

BSC (HONS) QUANTITY SURVEYING

University of Wales Trinity Saint David

Title

Assessing the Reliability of CVRs as a
Performance Measurement Tool in Construction

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Abstract

This dissertation assesses the reliability of Cost Value Reconciliations (CVRs) as a performance measurement tool within construction projects. CVRs are widely used within contractor organisations to monitor financial performance by comparing cost against value and forecasting the final project position. Despite their widespread use in industry, there is limited research examining how accurately CVRs reflect actual project outcomes throughout the lifecycle of a project.

The research adopted a hybrid approach combining both quantitative and qualitative methods. Firstly, a project audit was carried out using completed projects within the researcher's organisation. Archived CVRs from different stages of each project were compared against final account outcomes and post-project financial reviews in order to assess forecasting accuracy over time. Secondly, semi-structured interviews were conducted with Quantity Surveyors to explore how CVRs are prepared in practice and identify factors that influence their reliability.

The findings show that CVRs became more accurate as the projects progressed. In the four projects reviewed, the early CVR margin was higher than the final margin in each case. The difference was small on the minor works project, but more noticeable on the larger and more complex schemes, particularly where groundworks, subcontract accounts and unresolved costs affected the final position.

The research also identified that professional judgement, project complexity and commercial pressure all influence the reliability of CVRs. Overall, the study found that CVRs are still useful for commercial management, but they should not be treated as fully reliable at every stage of a project. Their accuracy depends heavily on how much cost certainty is available when the CVR is prepared.

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Chapter 1 – Introduction

1.1 Background

Financial control is a key part of construction contracting because profit margins are often narrow and costs can change quickly once work starts on site. This is particularly relevant to contractors working on short and medium-duration projects, where issues such as labour costs, subcontractor accounts, variations and site conditions can affect the final margin. Throughout the project lifecycle costs move, risks develop, subcontract accounts change and variations are agreed or disputed. Because of this, contractors need a way of regularly checking whether a project is still making money. This is where the Cost Value Reconciliation (CVR) comes in.

A CVR is normally set up near the start of a project and then updated regularly, often monthly, by the project Quantity Surveyor and is reviewed by senior commercial management. Its purpose is to compare the cost of delivering the works against the value achieved, and to forecast the likely final position of the project. At a very basic level, the profitability of a project is determined by:

$$\text{Profit} = \text{Contract sum} - \text{Cost to complete}$$

However, CVRs are not just used to see what has already happened. At Premier Forecourts and Construction, they are used to assist the QS in setting the project budget by using an initial cost forecast and a running cost forecast which is determined by:

$$\text{Forecast final profit} = \text{Forecast final value} - \text{Forecast final cost}$$

This forecasting element is where things become less straightforward. While actual cost to date can usually be verified through cost reports and subcontract applications, the forecast cost to complete depends on professional judgement. It requires assumptions about risk, future variations, potential claims, and subcontractor performance. Because of this, two different Quantity Surveyors could potentially forecast different outcomes on the same project.

Despite this, CVRs are relied upon heavily within contractor organisations as a primary cost control and performance monitoring tool (Ashworth and Perera, 2018; Royal Institution of Chartered Surveyors, 2015; Royal Institution of Chartered Surveyors,

2020). Senior management use them to forecast company turnover and profit. Divisional directors rely on them to identify underperforming projects. In many businesses, the CVR is the primary financial performance document. Given how much influence CVRs have, it is reasonable to question how reliable they are.

1.2 Research Context

Previous literature identifies CVRs as widely used within UK contractor organisations (Ashworth & Perera, 2018; RICS, 2020). Research into performance measurement highlights the importance of accurate forecasting and professional judgement throughout the project lifecycle (Brook, 2016; Kerzner, 2017).

However, wider construction research also shows that cost forecasting is vulnerable to optimism bias and subjective judgement (Flyvbjerg, 2014; Love et al., 2012). Organisational culture and commercial pressure can influence how information is reported and interpreted (Neely et al., 2005; Flyvbjerg, 2014).

What is less clear in existing research is how accurate CVRs are when tested against actual final project outcomes. Much of the literature focuses on cost overruns at an industry level rather than examining contractor internal reporting tools.

From practical experience, early-stage CVRs often involve significant estimation. As projects progress and more costs become fixed, the reported margin typically stabilises. This suggests that reliability may change over the course of a project.

This dissertation therefore aims to examine CVR reliability both in theory and in practice.

1.3 Research Aim

The aim of this research is:

To assess the reliability of Cost Value Reconciliations (CVRs) as a performance measurement tool in construction projects.

Reliability in this context refers to whether CVRs provide a realistic and consistent representation of financial performance throughout a project's construction phase.

1.4 Research Objectives

To achieve the aim, the study will:

1. Review literature on performance measurement and cost control within construction.
2. Examine how CVRs are used in professional practice.
3. Audit selected completed projects to compare CVR forecasts at key stages, including initial, running and final outcomes, using project reviews.
4. Identify factors influencing the reliability of CVRs.

5. Evaluate whether CVRs accurately reflect project financial performance upon completion.

The inclusion of a project audit allows forecast accuracy to be assessed directly rather than relying solely on perception.

1.5 Research Approach Overview

This study adopts a hybrid approach combining documentary analysis and qualitative interviews.

Firstly, completed projects within the researcher's organisation will be reviewed. Archived CVRs from different stages of each project (for example early, mid, and late stages) will be compared with final account outcomes and post-project financial reviews. This will allow variance between forecast and actual performance to be assessed. Forecast variance can be conceptually defined as the difference between the actual final cost and the forecasted final cost:

$$\text{Forecast variance} = \text{Actual final cost} - \text{Forecast final cost}$$

This formula shows whether the actual cost exceeded the forecast (positive variance) or came in under the forecast (negative variance). This makes it possible to identify whether:

- Early-stage forecasts were too optimistic or conservative.
- Losses were recognised late in the project.
- Forecast accuracy improved as the project progressed.

Secondly, semi-structured interviews will be conducted with 6–8 practising Quantity Surveyors. These interviews will explore how CVRs are prepared, how risk allowances are determined and whether commercial pressure influences reporting.

By combining real project data with professional insight, the study aims to provide a more balanced and accurate assessment of the reliability of CVRs.

1.6 Structure of the Dissertation

Chapter 1 – Introduction

Chapter 2 – Literature Review

Chapter 3 – Methodology

Chapter 4 – Results

Chapter 5 – Discussion

Chapter 6 – Conclusion

1.7 Value of this Research

This research investigates the factors that affect CVR accuracy and may help improve cost reporting and forecasting in practice.

While CVRs are widely used throughout the construction industry, there is limited academic research assessing how reliable they are when compared against actual project outcomes. Much of the existing literature focuses on forecasting theory or large-scale project cost overruns rather than internal contractor reporting processes.

By analysing completed project data alongside the views of practising Quantity Surveyors, this research aims to provide a more practical assessment of how CVRs operate within live construction projects. The findings may be useful to contractors, commercial managers, and Quantity Surveyors by improving understanding of the limitations and strengths of CVRs as a performance measurement tool.

The study may also contribute to future research relating to construction forecasting, commercial reporting, and performance measurement within contractor organisations.

Chapter 2 – Literature Review

2.1 Introduction

This chapter reviews existing literature relevant to the reliability of Cost Value Reconciliations (CVRs) as a performance measurement tool within construction. It focuses on four main areas:

1. Performance measurement in construction
2. Cost control and forecasting
3. Bias and subjectivity in financial reporting
4. Organisational and behavioural influences

The purpose of this review is to identify gaps and establish a framework for analysing CVRs in practice. While CVRs are widely referenced in professional guidance, there is limited academic research directly assessing their reliability. This chapter therefore builds the foundation for the research undertaken in later chapters.

