A Survey of Claim Pricing of Construction Projects in Thailand

การสำรวจกระบวนการการคำนวณมูลค่าการเรียกร้องสิทธิในงานก่อสร้างของประเทศไทย

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Abstract

Efficient construction claim management is necessary for all parties in a construction project. Claim pricing is one of the most important sub-processes of claim management, which gives substantive description and details of extra costs incurred or to be incurred due to change. This paper aims at 1) finding suitable pricing method for each claim component of both contractors and employers, and 2) surveying claim pricing process of existing employers' claim management system. The research was done by reviewing literatures, analyzing FIDIC's "Conditions of Contract for Construction (First Edition)", and performing interview of 29 key staff from both public and private organizations. It was found that there are 23 contractor's claim cost components and 22 employer's claim cost components. From the survey results, Thai construction industry has much simpler claim pricing methods than those theoretically described in international practices in several aspects, i.e. the number of claim components and the indemnity method. This factor should be recognized in the development of the industry dealing with the high international competitive atmosphere in the future.

บทคัดย่อ

การจัดการการเรียกร้องสิทธิที่มีประสิทธิภาพเป็นสิ่งที่จำเป็นสำหรับทุกฝ่ายที่เกี่ยวข้องในงานก่อสร้าง การคำนวณมูลค่าการเรียกร้องสิทธิเป็นกระบวนการย่อยกระบวนการหนึ่งของการจัดการการเรียกร้องสิทธิซึ่งสำคัญที่สุด เนื่องจากช่วยให้รายละเอียดและจำนวนเงินซึ่งเกิดขึ้นหรือคาดว่าจะเกิดขึ้นเนื่องมาจากการเปลี่ยนแปลง บทความนี้มีวัตถุประสงค์เพื่อ 1) พิจารณากระบวนการคำนวณมูลค่าการเรียกร้องที่เหมาะสมสำหรับแต่ละองค์ประกอบของการเรียกร้องสำหรับทั้งผู้รับจ้างและผู้ว่าจ้าง และ 2) สำรวจกระบวนการคำนวณมูลค่าการเรียกร้องซึ่งผู้ว่าจ้างดำเนินการอยู่ในปัจจุบัน ขั้นตอนการวิจัยประกอบด้วยการทบทวนวรรณกรรมที่เกี่ยวข้อง การวิเคราะห์ "เงื่อนไขสัญญาสำหรับงานก่อสร้าง (พิมพ์ครั้งที่ 1)" ซึ่งจัดทำโดยสมาพันธ์วิศวกรที่ปรึกษานานาชาติ (FIDIC's Conditions of Contract for Construction

(First Edition)) และการสัมภาษณ์ 29 บุคลากรหลักขององค์กรทั้งภาครัฐและภาคเอกชน ผลการวิจัยแสดงว่ามีองค์ประกอบของการเรียกร้องของผู้รับจ้างและของผู้ว่าจ้างจำนวน 23 และ 22 องค์ประกอบ ตามลำดับ และจากผลการสำรวจอุตสาหกรรมก่อสร้างของประเทศไทยมีวิธีคำนวณมูลค่าของการเรียกร้องสิทธิซึ่งแตกต่างจากกระบวนการคำนวณมูลค่าการเรียกร้องตามหลักทฤษฎีที่ปฏิบัติกันในสากลในหลายประการ ได้แก่ จำนวนขององค์ประกอบของการเรียกร้อง และวิธีการชดเชยความเสียหาย ปัจจัยดังกล่าวควรนำมาใช้ในการพัฒนาอุตสาหกรรมก่อสร้างเพื่อสร้างความสามารถในการแข่งขันในระดับสากลต่อไปในอนาคต

Keywords

Construction Claim (การเรียกร้องสิทธิในงานก่อสร้าง)
Claim Management (การจัดการการเรียกร้องสิทธิ)
Claim Pricing (การคำนวณมูลค่าการเรียกร้องสิทธิ)
FIDIC Contract (สัญญา FIDIC)
Claim Cost Component (องค์ประกอบของการเรียกร้องสิทธิ)

