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Risks in subcontracting: Subcontract conditions

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The use of non-standard, contractor-prepared subcontract conditions is widespread in the Australian construction industry. Many conditions in such subcontracts are harsh and are viewed by Australian subcontractors as the most critical risk for which they make risk allowances in the bid price.

Keywords: Risk, uncertainty, subcontract conditions, subcontractors.

Introduction

Construction projects are characterized by a multitude of contractual relationships formed among the parties in the building team. If the project is to succeed, such contractual arrangements must be clear, fair and equitable, to ensure an effective and dispute-free contractual performance.

A contract embodies working drawings, specifications, sometimes a bill of quantities, conditions of contract, and any other relevant documents. Contracts must clearly state the rights and responsibilities of contractual parties as well as include a full description and the extent of work, timing, quality standards and the price. This involves drawing up contract conditions which will allow the contract to be administered and future contract disputes settled.

The ability of general contractors and subcontractors to make a profit is very much related to the success or failure of forming fair and equitable contracts and executing them in the most effective and productive manner. As most construction activities are performed by subcontractors, it is clear that the smooth execution of subcontracts is the key to the successful production process. If only one subcontract link breaks down and a dispute arises, causing either a time delay or a cost claim or both, such a subcontractual dispute will affect not only the principal parties to a subcontract, but possibly other parties forming a building team including a client. The cost and time overruns may then be inevitable.

On projects hampered by delays and cost overruns, contract conditions become the subject of close scrutiny as soon as the prospect of a loss to either of the parties seems possible. Unclear, contradictory, ambiguous or incomplete contract conditions create an environment promoting an escalation in the number of protracted and costly contractual disputes. These in turn will further frustrate efforts to keep the project time and cost under control.

Ferrett (1985) claims that clients are undoubtedly paying more for their buildings than

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they need as a result of onerous subcontract conditions and unfair contracting practices being enforced on subcontractors by general contractors. The presence of such conditions may increase the client's risk either through the insolvency of subcontractors, an increase in the level of claims and disputes, or by cost-cutting measures on the part of subcontractors which affect the quality of the works. Ferrett's view is supported by the findings of Uher's (1990) survey, which identified subcontract conditions as the most critical risk affecting subcontractors, for which subcontractors make a risk allowance of up to 7.6% in their tender (refer to Table 4).

It would thus seem highly beneficial to clients to ensure that the formation and execution of subcontracts is carried out in the most efficient manner in order to minimize the possibility of the project risk escalation. But this is not so. Clients generally distance themselves from any involvement in subcontractual matters and allow the contracting parties to form contracts more or less as they please. Clients are either unaware or ignorant of the impact that inequitable contractual arrangements between general contractors and subcontractors may have on the performance of their projects. Also, they do not seem to be concerned about an increase in the level of their own financial risk.

Uher (1990) attempted to establish what risks, if any, are perceived by Australian subcontractors as having an effect on their bids. A random sample of 47 subcontracting firms was used in the study. The sample was divided into five groups according to turnover of subcontractors, and into three work groups according to the type of work performed and the degree of skill required: *mechanical* (air-conditioning, lifts, ventilation, fire protection), *licensed* (plumbing, electrical) and *ordinary* (generally semi- or unskilled trades). All subcontractors in the mechanical group and approximately 20% of subcontractors in the licensed group were nominated, while the remaining subcontractors in the licensed and all subcontractors in the ordinary groups were domestic.

Rights and obligations, and risk allocation in subcontract conditions

By subletting some or all parts of the work, the general contractor assigns obligations and rights under the contract for building to others who are not parties to the contract, but at the same time retains the overall contractual responsibility as far as the head contract is concerned. He allocates specific risks to subcontractors and he may activate certain subcontract clauses in order to compel them to perform.

The 'Conditions of Subcontract' is an important and generally quite extensive document which allocates risks and defines the rights and obligations of the parties in relation to many matters, including:

- terms of payment;
- security deposits and retentions;
- times for commencement and completion;
- variations;
- delays and cost of delays; and
- liquidated damages.

The conditions of subcontract should be framed in such a way that:

1. They are equitable to both parties, with neither in a preferred position with regard to the other. This is particularly important with regard to risk allocation.
2. The rights and obligations of the parties, and the work to be done, are clearly described.
3. In the event of non-performance of one or the other party, the injured party may claim adequate remedies.
4. A satisfactory procedure for settling of disputes forms an integral part of the document including an arbitration clause (BIAC, 1977).

