University of Southern Queensland

School of Engineering

Stressors and Failures of Construction Companies

A dissertation submitted by

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Abstract

This dissertation develops and analyses the main contributing factors to construction companies declaring bankruptcy. This paper identifies the main stressors businesses face in the construction industry, how they currently are being handled, and the potential for a more robust solution.

The projects' objectives are to determine the magnitude of the effects within contracts: weather, COVID-19, labour shortages, price increases and small profit margins have on business's declaring bankruptcy. According to the Australian Bureau of Statistics, the rates of business's 'exiting' the market sector of economy, is increasing. From 2020-2021 to 2021- 2022 there has been an increase in exits by 27,411 (Australian Bureau of Statistics, 2020).

Through this dissertation there are differing mitigating factors which are researched and analysed, as many construction companies will fail due to incorrectly priced jobs, leaving a very small profit margin, if any at all. Companies price jobs based off previous similar projects, data collected, current market prices and risk – if one of these isn't accounted for correctly, the construction team will need to claw back income that is not there from the start. Many companies will go into liquidation due to negative cash-flows; the main findings are that delays in payments, inadequate financial assistance, cumulatively cause the cash-flow problems in construction projects, ultimately leading to delays, reduced profit margins, and even abandoned projects (Omopariola et al. 2019).

The research has found that there is no 'one size fits all' method to aid the problem, however, every issue loops back to risk management. Risk management is often overlooked and undermined, however, it is fundamental to a company's survival, especially in an industry where risk is often attached to large quantities of money. Risk management is defined in many ways in construction, ultimately the risk of the project, purchase, person, and treat general exposure to potential losses.

This paper will investigate the need for stronger contracts which stipulate clear terms on payment schedules, absorption of cost increases and any costs associated with delays. The project will analyse businesses at a commercial and engineering management level, investigating how many factors which lead to collapse can be mitigated. The issues that can be mitigated need to be proven, as it will ultimately dictate whether businesses had a chance at survival.

Keywords: Cash-flow, Payment Schedule, COVID-19, Price Increases, Supply Difficulties, Labour Shortages, Delays, Contract Law, Tenders, Training.

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I further certify that the work is original and has not been previously submitted for assessment in any other course or institution, except where specifically stated.

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List of Abbreviations

The following abbreviations have been used throughout the text and bibliography: -

ASIC - Australian Securities and Investments Commission

ASBFEO – Australian Small Business and Family Enterprise Ombudsman

BIM – Building Information Modelling

CEO – Executive Officer

COO – Chief Operating Office

GM – General Manager

LD – Liquidated Damages

MD – Managing Director

PCBU - Person Conducting a Business or Undertaking

PM - Project Manager

SOPA – Security of Payment Act

SOW – Scope of Works

SMOs – Small Medium Organisation (200 employees or less)

UK – United Kingdom

WA – Western Australia

NT – Northern Territory

VIC – Victoria

NSW – New South Wales

SA – South Australia

TAS – Tasmania

ACT – Australian Capital Territory

Chapter 1 Introduction

"Let me say that the collapse of construction companies has just started,"

(Mr Abedian)

Co-Founder Sunland Group Property Development

1.1 Background

This project involves an investigation into the prevalent worsening matter of bankruptcy in construction. Over the last decade alone, there has been more insolvencies than ever. Construction makes up 9% of the country's Gross Domestic Product (GDP), with a projected annual growth rate of 2.4% ("The Australian Construction Industry: Facts and Stats for 2022").

Sub-contractors, who are the people or enterprises that carry out the work for the main contractor/builder, have contracts in place. These contracts should act to help the subcontractor, but often, they are not reviewed thoroughly, include gaps in the scope of works and can negatively impact the likelihood of the sub-contractor being paid as initially expected. The global construction industry has experienced larger companies collapsing in the last two years. In 2021 in the United Kingdom (UK) the insolvency rates in the construction industry reached an average of 291 per month, with November peaking at 325 (Rowsell 2022).

Most of the insolvencies are small and sub-contractors, with entities of assets totalling less than $10,000.00 (BIS Shrapnel, 2012). This may be expected due to many construction companies being small and specialist trade services. Unfortunately, many small subcontractors and enterprises collapse due to the larger companies collapse. For example, in 2022 alone: Oracle Homes $14m owed to creditors (Tribune 2022), Condev $31m owed to creditors (Pots 2022), and Pro Build who had 800 workers and owed 2,300 creditors over $14m (Terzon 2022). Highlighted by only some of the many figures given from large companies going into solvency, small businesses and sub-contractors are vulnerable. The chain reaction of these insolvencies requires regulations to ensure that larger builders and principal contractors operate in an ethical and commercially viable manner.

1.2 Aims and Objectives

This project aims to investigate the reasons behind the drastic increase in companies collapsing within the construction industry, as it is not sustainable and tarnishes any new upcoming businesses from wanting to join the market, especially when the tier 1 and 2 builders are also collapsing. The Australian construction industry sees more insolvencies each year than any other industry. This is due to the high risk taken and large sums of money being relied upon to complete work and generate profit. Within the process of tendering, constructing and remediation works, there is usually very small margin for error. When errors occur, large quantities of money (profit) are lost which in turn can lead to liquidation and bankruptcy.

Project Objective

- Identify the reasons why construction has the highest solvency rates of any industry within Australia.
- Identify the current laws and procedures in place to help businesses to stay afloat.
- Review the existing systems and assess real data from the outcomes.
- Interviews targeting people in the industry to analyse their experiences in what does and does not work, and what may can be better. Including:
    - Sub-contractor business owners
    - CEO's / MD's / COO's
    - Contract/Commercial Manager
    - Administrators
    - Project Managers
- The project outcome shall be compiled by interviews:
    - Identify the goal of the interview.
    - Interview Design
    - Pilot Interview
    - Revise the interview
    - Execute the interview
    - Analyse the interview

1.3 Conclusion

This paper aims to identify the major reasons for the prevalent construction insolvency problem in Australia, whilst assessing the effectiveness of the measures which are in place currently for firms to protect themselves with and mitigate the risk. The project is based upon researching by utilising current government data, interviews with a range of different sized entities, analysing some contracts – correlating the relevant information that contributes to the insolvency crisis in the construction

industry in Australia. The current increasing rates of companies exiting the market industry is not sustainable, hence the need for this project.

1.4 Dissertation Structure

Chapter 2 Literature Review

This chapter reviews and assesses the applicable literature which relates to Stressors and Failures of Construction Companies.

Chapter 3 Methodology

This chapter summarises and discusses the process in developing the methodology. Through the analysis of previous literature and research, the new survey is developed and assessed through a focus group. Interviewing different employees from the multi-tier construction structure, gives varied results and findings.

Chapter 4 Data Collection and Responses

The crucial results from the in-depth interviews are reviewed and analysed. The proposed for improvements in contracts are reviewed and scrutinised.

Chapter 5 Conclusion

This chapter concludes the dissertation by summarising the main outcomes and findings. Finally, several recommendations and future work are suggested.

Chapter 2 Literature Review

Queensland Building Services Authority (now Queensland Building and Construction Commission) in 2001: "The financial failure of any one party in the contractual chain can cause a domino effect on other parties with those at the bottom most at risk in the event of a client or contractor defaulting."

2.1 Introduction

This literature review focuses on the analysis on the prominent points associated with this project. Literatures investigate many differing topics which contribute to insolvencies in Australian construction. It will particularly consider:

- Contracts;
- Risk involved in projects;
- Previous solutions and why they have or have not been implemented;
- Current solutions that have been successful.

2.2 Government Implemented Mitigation

2.2.1 Security of Payment Act

Bowyer (2018) found that the construction industry accounts for nearly a quarter of the countries insolvencies, investigating the main reason being the long-term and late payment delays. Bowyer (2018) conducts research as to why the SOP regime isn't as effective as intended. This paper is limited as there is no research conducted, it solely relies upon the research of others – ASIC 2017 figures, ASBFEO 2017 Survey and some others. This is extremely limiting as Bowyer (2018) wouldn't have the raw data or an understanding of the respondents or their demographic. This needs further research conducted, with parameters in place to show where the results and insights are coming from. The objectives of this proposal project are to underline which businesses fully utilise the SOP Act, whether businesses believe it holds builders accountable fully or whether it holds no credibility as there are ways around abiding by the legislation. There is a need and a gap in understanding into how the SOP Act truly works with subcontractors to ensure the necessary cash flow, this is a weakness into Bowyer (2018) paper.

