on facts, not personal biases and opinion of the consultant							
2	The additional cost claims allowed are based on facts, not personal biases and opinion of the consultant							
3	In the process for handling claims, the consultants applied the rules for claims without favouring the client/employer.							
4	On this project, the consultant usually makes an effort to adequately explain the basis for decisions made							

Q29: Please indicate by ticking (✓) the number that represent your response to the following:		Rarely						Always
		1	2	3	4	5	6	7
1	How often do you believe and agree with the reasons stated by the consultant as basis for decisions made?							
2	On this project how often were the rules and procedure for claims applied consistently across all the claims presented?							
3	During the course of the project, how often did the consultant bring issues relating to claims into the open so that they can be discussed and resolved?							

Q30: Please indicate by ticking (✓) the number that represent your response to the following		Strongly disagree						Strongl y agree
		1	2	3	4	5	6	7
1	Our Company's contractual rights were respected during the process for assessing and deciding the claims							
2	Our company's personnel were treated with politeness, dignity and courtesy during the process for assessing and deciding the claims							
3	The employer project team usually keeps to promises made in the course of this project (i.e. keeping to agreements reached at site meetings).							

Q31: Please indicate by ticking (✓) the number that represent your response to the following questions		Very Low Level						Very High level
		1	2	3	4	5	6	7
1	How would you rate the consultant's level professional expertise in diagnosing, and assessing the claims?							
2	How would you rate the consultant's level professional expertise in deciding the claims?							

Q32: How would you rate the percentage of consultants personnel who were acquainted with the history of your claims from the beginning but had left the project at the time when your claims were being assessed and decided?.	1% up to 14..99%	15% up to 29.99%	30% up to 44.99%	45% up to 59..99%	60% up to 74..99 %	75% up to 89.99%	90% up to 100%

Q33: Please indicate by ticking (✓) the number that represent your response to the following:		Not fair at all						Very fair
		1	2	3	4	5	6	7
1	How would you describe the procedure and rules that was applied in assessing claims on this project?							
2	On the overall, kindly rate how fairly claims were decided on this project?							

Q34: How satisfied are you with the procedure and rules that was applied in assessing and deciding claims on this project?

	Very dissatisfied						Very satisfied
	1	2	3	4	5	6	7
EoT claims							
Additional cost claims							

Q35: Kindly rate from 1 to 7 the extent to which the consultants tried hard to be fair in the process for handling claims?

Not at all						Tried very hard
1	2	3	4	5	6	7

Q36: Please indicate by ticking (✓) the number that represent your response to the following questions		Never						Always
		1	2	3	4	5	6	7
1	How often did the employer/client directly and actively participate in the discussion relating to your claims before they were decided?							
2	How often were the claims allowed by the consultant based on the client's/employer's concerns (i.e. concern on time and cost overrun)?							

Q37: On the overall, how would you rate the frequency of disagreements that arose from claims?

Never						Very often
1	2	3	4	5	6	7

Q38: How would you rate the severity of disagreements that arose from claims?

not severe						Very severe
1	2	3	4	5	6	7

Q39: How would you rate negative effect of disagreements on your working relationship with the employer?

not much						A lot
1	2	3	4	5	6	7

Q40: Generally, how would you describe the nature of the final solution to claims?

- ☐ Most of the solutions were mutually agreed upon
- ☐ They tried to impose most of the decisions on us
- ☐ In most cases our company gave up our rights and position so as not engage in dispute

Q41: To what extent would you have rejected the consultant's decision and final solution to the claims assuming you had freedom to do so?

Not at all						To a great extent
1	2	3	4	5	6	7

Q42: To what extent would you have contested the consultant's decision using other resolution process such as arbitration?

Not at all						To a great extent
1	2	3	4	5	6	7

Q43: Assuming you are given opportunity to choose, to what extent would you prefer other consultants in future projects?

Very little					A lot
1	2	3	4	5	6

Q44: To what extent was each of the following issues responsible for disagreements during the process for handling claims on this project?
Where: 1 represents least often, and 10 represents most often

		Least often						Most Often
		1	2	3	4	5	6	7
1	The quantum of contractor's entitlements							
2	Criticality of delays							
3	Responsibility for delays							
4	Whether or not the works giving rise to claims was required by the contract or was extra work							
5	The type and amount of information used in substantiating claims							
6	Whether or not the contractor actually incurred added cost							
7	Contract interpretation							
8	Concurrency of Delays							
9	The methodology and technique used in substantiating and assessing claims							

APPENDIX 2: LETTER TO RESPONDENTS

5th January, 2005.