A knowledge of subcontract conditions, their interpretation and administration are fundamental requirements of good contract management. It is therefore not surprising to find that subcontractors do make an effort to know subcontract conditions relating to a subcontract for which they are preparing a bid (Uher, 1990; see also Table 1). The differences in responses of the various trade groups in the sample showed no statistical significance.*

Table 1. The knowledge of subcontract conditions

	No. of responses[a]			
Trade groups	1	2	3	4
Mechanical group				
yes	9	5	1	0
no	6	10	14	15
Licensed group				
yes	6	6	2	0
no	8	8	12	14
Ordinary group				
yes	8	9	1	0
no	10	9	17	18
Total for all groups				
yes	23	20	4	0
no	24	27	43	47

Note: this table give responses to the following question: 'Do you insist that you know subcontract conditions relating to a subcontract for which you are preparing a bid?'

[a] 1, Always; 2, usually; 3, sometimes; 4, never.

While standard head contract documents are almost universally used, the same cannot be said about subcontract documents. According to Uher (1987), general contractors prefer to use mainly their own documents or, where required, heavily modified standard documents containing subcontract conditions tailored to their requirements. Most in-house subcontract documents often contain terms and conditions unfavourable to subcontractors (Peacocke, 1978).

The basic problem with many non-standard subcontract documents is that they do not treat both the contractual parties as being equal. As practically all non-standard subcontract

*The difference in responses of various trade groups in the sample were tested using the chi-square test. The underlining hypothesis (the null hypothesis) was that there were no significant differences in responses among various trade groups.

documents are prepared by general contractors, inequity of subcontract conditions is borne predominantly by subcontractors. Terms of payment, contractor's programme, arbitration, withholding payment, retention, variations, delays, site facility and acceptance of responsibility are examples of a few typical areas where unfair or onerous conditions have been applied (Peacocke, 1978). According to Uher and Runeson (1984), subcontractors have an arduous task in negotiating fair conditions, and an even harder task in getting them applied.

Risks arising from onerous subcontract conditions

Inclusion of onerous conditions in a subcontract is perceived by subcontractors as a critical issue which leads to uncertainty. This has been verified by Uher (1990), who showed that subcontractors are most sensitive to the risk arising from the presence of such harsh subcontract conditions. The close examination of the survey data reveals that almost two-thirds of the subcontractors surveyed labelled subcontract conditions as being unfair (see Table 2). There were no significant differences in responses of the trade groups of subcontractors.

Table 2. Ranking of subcontract conditions by Australian subcontractors

	No. of responses[a]				
Trade groups	1	2	3	4	5
Mechanical group					
yes	0	3	3	4	5
no	15	12	12	11	10
Licensed group					
yes	1	1	1	4	7
no	13	13	13	10	7
Ordinary group					
yes	1	1	4	10	2
no	17	17	14	8	16
Total for all groups					
yes	2	5	8	18	14
no	45	42	39	29	33

Note: this table give responses to the following question: 'How would you rate subcontract conditions on a scale of 1–5?'

[a] Fair Unfair

1 2 3 4 5

More critically, the vast majority of subcontractors (83%) expressed concern about the impact of unfair conditions on their profitability. Their concern was reflected in the inclusion of appropriate risk allowances in their bids, as shown in Table 3. Again, there were no significant differences in responses of the trade groups of subcontractors. Further examination of the sample of subcontractors revealed that a greater proportion of smaller subcontractors (the size was measured in terms of turnover) made risk allowances than larger subcontractors.

Table 3. Responses of Australian subcontractors to making risk allowances in their bids for unfair subcontract conditions

Trade groups	No. of responses
Mechanical group	
yes	12
no	3
Licensed group	
yes	13
no	1
Ordinary group	
yes	14
no	4
Total for all groups	
yes	39
no	8

Note: this table give responses to the following question: 'Do you make a risk allowance in your bid for unfair subcontract conditions?'

The expression of concern by the subcontractors about the fairness of subcontract conditions is further supported by the large allowance for risk that they make in their bids. Table 4 shows the magnitude of the maximum levels of risk allowance, ranging from 6.6% to 8.5% for the different subcontract groups, with 7.6% being an average maximum percentage figure.