2.2 Performance Measurement in Construction

Performance measurement within construction differs from other industries due to the project-based nature of work. Each project is temporary, location specific and is subject to unique risks. Unlike manufacturing, there is no consistent production line. As a result, financial performance must be monitored at project level rather than purely organisational level. However, Neely et al. (2005) discuss performance measurement at a broad organisational level rather than focusing specifically on contractor commercial

reporting. Similarly, Kaplan and Norton (1996) promote balanced performance indicators, although their work is less focused on project-level financial management within construction.

Neely et al. (2005) define performance measurement as the process of quantifying efficiency and effectiveness. In a contractor environment, this typically relates to:

- Cost performance
- Profitability
- Cash flow
- Programme performance

Within UK contracting practice, financial performance is the primary indicator of success. While programme and quality are important, profitability ultimately determines organisational sustainability. This reflects the wider project management literature, where cost, time and quality have traditionally been treated as core measures of project performance, although these measures alone may not fully capture project success (Atkinson, 1999).

Ashworth and Perera (2018) note that contractors rely on internal cost control systems to monitor performance, with the CVR being a common mechanism. Similarly, RICS (2020) recognises CVRs as a standard commercial reporting tool within contractor organisations.

However, most professional texts describe how CVRs are prepared rather than critically evaluating their effectiveness. There is limited discussion around how reliable they are as a measurement tool.

Kerzner (2017) argues that effective performance measurement must be timely, accurate and relevant. Similarly, Chan and Chan (2004) identify cost performance as one of the key indicators used to measure construction project success. If reporting systems provide distorted information, decision-making becomes flawed. This raises an important question in relation to CVRs, do they meet these criteria consistently throughout a project lifecycle?

2.3 Cost Control and Forecasting

Cost control is a core responsibility of the Quantity Surveyor, with financial reporting, forecasting and cost monitoring forming central parts of the Quantity Surveyor's role (Cartlidge, 2020). Brook (2016) emphasises that cost management is not simply recording expenditure but involves forecasting future outcomes and identifying risk.

A central feature of CVRs is forecasting final cost. This can be summarised as:

Forecast final cost = Cost to date + Forecast cost to complete

While cost to date is generally based on verified data (subcontract applications, labour returns, plant hire records), forecast cost to complete depends on judgement. This reflects traditional Quantity Surveying practice, where cost reporting, valuation and financial control are central to managing construction expenditure (Seeley, 1997).

Forecasting requires assessment of:

- Variations not yet agreed.
- Potential claims.
- Risk allowances.
- Programme impact on preliminaries.
- Remaining subcontractor liabilities.

Although Brook (2016) identifies the uncertainty involved in forecasting, the discussion focuses mainly on estimating principles rather than how forecasting affects live reporting tools such as CVRs. This creates a gap between forecasting theory and contractor reporting practice. Research into construction cash flow forecasting also highlights the difficulty of producing accurate forecasts during live projects, as forecast accuracy is affected by the number of variables and assumptions involved (Kaka, 1996).

Flyvbjerg (2014) highlights that cost forecasting in construction is often inaccurate, particularly on major projects. Although his research focuses largely on infrastructure and public sector schemes, the principle remains relevant: forecasting is inherently uncertain.

Love et al. (2012) further identify that cost overruns are frequently linked to optimism bias and strategic misrepresentation. While these studies consider client-side budgets and overall project cost, the behavioural factors described may also apply to internal contractor forecasting.

Within CVRs, forecast final value may also fluctuate due to:

- Unagreed variations
- Claims progression
- Changes in scope
- Commercial strategy

Therefore, both sides of the profitability equation contain uncertainty.

2.4 Reliability and Forecast Variance

Reliability, in this context, refers to the consistency and accuracy of CVR forecasts compared to actual outcomes.

Forecast variance can conceptually be considered as:

Forecast variance = Actual final cost – forecast final cost

If variance is consistently significant, reliability may be questioned. However, it is also reasonable to expect greater variance in early project stages when uncertainty is highest.

Brook (2016) suggests that as a project progresses, financial certainty should increase. This implies that CVR reliability may improve over time as risks become clearer and subcontract accounts are agreed.

This raises several practical considerations:

- Are early-stage CVRs overly optimistic?
- Is loss recognition delayed?
- Does reported margin gradually reduce as projects near completion?

While literature discusses cost overruns at a basic level, there is limited academic research testing internal contractor reporting tools against final account outcomes. This gap supports the need for this study.

2.5 Professional Judgement and Subjectivity

A key issue affecting CVR reliability is the role of professional judgement.

Brook (2016) emphasises that cost forecasting requires experience and commercial awareness. It is not a purely mathematical process. Two Quantity Surveyors may apply different risk allowances based on, personal experience, risk appetite, knowledge of subcontractor performance, relationship with project management

Flyvbjerg (2014) introduces the concept of optimism bias, where individuals systematically underestimate risk and overestimate positive outcomes. In a contractor environment, this could show as:

- Understated cost to complete
- Overstated variation recovery
- Delayed recognition of loss

Love et al. (2012) argue that forecasting errors are not always accidental but can result from cognitive bias or external pressure. While this research is often linked to strategic misrepresentation at pre-contract stage, similar behavioural factors may influence post-contract reporting. Ahiaga-Dagbui and Smith (2014) also argue that construction cost overruns should not be explained only by technical estimating error, as cognitive behaviour, learning and project context can all influence cost prediction.

This highlights that CVRs are not purely technical documents; they are shaped by human judgement.

2.6 Organisational Culture and Commercial Pressure

Organisational context plays a significant role in financial reporting.

Neely et al. (2005) suggest that performance measurement systems are influenced by organisational culture and management expectations. In contractor environments, commercial teams often operate under pressure to achieve margin targets.

Flyvbjerg (2014) identifies that incentive structures can distort reporting. If project teams are assessed based on reported margin, there may be reluctance to recognise losses early.

In practice, commercial reviews often involve senior management questioning forecast assumptions. While this can improve robustness, it may also create pressure to justify optimistic positions.

Potential influences on CVR reliability include:

- Margin expectations that are set at tender stage
- Bonus structures that are linked to project performance
- Profit targets
- Concerns around reputation

These factors may affect how risk allowances are applied or how variations are valued within the CVR.

However, there is limited academic research specifically examining how these organisational pressures influence CVR preparation within UK contractors. This represents another gap addressed by the present study.

2.7 Limitations in Existing Literature

The review of literature identifies several limitations:

1. CVRs are acknowledged in professional guidance but rarely critically analysed.
2. Research into forecasting bias focuses largely on client-side budgets or mega-projects rather than contractor internal reporting systems.
3. There is limited empirical research comparing CVR forecasts with actual final outcomes.
4. Behavioural influences are discussed conceptually but not tested in relation to CVRs specifically.

While Flyvbjerg (2014) focuses mainly on major infrastructure projects, the principles of optimism bias remain relevant to contractor forecasting and CVR preparation. However, there is limited research specifically examining how these behavioural issues affect CVRs in practice.

This highlights that while theoretical concepts such as optimism bias and forecasting error are well established, their application to contractor CVR processes remains under-researched.

2.8 Conceptual Framework for This Study

Based on the literature, CVR reliability may be influenced by three main factors:

1. Technical accuracy of cost forecasting
2. Professional judgement and experience
3. Organisational and behavioural pressures

This study therefore examines reliability from both a quantitative and qualitative perspective:

Quantitative: comparing forecast and actual outcomes

Qualitative: exploring practitioner perceptions and influences

By combining these approaches, the research aims to provide a more balanced assessment than literature alone.