1. Introduction

Claims affect vastly on cost and time of construction projects. A survey done by Semple (1994) in Western Canada found that a large proportion of claims involved a number of delays and in several cases the delays exceeded the original contract duration by over 100%. Regarding project cost, more than half of the claims resulted in additional cost of at least 30% of the original contract values (Semple & Hartman, 1994). Efficient construction claim management is necessary for every party in a construction project because it can prevent cost and time overruns while maintaining good relationships among parties. Claim management process comprises six sub-processes: 1) claim identification, 2) claim notification, 3) claim documentation, 4) claim analysis, 5) claim preparation, and 6) claim negotiation (Kululanga, 2001; Levin, 1998).

1) Claim Identification

Construction claim recognition and identification involves "timely" and "accurate" detection of a construction claim. It is the first and critically important ingredient of the claim process (Kululanga, 2001).

2) Claim Notification

Construction claim notification involves alerting the other party of a potential problem in a manner that is non-adversarial. Time limit requirements are very crucial and critical. An initial letter of a claim notice should be concise, clear, simple, conciliatory, and cooperative. It should indicate the problem and alert the other party of the potential increase in time or cost (Kululanga, 2001).

3) Claim Documentation

Records and documentation play a very important role in the settlement of contract claims. However, there are a lot of evidences, i.e. Scott and Assadi (1999) and Pogorilich (1992), that the importance of record management is not realized as much as it should be. This process is in accordance with the "Seven Basic Principles in Practice for Maximizing the Legal Protection" (Tantisiriwat, 2004)

4) Claim Analysis

There are various literatures concerning the calculation procedures of the time and the cost impacts caused by the events leading to the rights to claim. These can be grouped into two major categories: time impact analysis (or schedule analysis) and cost impact analysis.

After analysis of claim quantum, the amount of damages claimed to the other party will be determined. Pricing of claims can be divided into two types (Levin, 1998):

a) Forward Pricing

Under this scheme, the price is negotiated before the work is done. This type of pricing method is typically preferred since it encourages prompt revision of the progress schedule thus maintaining accurate record of the sequencing of the remaining work, the final contract price, and the final completion date.

b) Post-Pricing

In post-pricing, the risks have been incurred and the added costs were known. The difficulty is identifying and isolating all the changes and their attendant costs. The claimants are supposed to have good cost records, with adequate descriptions of the work performed. Thus, after a determination of the work which was affected by a change, the claimant will be able to identify and price all the costs associated with the changed work.

5) Claim Preparation

The purpose of this process is to give the other party in the contract a substantive description and details of extra costs incurred or to be incurred

due to a contract change. This detailed cost description is necessary for understanding, negotiating, and justifying extra contract costs.

6) Claim Negotiation

Kululanga (2001) explained the reason for having negotiation and its advantages. If an agreement cannot be reached and any party believes his position is correct, he should propose an alternative dispute resolution method. If this fails, the choice remaining is to take the matter to court.

Claim pricing is a sub-process in claim analysis. It is one of the most important sub-processes of claim management for both employers and contractors because poor pricing causes not only the failure of being indemnified but also the bad relationships among parties. However, the survey done in this research showed that Thai construction industry has distinctive claim pricing process, of which some inadequacies should be improved.

2. Objectives and Methodology

The objectives of this research are to find the suitable pricing method of each claim component, both of the contractors and the employers, and to survey the claim pricing process of the existing employer's claim management.

The employer's and the contractor's claim cost components were collected from literatures (Adrian, 1988; Drew & Skitmore, 1997; Ross et al., 2000; Tanakitkhamjorn, 2005) and by analyzing an international standard form of construction contract. Because of its reliability and most frequent use in several international projects in Thailand, the "Conditions of Contract for Construction" prepared by the Fédération Internationale des Ingénieurs-Conseils (FIDIC) in 1999 was selected to be the framework for collecting the claim components in accordance with construction project provisions in this research. In case there are more than one method applicable, the method for calculating each cost component amount was identified and selected after determining all cost components, taking account of their accuracy and practicality.