School of
Design and Environment
Department of Building
National University of Singapore
4 Architecture Drive
Kent Ridge Crescent
Singapore 117566.

Dear Sir/Madam,

SURVEY ON HOW TO IMPROVE THE PROCESS FOR HANDLING CLAIMS

This study is aimed at finding ways of improving the process for handling claims. Your responses are very important and it is appreciated.

Completing the questionnaire would take **about 25 minutes.** You are not required to state your name or the name of your company, hence your anonymity is guaranteed. Additionally, your responses would be kept confidential. The questions are in respect of a particular project in which you have been involved in the past (**name of project is not required**). It would be appreciated if you could respond to all questions as best as you can.

A self addressed and stamped envelope is enclosed for the purpose of returning your response. If you would like a summary of the finding of this research, please tick the box below and send this page to me at the address above. If you have any query, please do not hesitate to contact me at Tel. No: 90220657. Thank you for your cooperation. I hope to hear from you by <u>30th February, 2005.</u>

Yours Faithfully,

Ajibade Ayodeji Aibinu

PhD Candidate

☐ Please let me have a summary of the research findings

APPENDIX 3: LIST OF PUBLICATIONS ARISING FROM THIS THESIS

REFEREED JOURNAL ARTICLES

Articles Published/In press

- **Aibinu A.A.**, Ofori, G.O; and Ling, Y.Y. (2008) Explaining Cooperative Behaviour in Building and Engineering Projects Claims Process: the Interactive Effect of Outcome Received and Procedural Fairness. ASCE, *Journal of Construction Engineering and Management, Vol. 134 (9), pp. 681-691.*

- **Aibinu, A.A**. (2006) The relationship between distribution of control, fairness and potential for dispute in the claims handling process. *Construction Management and Economics*, Vol. 24, No 1, pp. 45-54.

- **Aibinu A.A.** Avoiding and Mitigating Delay and Distruption Claims Conflict**.** *The Legal Affairs Section, American Society of Civil Engineer (ASCE) Journal of Professional Issues in Engineering Education and Practice*, *- In press.*

REFEREED CONFERENCE PAPERS

- **Aibinu A.A.** (2008) Managing Building and Civil Engineering Claims to Enhance Organizational Justice and Reduce Dispute. *In COBRA 2008. Proceedings of the construction and building research conference of the Royal Institution of Chartered Surveyors. Dublin Institute of Technology, Sri Lanka, September 4 - 5, 2008.*

- **Aibinu A.A.** (2007) Construction Project Claims and Conflict in Singapore. Accepted for presentation and publication in conference proceeding at the forthcoming *CME25: Construction management and Economics: past, present and future conference. University of Readings United Kingdom. July 15 to 18th 2007.*

- **Aibinu A.A** (2005) Influence of Process and Decision Control on the Process for Handling Claims. In Sullivan, K & Kashiwagi, D.T. (eds.), *The Impact of Cultural Differences and Systems on Construction Performance,* Proceedings of the CIB W92/T23/W107 International Symposium on Procurement Systems, University of Nevada Las Vegas (UNLV), USA, 8th to 10th February.

- **Aibinu A.A** (2004) Third Party Decision-maker's Attributes that Influence Efficacy of Claims Procedure - A Conceptual Framework. In Ogunlana (ed.), *Globalisation and Construction: Meeting the Challenges, Reaping the Benefits*, Proceedings of the International Symposium of CIB W107 Construction In Developing Economies, Bangkok, Thailand, 17 – 19 November.

- **Aibinu A.A** (2003) Claims and Dispute Development: a transaction cost approach. In Ofori, G & Yean Yng Ling (Eds.), *Knowledge Construction*, Proceedings of the Joint international Symposium of CIB Working Commissions, Singapore, 22-24 October.

ARTICLES IN PROGRESS

- Improving Organizational Justice in Project Process Governance - A Gateway to Building Cooperative Interorganizational Relationships in Construction

- Conflict-handling Styles of Contractors in Singapore.