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# Building Theory on Monetary Retention Regimes

Vasantha Abeysekera, Priyanka Raina, Thomas Neitzert
*AUT University, Auckland, New Zealand*
*vasantha.abeysekera@aut.ac.nz, priyanka.raina@gmail.com, tneitzer@aut.ac.nz*

## Abstract
The aim of this paper is to explore and recommend a rational basis for setting up a retention regime for a given project. Despite a century of practice, there is no theory to provide guidance yet. Using insights gained from the recently developed theories on monetary retentions, this study argues that retention regimes should be designed to cater for the needs of those who have the power to control. Citing this as an important discovery, the study focuses on public clients and proposes three main objectives to be achieved and a tentative methodology for doing so in the pursuit of knowledge on how to set up a retention regime to cater for a wide variety of needs.

## Keywords
Monetary retentions, Retentions, Retainage, Theory

## 1. Introduction

There has been much debate and discussion on the merits and demerits of retentions (Fullerton, 2000; Abeysekera, 2002) and some countries such as the USA have abolished its use (only in public contracts of some states though) whereas in other countries such as the UK they have tried and failed to abolish retentions (House of Commons, 2003). However, others seem to find it useful and are content with the status-quo. Despite its extensive use for well over a century, originally enforced by law in New Zealand as far back as 1897 and later abolished in 1987 (almost a century later) there is still a lack of understanding on a rational basis for setting up retention regimes. This is not surprising given that there have hardly been any attempts to build theory in the field of construction management. However, Abeysekera (2008) attempted to develop five theories on monetary retentions using a metaphorical approach which are described briefly in this paper. Though these theories provide interesting insights on various issues, they fall short in providing a theoretical basis for setting up retention regimes. Thus, the aim of this paper is to pursue this journey by developing a conceptual basis for doing so.

## 2. Introduction to Theory

In engineering, 'theory' is the foundation for many applications whether it is in the design and construction of a bridge, a building, or a road. Many codes of practice for design of structures for example, are based on theoretical knowledge. In this regard, those with a background in engineering would find it easy to see the relevance of 'theory' and its value. If not for theory, one would have to use experience, intuition, and judgement instead, to create the built environment we live in, no doubt, with much trial and error, inefficiency, and waste.

In common usage, the word 'theory' is often used to signify an opinion as in "he has a theory that wearing hats makes men go bald". In fact, most seem to have theories about many things including how to 'choose a bait, a date, or mate' as eloquently put by Shoemaker *et al* (2004). In this **usage**, theory is not necessarily based on facts; and is not required to be consistent with true descriptions of reality. Such usage of the term 'theory' is confusing, incorrect and inappropriate. However, this usage shows us that theory helps us to ***know,*** and is also about *knowing*, but this is not enough; **it must work in practice** too. However, knowing is much more than this too. The ancient astronomers made excellent predictions of the future positions of planets but they were unable to say *why* (understanding) the planets behaved this way because they lacked understanding (Meredith, 1998). So, theory is of a particular kind of knowing which goes beyond knowing how to practice. Moreover, it is very much more than other ways of knowing such as authority, intuition, and experience, whereby logic (reason) needs to be applied to questions for right understanding (Shoemaker *et al*., 2004).

Theory consists of answers to four elements, namely, 'what, how, why and so-what'. The *what* identifies the phenomena, the *how* provides explanation (and prediction) and the *why* provides understanding whilst the *so-what* element is necessary to demonstrate the implications and consequences of a proposed theory. Other elements to include are responses to *when, where, who,* which are considered to be the limiting parameters i.e. the context (Abeysekera, 2008a).

Finally, if as noted before *theory* should respond to the questions of 'what, how, why and so-what' in relation to phenomena, how does one judge or evaluate theory? Shoemaker *et al.* (2004) provide ten criteria, namely, testability, falsifiability (i.e. capability of being criticised by observational reports), parsimony (least complex explanation for an observation), explanatory power, predictive power, scope, cumulative nature, degree of formal development, heuristic value (generate ideas for research), and aesthetics (expressing the value of a theory by the application of aesthetic principles such as by referring to an idea as "beautiful") whilst noting that it is unlikely that all these criteria can be fulfilled simultaneously.