Coggins, J, Teng, B & Rameezdeen, R 2016 (Coggins et Al) conducted a research paper specifically focusing on the NSW Parliament commissioning Bruce Collins (QC) to conduct an independent inquiry into the insolvency rates in NSW construction in 2012. This was conducted once the government recognised the SOPA was not going to positively impact the rates. Resulting in

Construction Industry Security of Payment Amendment Act 2013 (NSW), the main features of change being:

- Contractors are no longer required to endorse the SOPA on a payment claim
- Head contractors are required to include a supporting statement declaring that all subcontractors have been paid all amounts due and payable in relation to the construction work concerned
- Mandatory payment deadlines for making progress payments have been introduced
- The Amendment Act provides for the making of regulations which could require head contractors to create a trust account to hold retention money for subcontractors.

(*Changes to the Building and Construction Industry Security of Payment Act 2013 (NSW) – what does it mean for you? - Construction & Planning - Australia* n.d.)

SOPA 2013 is a state-by-state regulation, which has improved the payment practices, prohibiting clauses such-as "pay when paid". Although this has made improvements to that specific issue, it is far from perfect, insolvency rates are still much higher than most industries.

Coggins et Al address the domino effect that happens within all project structures, which are generally based upon a multi-tier structure. Multi-tier structures mean that, there is a principal contractor (builder/developer) who makes claims based upon specialist trades works. The specialist trades will employ sub-contractors, who will also engage and manage sub-contractors. This creates the snow-ball effect, where they rely on the trade above to be paid to be paid down the chain as figure 1 depicts below. Therefore, the withheld and non-payment of contractors is a key factor to insolvency rates.

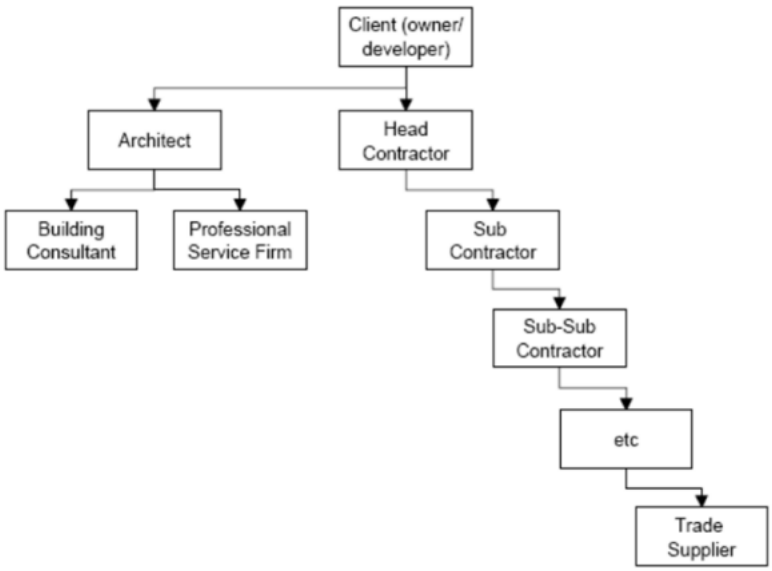


Figure 1 "Illustrative outline of the "contracting chain" in the building and construction industry" (Coggins, J, Teng, B & Rameezdeen, R 2016)

The conclusion from the Coggins et Al review of the revised SOPA from 2013, states there is too much room for confusion and therefore it is hard to hold any accountability and serves little help toward insolvency. This literature is in depth and has an academic understanding of the Act, however, it does not conduct any research further than opinion-based theory and solution. This dissertation seeks to investigate real-life application of the Act, whether it has aided companies or not.

Ross, S. (2013) researches the Issues with Adjudication Decisions. Ross addresses the fact the legislation is different in each state, although they all address the similar issue of ensuring a frequent and on-time paying legislation. The main difference between states is Western Australia (WA), the Northern Territory (NT) and the East Coast States: Victoria (VIC), New South Wales (NSW), South Australia (SA), Tasmania (TAS), Australian Capital Territory (ACT). The difference lies in the adjudication approach, this is when a dispute arises and the dealing process. The main differences between East and West coast are detailed below in Table 1. Table 1 is an adaption from a table originally formed by Coggins, Elliot & Bell, 2010.

Table 1: Comparison of East to West Coast Act (Source: adapted from Coggins, Elliot & Bell, 2010)

East Coast Model	West Coast Model
Detailed statutory payment regime, overrides any ambiguous contractual statements, a party can claim under the act at regular intervals and be responded to within a specific timeframe.	Preserve the contractual interim payment model, rather than override.
Only allow for payment claims to be made up the tiers. For example, by a subcontractor to the head contractor or head contractor to principle.	Allows for payment claims up and down the tiers.
Disallows: • Mutual agreement of adjudicator • Consideration of reasons for withholding payment which have not been duly submitted in-line with the statutory payment scheme. • Discouraging an evaluative approach to adjudicators determinations.	Changes with respect to: • Adjudicator appointment • Submissions which can be considered by an adjudicator. • The approach the adjudicator takes to arrive at decision

The research conducted by Ross S. shows case studies where in the circumstance you are dealing across borders, the act may be more of a hindrance than a help. The limitation of this study is the

length, there is no actual study conducted, only case studies. The whole paper is only 7 pages in length, which does not remotely cover the limitations of the Security of Payment Act.

Through the gap in Ross S. research, this dissertation will aim to speak to commercial managers specifically in regard to the Act, as they are the people who deal with the mater every day and have full insight into the positives as well as the stressors caused by the Act.

2.2.1 Alliance Model

The alliance model is based on alliance partners who are brought together for a targeted outcome for a project, sharing the risks and rewards – where there is an alignment between the alliance partners.

Rowlinson, Steve and Cheung, Yan Ki Fiona (2005) conducted a research paper which utilised questionnaires and interviews to interrogate the purpose and success of alliance structured projects in Australia. The paper specifically investigates one projects – The Wastewater Treatment Plants Project. The project had a 'No Dispute' clause in the contract, which stipulates that outcomes are based upon the best case for the project rather than individual contractors. The 'no blame, no dispute' clause is supposed to drive a win-win scenario for all alliances and the project. The main outcomes from the interviews were that the high staff-turnover had a negative impact on the trust and relationship between alliances. This gives the importance of great leadership and consistent need to check-in on the alliances, to maintain the collaborative relationship. There is gap in this literature as they have only analysed one project, with no evidence or example of the way the interviews or questionnaires were utilised. This gives the reader little understanding of the premise of knowledge and theory.

Project Alliancing has been created to allow for better engineering in complex large projects. As the teams and management is integrated, there is an open-book policy meaning each company within the alliance is there for the same reason – as previously mentioned. As stated in the National Alliance Contracting Guidelines Guide to Alliance Contracting 2015 "The Participants share the benefit of a cost underrun, and the 'pain' of a cost overrun, under the Risk or Reward Regime; and The Participants commit to an 'open book' arrangement and have broad mutual access and audit rights to each other's documentation." However, alliances generally only take place on the largest of construction projects as the alliance model is not deemed suitable for projects under the value of $50million. These generally only take place in the public sector, backed by government funding – the private sector doesn't usually use an alliance model. Alliance models do appear to of had a positive impact on larger scale public sector projects, as these are not suitable for all project types, there is a need for a better understanding and solution for the smaller scale projects and private sector.

2.3 Contractual and Residual Risk

Contracts in construction are the underlying issue. They are the legally binding document which fair-trading stipulates must contain certain information such as, contractors license number, the plans of work to be carried out, warranties in relation to the Home Building Act 1989, and many more. These are in place to protect both the consumer and the builder. There are different requirements depending on the size of the project (dollar value). The main points within a contract between the sub-contractor however, and the builder (Principle Contractor) are:

- Scope of Works (SOW)
- Schedule of Rates
- Payment terms
- Claims and Variation process
- Retentions and securities
- Length of defects liability period

If there are any gaps within the contract, including ambiguity, this can cause major issues with finances and disputes throughout the project cycle and even long after. The next section of literature review will investigate and analyse research currently conducted on the issue surrounding contracts within construction.