2.9 CVRs in Practice vs Theory

Although CVRs are widely referenced in professional guidance, there is a noticeable gap between how they are described in literature and how they are used in practice.

Ashworth and Perera (2018) present CVRs as structured and logical tools for monitoring financial performance. Similarly, RICS (2020) guidance implies a level of consistency and control in how cost reporting should be carried out. However, these sources tend to describe the process in an idealised way. This highlights a gap between how CVRs are presented in professional guidance and how they operate within live construction projects. Existing literature tends to describe CVRs in theory rather than assessing their reliability in practice.

CVRs are often shaped by project specific issues such as incomplete information, unresolved variations, and ongoing subcontract negotiations. This means that the figures presented are not always based on fully agreed positions but on estimated outcomes.

This creates a situation where CVRs are technically structured documents but practically dependent on assumptions. As a result, their reliability may vary significantly depending on how conservative or optimistic those assumptions are.

This gap between theory and practice is not widely addressed in existing literature, reinforcing the need for research based on real project data.

2.10 Reliability Across the Project Lifecycle

One of the key factors affecting CVR reliability is the stage of the project. At early stages, there is limited cost certainty. Subcontract packages may not be fully procured, variations may not yet be identified, and programme risks are still developing. As a result, early CVRs rely heavily on assumptions.

At later stages, more information becomes available:

- Subcontract accounts are closer to agreement.
- Variations are more defined.
- Remaining risk is reduced.

Brook (2016) suggests that cost certainty improves as projects progress. This would imply that CVRs should become more reliable over time.

However, this also raises a potential issue. If early CVRs are less reliable, but still used for decision-making, there is a risk that:

- Problems are not identified early enough.
- Margins appear stable until late in the project.
- Losses are recognised too late.

This concept is particularly relevant to this study, as the audit of completed projects allows comparison of CVR forecasts at various stages against final outcomes.

2.11 Risk and Uncertainty in Forecasting

Construction projects are inherently uncertain. Unlike repeat manufacturing processes, each project involves unique conditions, stakeholders, and risks. Smith, Merna and Jobling (2014) identify risk management as a key part of construction project control, particularly where uncertainty can affect cost, time and commercial outcomes.

Key sources of uncertainty include:

- Design development
- Ground conditions
- Weather
- Subcontractor performance
- Changes in the scope of works

When preparing a CVR, these uncertainties must be translated into financial allowances. This is typically done through risk provisions or contingencies within the forecast cost. Odeyinka, Lowe and Kaka (2012) found that risk factors can significantly affect construction cost flow forecasts, supporting the view that forecast reliability depends on how effectively project risks are identified and priced.

However, estimating risk is not straightforward. It depends on:

- Experience of similar projects
- Quality of available information
- Commercial judgement

Flyvbjerg (2014) argues that individuals tend to underestimate risk due to optimism bias. Love et al. (2012) suggest that behavioural and organisational pressures can influence forecasting decisions. This indicates that CVRs may not always represent a fully objective assessment of project performance.

Love et al. (2012) also highlight that uncertainty is often poorly managed in construction, with risks either underestimated or recognised too late.

This suggests that CVR reliability is closely linked to how effectively risk is identified and priced within the forecast.

2.12 Linking the Literature to the Research Method

The literature reviewed highlights several key issues:

- Forecasting is uncertain and subjective.
- Bias can influence financial reporting.
- Reliability can change as the project progresses.
- CVRs are under researched in practice.

These points directly inform the research design used in this study.

The audit of completed projects allows:

- Direct comparison between forecast and actual outcomes
- Assessment of how reliability changes over time
- Identification of patterns in forecasting accuracy

The interviews allow:

- Exploration of how CVRs are prepared.
- Understanding of how risk and judgement are applied.
- Insight into organisational pressures.

2.13 Chapter Summary

By combining both approaches, the study addresses limitations in existing literature, which tends to focus on theory rather than real contractor data.

This chapter has reviewed literature relating to performance measurement, cost control, forecasting, and behavioural influences within the construction industry.

The review shows that CVRs are widely used within UK contractor organisations as a key tool for monitoring financial performance. However, most literature focuses on how they should be prepared rather than critically assessing how reliable they are in practice. This creates a gap between theory and how CVRs are used on live projects.

A key theme throughout the literature is that cost forecasting is not purely data driven. While elements such as cost to date are based on actual figures, forecasting the final position relies heavily on professional judgement, experience, and assumptions about future risk. This introduces uncertainty into the process.

Research also highlights that forecasting can be affected by optimism bias and subjective decision-making, which may lead to overly positive financial positions being reported, particularly in earlier stages of a project. In addition, organisational culture and commercial pressure may influence how information is presented, especially where project performance is being closely monitored against targets.

Another important point is that reliability is unlikely to be consistent throughout the project lifecycle. Early-stage CVRs are more dependent on assumptions and incomplete information, while later-stage CVRs benefit from greater cost certainty as subcontract accounts are agreed and risks are reduced. However, there is limited research testing whether this improvement in reliability actually occurs in practice.

Overall, the literature suggests that while CVRs are a standard and necessary part of contractor cost control, their reliability as a performance measurement tool is influenced by a combination of technical, behavioural, and organisational factors.

These findings highlight a clear gap in both academic and professional research, particularly in relation to comparing CVR forecasts with actual project outcomes. This study aims to address that gap through a hybrid approach, combining project data analysis with industry interviews, as outlined in the following chapter.

Chapter 3 – Methodology

3.1 Introduction

This chapter explains how the research was carried out and why the chosen approach is suitable for addressing the aim of the study.

The aim of this dissertation is to assess the reliability of Cost Value Reconciliations (CVRs) as a performance measurement tool in construction projects. As identified in the literature review, CVRs are not purely based on factual cost data but also rely on forecasting, judgement, and experience. Because of this, it would not be appropriate to rely on a single research method.

A combined approach was therefore used. This allows the research to assess actual project performance while also gaining insight into how CVRs are prepared and interpreted in practice. The intention is not only to identify whether CVRs are accurate, but also to understand the reasons behind any differences between forecast and final outcomes.

3.2 Research Approach

This study followed a mainly qualitative approach, supported by a limited amount of quantitative analysis of project data.

A purely quantitative approach would typically involve analysing a large number of projects to identify statistical trends. While this may highlight patterns, it would not explain why forecasting differences occur. On the other hand, a purely qualitative approach based only on interviews would rely on opinion without testing those views against actual outcomes.

In practice, CVRs sit somewhere between the two. They are based on numerical data but also involve professional judgement and interpretation of risk. For that reason, a hybrid approach is considered more appropriate.

By combining project data with input from Quantity Surveyors, the research was able to compare forecast and actual outcomes while also understanding how those forecasts were developed. This provides a more complete assessment of reliability.

3.3 Research Methods

Two main methods were used in this study. The first involved analysing real project data, and the second involved speaking directly with Quantity Surveyors who prepare and use CVRs.

3.3.1 Project Audit

The first stage of the research involved reviewing completed construction projects within the researcher's organisation. This was done by analysing CVRs prepared at different stages of each project and comparing them with the final account position.

The key purpose of this was to identify how accurate the forecasts were over time. Rather than only looking at the outcome, the study considered how the forecast position changed throughout the project lifecycle. This made it possible to see whether issues were identified early or only became apparent towards completion.

The comparison focused on the difference between forecast cost and actual final cost.

This approach provided a clear way of measuring reliability using actual project data rather than assumptions.

3.3.2 Semi-Structured Interviews

The second stage of the research involved semi-structured interviews with Quantity Surveyors working within contractor organisations.