It has been shown that subcontractors fear the effect of onerous subcontract conditions. As shown in Table 4, the most feared subcontract conditions are (in decreasing order of importance):

- terms of payment;
- extension of time;
- rise and fall;
- liquidated damages; and
- delays and cost of delays.

The above will now be discussed.

Terms of payment

Research shows (Uher, 1990) that 'terms of payment' is perceived by subcontractors to be a subcontract condition with the greatest degree of risk. The exposure to risk is most severe under 'Pay when Paid' conditions, which provides for a payment to be made to a subcontractor only when the general contractor secures payment from the client. This condition is commonly inserted in in-house prepared subcontracts and it gives no guarantee as to when payment is to be made. Standard forms of subcontract stipulate specific periods of time for payments to ordinary subcontractors arrived at by negotiation; however, they are very rarely used. Interestingly, the currently available standard subcontract documents, for

Table 4. The most critical subcontract conditions for which Australian subcontractors make risk allowances

	No. of responses[a]										
Trade groups	1	2	3	4	5	6	7	8	9	10	11
Mechanical group											
yes	12	9	5	8	10	2	9	8	10	3	6
no	0	3	7	4	2	10	3	4	2	9	6
n.a.	3	3	3	3	3	3	3	3	3	3	3
Risk allowance for all 11 risks = 8.5%											
Licensed group											
yes	11	13	8	8	7	3	11	8	13	5	8
no	2	0	5	5	6	10	2	5	0	8	5
n.a.	1	1	1	1	1	1	1	1	1	1	1
Risk allowance for all 11 risks = 7.8%											
Ordinary group											
yes	12	14	6	5	12	0	6	9	9	9	8
no	2	0	8	9	2	14	8	5	5	5	6
n.a.	4	4	4	4	4	4	4	4	4	4	4
Risk allowance for all 11 risks = 6.6%											
Total for all groups											
yes	35	36	19	21	29	5	26	25	32	17	22
no	4	3	20	18	10	34	13	14	7	22	17
n.a.	8	8	8	8	8	8	8	8	8	8	8
Risk allowance for all 11 risks = 7.6%											

Note: this table gives responses to the following question: 'What are the most critical subcontract conditions for which you make risk allowances?'

[a] 1, Extension of time; 2, terms of payment; 3, retention not released; 4, negative variations; 5, liquidated damages; 6, cost of arbitration; 7, delays and cost of delays; 8, completeness of contract documents; 9, no rise and fall clause; 10, short notice to commence work; 11, acceptance of responsibility.

example SC.JCC.A (1985), to which the Building Industry Specialist Contractors Organization of Australia is a signatory, enforce the 'Pay when Paid' terms on nominated subcontractors. The impact of such a clause on nominated subcontractors is somewhat less severe, as each payment is certified by the architect, who then informs the subcontractors of the amount which has been approved for them in each certificate issued to the general contractor.

The tactic of delaying payments, often employed by general contractors, is aimed at transferring responsibility for financing portions of a project to subcontractors, the party least equipped to carry financial risks (Ferrett, 1985). In addition to having their payments delayed, discounts originally offered to general contractors as inducement for prompt payment are commonly deducted, whenever the payment is made.

The risk to subcontractors is further increased through the general contractor's right to withhold, reduce or defer payment of any sums due, provided there are valid reasons for doing so. The general contractor is obliged to give written advice of the reason, but subcontractors often complain that this right is open to abuse (Moss, 1986; Humphrey, 1985).

Extension of time

The subcontractors surveyed identified 'extension of time' as the second most risky subcontract condition. Commonly, the subcontractor is entitled only to extensions of time in relation to delays to the date for practical completion of the head contract works. However, the subcontractor's right to an extension of time in situations where the general contractor receives an extension is not guaranteed and, indeed, is often denied. Delays caused by the general contractor or other subcontractors do not necessarily form a legitimate ground for the granting of an extension to the subcontractor irrespective of whether or not the delay affects the critical path. As stated by Kinsella (1988), 'Whether or not a particular delay of the subcontract works falls on the critical path of the project is a rather hit or miss situation'.