2.3.1 Early Sub-Contractor Engagement

The most common way to engage sub-contractors currently, is close to construction. This means the process from design to construction is quite far-removed. Sub-contractors are chosen based on their reputation, availability, ability to complete the job on-time to a high quality and most importantly on their tendered price. The literature (Mosey, 2009) analyses a case study whereby the risk allocated to the contractor were only risks which were within their control and manage. Mosey concludes that if there is an earlier involvement from the contractors, the risk is then accounted for correctly and more accurately. Risks can be allocated on the basis of expediency – the result of a single-stage tender. Mosey recognises that when there is a transfer of risk in a contract, the contractor or person taking on the risk is usually not covered financially and therefore proceeds to claim and apply for variations. This is less financially beneficial for both parties, whereas an earlier engagement from the contractor can allow for management of risk – where neither party is left financially burdened (or less so).

Figure 2 shows the cost, time, and client satisfaction results from three different projects each with different contract structures. The highest satisfaction comes from a two-stage contract process along with transparency on design and costs, most importantly the relationship and experience of the

contractors. If they have worked alongside each other previously, or have completed a similar job, there will be lessons already learnt prior, with new solutions implemented.

NAO (2005) University of Cambridge Case Studies		
Contract 1 (1998)	**Contract 2 (2000)**	**Contract 3 (2002)**
Traditional single-stage tender awarded on lowest price. No contractor involvement in design. Cost and time overruns, with buildings containing many defects and relationships with the contractor strained. **Cost: +2%** **Time: eight weeks late** **Client satisfaction: 6/10 (post-project completion review six months after practical completion)**	Two-stage tendering process (JCT98 contract). Contractor involved in design. Effective teamwork. New contractor, so limited lessons learnt from repeat work. **Cost: +0%** **Time: on time** **Client satisfaction: 7/10**	Two-stage contract (New Engineering Contract), with a professional services contract used for the first stage, and the contractor and principal subcontractor involved in the design. Selection on transparent criteria (30% quality: 70% price balance), with the original contractor re-engaged and so lessons brought to bear along with effective teamwork. Changed user move dates successfully met. **Cost: –3%** **Time: On time** **Client satisfaction: 9/10**

Figure 2 (Improving Public Services through better construction, 2004)

Mosey recognises the following are the top ten reasons subcontractors claim:

1. Inaccurate design information
2. Inadequate design information
3. Inadequate site investigations
4. Slow client responses (decisions)
5. Poor communications
6. Unrealistic time targets
7. Inadequate contract administration
8. Uncontrollable external events
9. Incomplete tender information
10. Unclear risk allocation

If these claims are processed and have substantial evidence therefore are successful claims, they pose project delays, and client liabilities to extra payments. This finding from Mosey leads this thesis to investigate the reasons raised above. The gap in the knowledge is due to inadequacies, this paper will research whether there can be guidelines and regulations stipulated to ensure complete information is provided – tightening of consequences. This could leave less room for ambiguity from the principal contractor, putting pressure on them to ensure the tendering information and design is fully complete or at least has clause to protect the engaged sub-contractor.

2.3.2 Risk Management in the Construction Industry

A significant amount of research has been conducted on risk management within construction, due to the multiphase of construction and number of stakeholders involved in a project. Risk management means to identify, minimise, prioritise, and monitor risk. The ability to effectively manage risks depends on the experience of the business, the profitability and much more. Unfortunately, many small business owners aren't experienced enough at managing and foreseeing risk leading to major issues with gaps in contracts or ambiguity that wasn't noticed until it is too late. The next section is going to analyse literature that has been written around risk management within the industry, methods that have potential as well as the gaps and possible improvements.

Jin et al., 2017 identify that risks often aren't able to be eliminated and successful projects come from appropriately managed risk. The research by Jin et al., 2017 answers the questions;

- whether there is correlation between a person's role, education and experience with relation to managing the risk;
- Do major participants with different characteristics approach risk differently;
- How is intuition and experience used throughout the process.

The general census from Jin et al., 2017's research was that – most risk management processes come from experience and personal opinion. When there is a lack of solid risk management it is due to lack of training, experience, and professional development. Jin et al., 2017's research conducted proves there is a definite problem with risk management within the industry – as most insolvencies are due to unforeseen circumstances if the risk was foreseen the company could have mitigated the risk prior to liquidity.

Coggins, Teng & Rameezdeen (2016) explain the 'beast' operators that contribute towards insolvency rates. Their research methods included a questionnaire survey investigating the views of building contractors in South Australia (SA) regarding to, 'extent, causes and regulation of construction insolvency' (Coggins, Teng & Rameezdeen 2016). There were 42 questionnaires completed with a return rate of 24%. The questionnaire had four sections:

- Section 1: General demographic of study sample
- Section 2: Perception of impact of insolvency rates in the SA construction industry
- Section 3: Contributing factors to insolvency
- Section 4: Awareness to mitigation measures

The findings showed the main contributing factors to insolvency were; unethical payment practices, underbidding at tender stage, poor cash-flow. Surprisingly, this project found that the Security of Payments act doesn't contribute greatly to the mitigation of insolvency – this shows a need for more research and a deeper understanding of what can aid lower insolvency rates. There are also limits to

the research carried out by Coggins, Teng & Rameezdeen (2016), they only conducted one study to 42 participants, most of which had more than 20 employees and the respondent was mainly the owner/CEO/COO/GM/Director/MD. The research is limited due to the similarity of the role of the respondent, a Project Manager may have a deeper insight into the daily activities on the construction site for example, therefore giving a differing view on the reasons to insolvency. This area will need further investigation, focusing more on a different demographic of people within the industry, this will give an insight into the operations which directly occur on the job site and have an immediate impact on a business's success. This paper also gives little understanding of some of the broader stressors within the contracts as the research is purely a questionnaire. The limitation of only utilising a questionnaire is that it gives no room for discussion or deeper understanding. This dissertation will ensure that both interviews and questionnaires are comprised and the questions and topics correlate.

Alsalman, 2012 investigates risk allocation and an optimal allocation model. The paper used a questionnaire with two sections, the first finding the issues associated with risk allocation:

1. Dispute, claims, and tension leads to adversarial relationships.
2. Competitive relationship leads to aggressive relationships.
3. Subjective pricing of risk leading to higher contingency.
4. Allocation by aversion that leads to misallocation of risks.

Alsalman 2012 used a Delphi study, which uses the general opinion of a group of people to gain a consensus and reach a solution. The conclusion and questions asked are not specific enough to give a thorough understanding of the qualitative data found. There are significant gaps and room for investigation in the studies matter. The research paper identifies that external risks cannot be controlled by the enterprise and company – however, there is no solution to the problem, there is no critical evaluation, only hypothesis. The gap in this paper gives solid foundation of a need for a more in-depth investigation with cause, effect and solution. The study by Alsalman was intended to investigate risk allocation, however, the method to allocate risk is flawed. It is trying to solve a massively complex issue with a small excel spreadsheet – this is unrealistic and could not be adopted by construction companies.

Research conducted by Dunuwilage Kanchana Nandasena and Skaik (2022) investigated the factors contributing to higher liquidation rates in the construction industry in Australia by creating a prediction model. The project conducted a literature review on the subject, summarising the differing factors which ultimately lead to liquidation of a company as the first phase. The second phase of the project used quantitative data from the ASIC Insolvency Statistics Reports from 2004 to 2019 and triangulated with the literature review. Once these were found a Pareto Analysis was used at the prediction model, this uses frequency and occurrence of data.

The research analysed 30 literatures to obtain the results from figure 3. The findings from the literature review are shown below in figure 3, showing the four lead contributing factors were profitability, liquidity, management efficiency and leverage. All of these factors should be foreseeable and manageable and interestingly company macro forces which relate to external factors, is almost half that of the leading 4. This is promising data research, as it does show that with further research and a deeper understanding into these issues and stressors, something can be enforced to try reduce the liquidation epidemic in Australia's construction industry.

Index	Factors	Occurrences	Percentage of Occurrences	Cumulative Percentage of Occurrences
F1	Profitability	23	18.0%	18.0%
F2	Liquidity	22	17.2%	35.2%
F3	Management efficiency	20	15.6%	50.8%
F4	Leverage	19	14.8%	65.6%
F5	Company characteristics	9	7.0%	72.7%
F6	Cash flow	9	7.0%	79.7%
F7	Company macro forces	8	6.3%	85.9%
F8	Capital structure	5	3.9%	89.8%
F9	Contract/project characteristics	3	2.3%	92.2%
F10	Owner/manager characteristics	3	2.3%	94.5%
F11	Strategic management of the business	2	1.6%	96.1%
F12	Contractor characteristics	2	1.6%	97.7%

Figure 3 Literature Review Findings – (Source Dunuwilage Kanchana Nandasena and Skaik (2022))

From Dunuwilage Kanchana Nandasena and Skaik's ASIC review, they found similar findings from quantitative data. The data was gathered from ASIC 2004-2019 and gave an overview of the main contributing factor towards the companies failure, the top 5 causes represented 79.8% of the reasons as to why companies are failing. The data from cause 1-5 is then correlated with the above reasons from the literature review in figure 3 through Pareto Analysis.