Between six and eight participants were interviewed. This number is considered appropriate for a study of this scale, as it allows for a range of perspectives while remaining manageable within the available timeframe.

Participants were selected based on their experience of preparing or reviewing CVRs. A mix of roles was included, from Assistant Quantity Surveyors to Senior Quantity Surveyors, in order to capture different levels of responsibility and experience.

Each interview lasted approximately 20 to 30 minutes. A set of core questions was used to guide the discussion, focusing on how CVRs are prepared, how forecasts are developed and how reliable they are considered to be in practice. However, the format remained flexible, allowing participants to expand on points where relevant.

This approach provided more detailed responses than a structured questionnaire while still maintaining consistency across interviews.

3.3.3 Interview Questions

A set of semi-structured questions was used to guide each interview. The questions are designed to explore how CVRs are prepared in practice, how forecasts are developed and how reliable they are by those responsible for producing them.

The aim is not to follow a strict script, but to ensure that similar topics are covered in each interview while still allowing flexibility for participants to expand on their own experience.

The questions focused on the following areas:

Background and Experience

Participants were asked about their role and experience to provide context for their responses.

- What is your current role and how long have you been working as a Quantity Surveyor?
- Are you directly involved in preparing or reviewing CVRs?

CVR Process

These questions aim to understand how CVRs are prepared in practice.

- How are CVRs prepared within your organisation?
- How frequently are they updated?
- What information is typically included in a CVR?

Forecasting Approach

These questions focus on how the forecast element of the CVR is developed.

- How do you estimate the cost to complete on a project?
- How do you deal with unagreed variations or potential claims?
- How are risk allowances included in the forecast?

Reliability of CVRs

These questions directly relate to the aim of the research.

- In your experience, how accurate are CVRs at different stages of a project?
- Do you think early-stage CVRs are reliable? Why or why not?
- At what stage do you think CVRs become more accurate?

Influencing Factors

These questions explore potential behavioural or organisational influences.

- Do you think commercial pressure affects how CVRs are reported?
- Have you ever seen situations where issues were recognised late in a project?
- What factors do you think have the biggest impact on CVR accuracy?

General Views

These questions allow participants to give broader opinions.

- What do you think are the main strengths of CVRs as a tool?
- What do you think are their main weaknesses?
- Do you think there are better ways to measure project performance?

3.4 Sampling Strategy

The research was based on a relatively small sample, which is typical for a dissertation at this level.

Projects were selected from within the researcher's organisation based on the availability of both CVR records and final account data. Consideration was also given to selecting projects that are representative of typical contractor work, rather than unusual or highly specialised schemes.

Interview participants were selected based on their involvement in CVR preparation and their availability to take part. A range of experience levels was included to provide a broader view of industry practice.

While the sample size is limited, it is considered sufficient for identifying common trends, particularly when supported by both project data and interview responses.

3.5 Data Collection

Data for the project audit was collected from internal company records. CVRs were reviewed at different stages of each project, typically covering early, mid, and late phases. These were then compared against final account figures to identify any differences between forecast and actual outcomes.

Where available, post-project reviews were also considered, as these often highlight key issues that affected financial performance.

The interviews were carried out on a one-to-one basis. Notes were taken during each discussion, and responses were recorded in a generalised form rather than as direct quotations where appropriate. This is intended to encourage open and honest responses while maintaining confidentiality.

3.6 Data Analysis

The project audit and interview data were analysed separately before being compared.

The project data were reviewed to identify patterns in forecasting accuracy. This included examining how forecast margins change over time and whether there are any consistent trends across different projects. The focus will not only be on the final variance, but also on how the forecast develops throughout the project lifecycle.

The interview responses were analysed by identifying common themes. These included forecasting approach, treatment of risk and perceptions of reliability. Where multiple participants raise similar points, these were identified as recurring patterns.

The findings from both methods were then compared to determine whether the views expressed by practitioners align with the trends observed in the project data.

3.7 Research Position

This study takes a practical approach rather than following a strict theoretical research philosophy.

In construction, decisions are rarely based purely on data. Experience, judgement and commercial awareness all play a role, particularly when preparing cost forecasts. For that reason, a more flexible approach is considered appropriate.

The aim of this research is to produce findings that are relevant to industry practice. The approach reflects how CVRs are used by Quantity Surveyors, rather than attempting to apply a rigid academic model.

3.8 Reliability and Validity

Using both project data and interviews helped improve the reliability of the research.

The project audit provided factual evidence based on real outcomes, while the interviews provided context and explanation. Where similar patterns are identified in both, this increases confidence in the findings.

However, it is recognised that the results were based on a limited sample and may not fully represent the wider industry. The intention is to provide a realistic assessment rather than a definitive conclusion.

3.9 Ethical Considerations

As this research involves the use of company data, confidentiality is important.

All project information was anonymised, and no details will be included that could identify the organisation or specific projects. Interview participants were also informed of the purpose of the research, and their responses will be kept anonymous.

This ensures that the research is carried out responsibly and does not breach any commercial sensitivity.

3.10 Limitations

There are some limitations to the chosen approach.

The research was based on data from a single organisation, which may limit how representative the findings are of the wider industry. In addition, the number of projects reviewed will be small.

It is also important to recognise that CVRs are based on judgement. Differences between forecast and actual outcomes may not always indicate inaccuracy but could reflect changes in project conditions over time.

Despite these limitations, the methodology is considered appropriate for the aims of the study.

3.11 Strength of the Approach

A key strength of this research is the use of real project data alongside input from industry professionals.

Many studies rely solely on surveys or theoretical models. In contrast, this approach reflects actual contractor practice and allows direct comparison between forecast and final outcomes. This makes the findings more relevant to Quantity Surveyors and commercial teams.

3.12 Chapter Summary

This chapter has outlined the methodology that was used to assess the reliability of CVRs.

A hybrid approach was adopted, combining project data analysis with semi-structured interviews. This allows both the accuracy of CVRs and the reasons behind forecasting decisions to be examined.

The next chapter presents the findings from the project audit and interviews.

Chapter 4 – Results

4.1 Introduction

This chapter presents the findings from both the project audit and the semi-structured interviews.

The purpose of the analysis is to assess how accurately Cost Value Reconciliations (CVRs) reflect financial performance throughout a project. This is done by comparing forecast positions at different stages against the final account outcome.

As outlined in the methodology, the research focuses on a small number of completed projects. These have been reviewed at different stages to understand how forecast positions develop over time. The findings from the interviews are then used to provide context and help explain any patterns identified in the project data.

The results are presented in three stages. Firstly, each project is analysed individually. This is followed by a review of overall trends across the projects. Finally, the interview findings are presented to support and explain the data.

4.2 Overview of Selected Projects

Four completed petrol station projects were selected for review based on the availability of CVR records and final account data.

The projects vary in size and duration, ranging from minor works lasting approximately two weeks to larger schemes of up to fourteen weeks. Contract values range from £20,000 to £300,000, reflecting typical work carried out within this sector.

To maintain confidentiality, all project details have been anonymised and presented in a generalised format. The purpose of reviewing multiple projects is to identify whether any consistent patterns exist in how CVRs track financial performance.

Project	Type	Duration (Weeks)	Final Value	Final Margin
Project A	Refurbishment	4	£45,000.00	8%
Project B	EV Charger Works	10	£180,000.00	5%
Project C	Tank Replacement	14	£300,000.00	3%
Project D	Minor Works	2	£20,000.00	10%

The variation in project contract value and programme duration allows comparison between simpler and more complex jobs. This is useful in assessing whether project scale has an impact on the reliability of CVRs.