This, however, does not mean that subcontractors do not try to secure extensions of time. In fact, subcontractors are particularly successful in securing extensions of time with regard to the delays caused by (see Table 5):

- variations (87% of success);
- inclement weather (83%);
- industrial disputes (60%);
- clients (55%);
- architects (53%);
- authorities (51%); and
- general contractors (40%).

Detailed responses of the subcontractors surveyed are given in Table 5.

Table 5. Responses of Australian subcontractors to gaining extension of time

	No. of responses[a]										
Trade groups	1	2	3	4	5	6	7	8	9	10	11
Mechanical group											
yes	14	11	9	10	8	3	8	6	4	1	5
no	1	4	6	5	7	12	7	9	11	14	10
Licensed group											
yes	11	12	8	4	3	1	8	4	2	0	9
no	3	2	6	10	11	13	6	10	12	14	5
Ordinary group											
yes	16	16	11	11	7	4	10	9	7	5	10
no	2	2	7	7	11	14	8	9	11	13	8
Total for all groups											
yes	41	39	28	25	18	8	26	19	13	6	24
no	6	8	19	22	29	39	21	28	34	41	23

Note: this table gives responses to the following question: 'Are you generally successful in gaining an extension of time for the delays listed below?'

[a] 1, Variations; 2, weather; 3, industrial matters; 4, architect; 5, engineer; 6, quantity surveyor; 7, client; 8, general contractor; 9, other subcontractors; 10, supplier; 11, authorities.

While there were no significant differences in responses of the trade groups of subcontractors, further analysis of the sample revealed that smaller subcontractors, who are

likely to be affected more by the use of unfair subcontract conditions, have greater difficulties gaining extensions of time for delays caused by variations.

Rise and fall

It seems reasonable to assume that subcontractors need to be in a position to be able to price the works as realistically as possible. Theoretically, where a 'rise and fall' clause is deleted from the subcontract conditions, the prudent subcontractor will assess the risk associated with likely causes of delays and, depending on the subcontractor's utility function as well as his ensuing need to win the subcontract, will make an appropriate risk allowance. However, subcontractors are generally unable to assess accurately the magnitude of the risk and experience difficulties in finding the most efficient way of minimizing its effect. For these reasons, they prefer the rise and fall clause to be included in the subcontract document.

The majority of subcontracts in the survey sample (Uher, 1990) contained no rise and fall clause, irrespective of whether the head contract was of a fixed term or not. By excluding a rise and fall clause from the subcontract document, the general contractor attempts to transfer the risk for the escalation of labour and material costs due to inflation to subcontractors in much the same way as the client attempts to do the same to the general contractor.

It must be realized that the client ultimately pays for the escalation of costs one way or the other. By excluding rise and fall from the head contract (which undoubtedly would lead to the deletion of the same clause from subcontracts), the client denies himself an opportunity to control such costs. Instead, he undertakes the risk of either paying too much if the general contractor and subcontractors make substantial risk allowances in excess of the actual inflation increases, or exposing himself to an increased level of risk in situations where the rise and fall allowances made by the general contractor and subcontractors are indequate. In such a case, the risk of poor-quality work or even bankruptcies among subcontractors increases.

It is recognized that risks should be assigned and borne by those parties who are able to control them. On short-term contracts, up to 6 months in duration, both general contractors and subcontractors should be able to predict with a reasonable a degree of confidence the most likely rate of inflation and, consequently, should be able to control such a risk by, for example, early ordering of materials and equipment. However, on long-term projects, an accurate assessment of the likely rate of inflation, and consequent rises in the prices of labour and materials are very difficult to forecast. In such cases, it may be more appropriate for the client, who is in the best position to control such risks, to insert a rise and fall clause into the head contract. Similarly, the general contractor should reciprocate and include rise and fall in the subcontract conditions.

Liquidated damages

The 'liquated damages' clause appears in practically all subcontracts and its purpose is to compel the subcontractor to complete the work by the date for completion stated in the subcontract. The failure to do so will expose the subcontractor to a risk of compensating the general contractor for loss.

In Peak Construction Liverpool Pty. Ltd *v.* McKinney Foundations Limited 1971 (Anon, 1982), the view was expressed by Phillimore that a clause providing for liquidated damages is closely linked with a clause which provides for an extension of time. The reason for this is that

when the parties agree that if there is a delay for which the subcontractor is liable, the liquidated damages clause becomes operational and the subcontractor will bear its full brunt.