Index	Causes of Failure
Cause 1	Inadequate cash flow or high cash use
Cause 2	Poor strategic management of business
Cause 3	Poor financial control, including lack of records
Cause 4	Trading losses
Cause 5	Under-capitalisation
Cause 6	Poor economic conditions
Cause 7	Poor management of accounts receivable
Cause 8	Dispute among directors
Cause 9	Industry restructuring
Cause 10	Fraud
Cause 11	Deed of company arrangement failed
Cause 12	Natural disaster

Figure 4 The list of insolvency causes in Australian construction industry between 2004 and 2019 (Source Dunuwilage Kanchana Nandasena and Skaik (2022))

Through the Pareto Analysis, the research found from the qualitative data the highest contributing factors to be:

- Cash-flow
    - Operating cash flow
    - Cash flow ration
- Profitability
    - Return on assets
    - Return on equity
- Liquidity
    - Current ratio
    - Quick ratio
- Management Efficiency
    - Total asset turnover
    - Accounts receivable turnover

From the quantitative data Pareto Analysis, the highest contributing factors were found to be:

- Strategic Management of the Business
    - Investment decisions
    - Planning
- Owner/Management Characteristics
    - Experience
    - Financial knowledge
- Contractor Characteristics
    - Financial status
    - Funding ability
    - Contractor's cash flow
- Company Macro Factors
    - Shrinkage in construction
    - Demand
    - Index of stock price

From this research, they concluded that this is a prediction model, this does not solve the issue of insolvency rates, it simply points out the reason as to why it is happening. The research was also only conducted based on literature reviews and ASIC data, there is no expert opinion or background to the data. This research paper aims to further progress on this hypothesis, by interviewing the current management within construction companies and investigate their opinions and ways of keeping their company within the industry and solvent.

The conclusion gives reason to believe that these factors should be controllable, the main contributing factors to a company's insolvency is due to poor management and poor financial performance and reporting. If these can be controlled, trained, and mitigated, the country may see a decline in the rate of insolvencies in the industry.

2.3.3 Fixed-Price Vs Cost-Plus Contracts

Fixed-Price contract means that the cost of the build is decided prior to the construction, this can be months or even years depending on the scale of the project. In Queensland there are usually three different fixed price contract models used:

1. HIA Fixed Price Contract.
2. Master Builders Fixed Price Contract.
3. QBCC Fixed Price Contract.

The price of the contract is fixed and does not depend on the rise and fall of material costs, time of completion or labour shortages. There are only a few cases where the builder can adjust the price:

1. A price increase of prime cost items

Prime cost items are items such as fixtures or fittings which have not yet been decided, the price is unknown at the time of the contract.

2. A price increase of provisional sum items

Provisional sum items allow for works which cannot be accurately priced at the time of the contract. Such as materials, plant hire, labour, service connections and landscaping.

3. Rise and fall clauses in the contract.

This clause protects the builder, they can pass on any price increases or discounts to the client. The is usually formula or cost based.

4. An increase in statutory fees/costs.

This includes charge, levy, regulation, tax and statutory and other authority fees.

(Davis, 2022)

Cost-Plus contract is as stated, the cost of the building works plus the profit margin. This contract ensures that the builder is paid for direct and indirect costs, whilst making a profit "plus". This also means much more paperwork for the builder, as they have to prove with sufficient evidence that all

expenses have been used during the construction. Payments are made more regularly as well, as there are no estimated costs, therefore having no initial lump sum.

The cost-plus model can work in the builder's favour if they are keeping a meticulous record of all materials, they have the funds to front the cost as they are only paid periodically rather than the lump sum initial payment. (Accent Estimating, 2019)

Öztaş and Ökmen, 2004 conducted research into the risk associated with fixed-price and design-build contracts. They used a real project in Turkey, and Monte Calro simulation risk model. The Monte Carlo simulation is used as a computational risk analysis tool, which defines the events which are uncertain or variable and project the possibilities of the outcome of the project. Monte Carlo takes each task, gives a 'best case' and minimum duration, 'most likely' and a 'worst case' maximum duration. From the possible combinations, you get a percentage of chance the project will finish in 'X' number of weeks, months, or years.

As Öztaş and Ökmen, 2004 found, there was no Monte Carlo risk simulation used, the contractual duration of the project was 131 days. When putting the project through the simulation, this was seen to never be feasible, with fastest duration being 162 days. The project ended up being finished at 190 days, this puts the project at 80-90% risk. The percentage of risk is worked out from the Monte Carlo model, it gives you the possible completion timeframes, the worser the case the higher risk factor. Therefore, for example, a completion at 162 days would have fallen at a 0-10% risk range, being on-time. As expected, a project in the 80-90% risk and over-time, does not return profit. This paper shows the importance of a Monte Carlo risk simulation to identify risks which are ultimately a stressor and cause of failure in construction companies.

This study is useful as an evaluation tool for the Monte Calro simulation and potential benefits, as well as the catastrophic outcomes when risk is not carefully analysed. However, the limitations to the study are that the only real considerations are the Monte Carlo response, there is no emphasis on the importance of cash-flow, relationships, different contract options, economic factors. There is also no direct involvement with the project team. With no contact to the people involved in the team, it is hard to gain an understanding of the whole scenario.

This dissertation aims to address the risk analysis tools used currently by companies, the effectiveness, if there is any correlation between the unforeseen risks and whether there could be room for legislation to protect against unforeseen risk.

Love et al., 2010 conducted research about the determination of rework cost predictors in construction. Rework in construction refers to any work which is unplanned as a direct result of mistakes. Rework generally occurs due to:

- Ineffective use of information technologies.

- Excessive client involvement in the project.
- Lack of clearly defined working procedures.
- Changes made at the request of the client.
- Insufficient changes initiated by the contractor to improve quality.

The research was based on a questionnaire and interview conducted by Love in 2002. They utilised stratified random sampling from the telephone directory, benefits of stratified sampling are identified as: ensuring the number of respondents within each group are adequate and representative, they are as similar to each other as possible in each group.

Love 2002 conducted a pilot study initially, testing the predicted response rates, suitability, clarity, and comprehensibility of the questionnaire. Finding a response rate of 17/20, 85%. They then conducted questionnaires on 100 participants to each one of the groups: Project Managers, Consulting Engineers and Contractors, equating to 300 total participants. They received 96 valid responses, with the pilot survey Love had 115 validated responses, 36% consolidated response rate.

The consensus from the 115 projects, showed a mean of rework costs being 10% of contract sum. This is a factor which cannot be counted for in cost-plus contracts and can only be accounted for as 'risk factor' in a fixed-price contract. Depending on the cost of the rework, this can be claimed under Subcontract Default Insurance, under this insurance policy 27% of claims are related to rework. (axaxl.com, n.d.)

Love et al., 2010 emphasises the importance of these costs, if the rework is on average 10% of original contract sum and not accounted for, a profit margin at 15% quickly reduces to 5%. The risk in construction is substantial and it absolutely cannot be ignored by companies. In this dissertation, it will aim to address the gap in the paper by Love et al., 2010 – can education and awareness solve the matter? We know what the issues are, can they be solved? This seems to be the gap in many literatures, there is only research to identify and analyse the stressors and reasons for failures. If the stressors are unsolvable, then there needs to be much wider education on the risk involved with owning a construction company. This dissertation will investigate the possibility and repercussions of tighter restrictions and regulations on who can gain the license to build and construct.

2.4 Prediction of Bankruptcy – Tipping Point

Is there a common tipping point within companies declaring bankruptcy? Can we predict and mitigate if people are educated on the 'tell-tale' signs that there is a serious issue, prior to it becoming the end of a business.