4.3 Project Analysis

For this analysis, project stages have been defined as early (20–30% complete), mid (around 50–60%) and late (around 80–90%). This provides a consistent basis for comparing CVR forecasts across different projects.

4.3.1 Project A

Project A was a relatively small refurbishment project with a duration of four weeks and a contract value of approx. £45,000.00.

The CVRs were reviewed at early, mid, and late stages and compared to the final account position.

Project A			
Stage of Project	% Complete	Forecast Margin (%)	Forecast Profit (£)
Early	25%	12%	£5,400.00
Mid	55%	9%	£4,050.00
Late	85%	8%	£3,600.00
Final	100%	8%	£3,600.00

At the early stage, the CVR showed a forecast margin of 12%, equating to an expected profit of approximately £5,400. This was based on the initial cost plan and assumptions made before works had fully progressed on site.

The reduction in margin to 9% at mid-stage was driven by additional labour and material costs that became clear once the refurbishment works were underway. Some of the existing elements required more work than originally allowed for, which increased both time on site and material usage.

Given the short duration of the project, these changes had a quick impact on the overall margin. Most of the adjustment occurred between early and mid-stages, which aligns with when the main construction activities were taking place.

By the late stage, the margin had reduced slightly further to 8%, which matched the final account position. At this point, most of the work had been completed and the remaining cost exposure was minimal. The final adjustment was due to small variations and final account agreement with suppliers.

Overall, the CVR on Project A overstated the margin at the early stage due to limited information. Once the works progressed and actual costs became clearer, the forecast was adjusted and became accurate by the end of the project.

4.3.2 Project B

Project B involved EV charger installation works, with a duration of approximately ten weeks and a contract value of around £180,000.

Project B			
Stage of Project	% Complete	Forecast Margin (%)	Forecast Profit (£)
Early	25%	9%	£16,200.00
Mid	55%	6%	£10,800.00
Late	85%	5%	£9,000.00
Final	100%	5%	£9,000.00

At the early stage, the CVR showed a forecast margin of 9%, equating to an expected profit of approx. £16,200. This position was based on initial allowances for civils and electrical works before the full scope had been confirmed on site.

The reduction in margin to 6% at mid-stage was driven by additional groundworks, which required additional labour on site. Once excavation works began, it became clear that more work was required than originally anticipated, particularly in relation to existing services and the preparation needed for the EV infrastructure. These additional works increased both labour and subcontract costs. This had a direct impact on the forecast margin. The scale of the reduction, approximately £5,400 in forecast profit, reflects the significance of these adjustments.

The margin then reduced further to 5% at the late stage. This final reduction was linked to the finalisation of subcontract accounts and some additional costs associated with installation and commissioning of the EV chargers.

Unlike Project A, where most of the adjustment happened early, this project saw a more gradual reduction in margin. This reflects the nature of the works, where different elements were completed and costed at different stages throughout the programme.

Overall, the CVR for Project B overstated the margin at the early stage due to incomplete information around ground conditions and installation requirements. As these became clearer, the forecast was adjusted, with the final position only becoming fully accurate towards completion.

4.3.3 Project C

Project C involved a tank replacement scheme, with a duration of approximately fourteen weeks and a contract value of around £300,000.

Project C			
Stage of Project	% Complete	Forecast Margin (%)	Forecast Profit (£)
Early	25%	7%	£21,000.00
Mid	55%	5%	£15,000.00
Late	85%	3%	£9,000.00
Final	100%	3%	£9,000.00

At the early stage, the CVR showed a forecast margin of 7%, equating to an expected profit of approximately £21,000. This position was based on initial allowances for major elements of the works, including excavation, tank installation, and associated civils.

The reduction in margin to 5% at mid-stage was driven by increased costs associated with excavation and ground conditions. Once the main excavation works began, it became clear that the existing ground conditions were worse than anticipated, requiring additional work and time on site. This had a direct impact on labour, plant, and subcontract costs.

The margin then reduced further to 3% at the later stage, representing a total reduction of approximately £12,000 from the initial forecast. This final drop was linked to the completion of subcontract accounts and additional costs associated with sheet piling and extended hire of sub pumps.

On a project of this size, the level of uncertainty at the early stage was significantly higher compared to the smaller projects reviewed. The initial CVR did not fully capture the extent of the groundworks and associated risks, which only became clear once the works were underway.

Unlike Project B, where the reduction was more gradual, Project C shows a more significant overall change in margin. This reflects the scale and complexity of the works, where individual issues have a larger impact on the overall financial position.

Overall, the CVR for Project C overstated the margin at the early stage and required significant adjustment as the project progressed. The final position only became clear once the main risk elements of the works had been completed.

4.3.4 Project D

Project D was a minor works project with a duration of approximately two weeks and a contract value of around £20,000.

Project D			
Stage of Project	% Complete	Forecast Margin (%)	Forecast Profit (£)
Early	25%	11%	£2,200.00
Mid	55%	10%	£2,000.00
Late	85%	10%	£2,000.00
Final	100%	10%	£2,000.00

At the early stage, the CVR showed a forecast margin of 11%, equating to an expected profit of approximately £2,200. This was close to the final achieved margin of 10% (£2,000).

The slight reduction between early and mid-stages reflects minor adjustments to labour and material costs as the works progressed. Given the short duration and limited scope of the project, these changes were small and had a minor impact on the overall position.

From the mid stage onwards, the forecast remained stable at 10%, which aligned with the final account. This shows that the CVR was reliable from an early stage and did not require significant adjustment as the project progressed.

The limited scope and short duration of the works meant that there was less uncertainty compared to the other projects. Most of the costs were known or easily estimated at the outset, which improved the accuracy of the initial forecast.

Overall, Project D demonstrates that CVRs can be relatively accurate at an early stage where the scope is simple and the level of risk is low. Unlike the larger projects, there were no significant unknowns that impacted the final cost position.

4.4 Cross Project Trends

When the projects are considered together, several consistent patterns can be identified in how CVRs track financial performance.

The most noticeable trend is that early-stage CVRs reported higher margins than those achieved at final account. In all four projects, the initial forecast position was more favourable than the final outcome, although the extent of this varied depending on the project.

On Project A, the early margin reduced from 12% to 8%, while Project B reduced from 9% to 5%. The most significant change was seen on Project C, where the margin reduced from 7% to 3%. In contrast, Project D showed only a small reduction from 11% to 10%, indicating a much closer alignment between early forecast and final position.

This indicates that early CVRs tend to be optimistic, particularly on projects where there is a higher level of uncertainty. In each case, the initial forecast was prepared before all

costs were fully known, which resulted in adjustments being made as the project progressed.

A second key pattern is that the level of change in forecast margin appears to be linked to project size and complexity. The larger projects, particularly Project C, showed the greatest reduction in profit. This reflects the increased level of risk and uncertainty associated with more complex works, where elements such as ground conditions, services and subcontractor costs are not fully defined at the outset.

In comparison, the smaller projects showed less variation. Project D, which was the shortest and least complex, remained stable throughout. This indicates that where the scope is simple and well defined, CVRs are more likely to be accurate from an early stage.

Another observation is the timing of when changes to the forecast occur. On Projects A and B, the majority of the margin reduction occurred between the early and mid-stages, suggesting that key cost issues were identified once the main works were underway. On Project C, the reduction continued throughout the project, indicating that cost issues were identified progressively rather than at a single point.

By the late stage of each project, the CVRs were aligned with the final account position. This shows that forecasting accuracy improves as projects progress and uncertainty reduces. However, it also highlights a limitation, as the CVR may not provide a fully accurate reflection of performance at earlier stages when decisions are still being made.