The beginning point of building theory would be a problem (Shoemaker *et al*., 2004). Problems could be intellectual in nature or practical problems, or a combination of both. Concepts (such as 'retentions') could also be a starting point for theory building particularly if they are problematic. Such concepts could lead to hypotheses which could be tested for validity and thereby provide greater understanding. It is also possible that theory building could start with a hypothesis or even with a question about something that needs better understanding. Another possible beginning point for building theory would be to start with an area in which theory is vague or lacking. This is clearly the case with 'monetary retentions'.

## 3. Theories on Monetary Retentions

*"Actions without thinking, practice without theory are unimaginable..."* (Miettinen, 2001)

Abeysekera (2008a) discussed the experience of moving from engineering to a practice-driven profession like construction management wherein he noted that there are hardly any theories to inform practice. The situation is not much different today: educational curricula in construction management rarely if ever focus on theory. Part of the problem is that there has not been an attempt to differentiate practice with scientific practice. Moreover, neither has there been an attempt to build theory nor appreciate the need.

Having explored different methodologies for building theory on monetary retentions, Abeysekera (2008a) experimented with the use of metaphor as it was found to be a convenient and a powerful approach for channelling knowledge, give it structure, and develop a narrative, in a way that it condensed knowledge and facilitated practice. Accordingly, five theories were presented under *Images of Retentions* – an unfolding story about the practice of retention. These theories were named as *Cash-Cow*, *Steroid*, *Beast*,

*Stress*, and *Chaos*. They were seen as providing a deeper understanding of the reasons for this phenomenon along with new insights on retentions.

Individually, these 'theories' tell us a one-sided story by highlighting certain interpretations and forcing others to the background. This needs to be understood but importantly these theories needs to be viewed together as a collection rather than in isolation, understanding the opposing and complementary points of view, along with their interactions. The theory (and theories) presented therein are not exhaustive as noted by Abeysekera (2008a). In fact, there are still a number of issues pertaining to retentions that need to be understood. One such is the issue of understanding how to set up a retention regime focussing on *why*.

## 4. Retention Regimes and Underlying Assumptions

The original purpose of retentions in New Zealand (NZ) as set out in the 1897 Act was to protect subcontractors (payee). With the abolition of the Act in 1987 (almost a century after), the role of retentions has reversed from protecting the payee to protecting the payer and the practice has continued unabated (Abeysekera, 2003). The amount of money held varies but it is not uncommon in NZ to hold back sums of money as a high as 10% of the contract price particularly from trade contractors. Only a part is reimbursed on completion (usually about half is held back) and the balance released only at the end of the defects liability period which usually varies from 3 months to a year. As to why such percentages have been used is a mystery as there does not seem to be any guidance on this matter.

Retentions are not only held by clients but also by contractors when they make payments to subcontractors. If the payer goes bankrupt, the payee stand to lose all their moneys as it is highly unusual for the payer to provide a payment guarantee. Thus the quantum of money withheld is an important concern for payees. The greater the amount of money held by the payer, the greater is the risk for the payee. Whether the quantum of money held is a reasonable reflection of the risks involved is unknown as payers do not seem to distinguish between risky and non-risky contractors (or subcontractors) treating them alike (Abeysekera, 2008a)! This is wasteful and is not value-adding. Moreover, greater the money held, greater is the impact on their cash flows: On the one hand, the payer benefits by withholding payments as they pay less and minimise their financing costs (Abeysekera, 2005). On the other hand, the payee incurs extra costs sourcing funds from private financiers. In recessionary economic conditions the impact could be devastating with diminishing lines of work in capital (Bill, 2009). Thus the amount of money held should be a thoughtful decision for an efficient industry and not an arbitrary one. Nevertheless, examination into current practice in New Zealand reveals otherwise!