Alaka et al., 2016 finds the qualitative factors can help to predict insolvencies within a construction company through:

- Management/Owner Characteristics – inertia, unfound optimism, unworthy risk-taking, a person holding too many executive positions within a company.
- Internal Strategic Factors – Sales and bids, competitiveness, planning. The more successful the business is at bidding the more the business grows, in turn becoming more solvent.
- Management Decision Making – Decisions based on what is best for the firm rather than ego, friendship etc. Managers need to be in touch with the businesses financial statements to assess risk efficiently.
- Firm Characteristics – Size, age, maturity, flexibility can have a slight effect on the solvency.
- Macroeconomic – The most important factor to predicting insolvency prediction. The amount of construction activities by existing 540 firms, number of available construction contracts in a country at a time, interest rate, industry 541 weakness, threat of new entrants, etc
- Sustainability - Depending on the government legislation, can make a firm more competitive.

This research by Alaka et al. is limited as it does not propose a clear solution or conclusion to the proposition of predicting insolvency. This leaves a gap in the research; in this dissertation it will investigate the possibility of audits amongst companies. Is there a prediction model that can be based on quantitative data and qualitative (experience)? If so, can this be a government mandated and funded legislation, to closely monitor and track businesses which are highlighted as 'at risk'.

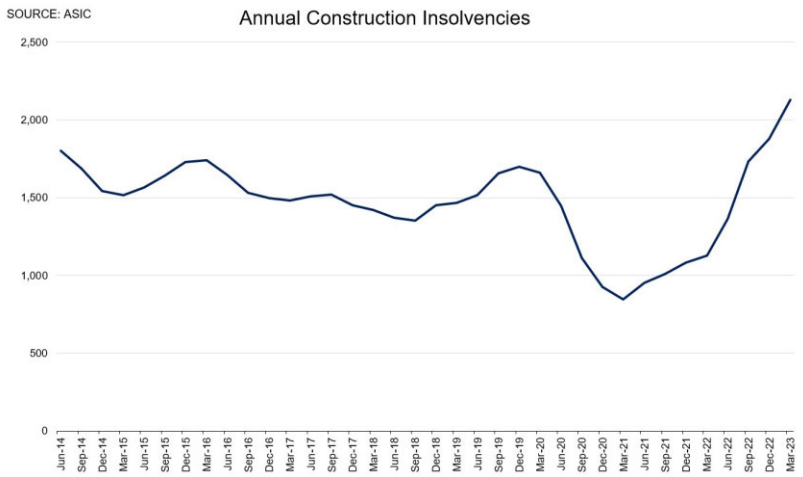


Figure 5 Construction Insolvencies 2023 (ASIC) (Wargent 2023)

Figure 3 highlights the rising trend in insolvencies within the construction industry. This highlights the need and concern for research into the industry. The rise in construction insolvencies is not going to end any time soon, meaning that if there are mitigating factors which are identified and raised, there could be something done to aid the rise.

2.4.1 Case Studies

This focuses on current case studies from the last twelve months which highlight and further support the need for research to be continued. There is at least one article per week headlining the collapse of a major building company – these are the companies at the top of the tier, does that mean they are absorbing the risk and folding? This paper will investigate the current practices and wrongdoing by many companies. The snowball effect of the top of the tier going into liquidation is substantial – as these case studies will show. So far, in 2023, over a dozen builders have collapsed.

Note: These are case studies, not academic literature. They have been placed into the dissertation as context and to highlight the topic.

2.4.1.1 Porter Davis Home Group

Porter Davis Group were a renowned trusted builder in Victoria, 13th largest builder in Australia, employing over 400 people and having around 20 years of experience. Neither of these factors were enough alone to keep the company in the industry for longer, on Friday 31st March 2023 Porter Davis Group went into administration. Leaving 1700 live projects in limbo, with a further 779 signed contracts to abandon.

The investigation for liquidation is carried out by administrators, who claimed the reasons toward the liquidation are due to the "rising input costs, supply chain delays, labour shortages and drop in demand for new homes in 2023." (Sharples 2023) Porter Davis had a forecasted $555 million this financial year – perspective of the debts and troubles.

What happens next? This is down to the administrators to aid solving, key stakeholders and interested parties to take over the company's debts and continue the unfinished projects.

(Sharples 2023)

Russ Stephens who is the co-founder of Association of Professional Builders says we can learn from the mass collapsing of companies like Porter Davis. Russ says there is a crucial need for compulsory financial education. Large building companies have sales team, who, during the COVID boom, low interest rates, abnormal circumstances, signed up far too many contracts. These contracts were also signed on a fixed price, which meant the builder was guaranteed to lose money, unless the price was renegotiated prior to commencement – the right thing to do. The compounding cost increases by 20

per cent or more post-covid, this meant the equity and small profit margins are quickly diminished. Russ highlights that companies do not lose 40 per cent of their revenue in a short period of time, there is usually a long-standing inaccuracy of financial reporting – again, highlighting the need for financial education. (Business News Australia, n.d.)

2.4.1.2 PBS Building Group

PBS Building, a multi-million-dollar construction firm, with commercial and residential contracts called in an administrator on the 7th of March 2023. With PBS Building having 33 years of experience, employing 180 staff, they were considered to be an established and safe builder. They had 80 residential projects forced into limbo, only from a preliminary investigation, there were also over 1000 secured and unsecured creditors which were owed over $25 million.

Similar to Porter Davis, the main issues raised by PBS were rising costs of materials, fixed price contracts, labour and material shortages, as well as extreme weather. These factors are controllable, other than the weather, they are all contributing factors which fundamentally should be foreseeable or at least accounted for. As Russ expressed, there is a serious need for financial education, tightening on reporting, substantially more involvement for auditing.

Jonathon Colbran warned that "We won't be the last construction group to buckle under the weight of a broken industry and way of doing business that needs urgent reform." (Turner-Cohen, 2023)

The snowball effect, contractors are unlikely to be paid. This is the multi-tier structure and flaw, all financial struggles in construction trickle down the tiers. Zach Smith, the head of construction, Forestry, Mining and Energy Union said that there are at least two of PBS building sites, which have been abandoned, where contractors will most likely not be paid. This is due to the severe lack of security payment laws. Contractors will carry out work, the money owing is not secured. This is one of the only industries where this is tolerated, you cannot simply buy something or engage a service without secured funds. You cannot purchase a car if you do not have the correct funds. So why is this happening in construction. (www.mpamag.com, n.d.)

2.4.1.3 Probuild Collapse

Probuild's collapse in late 2022 was shocking to most. They were undoubtedly one of the biggest builders in the industry. They went into liquidation owing $250 million, owing over 2300 individual creditors and $14 million owed to 784 workers.

The collapse stemmed from WBHO South Africa withdrawing all financial assistance, they did this not long after they had injected millions of dollars into Probuild.

Deliotte the administrator engaged to reduce damage from the collapse, claimed the main issues here were from inappropriate risk sharing and fixed price contracts. (Sharples, S)

2.5 Conclusion

Unfortunately, this paper could include one hundred pages alone on case studies. They all generally have similar reasonings for collapse:

- Poor financial education.
- Fixed price contracts.
- No secure funds.
- Supply chain issues.
- Cost/Interest rates increasing.
- Labour Shortages.
- Weather conditions.

Some of these are manageable and should be foreseeable. Granted, the weather cannot be controlled or generally foreseen. These three case studies and literature review alone, show the need for further research and this dissertation. The current climate and conditions within the industry are not sustainable, they are only getting worse, and the roll-on effects are devastating.

Each of the companies from the case studies have highlighted the need for change, within the companies alone, the legislations to support the contractors, the support and government funding.

This dissertation seeks to contribute to an innovative approach to alleviate the liquidity rate within the industry. Flatten booms, and lower crises. The industry needs consistency and certainty.

The research questions are:

- Are cost-plus contracts the way forward?
  - Can there be a legislation on the time-frame validity of fixed-price to protect companies?
- Is there a tipping point?
  - Would more auditing and regulated reporting structures help?
  - Should there be mandatory education on financial reporting?
  - Would mandatory third-party financial reporting help?
- Do the government's current legislations help?
  - SOPA
  - Alliance model
  - Government grants

Chapter 3 Research Methodology

3.1 Introduction

The aims of this project are to investigate the reasons behind the mass insolvency within the Australian Construction industry, as it has always been the case with little improvement – even from mitigating measures. This shows a definite need for further investigation and research. The project will validate which points are mostly contributing towards the insolvencies, and whether the current policies and procedures can be adjusted to better solve the problem.