Overall, the results show that while CVRs are effective in tracking financial performance over time, their reliability is not consistent throughout the project lifecycle. Early-stage forecasts tend to overstate the final position, particularly on larger and more complex projects, while later-stage CVRs provide a more accurate reflection of the final outcome.

Figure 4.1: Forecast Margin Throughout Project Lifecycle

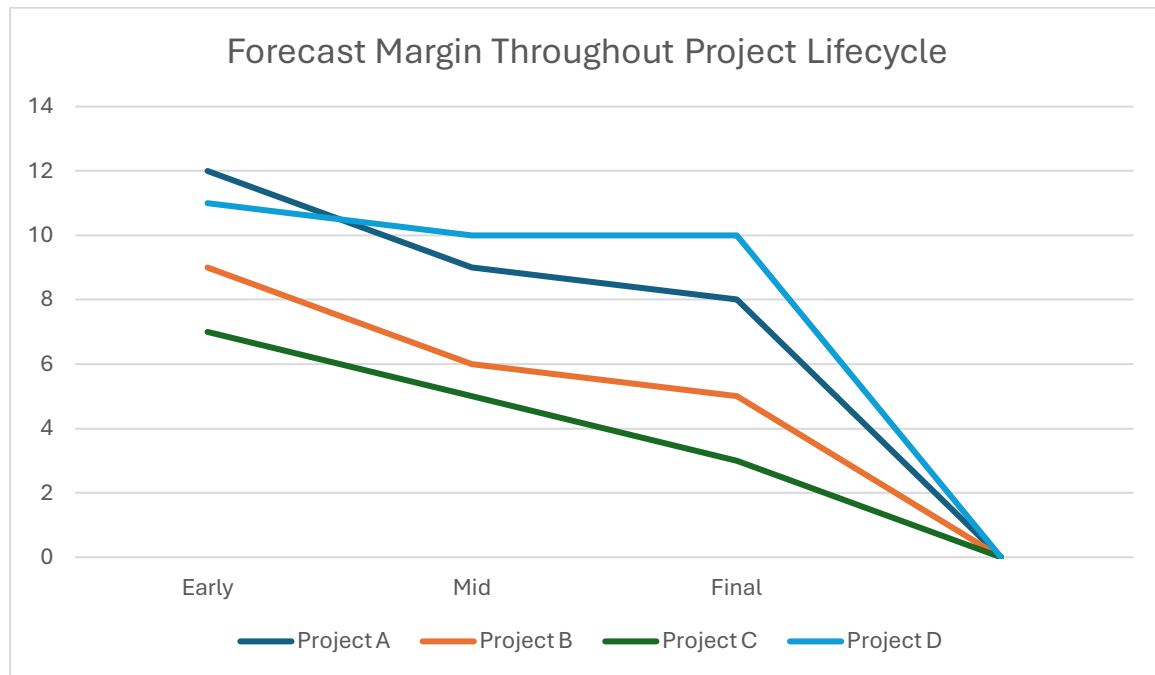


Figure 4.1 shows that forecast margins reduced as projects progressed. The most significant reduction was observed on Project C, which was also the largest and most complex project reviewed. In comparison, Project D remained stable throughout the project lifecycle. This suggests that early-stage CVRs were more optimistic than final outcomes, with forecast accuracy improving as projects progressed. Overall, the figure demonstrates that forecast margins reduced across the majority of projects reviewed, with the greatest movement occurring on the larger and more complex projects. Figure

4.2: Early Forecast Profit vs Final Profit

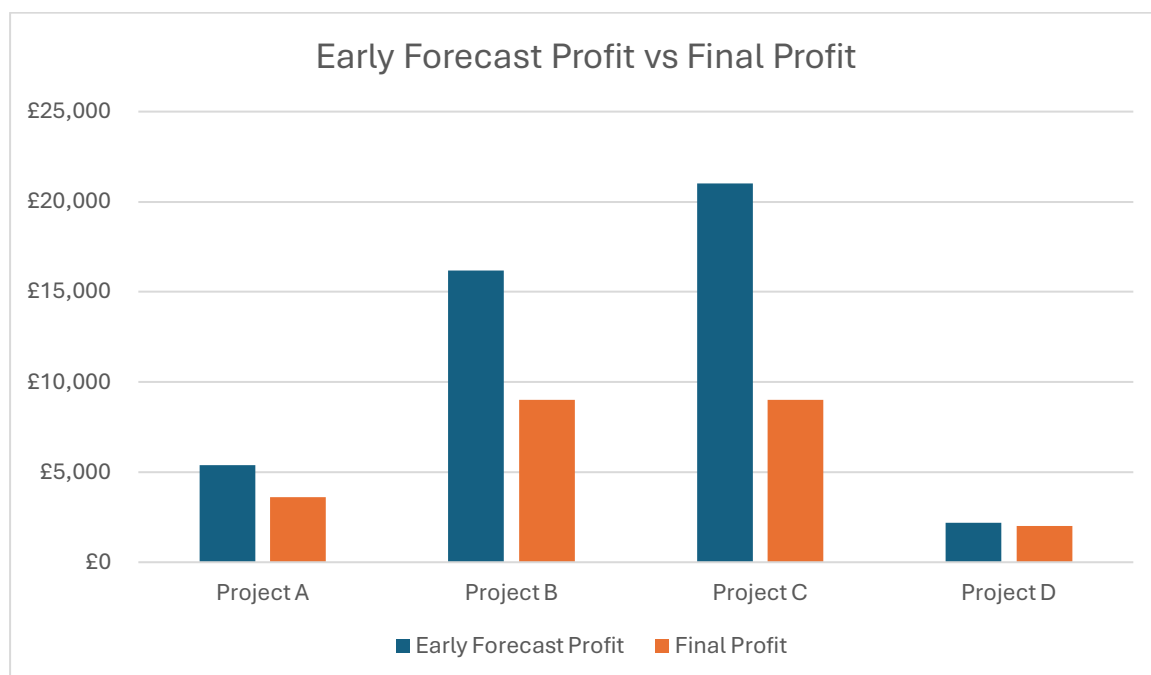


Figure 4.2 compares the early forecast profit against the final account profit for each project reviewed. All projects showed some reduction between the original forecast and final outcome, although the scale of the variance differed. The largest variance was observed on Project C, while Project D remained broadly consistent throughout.

Figure 4.2 further demonstrates that early-stage CVRs presented a stronger financial position than the final outcome achieved.

Table 4.3: Forecast Margin Variance Summary

Project	Early Margin	Final Margin	Variance
A	12%	8%	-4%
B	9%	5%	-4%
C	7%	3%	-4%
D	11%	10%	-1%

Table 4.3 demonstrates that all projects experienced some level of reduction between the early forecast margin and the final account position. This supports the view that early-stage CVRs may not provide a fully accurate reflection of final project performance.

As shown in Table 4.3, the variance between early-stage forecasts and final outcomes was present across all projects reviewed.

4.5 Interview Findings

The findings from the interviews generally support the patterns identified in the project data.

Most of the Quantity Surveyors interviewed described CVRs as a monthly process used to track cost against value and forecast the final position. While the structure of the CVR was fairly consistent, there was a common view that the reliability of the figures depends heavily on the stage of the project and the level of information available.

A consistent point raised by participants was that early-stage CVRs are less reliable. This was mainly linked to the fact that, at this stage, a large proportion of the forecast is based on assumptions rather than confirmed costs. In particular, uncertainty around subcontract packages, ground conditions and variations was highlighted as a key issue.