### 4.1 Sliding Retention Regimes

One of the commonest retention regimes used in NZ with respect to the work done by main contractors is shown in Figure 1 whereby 10% is retained on the first $200,000 and 5% on the next $800,000, and a further 1.75% thereafter with a ceiling of $200,000 (NZS 3910: 1998). The dollar limit works out to a threshold contract price of NZ $ 9M, which is an 'effective rate' of just 2.22%. Clearly, the effective rate will **decline further** as the value of the project increases. This is one of regimes specified in NZS 3910 and interestingly this is the regime that was enforced by law at the time the Liens Act was abolished in 1987. This may be referred to as a *sliding* regime as the effective rate of retention reduces with the size of project. Interestingly, it is a *unique* retention regime used nowhere else but in New Zealand. As such, it needs a deeper investigation to understand the reasons behind the use of such a regime.

In the setting up of the sliding regime mentioned earlier, it appears that those who conceived it might have made the following decisions:

- Retention rates should vary according to the size of the project; smaller projects need higher retention rates than larger projects (10% for 200k project as against 6% for 1M project and 2.22% for 9M project).
- Retention rates should not be differentiated within certain values of work (up to 200k, 10%; from 200k to 1m, 5% etc.).
- Retentions should be recovered at a faster rate initially and at a lesser rate later.
- As the size of the project increases, the drop in rates should be higher with low value projects than higher value projects (a drop of 4% from 200k to 1M as against a similar drop from 1M to 6M).
- Retention rates should be a constant within certain bands
- Total amount of retentions should be capped at $200,000 and not increase with the size of the project.
- The limit of retentions and the value of work for the first tier of retentions should be the same (i.e. 10% for projects less than 200k with a similar retention limit)

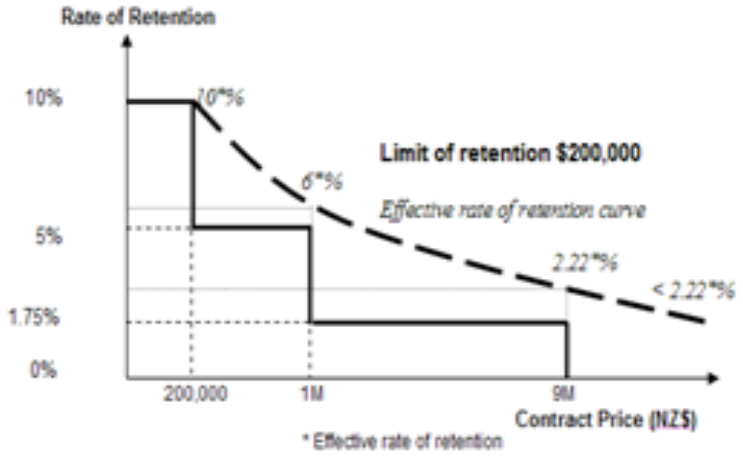


**Figure 1: A common retention regime in New Zealand (Source: Abeysekera, 2006)**

The assumptions mentioned above are intriguing and challenges the academic and the practitioner community to think whether there has been any rational basis for such a decision. Interestingly, investigations into some projects executed during the last decade revealed that those who commission projects have adopted various retention regimes as shown in Table 1. Interestingly, these regimes fall broadly into two categories, namely *sliding* and *flat* with each regime showing similar characteristics.

### 4.2 Flat Retention Regimes

Compared with sliding regimes, *flat* regimes are more common wherein the rate applied remains the same for all payments. However, retentions seem to be recovered faster in the Britomart project similar to the sliding retention regimes although the limit seems to be specified as a percentage than as a dollar limit. The reasons for these and other decisions are unknown, and whether in fact, they have been made with a good understanding of the real needs is questionable as there are no available guidelines on how to set up retention regimes.

Further investigations will be necessary to see whether the rates should vary depending on project size or due to other factors, and the impact of such rates on industry efficiency. As mentioned before, what is not clear is the basis on which these have been set up as mentioned before. Moreover, as to whether a *sliding* regime or a *flat* regime or for that matter a *hybrid* regime is better for industry (in terms of improving efficiency) also needs investigation.