Uher (1987) examined 267 subcontract packages for nine different subcontract trades associated with 49 major building projects. In all cases examined, only non-standard subcontract documents were used, each containing a liquidated damages clause with a pre-ascertained amount. Over 95% of the sampled subcontract packages were delayed for a variety of reasons, including delays caused by the subcontractors (approximately one-third of all the packages). Surprisingly, only once was a liquidated damages clause used against an offending subcontractor. It appears that general contractors are reluctant to use the clause against subcontractors, as its imposition would almost certainly result in costly arbitration or a lawsuit which would most likely lead to even greater financial losses. They may, however, expect to recover some, if not all, of the liquidated damages from the same subcontractors on future projects through 'bid negotiation'.

The insertion of a liquidated damages clause in subcontracts appears to be intended purely as a threat without a conscious intent to apply it. However, the risk of possible liability under liquidated damages is too great to be ignored by subcontractors. They generally respond by making an appropriate risk allowance for such a risk in their bid prices.

Delays and the cost of delays

It is common practice for a general contractor to delete clauses which impose upon him any obligation to compensate the subcontractor for delays caused by his actions. At the same time, other clauses which operate in the reverse direction, are left in. It was pointed out by Peacocke (1978) that, 'It is in the general interests of the building industry to have such clauses working both ways, as clearly it must be as great an inducement to the general contractor to complete his work on time as it is to the subcontractor, and the average situation will reflect a saving in money all round.'

Uher's (1990) survey identified industrial matters (including safety), competency of general contractors, inclement weather and variations as the main causes of delays (see Table 6). The degree of uncertainty about whether claims for such delays would be accepted, is reflected in subcontractors' attempts to make appropriate risk allowances. These range from 0% to 4.1% (see Table 6). As shown in Table 7, claims for variations appear to be the only cause of delays for which the subcontractors have little trouble being reimbursed. Generally, no significant differences in responses of the trade groups of subcontractors were found (the exception being the responses to the presence of risk associated with their own competence and the competence of authorities). However, smaller subcontractors were found to have more difficulties in claiming for the cost of delays.

These findings differ substantially from the findings of Bromilow (1970) and Levido *et al.* (1981), who examined causes of delays of head contracts. They identified variations as being the most significant factor causing delays, while industrial matters were found to have a relatively small influence on delays. Because the actual construction work is performed by subcontractors, they are naturally exposed to an industrial conflict over which, however, they have little control. Such matters are firmly in the hands of general contractors.

Other subcontract conditions

Other subcontract conditions which raise subcontractors' risk are:

Table 6. Ranking of five most important causes of delays by Australian subcontractors and the amount of risk allowances made for such delays

	No. of responses[a]											
Trade groups	1	2	3	4	5	6	7	8	9	10	11	12
Mechanical group												
rank value	42	61	22	8	9	0	0	39	7	19	6	5
rank order	2	1	4	7	6			3	8	5	9	10
risk allowance												
yes	12	14	9	4	5	0	0	13	6	7	2	3
no	3	1	6	11	10	15	15	2	9	8	13	12
%	5.2	7.5	2.8	1.9	1.5	n.a.	n.a.	2.7	3.5	1.2	5.0	4.1
Licensed group												
rank value	52	54	23	9	11	4	1	48	0	5	3	0
rank order	2	1	4	6	5	8	10	3	—	7	9	—
risk allowance												
yes	13	14	10	5	5	3	1	14	0	3	2	0
no	1	0	4	9	9	11	13	0	14	11	12	14
%	2.8	1.9	0.4	0.0	0.6	0.7	0.0	1.6	n.a.	0.3	1.5	n.a.
Ordinary group												
rank value	53	66	25	6	5	1	0	66	11	21	13	0
rank order	3	1	4	8	9	10		1	7	5	6	
risk allowance												
yes	18	17	11	3	4	1	0	18	4	9	5	0
no	0	1	7	15	14	17	18	0	14	9	13	18
%	0.6	0.2	0.0	0.0	0.0	0.0	n.a.	0.1	0.1	0.1	0.1	n.a.
Total for all groups												
rank value	147	181	70	23	25	5	1	153	18	45	22	5
rank order	3	1	4	7	6	10	12	2	9	5	8	10
risk allowance												
yes	43	45	30	12	14	4	1	45	10	19	9	3
no	4	2	17	35	33	43	46	2	37	28	38	44
%	2.6	3.3	1.0	0.6	0.7	0.5	0.0	1.4	2.4	0.6	1.6	4.1

Note: this table gives responses to the following question: 'Select and rank the five most important causes of delay. What risk allowances do you make for such delays?'