This reflects what was seen in the project data, where all projects showed some level of reduction in margin from early stage to final account. Participants explained that this is often because certain costs only become clear once works begin on site and more detailed information is available.

As projects progress, the level of confidence in the CVR increases. Several participants noted that once the main packages are in place and works are underway, the forecast becomes more accurate. This aligns with the project analysis, where late-stage CVRs were generally consistent with the final outcome.

The influence of project size and complexity was also highlighted. Larger and more complex projects were generally seen as more difficult to forecast accurately, particularly at the early stage. This supports the findings from Project C, where the largest reduction in margin was observed.

Some participants also referred to the role of judgement in preparing CVRs. While the process is based on cost data, there is still a level of interpretation involved, particularly when estimating cost to complete and assessing risk. More experienced Quantity Surveyors were generally seen as more confident in making these judgements, although they still recognised the limitations of early-stage forecasting.

There was also some acknowledgment that commercial pressure can influence how CVRs are presented. While this was not described as deliberate misreporting, there was a general view that issues may not always be fully reflected at the earliest stage, particularly where performance is being closely monitored.

Overall, the interview findings support the view that CVRs are a useful tool for monitoring financial performance, but their reliability is dependent on both the stage of the project and the quality of the information available.

4.5.1 Key Interview Findings

The main findings from the interviews can be summarised as follows:

- CVRs are widely used as a monthly cost control and forecasting tool within contractor organisations.
- Early-stage CVRs are generally considered less reliable due to reliance on assumptions and incomplete information.
- Forecast accuracy improves as projects progress and more costs become fixed.
- Project size and complexity have a direct impact on reliability, with larger projects showing greater levels of uncertainty.
- Professional judgement plays a significant role in forecasting, particularly when estimating cost to complete and assessing risk.
- Commercial pressure may influence how CVRs are reported, particularly in the early stages of a project.

4.6 Chapter Summary

This chapter has presented the findings from the project audit and the semi-structured interviews.

The project data shows that CVRs do not consistently provide an accurate reflection of financial performance at all stages of a project. Early-stage forecasts were generally more optimistic than the final outcome, particularly on larger and more complex projects. As projects progressed, forecast accuracy improved, with late-stage CVRs closely aligning with the final account.

The interview findings support these observations, highlighting the role of uncertainty, judgement, and project complexity in influencing CVR reliability. In particular, early-stage forecasts were identified as being less reliable due to the level of assumptions involved.

Overall, the results suggest that while CVRs are effective as a monitoring tool, their reliability varies throughout the project lifecycle and improves as more information becomes available.

Chapter 5 – Discussion

5.1 Introduction

The aim of this research was to assess the reliability of Cost Value Reconciliations (CVRs) as a performance measurement tool in construction projects.

The findings presented in chapter 4 showed several clear patterns across both the project audit and the interview responses. The most consistent of these was that CVRs

do not provide the same level of reliability at all stages of a project. Early-stage forecasts were generally more optimistic than the final outcome, while later-stage CVRs were much closer to the final account position. The results also showed that project size, complexity and professional judgement all have a direct influence on how reliable a CVR is likely to be.

This chapter discusses those findings in relation to the literature reviewed in Chapter 2. The discussion focuses on the reliability of CVRs across the project lifecycle, the influence of project size and complexity, and the role of judgement and behavioural factors in forecasting.

5.2 Reliability of CVRs Across the Project Lifecycle

A clear finding from this research is that the reliability of CVRs changes throughout the project lifecycle. Based on the project data, early-stage CVRs were consistently less accurate than those produced later in the project. In each of the four projects reviewed, the initial forecast position was more favourable than the final account position, although the size of the difference varied.

This was most evident in Projects A, B and C, where forecast margins reduced as the projects progressed. In contrast, Project D remained relatively stable. This suggests that early-stage CVRs tend to overstate the final financial position.

This finding supports Brook (2016), who highlights that cost forecasting in construction is inherently uncertain, particularly at the early stages where many costs are not yet confirmed. At this point, cost to complete is largely based on assumptions rather than actual data, which increases the likelihood of inaccuracies.

The results also reflect the concept of optimism bias identified by Flyvbjerg (2014), where early forecasts tend to present a more favourable outcome than is ultimately achieved. In the context of this study, the consistent reduction in margin across projects suggests that some level of optimism is present within early CVRs.

The interview findings further support this, with participants consistently describing early-stage CVRs as being dependent on incomplete information and professional judgement. This reinforces the view that while CVRs are used as a performance tool, their reliability at this stage is limited.

As the projects progressed, the accuracy of CVRs improved. In all cases, late-stage CVRs were aligned with or very close to the final account. This supports the argument that cost certainty increases over time as more information becomes available (Brook, 2016).

Overall, the findings suggest that CVRs are conditionally reliable. They are less accurate at the early stage, where uncertainty is highest, but become more reliable as the project develops and costs are confirmed.

5.3 Influence of Project Size and Complexity

The research also identified a clear relationship between project size, complexity, and the reliability of CVRs. The larger and more complex the project, the greater the variation between the early-stage forecast and the final outcome.

This was clearly demonstrated when comparing Project C and Project D. Project C, which involved more complex works over a longer duration, showed the largest reduction in margin. In contrast, Project D, which was smaller and more straightforward, showed minimal variation.

This suggests that CVRs are more reliable on simpler projects, where the scope is well defined and the level of uncertainty is lower. On larger projects, there are more variables that can affect cost, including ground conditions, coordination between subcontractors and potential changes during construction.

This aligns with Winch (2010), who argues that construction projects are inherently complex and that increased complexity leads to higher levels of uncertainty. Baccarini (1996) also defines project complexity in terms of differentiation and interdependency, which supports the finding that larger projects with more work packages, subcontractors and site risks are harder to forecast accurately. As a result, it becomes more difficult to accurately forecast final costs at the early stage.

The interview findings support this, with participants highlighting that larger projects are harder to forecast accurately, particularly in the early stages. This is also supported by Davies and Mackenzie (2014), who show that complex construction projects create difficulties in coordination and control, which can affect project performance. This was mainly attributed to the number of assumptions required when estimating cost to complete.

An important implication of this is that CVRs should not be treated as equally reliable across all projects. Their accuracy is influenced not only by the stage of the project, but also by the level of complexity involved.

5.4 Role of Professional Judgement in CVR Preparation

A key factor influencing the reliability of CVRs is the level of professional judgement involved in their preparation. While CVRs are based on cost data, the process of forecasting cost to complete requires interpretation rather than purely factual input.

The findings from this research showed that a considerable proportion of the forecast, particularly at the early stages of a project, is based on assumptions. These include estimating the value of unagreed variations, assessing potential risks, and predicting how the remaining works will be delivered. As a result, the accuracy of the CVR is partly dependent on the experience and judgement of the Quantity Surveyor preparing it.

This was reflected in the interview responses, where participants highlighted that different individuals may produce different forecasts on the same project. More experienced Quantity Surveyors were generally seen as more confident in assessing risk and estimating cost to complete, although they also recognised the limitations of early-stage forecasting.

This supports Brook (2016), who emphasises that cost forecasting is not a purely technical exercise, but one that requires professional experience and commercial awareness. It also aligns with Neely, Gregory, and Platts (2005), who argue that performance measurement systems are influenced by human judgement rather than being entirely objective.

The implication of this is that CVRs cannot be considered fully consistent as a performance measurement tool. Even where the same process is followed, the outcome may vary depending on who prepares the forecast. This introduces a level of subjectivity, which can reduce reliability, particularly in situations where information is limited.