The next step of the research was done by interviewing 29 key staff who was responsible for managing construction claims and worked for claim management process such as architects, engineers, lawyers, public procurement officers and accountants from 14 public authorities and 7 private consulting companies. Table 1 shows fields of expertise of the interviewees.

The interviewees were asked about the method they adopted in pricing construction claims, including problems and recommendations for improving the process.

Table 1. Interviewees' expertise.

Field of Expertise	Number of Interviewees (persons)
1. Engineering	23
2. Architecture	2
3. Procurement	2
4. Law	1
5. Accounting	1
Total	**29**

3. Construction Claim Pricing in International Practices

3.1 Pricing Contractor's Claim Components

From reviewing literatures and reviewing the FIDIC (1999) conditions of contract, there are 23 cost components related to the contractor's claim consisting of 17 cost components generally found in contractor's construction claims and 6 cost components stipulated in the FIDIC (1999) provisions. List of the contractor's cost components and their pricing method are shown in Table 2.

Table 2. Contractor's claim cost components.

No.	Contractor's Claim Cost Components	Method of Calculation
1.	Additional Direct Labor Hours	∑ (Actual Labor Hours Used in Additional Works x Actual Labor Rate)
2.	Additional Direct Labor Hours due to Lost Productivity	*a) If there are normal productivity data,* ∑ {[1/ (Normal Period Productivity – Inefficiency Period Productivity)] x Actual Work Quantity x Actual Labor Rate} *b) If there is no normal productivity data,* ∑ {(Actual Labor Hour x Actual Labor Rate) – [(Estimated Labor Hour x Estimated Labor Rate) x (Estimated Work Quantity + Variation Quantity) / Estimated Work Quantity]}
3.	Increased Labor Rate	∑ [(Increased Labor Rate – Original Labor Rate) x Labor Hours of Increased Labor Rate]
4.	Additional Material Quantity	∑ [(Actual Quantity of Material Used in Original Works – Estimated Quantity of Material Used in Original Works + Actual Quantity of Material Used in Variation Works) x Material Unit Price]
5.	Additional Material Unit Price	∑ [(Increased Material Unit Price – Original Material Unit Price) x Quantity of Increased Unit Price Material]
6.	Additional Subcontractor Work	∑ (Payment to Subcontractor for Additional Works)
7.	Additional Subcontractor Cost	∑ (Actual Payment to Subcontractor – Estimated Payment to Subcontractor – Payment to Subcontractor for Additional Works)
8.	Equipment Rental Cost	∑ (Actual Equipment Rental Cost – Estimated Equipment Rental Cost)
9.	Cost for Owned-Equipment Use	∑ (Equipment Unit Cost x Actual Contractor's Equipment Hour); *When:* Equipment Unit Cost = Normal Hourly Equipment Ownership Cost + Normal Hourly Equipment Operating Cost
10.	Cost for Increased Owned-Equipment Rates	∑ [(Actual Equipment Unit Cost – Estimated Equipment Unit Cost) x Actual Equipment Hour]; *When:* Equipment Unit Cost = Normal Hourly Equipment Ownership Cost + Normal Hourly Equipment Operating Cost
11.	Company Overhead Costs (Variable)	∑ (Contractor's Cost in the Segmented Cost Code: Company Overhead) *Note:* Use Eichleay's Formula to allocate

Table 2. Contractor's claim cost components. (cont.)