[a] 1, Weather; 2, industrial matters; 3, variations; 4, competency of architect; 5, competency of engineer; 6, competency of client; 7, competency of quantity surveyor; 8, competency of general contractor; 9, your own competency; 10, competency of other subcontractors; 11, competency of suppliers; 12, competency of authorities.

- completeness of contract documents;
- acceptance of responsibility (without authority);
- negative variation; and
- retention not released.

Completeness of contract documents. Subcontractors often complain about the lack of information available to them during bidding. They are commonly issued with only those drawings and those sections of the specification which refer to the work for which they prepare the bids. While such documents show the extent of the work, they may not always

Table 7. Responses of Australian subcontractors to the question of successful claims for the cost of delays

	No. of responses[a]										
Trade groups	1	2	3	4	5	6	7	8	9	10	11
Mechanical group											
yes	14	5	6	10	6	3	9	8	4	2	3
no	1	10	9	5	9	12	6	7	11	13	12
Licensed group											
yes	10	1	4	4	2	1	7	2	0	1	4
no	4	13	10	10	12	13	7	12	14	13	10
Ordinary group											
yes	14	2	5	9	6	5	11	5	4	3	7
no	4	16	13	9	12	13	7	13	14	15	11
Total for all groups											
yes	38	8	15	23	14	9	27	15	8	6	14
no	9	39	32	24	33	38	20	32	39	41	33

Note: this table gives responses to the following question: 'Are you generally successful in claiming for the cost of delay caused by the following factors?'

[a] 1, Variations; 2, weather; 3, industrial matters; 4, architect; 5, engineer; 6, quantity surveyor; 7, client; 8, general contractor; 9, other subcontractors; 10, supplier; 11, authorities.

include all the details. The unavailability of the full set of documents further prevents the subcontractor from gaining a better perspective and understanding of the whole project, particularly with regard to materials handling and co-ordination of activities of other subcontractors. The lack of information is perceived by subcontractors as a risk for which they make risk allowances

Acceptance of responsibility. Unsuspecting subcontractors may be manoeuvred into accepting responsibility for the work normally performed by the general contractor. For example, a subcontractor could be made responsible for the co-ordination of the preceding and following trades, or be required to supply his own materials handling equipment. In both cases, a subcontractor is exposed to the risk which he may be unable to control. Although subcontractors are aware of the effect of such a risk, they often have no alternative but to accept it in order to secure a subcontract.

Negative variations. Whether or not the issue of negative variations is a deliberate attempt on the part of general contractors to reduce the value of subcontracts is unknown; however, subcontractors perceive such actions of general contractors as a risk for which they make risk allowances.

Retention not released. Retention is used as a form of security to ensure that the work is completed by the subcontractor according to the subcontract conditions. It also provides an incentive for the subcontractor to complete the works on time and within the required quality. It is progressively deducted from progress payments to the subcontractor, commonly at 10% until the sum reaches 5% of the subcontract value. The amount of retention held by the general contractor is usually reduced to 2.5% when practical

completion is reached, the remaining 2.5% being released at the end of the defects liability period when the Final Certificate is issued to the general contractor. The retention fund should more realistically be looked upon as a capital sum from which the general contractor can seek redress should the subcontractor default in performance of the subcontract.

It is common practice for general contractors to hold retention on all subcontracts, regardless of the nature of their work. This is unnecessary and unfair for such subcontractors as demolishers, excavators, land clearers and similar, whose work by its nature is either finished or is free of maintenance and faulty workmanship considerations.