Research methodology defines the procedures and techniques that are used to identify, select, process, and analyse the information about this topic (Heever 2020). Research projects utilise a number of chronological steps that follow:

- Finding the research topic
    - Stressors and Failures of Construction Companies
- Investigating the literature for the gap in knowledge
    - Types of Contracts
    - Tipping Points
    - Current Legislation
- Formulate research questions.
- Fulfil the knowledge gap.
    - Research Methodology
        - Interviews

To fulfil the research gap, more research is needed. There are two main ways to conduct research, by gathering quantitative, or qualitative data. Quantitative data is defined by the researcher asking specific questions concerned by a numerical or statistical response. Quantitative data concludes a hypothesis from numerical models. Whereas qualitative data the researcher's investigating an open-ended discussion that cannot be collected through numbers. Qualitative data gathers a deeper insight into the problem to generate new ideas and solve the issue (Bhandari 2020).

The structure of this chapter will follow:

1. Ethics Approval
2. Research Design Choice
3. Methodological Limitations
4. Concluding Summary

3.2 Initial Steps

3.2.1 Ethics Approval

An ethics approval was required to obtain permission to conduct interviews on respondents. The ethics approval required information regarding the extent of the research, nature, methods, and potential benefits, as well as the relationships between the interviewer and participants. The interviews were only conducted once they were reviewed and approved by the University of Southern Queensland Human Research and Ethics Committee. Ensuring that no participants were harmed or subject to any potential physical or psychological harm. The project submitted a risk assessment for review in SafeTrak – the university system, this was approved with low risk (Appendix B)

Robert Yin's book 'Qualitative Research from Start to Finish' explains the code of ethics in regards to research integrity. Research integrity is presenting truthful positions and statements, with qualitative research it is important to show that the researcher has gone to length to ensure the research has been undertaken in the fairest of conditions. This research project will disclose the methodological conditions in length during this chapter and the conclusions.

Each respondent will be issued a consent form and an information sheet relating to the research. This gives the respondent an opportunity to choose whether or not they would like to participate (Appendix C).

3.2.1.1 Ethical Concerns with Interviewing

Interview-based research is an effective method for investigating stressors and failures within companies operating in the Australian construction industry. Conversely, the interviewing approach has risks and ethical concerns. It is essential to be aware of these risks and address the issues to guarantee the integrity of the research process and protect the rights and well-being of participants. This section discusses the key risks and ethical concerns associated with interview-based research in the context of stressors and failures in the construction industry.

Firstly, an obvious issue of participant vulnerability and informed consent. When conducting the interviews with participants, researchers must consider the potential vulnerability of participants. These participants could have experienced challenging working conditions, loss of business, or personal hardships. Engaging participants in this interview process has the potential to evoke emotional distress and therefore, required a consent form, which has listed potential questions and talking subjects. This research also mostly involves people whom are known to the researcher, therefore, the risk is already reduced.

Informed consent is a critical ethical consideration in interview-based research. This research has provided clear and thorough information to participants about the purpose, procedures, potential risks, and benefits of the study – this is part of the participant information sheet. Participants will have a full understanding of their rights to voluntary participation, withdrawal, and confidentiality. Consent forms were obtained from participants, clearly documenting their voluntary participation and acknowledgment of the study's terms (Flick, 2018; Punch, 2014).

The research remains aware of preconceived beliefs, values, and preconceptions that might impact data collection and interpretation. Objectivity should be maintained throughout the research process to ensure the credibility and validity of the findings.

To address this risk, research should employ techniques such as peer debriefing, and the researcher checking to reflect on their own biases and actively seek alternative perspectives. Transparency in research design, data collection, and data analysis is essential to enable others to assess and evaluate the potential impact of researcher bias (Creswell, 2013; Denzin and Lincoln, 2017).

Furthermore, respecting the participants' privacy is crucial in interview-based research. This research will inform participants about the confidentiality measures in place to safeguard their personal information. There will be a three-step method for holding the data which is the USQ process, on the laptop on a password protected file, a USB stick, and a cloud with password protection. The use of secure data storage, password protection, and restricted access to data are essential practices to protect participant privacy (Bryman, 2016; Cohen et al., 2013).

The researcher must comply with relevant data protection regulations, such as the General Data Protection Regulation (GDPR), when collecting, storing, and analysing personal data. Obtaining informed consent, anonymizing data, and ensuring data security are important steps in addressing privacy concerns (Burgess, 2014; Mason, 2017).

3.2.2 Research Design Choice

This dissertation will be utilising a semi-structured interview, which gives flexibility in the research to probe respondents whilst still maintaining the basic structure and staying focused on the outcome. This interview structure ensures that there is little to no need for multiple interview rounds, as you can steer the interview in the way that is necessary rather than having to come back to points. Interviews are more informative than questionnaires as they give a broader understanding as well as an opportunity to respond and delve deeper.

Qualitative data has been chosen as it will paint a broader picture rather than just figures and finances. As discussed previously, Administrators often note that financial reporting is not always an accurate

reflection of the actual finances. As there are also many different members of the multi-tier industry, the research will be conducted across different professions, companies, and positions.

The research and interview type shall be a mixture of inductive and deductive. Inductive is purely based off the research being conducted and starts from the bottom, with interviews being exploratory. Deductive research is based on previous established theories and questions to build, it is considered as more of a confirmatory approach. This dissertation will be using semi-structured interviews, meaning that there will be a guideline of topics and questions, however, it is more of an open-ended exploratory approach.

The benefits of the interview method for this project are the interpersonal response to an issue which is directly impacting people's livelihoods. The information needed, can only be gathered through current data collected on insolvency rates, financial data, or directly through speaking to the people within the industry.

The interview will have its own 8 phases to completion.

1. Identify the goal of the interview.
    a. Understand the role of the respondent.
        i. Time in the industry
        ii. Current job title
        iii. Current employer & size of employer
        iv. Location
    b. Gather information which leads to
        i. Stressors on businesses
        ii. Current mitigating procedures – if any
        iii. Resource management and issues
        iv. Contractual advantages and disadvantages
    c. Quantifiable data to analyse.
2. Divide the interviews between
        i. Sub-contractor business owners
        ii. CEO's / MD's / COO's
        iii. Contract/Commercial Manager

iv. Administrators

v. Project Managers

3. Interviews Design
    a. Based off the aims and objectives
    b. Number of questions
    c. Ordering of questions
4. Pilot Interview
    a. Test the interviews on a known respondent to gather feedback for any adjustments and improvements needed
5. Revise the interview
    a. Analyse feedback from the pilot interview, incorporate the feedback and adjust
6. Execute the interviews
    a. Conduct Interviews
    b. Ensure length of interview is consistent
    c. Set a deadline for completion of all interviews
    d. Ensure the environments are similar
7. Analyse the data
8. Communicate results in the dissertation

In Robert Yin's Qualitative Research from Start to Finish, there is a chapter based on design choice. Firstly, the chapter touches on the importance of starting the deign of the research at the beginning. This study had some basis of design prior to starting the research subject, this was always going to be qualitative research, conducted through interviews or questionnaires. As Robert Yin pointed out, as the study progresses, you can alter the design. This project changed and resulted in no questionnaires as it didn't feel as though there would be adequate insight. Project design can alter throughout the project, and this is more productive if there is still some basis.

The second part of this chapter relates to credibility of the study. 'A credible study is one that provides assurance that you have properly collected and interpreted the data'(Yin 2016). Yin explains

how credibility needs to be accounted for from the beginning of the research. There are four sub-choices which are:

1. Trustworthiness

Relating to the level of understanding and depth given to the reader. Giving the whole picture, the challenges faced, and process taken. To provide a trustworthy research project, there needs to be clarity and an in-depth explanation throughout.

2. Triangulation

To strengthen the credibility of the study by providing at least three ways to verify the findings. Through data, investigation, theory, research methods.

3. Validity

Properly interpretated data, with accurate representation of the findings. From figure three, there are Eight strategies to improve the validity of the study. This research project will focus on numbers, 2, 3, 6, 7, 8.

4. Rival Thinking

Utilising scepticism to analyse responses from candidates. This study will take into account the person, position and company of the respondent and analyse the responses based on that.