No.	Contractor's Claim Cost Components	Method of Calculation
12.	Company Overhead Costs (Fixed)	$\sum$ (Contractor's Cost in the Segmented Cost Code: Company Overhead) *Note:* Use Eichleay's Formula to allocate
13.	Job Overhead Costs (Variable)	$\sum$ (Contractor's Cost in the Segmented Cost Code: Job Overhead) *Note:* Use Eichleay's Formula to allocate
14.	Job Overhead Costs (Fixed)	$\sum$ (Contractor's Cost in the Segmented Cost Code: Job Overhead) *Note:* Use Eichleay's Formula to allocate
15.	Interest or Finance Costs	New Financing Cost – Original Financing Cost; *Cost of Capital (Dividend Growth Model Approach):* $i = WACC = (E/V) \times R_E + (D/V) \times R_D \times (1-T_C)$ $R_E = D_1/P_0 + g$ $V = E + D$ *When:* R_E = Shareholders' Require Return on the Stock D_1 = Next Period's Projected Dividend P_0 = Price Per Share of the Stock G = Growth Rate R_D = Yield to Maturity of Bond V = Value E = Equity D = Debt T_C = Corporate Tax Rate *Note:* Assume constant growth rate (g) and not consider risk
16.	Profit	Percent of Profit from Original Estimate x $\sum$ (Direct Cost of the Contractor's Claim + Indirect Cost of the Contractor's Claim)
17.	Loss of Opportunity Profit	$\sum$ (Opportunity Profit Rate x Total Cost of Loss Opportunity Profit Project x Opportunity to Get Project); *When:* Opportunity Profit Rate is the maximum between: 1) $\sum$ Present Value of Cash Out = $\sum$ [Present Value of Cash In x (1 + Opportunity Profit Rate)] or 2) Expected Interest Rate of Central Bank at Profit Loss Project Duration

Table 2. Contractor's claim cost components. (cont.)

No.	Contractor's Claim Cost Components	Method of Calculation
18.	Unforeseeable Physical Conditions (according to sub-clause 4.12 [Unforeseeable Physical Conditions])	MAX [(Cost Incurred by Unforeseeable Physical Conditions – Reduction in Cost for More Favorable Physical Conditions), 0]; *When:* Cost Incurred by Unforeseeable Physical Conditions = ∑ [Cost Incurred by Unforeseeable Physical Conditions]; Reduction in Cost with More Favorable Physical Conditions = ∑ [Reduction in Cost with More Favorable Physical Conditions]
19.	50% of Benefits Gained from Value Engineering (according to sub-clause 13.2 [Value Engineering])	0.5 x ∑ [Reduction in Contract Value from Proposed Variation – Reduction in the Value to the Employer from Proposed Variation]
20.	Interest for Delayed Payment (according to sub-clause 14.8 [Delayed Payment])	∑ [(Interest Rate for Delayed Payment / 365) x Payment Delay Duration x Amount of Payment Delayed]; *When:* Interest Rate for Delayed Payment (%) = Interest Rate Specified in the Contract or = Interest Rate of Central Bank (%) + 3%
21.	Cost Indemnified (according to sub-clause 17.1 [Indemnities])	∑ (Payment for Claim from Third Party)
22.	Insurance Premium (according to sub-clause 18.1 [General Requirements for Insurances])	∑ (Payment for Insurance Premium)
23.	The Amounts Payable for Works Carried out (according to sub-clause 19.6 [Optional Termination, Payment and Release])	*1) Lump-sum contract:* ∑ (Value in Schedule of Values x Percent of Completion) *2) Unit cost contract:* ∑ (Unit Cost of Works x Actual Quantity of Works) *When:* Unit Cost of Works = Unit Cost in the Contract Documents or Adjusted Unit Cost *3) Cost plus fee contract:* ∑ [Actual Total Cost of Works x (1 + Fee Percentage /100)]

It should be noted that some components can be priced by several methods. The methods shown are the ones the authors selected from their accuracy and their practicality. For example, there are several ways to pricing the company overhead cost such as Eichleay Formula, Hudson Formula, Emden's Formula, segmented costs approach, original estimate approach, industry average approach, and contracted percentage approach (Adrian, 1988). The segmented costs approach combining with Eichleay Formula allocation was selected because of its accurate result and limitation of other approaches.