However, it is also important to recognise that this reliance on judgement is unavoidable. Construction projects are dynamic and uncertain, and it is not always possible to base forecasts solely on confirmed data. In this context, professional judgement is not a weakness of the CVR process, but a necessary part of it. The issue is not that judgement exists, but that it introduces variability into the outcome.

Overall, the findings suggest that the reliability of CVRs is closely linked to the experience and approach of the individual preparing them. This reinforces the view that CVRs should be interpreted with an understanding of the assumptions and judgement behind the figures, rather than being treated as purely objective data.

5.5 Impact of Optimism Bias and Commercial Pressure

In addition to professional judgement, the research also highlights the influence of behavioural and organisational factors on CVR reliability.

A consistent pattern identified in the project data was that early-stage forecasts tended to present a more favourable position than was achieved at final account. This reflects the concept of optimism bias, where individuals underestimate risk and overestimate positive outcomes (Flyvbjerg, 2014).

In the context of this study, the reduction in forecast margins across multiple projects suggests that early CVRs may not fully account for potential risks. This is not necessarily due to deliberate misrepresentation but may reflect a natural tendency to assume that projects will perform as expected.

The interview findings also indicated that commercial pressure could influence how CVRs are presented. Participants suggested that, in some cases, negative issues may

not be fully reflected at the earliest stage, particularly where project performance is being closely monitored. This does not suggest that information is being intentionally hidden, but rather that there may be a reluctance to recognise problems before they are fully confirmed.

This aligns with Love, Edwards, and Irani (2012), who highlight that cost reporting in construction can be influenced by behavioural factors and organisational pressures. Similarly, Neely et al. (2005) suggest that performance measurement systems are shaped by management expectations and organisational context.

The implication of this is that CVRs should not be viewed as purely neutral financial documents. They are produced within a commercial environment, where performance is monitored and expectations are set. As a result, the figures presented may be influenced not only by technical factors, but also by behavioural and organisational considerations.

Overall, the findings suggest that both optimism bias and commercial pressure contribute to the variability of CVR forecasts, particularly at the early stages of a project. This further supports the view that CVRs are not fully reliable as a standalone performance measurement tool.

5.6 Overall Evaluation of CVRs as a Performance Measurement Tool

Based on the findings of this research, CVRs can be considered a useful but limited performance measurement tool within construction projects.

The project data and interview findings both show that CVRs are effective in tracking financial performance over time. They provide a structured method of comparing cost against value and allow contractors to monitor changes in profitability throughout the project lifecycle. In this respect, they remain a key part of commercial management within contractor organisations, as identified in previous research (Ashworth and Perera, 2018; Royal Institution of Chartered Surveyors, 2020).

However, the findings also demonstrate that the reliability of CVRs is not consistent. Early-stage CVRs were shown to regularly overstate the final financial position, particularly on larger and more complex projects. This reduces their effectiveness as a performance measurement tool at the early stages, where decision-making is still critical.

As discussed earlier in this chapter, this is largely due to the level of uncertainty and the reliance on assumptions when forecasting cost to complete. This supports the argument that cost forecasting is inherently uncertain and influenced by professional judgement (Brook, 2016). It also reflects the concept of optimism bias, where early forecasts tend to present more favourable outcomes (Flyvbjerg, 2014).

The research also highlights that CVRs are influenced by factors beyond purely technical cost data. Professional judgement, project complexity, and commercial pressure all contribute to the final forecast position. This means that CVRs should not be viewed as fully objective measures of performance, but rather as informed estimates that develop over time.

Despite these limitations, CVRs still provide value as a management tool. They allow contractors to identify trends, monitor performance, and make informed decisions as projects progress. Their usefulness increases significantly at later stages of a project, where the level of cost certainty is higher and forecasts are based on more reliable information.

Overall, CVRs can be considered conditionally reliable. They are most effective when used as part of an ongoing monitoring process rather than as a standalone indicator of performance at a single point in time. Their accuracy improves as projects develop, but their limitations at the early stage must be recognised.

In conclusion, CVRs are a necessary and widely used tool within construction, but their reliability as a performance measurement tool is dependent on both the stage of the project and the context in which they are prepared.

Chapter 6 – Conclusion and Recommendations

6.1 Conclusion

The aim of this research was to assess the reliability of Cost Value Reconciliations (CVRs) as a performance measurement tool in construction projects.

The findings from both the project audit and the interview responses show that CVRs remain a widely used and valuable tool within contractor organisations. They provide a structured approach to monitoring cost against value and allow project teams to track financial performance throughout the lifecycle of a project.

However, the research also demonstrates that CVRs are not consistently reliable at all stages. Early-stage CVRs were shown to regularly overstate the final financial position, particularly on larger and more complex projects. This was evident across multiple case studies, where forecast margins reduced as projects progressed and more accurate cost information became available.

This is largely due to the level of uncertainty present at the early stages of a project. At this point, forecasts rely heavily on assumptions relating to subcontractor costs, site conditions, and potential variations. As a result, the initial CVR does not fully reflect the final cost of delivery.

As projects progress, the reliability of CVRs improves. The findings showed that late-stage CVRs were generally aligned with the final account, indicating that they become more accurate as cost certainty increases and risks are resolved.

The research also identified that project size and complexity have a significant impact on reliability. Smaller projects with clearly defined scopes were shown to produce more accurate early-stage forecasts, while larger and more complex projects were subject to greater variation.

In addition, the study highlighted the role of professional judgement and behavioural factors in influencing CVR outputs. The preparation of a CVR is not purely a technical process, and the experience of the Quantity Surveyor, as well as commercial pressures within the organisation, can affect how forecasts are developed and presented.

Overall, the findings suggest that CVRs are conditionally reliable. They are effective as an ongoing monitoring tool, but their accuracy depends on the stage of the project and the level of information available. They should therefore be used with an understanding of their limitations, particularly during the early stages of a project.

6.2 Recommendations

Based on the findings of this research, a number of practical recommendations can be made to improve the reliability and use of CVRs within construction projects.

Firstly, greater emphasis should be placed on clearly identifying and documenting assumptions within early-stage CVRs. This would improve transparency and allow project teams to better understand the level of uncertainty within the forecast. By making assumptions more explicit, it becomes easier to review and adjust them as the project progresses.

Secondly, organisations should consider applying more structured approaches to risk assessment within CVRs. This could include the use of formal risk allowances or contingency planning, rather than relying solely on judgement. This would help to reduce the impact of unforeseen costs and improve the accuracy of early forecasts.

Thirdly, there is value in increasing consistency in how CVRs are prepared across different projects and teams. While professional judgement will always be required, introducing clearer internal guidelines or standardised approaches could reduce variability between individuals and improve overall reliability.

In addition, training and development should be prioritised, particularly for less experienced Quantity Surveyors. As the findings showed, experience plays a significant role in forecasting accuracy. Providing guidance on how to assess cost to complete and manage uncertainty could improve the quality of CVRs across the organisation.

Finally, CVRs should not be relied upon as a standalone measure of performance, particularly at the early stages of a project. They should be used alongside other forms of performance monitoring, such as programme tracking and risk reviews, to provide a more balanced view of project performance.

6.3 Limitations and Further Research

This research is subject to a number of limitations. The project analysis was based on a relatively small sample of projects within a specific sector, which may limit the wider applicability of the findings. Similarly, the number of interview participants was limited, meaning that the results reflect a relatively narrow range of professional experience.

Future research could expand on this study by analysing a larger number of projects across different sectors within the construction industry. This would allow for a more detailed comparison of how CVR reliability varies depending on project type.

There is also scope for further research into how digital tools and data-driven approaches could improve cost forecasting accuracy. As the construction industry continues to adopt new technologies, this may provide opportunities to reduce reliance on subjective judgement within CVRs.

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