VIGNETTE 4.1. Eight Strategies for Combating Threats to Validity in Qualitative Research

Joseph Maxwell (2013, pp. 126–129) offers an eight-point checklist to be used in combating the threats to validity:

1. *Intensive long-term [field] involvement*—to produce a complete and in-depth understanding of field situations, including the opportunity to make repeated observations and interviews;
2. *"Rich" data*—to cover fully the field observations and interviews with detailed and varied data;
3. *Respondent validation*—to obtain feedback from the people studied in order to lessen the misinterpretation of their self-reported behaviors and views;
4. *Intervention*—to use the presence of the researcher and observe how participants react as a further way of corroborating field patterns;
5. *Search for discrepant evidence and negative cases*—to test rival or competing explanations;
6. *Triangulation*—to collect converging evidence from different sources;
7. *Numbers*—to use actual numbers instead of adjectives, such as when claiming something is "typical," "rare," or "prevalent"; and
8. *Comparison*—to compare explicitly the results across different settings, groups, or events.

Figure 6 Joseph Maxwell (2013, pp. 126-129) - Validity in Research. From (Yin 2016)

Robert Yin's book has revealed some very important points on the ways to collect data along with the appropriate thought process behind ensuring that qualitative data is as credible as quantitative.

3.3 Choosing Respondents

3.3.1 Subcontractors and Business Owners

A sub-contractor is the person or company hired by the main contractor. Within the construction industry the most common structure follows a Person Conducting a Business or Undertaking (PCBU), followed by sub-contractors and specialists who have been awarded their section of work. Subcontractors can be small businesses, from one person to a large international company, there is no size limit to the sub-contractor's business model.

Sub-contractors are directly impacted when the PCBU on a construction project goes into administration, as they will most likely not be paid. Therefore, a sub-contractor's response to the research will be insightful at that level of the tier, showing the people impacted most by the administration rates. The subcontractors can explain the mitigating measures they have in place, such-as; cash-flow, payment terms, cash buffer, reporting systems and more.

3.3.2 CEO's / MD's / COO's of larger Builders

The people in charge of managing someone else's business, or a larger cooperation. Although CEO's/MD's/COO's do not directly own the company (in the case of this research), they have a duty and responsibility to act as though they do.

According to ASIC a Director of a company is personally liable in certain circumstances for the companies debts, if the company has continued trading and incurring debts whilst the company is insolvent.

Even if the MD is not personally liable for the debts, they are under a large amount of pressure as they have a legal obligation to act with honesty. If they fail to perform as a Director, in many current cases in construction where the company is owing millions of dollars, they may:

- Be investigated, charged, and convicted of a serious criminal offence.
- Have contravened a civil penalty provision and the court may order you to pay a fine
- Be personally liable to compensate the company or others for any loss or damage they suffer.
- Be disqualified from managing a company.

(Company director liabilities when things go wrong n.d.)

The people in charge of the company will also be obliged to continue communicating with the administrators throughout the process, they will be held accountable. Their insight into the process will give an idea of:

- How the need to enter administration takes place
- Where there is first signs of financial distress
- Mitigation measures
- Process after administration
- What could have helped

3.3.3 Contract/Commercial Manager

Contracts and Commercial Managers have a role that consists of creating the contracts for projects, negotiating with delays and other latent conditions, foresee risk, negotiate favourable contract conditions. Their role is essentially to control the legal contractual matters to mitigate them leading to a court and legal case.

Their view on a company's reason for liquidation is important, as they have an imminent role of foreseeing the risks associated with projects. This project research will be probing for their opinion on:

- Their role in foreseeing risk associated with projects
- Contract types – fixed/variable
- If there are any standards or conditions which should be mandatory in contracts
- SOPA positives/negatives
- Payment terms

3.3.4 Administrator

The administrator's role comes into place once a company has entered into administration. They are a solvency practitioner, who have a duty to evenly distribute the remaining funds to creditors. The administrator has to investigate the reasons for the administration, concluding that will be most lucrative for the creditors who are owed.

This research will be investigating their opinions on how companies end up in administration:

The most common financial reporting issues

- are any area of creditors at most risk of not being paid

- ways to mitigate creditor debt
- should there be administrator auditing
- what's the process followed once in administration
- best/worst case outcomes

3.3.5 Project Managers

Project Managers have the role of running the day-to-day costs of a project. A company or subcontractor may have multiple projects running at any given time. It can take just one disastrous project to ruin a company financially. The Project Manager is responsible for reporting the direct project costs as precisely as possible, with some contingency. In some cases, the project manager may even run the commercial business, until it gets to a level of no agreement.

If Project Managers are not proficiently recording and managing costs, there is a ripple on effect. These can cost a company millions of dollars in unforeseen costs.

This research will investigate:

- current reporting procedures
- ease of reporting – support to cover all duties.
- efficient methods to track costings.
- risk management prior to project commencement

3.3 Conducting Schema Analysis

This research will be conducted using semi-structured interviews. This means the researched will be typing notes throughout the interview, as similar talking points will be allocated to each role within a company, it will be required to conduct a schematic analysis to correlate data.

Schematic Analysis means "a way of summarizing, and then offering a clear and succinct presentation, of the essential elements within an original text" (Liamputtong, 2019). Interviewing ~10 respondents, some will have similar experiences within the industry and therefore may give similar responses to the questions. The answers and notes will be critically evaluated and summarised into each response group; this ensures that the data can be easily observed. The analysis provides clarity and emphasises the overarching reasons that respondents felt contributed to stressors withing a construction company.

3.5 Limitations

Throughout this research project, limitations have arisen, been analysed and recognised. All limitations found during the interview stage will be recorded in the discussion chapter. The predicted limitations are expected to be, but not limited to:

- Sample sizes – The project timeframe does not allow for more than 10-15 interviews. The more people interviewed, the more accurate the data as there is a larger demographic. Further to this, a smaller sample size, may not be representative of the entire population of construction companies in Australia. The specific experiences and perspectives of the participants may not be fully indicative of the broader industry.
- Bias – Some respondents may have an idea of what the research is 'wanting' to hear, therefore give answers which may not be exactly true to their opinion. Additionally, the researcher's own biases and subjectivity may impact the selection of participants and interpretation of the findings.
- Non-measurable – As the answers are subjective, and qualitative, they cannot be measured. Therefore, they need to be interpreted. Interpretation can be seen as subjective.
- Limited Scope: As this is a dissertation research project, there are time and resource constraints, therefore, it is not possible to cover all aspects and dimensions of stressors and failures in the construction industry. The research has needed to focus on specific subtopics and areas of interest, which in turn, potentially overlooks other important factors.

Other limitations may include, interviews are time consuming and require the researcher to be present, especially in the case of an interview. The data gathering and analysis can be time consuming as well, as there is a lot of information to listen to and conclude. There are also potential issues with anonymity and confidentiality, however, as stated in the risk assessment, all respondents will remain anonymous and unnamed. (Anderson, 2010).

Chapter 4 Data collection and Responses

4.1 Data Collection

4.1.1 Introduction

This section outlines the data collection methodology utilised in the research project focusing on the stressors leading to liquidation in the construction industry. The research aims to gather insights from participants through interviews and qualitative research, to further understand the research gap which has been identified. The interviews will be engaging directly with industry professionals. The research seeks to uncover a deeper understanding into differing contracts, tipping points and current legislations, which ultimately contribute to the unfortunate outcome of liquidation.

The data collection methodology for this dissertation research project involves conducting semi-structured interviews with a purposively selected sample of individuals from the construction industry. By employing interviews, the research aims to capture the experiences, perspectives, and insights of participants regarding the stressors causing liquidation in the construction industry. The subsequent sections will provide further details on the interview structure, types of questions raised, ethical practice utilised, and outcome from the interviews.

4.1.2 Interview Question Structure

The interview questions will differ depending on the role of the respondent, as this maximises the opportunity to gather insights from every aspect of the business and industry – with the constraints of a dissertation project. This is a semi-structured interview, meaning that there will be talking points and questions, however the responses will be longer and more of a discussion.