1) Overhead Cost

According to the segmented costs approach, the claimant creates new accounting codes for the specific types of costs, and implementing record-keeping practices aimed at recording the individual costs to the job for which a claim has occurred (Adrian, 1988).

In some cases which are difficult to record the individual costs, Eichleay's Formula should be used instead. This method was originally stated by the Federal Armed Services Board of Contract Appeals in the Appeal of Eichleay Corporation, 60-2 BCA Paragraph. 2668 (Levin, 1998). It is the most common approach to the quantification of company overhead to be included in a claim. There are two different versions of the Eichleay's formula commonly used in practice, one for delay claims and one for scope-of-work claims. In delay claim formula, total company overhead will be allocated to a project by its share in contract billing. On the other hand, scope-of-work formula use share in direct cost as the driver of allocation (Adrian, 1988).

For example, Contractor ABC has 4 projects which have billings of 100, 200, 300, and 400 million Dollars, respectively. The last project, which has 500 days time for completion, was delayed for 30 days by several employer's defaults. According that time, the company had 20 million Dollars overhead cost. From Eichleay's Formula, the overhead allocable to the contract is 8 Million Dollars

$$\left(\frac{400}{(100+200+300+400)} \times 20{,}000{,}000 \right),$$

the daily contract overhead is 16,000 Dollars (8,000,000 / 500); and, the unabsorbed home office overhead that the contractor is entitled to is 480,000.

2) Interest or Finance Cost

In claiming for interest or finance cost, the project cash-in and cash-out of the changed conditions due to the events giving the rights to claim have to be calculated and cash flow analysis will be performed by using discount rate (i) equals to the Weighted-Average Cost of Capital (WACC) of the company. The financing cost acquired then compared with the original financing cost before the claim events happened. In calculating the cost of equity capital, the dividend growth model is proposed because of its easiness to use. This model has assumption that the firm's dividend will grow at a constant rate (Ross et al., 2000).

For example, project DEF has projected cash-in of 1 million Dollars at the end of May. However, the employer's staff delayed the payment to 31 August of the same year. If the contract does not specify the rate of financial charge, the contractor can use the WACC in pricing his claim to the employer. Assume the WACC of 7%, the amount of claim that the contractor is entitled to equals to 17,602 Dollars

$$\left(\frac{1}{\left(1+ \frac{0.07 \times 1}{12}\right)^{3}} \times 1{,}000{,}000 \right).$$

3) Loss of Opportunity Profit

Loss of opportunity profit claim amount can be calculated from multiplying the opportunity profit rate with the total cost of the project and the possibility to get the project. The opportunity profit rate is the maximum value between (1) the rate that makes the net present value (NPV) of the project

cash-out equals to the net present value (NPV) of the project cash-in multiplied by (1+opportunity profit rate) and (2) the interest rate of the central bank. This approach is relied on the assumption that the claimant will choose to invest in the higher return choice (Tanakitkhamjorn, 2005).

For example, Contractor GHI signed contract with the employer in project A. The contractor also planned to bid for project A, B, and C, with the contract amounts of 100, 200, and 300 million Dollars and the possibilities to get the projects for Project A, B, and C are 0.10, 0.15, and 0.20, respectively. The expected profit for all projects done by the Contractor GHI is 15%. Because of the employer's defaults, the project A was delayed and the contractor failed to get the project B, C, and D. The amount of claim that the contractor is entitled to is 15 million Dollars ((100 x 0.10 x 0.15) + (200 x 0.15 x 0.15) + (300 x 0.20 x 0.15)).

3.2 Pricing Employer's Claim Components

On the other hand, there are 22 cost components related to the employer's claim specified in literatures and in the FIDIC (1999) contract provisions, divided into 15 generally found components and 7 components stipulated in the FIDIC (1999). Their list and pricing methods are shown in Table 3. Again, some components can be priced by several methods. The methods shown are the ones that the authors selected from their accuracy and practicality.