**Table 1: Projects with different retention regimes in New Zealand**

| Project | Retention Regime | Type of regime |
|---|---|---|
| **Auckland International Airport** | NZ 3910 sliding regime (see Fig. 1) | Sliding |
| **Britomart - $100 M** | 10% on first $15M + 5% on next 30M + 2.5% thereafter. Limit of retention $ 3.5M.<br>Defects liability retention 50% from last separable portion | Sliding |
| **Britomart Chief Post Office ($25M)** | Retention rate 10%, Limit of retention 5%, Defects liability retention 50% from last separable portion | Flat |
| **Air NZ Simulators (two projects each $ 4M)** | 5% of Contract Price with a limit of $125,000. Defects liability retention 50% | Flat |

### 4.3 Retention Regimes for the Defects Liability Period

Retention regimes have different elements: Discussions thus far has centred on rates, limits and forms of retentions (recovery and reimbursement forms) focussing on the 'construction period' (i.e. before handover for occupation) but not on the contractual defects liability period (which starts after the project is taken over). The retention regime for this period seems to be quite different to the 'construction period'. Interestingly, retention held is only a fraction of the amount held during construction and is usually around 50-60%. As to why this is so is intriguing and whether in fact this is due to a reduction in risks by a similar proportion is also unknown. Some of underlying assumptions for such thinking seems to stem from different perceptions on defect liability retention:

- Risks (of defects) remain constant during the defects liability period
- Risk of defects are larger with larger projects (use of retention rates)
- Risk of defects can be limited to a dollar value (when limit is specified in dollar terms)
- Retentions should be held over a period of 3 to 12 months.

Once again, it is not clear the basis for such assumptions including which of these assumptions have a negative impact on industry efficiency, and to what extent, are also unknown.

## 5. Retention Regimes and Impacting Issues

There are many factors that seem to impact on retention regimes including the impact retention regimes have on users (clients, contractors, subcontractors etc). Type and size of projects, industry characteristics, relationships between contracting parties are some. There are many other issues some of which are discussed below.

### 5.1 Impact on Costs

Greater the money held, greater is the impact on cash flows: On the one hand, the payer benefits by withholding payments as they pay less and minimise their financing costs. On the other hand, the payee incurs extra costs sourcing funds from private financiers. In recessionary economic conditions the impact could be devastating with diminishing lines of work in capital (Bill, 2009). Thus the amount of money held should be a **thoughtful decision for an efficient industry and not be an arbitrary one.**

### 5.2 Double Dipping

Not only do clients hold retentions from contractors but contractors too do so when they make payments to subcontractors. This duplication seems wasteful although large scale contractors use this practice to create a large pool of surplus money to the extent that they would not need commercial banks to provide lines of credit for construction work (Abeysekera, 2006). In other words, retentions act as a cash cow for main contractors who outsource their work (Abeysekera, 2008a). Thus for some contractors this duplication seems to add value but for others it creates waste (see 'beast theory' of retentions discussed by Abeysekera (2008a)).

### 5.3 Defects Profiles

Defects arise due to many reasons. These include mistakes of the designers, failures of manufacturers and poor workmanship. Defects that arise during construction due to poor workmanship are generally rectified before handover. However, workmanship related defects that arise during the defects liability period need to be rectified at no extra cost. Ideally, retention moneys should be sufficient to attend to these. Thus understanding cost and time impacts of defects is an important issue when setting up retention regimes.

### 5.4 Performance History

It was mentioned earlier that in general the current usage of retentions does not differentiate between a good and a not so good contractor (or subcontractor). They are treated alike with the same retention regime imposed on all. This appears to be unfair and wasteful with no reward for good performance. In other words, the underlying assumption seems to be that historical performance has no relevance to current or future performance. This is an issue that needs further investigation in relation to its link with retention regimes. If true, there seems to be a case for imposing the same regime for all contractors. Moreover, the link between retentions as an incentive or a disincentive for performance needs to be established too.