Sloan and Regan (1986) proposed the adoption of a sliding retention percentage. Although their 'sliding retention' model, which realistically reflects the level of risk that the client is bearing at any one time, was developed for the general contractor's retention, it can be just as easily applied to the subcontractor's retention. The philosophy behind the model is the same; as the risk declines, so should the retention sum (see Fig. 1). This would mean the

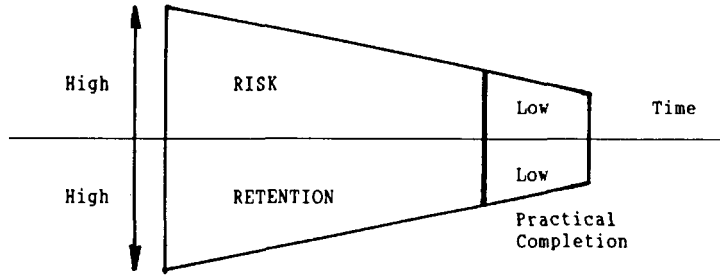

Fig. 1. The sliding retention model (after Sloan and Regan, 1986).

reversal of the present practice where retention is at its highest when the risk attributable to the general contractor is at it lowest. From a practical point of view, it would be more advantageous to reduce retention in a number of steps (see Fig. 2), which would be easier to administer than a 'sliding retention'.

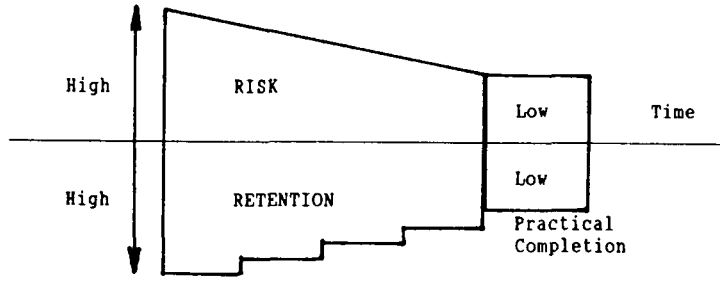

Fig. 2. The stepped retention model (after Sloan and Regan, 1986).

Runeson and Uher (1986) regard retention as an unnecessary contributor to high building costs. Their research showed that only large subcontractors were willing to trade retention for lower bid prices. For 1-year projects, the average reduction would be 2.14%, whereas it would be 3.12% for 2-year projects.

Conclusion

The Australian subcontracting process is affected by an inequitable relationship between general contractors and subcontractors, particularly in the area of subcontract conditions. The relationship has been influenced and dominated by general contractors who enforce their own, often harsh conditions on subcontractors. The presence of harsh subcontract conditions is seen by Australian subcontractors as the most critical risk they face during the execution of the work. Among the most feared conditions are terms of payment, extension of time, rise and fall, liquidated damages, and delays and cost of delays. The severity of the risk is reflected in the inclusion of the high level of risk allowance (7.6% average maximum value) in subcontractors' bids.

The presence of risk as seen by subcontractors is undoubtedly related to the proliferation of the general contractor prepared non-standard subcontract conditions. Such in-house prepared conditions serve no purpose other than minimizing the general contractor's risk, and apart from being unfair on subcontractors have a potential to also increase the client's risk. This practice should be abandoned in favour of standard conditions, which are available for use with major head contract documents, which treat the parties to a subcontract as equitable partners.

It is believed that ordinary subcontractors are commonly exposed to harsh subcontract conditions to a greater extent than nominated subcontractors (represented by the mechanical group in the sample), who by virtue of their nomination by the client may be better placed to negotiate fairer conditions. Whether in fact nominated subcontractors are better off is arguable. The results of this research point to insignificant differences in the perception of risks arising from the exposure to onerous subcontract conditions among different trade groups of subcontractors, but suggest that the impact of such conditions is much greater on small subcontractors.

If a breakdown occurs in only one of many subcontracts, it may cause a financial loss to the contracting parties and to the client. Because subcontractors make risk allowances for onerous subcontract conditions, the final contract cost is likely to be higher. There is also an added risk that if allowances made by subcontractors for the perceived uncertainties are inadequate, the ensuing loss of profit may lead to a decline in productivity, possible deterioration of quality standards, or even to bankruptcies. It is therefore possible to conclude that risks associated with subcontract conditions are likely to increase the client's risk.

Clients are urged to take more active interest in the general contractor/subcontractor relationship to minimize the presence of the subcontractual risk and its possible impact on the project performance. This would require an initiative to weed out the use of onerous subcontract conditions. One approach which could be adopted is to enforce the use of standard subcontract conditions.

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