It can be seen that the employer's claim cost components are similar to those of the contractors. However, some components are different. Additional interest or financing cost and loss of opportunity profit claim are not found in the employer's claim. On the other hand, the employers can claim for loss of use against the contractors if the project is delayed by the contractor's default.

Table 3. Employer's claim cost components.

No.	Employer's Claim Cost Components	Method of Calculation
1.	Additional Direct Employer's Personnel Hours	∑ (Employer's Personnel Hours Used in Additional Works x Employer's Personnel Rate)
2.	Additional Direct Employer's Personnel Hours due to Lost Productivity	*1) If there are normal productivity data:* ∑ {[1/ (Normal period productivity – Loss period productivity)] x Actual work quantity x Actual labor rate} *2) If there is no normal productivity data:* ∑ {(Actual labor hour x Actual labor rate) – [(Estimated labor hour x Estimated labor rate) x (Estimated work quantity + Variation quantity) / Estimated work quantity]}
3.	Increased Employer's Personnel Rate	∑ [(Increased Employer's Personnel Rate – Employer's Personnel Rate) x Employer's Personnel Hours of Increased Employer's Personnel Rate)]
4.	Additional Employer's Free-Issue Material Quantity	∑ [(Actual Employer's Free-Issue Material for Original Works – Estimated Employer's Free-Issue Material + Employer's Free-Issue Material Used in Variation Works) x Employer's Free-Issue Material Unit Price]

Table 3. Employer's claim cost components. (cont.)

No.	Employer's Claim Cost Components	Method of Calculation
5.	Additional Employer's Free-Issue Material Unit Price	$\sum$ [(Increased Employer's Free-Issue Material Unit Price – Free-Issue Material Unit Price) x Employer's Free-Issue Material of Increased Unit Price]
6.	Additional Other Contractor Work	$\sum$ (Payment to Other Contractors for Additional Works)
7.	Additional Other Contractor Cost	$\sum$ (Actual Payment to Other Contractors for Original Works – Estimated Payment to Other Contractors)
8.	Cost for Employer's Owned-Equipment Use	$\sum$ (Equipment Unit Cost x Actual Contractor's Equipment Hour); *When:* Equipment Unit Cost = Normal Hourly Equipment Ownership Cost + Normal Hourly Equipment Operating Cost
9.	Cost for Increased Employer's Owned-Equipment Rates	$\sum$ [(Employer's Equipment Actual Unit Cost – Employer's Equipment Estimated Unit Cost) x Employer's Equipment Actual Hour]; *When:* Employer's Equipment Unit Cost = Employer's Equipment Hourly Ownership Cost + Employer's Equipment Hourly Operating Cost
10.	Job Overhead Costs (Variable)	$\sum$ (Employer's Cost in the Segmented Cost Code: Job Overhead) *Note:* Use Eichleay's Formula to allocate
11.	Job Overhead Costs (Fixed)	$\sum$ (Employer's Cost in the Segmented Cost Code: Job Overhead) *Note:* Use Eichleay's Formula to allocate
12.	Interest or Finance Costs	Original PV – Changed PV; *Cost of Capital (Dividend Growth Model Approach):* $i = WACC = (E/V) \times R_E + (D/V) \times R_D \times (1-T_C)$ $R_E = D_1/P_0 + g$ R_D = Yield to Maturity of Bond *Note:* Constant growth rate (g) and not consider risk
13.	Company Overhead Costs (Variable)	$\sum$ (Employer's Cost in the Segmented Cost Code: Company Overhead) *Note:* Use Eichleay's Formula to allocate

Table 3. Employer's claim cost components. (cont.)