### 5.5 Fair Play

Sliding retention regimes as used in NZ are friendly to large contractors who outsource work. Abeysekera (2003, 2005) has pointed out that they have the opportunity to leverage retention moneys to create a large surplus pool of money by differentiating retention regimes. This may lead to unfair competition (as the playing field is not level). Clients who take note of such possibilities might decide to create retention regimes so as to minimise such possibilities and thereby create an efficient market structure.

### 5.6 Security of Payment

This is an important issue for industry. If the payer goes bankrupt, the payee stand to lose all their moneys as it is extremely rare for the payer to provide a payment guarantee (Abeysekera, 2008b). Thus the quantum of money held is an important concern for payees. Greater the amount of money held by the payer, greater is the risk for the payee. Whether what is held is a reasonable reflection of the risks involved is unknown.

### 5.7 Value-based Perceptions

Retention is a commodity that has value. It is not uncommon for contractors or clients to trade retentions for price discounts either at award or at completion. Retention regimes could be set up in such a way for that such exchanges would become a possibility. This then becomes part of business strategy.

### 5.8 Business Drivers

It must be remembered that it is the payer who sets the retention regime (and not the payee). The payer has the power to strategically manipulate it to suit its own business and/or other needs. The payee could either reject or respond appropriately. These drivers need to be understood too. For example, the drivers of a public body may be quite different to those of a property developer and depending on these differences, the types of retention regimes may also be different but not without consequences. Setting regimes without a good understanding of the consequences would be futile.

## 6. Retention Regimes and Theories on Retentions: A Way Forward

Given the power that is available to those who set retention regimes as mentioned in 5.8, it is prudent to approach the issue of setting up retention regimes from the point of view of those who have the power of control by focussing on how retention regimes could be used to achieve their needs. The cash cow theory shows that contractors who outsource work could generate positive cash flows by differentiating retention regimes. They would therefore set retention regimes in such a way to maximise such needs if desired. The adverse effects of such a strategy could be understood through the beast theory. However, if the intentions were to use retentions as a strategy for improving performance, steroid theory shows ways of achieving this need. Moreover, if retentions were overused, the stress theory explains what might happen. Additionally, if the industry were to see some order to problems due to retentions, chaos theory provides new insights on how this might be achieved. In short, what these theories of justified beliefs show are that depending on the need of those who award projects, a wide variety of retention regimes could be set up to achieve their needs. **This is an important discovery** – a discovery that paves the way to embark on how theory building could be approached.

## 7. The Challenge: Embarking on the Journey of Building Theory

The aim of this study was to understand how a rational framework could be developed for setting up retention regimes. Given the discovery outlined in section 6.0, a good starting point would be to focus on public clients whose needs may be more homogeneous than private clients. If such a study was to be commissioned, then it will be necessary to (a) understand drivers of public sector clients (b) establish the validity of underlying assumptions related with current practice and (c) assess how retention regimes could be developed to achieve their needs. Research methodology and methods that could be adopted are briefly noted in Table 2.

**Table 2: Theory building objectives and indicative methodology**

| Sub-objectives | Methodology/Methods |
|---|---|
| **(a) Understand drivers of public sector clients in relation to retentions** | Select suitable techniques to capture the voice of the customer including interviews/questionnaire surveys/archival data analysis separating wants from needs |
| **(b) Establish the validity of underlying assumptions related to current practice** | Establish current practice through case study methodology.<br>Synthesise assumptions, set up hypothesis and test for validity<br>Develop a methodology to quantify defects in construction projects (explore Delphi technique/risk quantification frameworks) |
| **(c) Assess how retention regimes could be designed to achieve needs** | Investigate how client drivers could be achieved (indicative examples):<br>• Cost minimisation: Cash flow analysis including sensitivity analysis, impact of double dipping and feasibility of potential solutions<br>• Risk minimisation: Cost impacts of bonds and guarantees and their cost effectiveness, defects- profiles and cost impacts<br>• Performance improvement: Establish the validity of the steroid theory<br>Test validity of theories on monetary retentions (related issues only) |

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