No.	Employer's Claim Cost Components	Method of Calculation
14.	Company Overhead Costs (Fixed)	∑ (Employer's Cost in the Segmented Cost Code: Company Overhead) *Note:* Use Eichleay's Formula to allocate
15.	Loss of Use	∑ (Damages per Day x Delay Duration Attributable to the Contractor)
16.	Liquidated Damages (according to sub-clause 8.7 [Delayed Damages])	MAX [Liquidated Damage per Day in the Contract x Delay Duration Attributable to the Contractor x (1 – Price of Parts Taken Over / Contract Price), Maximum Liquidated Damages]
17.	Reduced Value of Works (according to sub-clause 9.4 [Failure to Pass Tests on Completion])	∑ (Value of Deficiency in Works)
18.	All Sums Paid for Works (according to sub-clause 11.4 [Failure to Remedy Defects])	∑ (Payment to the Contractor for Works)
19.	Cost Indemnified (according to sub-clause 18.1 [General Requirements for Insurance])	∑ (Payment for Claim from Third Party)
20.	Insurance Premium (according to sub-clause 18.1 [General Requirements for Insurance])	∑ (Payment for Insurance Premium)
21.	Unavailable Insurance Cover (according to sub-clause 18.2 [Insurance for Works and Contractor's Equipment])	∑ (Payment for Insurance Premium in the former year)
22.	Cost Incurred by the Contractor in the Expectation of Completing the Works (according to sub-clause 19.6 [Optional Termination, Payment and Release])	∑ (Original Value of Works) – ∑ (Value of Works Done by the Contractor)

4. Claim Pricing of Construction Projects in Thailand

As to claim pricing in Thai construction projects, Table 4 shows the frequency of each type of claims, according to the interviewees' experiences. More than 75% of the interviewees seldom or never filed claim requesting compensation or time extension. This implied that both employers and contractors in Thai construction industry seem to be reluctant to claim against the other party.

Furthermore, interview results showed that normal practice in Thailand's claim management is quite different from that theoretically described based on international practices. From international practice point of view, claims enhance the fairness to both contractual parties and both employers and contractors should have be entitled to claim for particular items which are justifiable and verifiable, as seen from the variety of claim components shown in Table 2 and Table 3.

However, both employers and contractors in Thai construction industry view claims differently. The problems of claim pricing process raised by the interviewees are the unclearness of public construction contract provisions and procurement regulations related to claim pricing methods, strict provisions related to claims for additional payment, different opinions between lawyers and engineers, insufficient staff, and over-claim-pricing by the contractors.

The survey results also revealed that Thai practice in pricing construction claims is quite different from that of international practice. Claims in Thai construction industry are limited only in a few types. In public contracts, the contractors are granted additional payments only in case of additional work and price escalation. Other types of claims rarely find their ways to compensation for the contractors. The claims filed in private projects normally alienate claims for consequential damages.

Even though there is no serious problem concerning the claim pricing method, the studying of how claims should be priced in international practice is necessary to prepare the industry to be accepted in global competition.

Table 4. Frequencies of claim filing.

Frequency	Employer's Claim	Contractor's Claim	Both Types of Claims
Often	0% (0 respondent)	25% (1 respondent)	12.50% (1 respondent)
Seldom	75% (3 respondents)	25% (1 respondent)	50% (4 respondents)
Never	25% (1 respondent)	50% (2 respondents)	37.50% (3 respondents)
Total	100% (4 respondents)	100% (4 respondents)	100% (8 respondents)

5. Conclusion

This research presents 23 contractor's claim cost components and 22 employer's claim cost components with their accurate and practical pricing methods. Some claim cost components were collected from the FIDIC's (Fédération Internationale des Ingénieurs-Conseils) Conditions of Contract for Construction (First Edition) because of its wide acceptance in Thai construction industry. In addition, Thai practice in pricing construction claims is also mentioned in the research paper.

From the survey results, both employers and contractors in Thai construction industry seem to be reluctant to claim against the other party because of several problems such as the unclearness of public construction contract provisions and procurement regulations, strict provisions related to claims for additional payment, different opinions between lawyers and engineers, insufficient staff, and over-claim-pricing by the contractors. Moreover, Thai construction industry has more different pricing process than that of theoretically described based on international practices. Only a few types of construction claims were found in the research, especially in the public contracts. Other types of claims are rarely success to find compensation. This factor should be recognized in development of the industry dealing with high international competitive atmosphere in the future.

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