4.1.2.1 Sub-Contractor and Business Owners

Sub-contractor and small business owners have a substantial amount of involvement in the project process, from the beginning at tender stage through to completion. There are less employees, meaning a more intimate work environment, generally less room for miscommunication. However, there is also generally less budget in place for ‘overhead costs’, which refer to the ongoing operational expenses that are necessary for the day-to-day functioning of the business but are not directly tied to specific projects. These costs are incurred regardless of whether projects are active and are typically fixed or semi-fixed in nature. Some examples of overhead costs include:

- Office rent and utilities
- Salaries and benefits for administrative staff

- Office supplies and equipment
- Insurance premiums
- Communication and technology expenses
- Professional services fees
- Licenses and permits
- Training and development costs

The semi-structured interview will follow on from the resources allocated to these over heads. The questions followed the following talking points:

- Contracts
    - Disputes
    - Fixed-price vs cost-plus
    - Timeframe for contract validity
- Tipping Points
    - Financial difficulties, cash flow
    - Project delays
    - Economic factors
    - Training for financial reporting
- Legislation
    - Regulatory compliance challenges
    - Legal help, overhead allocation
    - Security of Payment Act knowledge

4.1.2.2 CEO's / MD's / COO's of larger Builders

In the Australian construction industry, larger builders often have a significant cash-flow stream due to their involvement in multiple projects across diverse locations. However, this size and scale also bring greater risks associated with the cumulative value of contracts undertaken. The CEOs of larger builders heavily rely on their employees, from Chief Financial Officers (CFOs) to Construction Managers (CMs), to effectively manage financial and operational aspects of the business. This chain of responsibility highlights the interdependence and importance of each role within the organisation. However, recent case studies of collapsed builders within the industry have revealed vulnerabilities in this chain, emphasizing the critical nature of having a strong and capable team at every level of the organisation.

Larger builders in the construction industry often have substantial outstanding debts owed to creditors. These accounts are established to facilitate the progression of construction projects while

receiving progress payments from investors. However, if these amounts owed are mismanaged or poorly reported, they can result in significant and unsustainable debt accumulation. As the debt reaches a point where it becomes unpayable and exceeds what the builder deems feasible to repay, it can lead to voluntary or involuntary administration. This highlights the critical importance of effective debt management and financial reporting practices to avoid reaching a point of insurmountable debt and potential company administration.

The semi-structured interview will lead on from the communication and reporting issues faced at larger companies.

- Contracts
    - Payment terms negotiated with creditors
    - How are progressive payments agreed
    - Timeframe for contract validity
    - Dispute management
- Tipping Points
    - Is there a role to manage the debt, how is this managed?
    - Project delays beyond control
    - Overleveraging debt
    - Poor management and communication
    - Economic Downturn
    - Risk management process
- Legislation
    - Financial reporting – Australian Securities and Investments Commission (ASIC) Act 2001
    - Security of Payment Act
    - Dispute resolution process

4.1.2.3 Contract/Commercial Manager

Contract/Commercial Managers in construction companies gain valuable insights into the factors that may lead the company to enter administration. Their personal involvement in financial management, contract negotiations, risk assessment, and project performance provides a comprehensive understanding of the company's financial health and operational challenges. With their expertise in addressing contractual disputes, navigating market volatility, ensuring compliance, and overseeing risk mitigation strategies, they are an invaluable insight.

The semi-structured interview will mainly be based around the contractual side of the company as this is their main area of expertise.

- Contracts
    - Market volatility
    - Downturn in work and desperation for cash-flow, even with little opportunity
    - Pricing disputes and tipping points within the price disputes
    - Risk management at contract stage
    - The legislations which aid and deter the commercial dispute process
    - Length of time disputes can be on hold, unresolved – the effects

4.1.2.3 Administrator

Administrators investigate construction companies that have entered administration. Their role is to conduct a thorough investigation of the company's financial statements, identify outstanding debts to creditors and subcontractors etc., evaluate project contracts, and examine employee and workplace matters. It is also an Administrators role to ensure regulatory compliance and establish communication channels with stakeholders. The purpose of the investigation is to gain a comprehensive understanding of the company's financial position, determine the causes of financial distress, and make informed decisions regarding the company's future, such as restructuring, asset sales, or orderly winding up. This information is crucial for maximising returns for creditors and managing the administration process effectively.

The semi-structured interview for the Administrator role will be focused on the tipping points found in the investigation.

- Tipping Points
    - Balance sheets, profit and loss statements, cash flow statements, and tax records
    - Debts and quantity of debts
    - Potential liability in unfinished projects
    - Compliance with legislation
    - Communication within the company with stakeholders and sub-contractors

4.1.2.4 Project Managers

Project managers play a vital role in monitoring and reporting project performance on a daily basis. They are responsible for communicating project updates to their superiors, typically a construction manager. Their close involvement in cost management, scheduling, quality control, and adherence to contractual requirements offers valuable insights into a company's financial well-being. Project managers work closely with the commercial team to develop project budgets, cost estimates, and financial plans. They also ensure that the project remains in compliance with contractual obligations

and specifications throughout its lifecycle. Their expertise provides essential indicators of a company's financial health and contributes to effective financial management within the construction industry. The semi-structured interview will follow the following topics of conversation:

- Contract types
    - How does ambiguity in the contract effect the project
    - Which gaps in contracts cause the most issues on site
    - Are there any notice periods which are hard to meet
- Tipping points
    - What stage of the project is the most time crucial
    - Does meeting a client's critical path ever effect the efficiency of the project
    - Is there enough support to PM's with commercial and financial reporting
    - What is usually over-sighted in your experience
- Legislation
    - Are the legislations made clear to PM's
    - Is there enough training and support with regards to the legislation you need to follow
    - Do legislations effect PM's with claims and delays – if so, how?

4.2 Responses

4.2.1 Introduction

This section of the dissertation aims to analyse the responses given from respondents, their opinions and views on the subject questions asked. As the interviews followed a semi-structured format, there were additional comments made which hadn't been previously considered. The questions aimed to find cause and correlation effect from differing parts of the business, with regards to the failing of construction projects, accounting, and eventually business administration.

Due to the nature of the information, which was being requested, the names of the companies and personnel will remain confidential. Respondents were working for 4 different companies, 2 of which were in the civil industry, one was a commercial builder, and one small sub-contractor.

4.2.2 Collection of the Data

The participants who had volunteered to assist with this dissertation were all known to the researcher, through being a direct colleague or an acquaintance through mutual connection. Through the ethics review process, it was highlighted that there will need to be consent from the Owner/Managing Director of the researcher's company, to ethically interview employees.

Participants were sent via email, a consent form, and an information sheet (Appendix C). This included all of the likely questions which they will be asked, along with the privacy information. Once the participants had confirmed a time that suited them, they were scheduled in for a ~1hour interview.

The interview itself, was semi-structured. They had already been provided with the talking points, so that they had an idea of what to expect. The interview ran through the discussion topics which had initially been thought of, with the participant often adding new points and discussing how the issues were interlinked.

The collected data underwent the Research Management Plan (RMP) procedure. An RMP outlines the way the data collected during interviews will be handled. The RMP provided the Ethics Committee with a detailed explanation of how the data will be used and handled once provided. This included utilising a 3-stage saving of responses:

- First copy HPC
- Second copy Institute/Centre/Faculty/School MS Teams
- Third copy Secure local desktop

4.2.3 Responses

The responses are summarised in this section per the role of the respondent, as each role views the topic of stressors, contributing to failing construction companies, differently. The below table 2 demonstrates the respondent number, with their present role in the company, the company they work for, age and gender. The responses were consolidated together with similar roles/responses.

Respondent no.	Role	Size of Company	Age	Gender
1	General Manager	Sub-Contractor Medium Civil	47	Male
2	Managing Director	Sub-Contractor Business Owner	48	Male
3	General Manager	Sub-Contractor Medium Civil	45	Male
4	Project Manager	Medium Civil Construction	40	Male
5	Project Manager	Tier 1 Civil Construction	42	Male
6	Commercial Manager	Tier 1 Builder	42	Male
7	Senior Project Engineer	Tier 1 Civil Construction	29	Male
8	Commercial Manager	Sub-Contractor Medium Civil	53	Male
9	Project Manager	Sub-Contractor Medium Civil	48	Male
10	Administrator	Larger Builder experience	53	Male

Table 2 Source: Developed for this dissertation.

4.2.3.1 General Manager/Managing Director/Owner & Sub-Contractor and Business Owners

These responses came from the people who manage the company to some degree, and they are reported to by the project managers and accountants. It is vital that they are involved with the company's financials prior to the money being spent. The management and involvement of these people is highlighted when a company enters liquidation if there is a clear mismanagement.

- **Contracts**
    - **Payment terms negotiated with creditors:**

There are benefits to a company having preferred suppliers as it will give leverage to negotiate favourable payment terms. When a supplier is used frequently, they are far more likely to have a collaborative relationship. If the relationship with the supplier is trusted, they can negotiate the payment terms to 30-60days. The larger projects with higher costs of materials, a 60-day payment period to suppliers may be preferred, which is then tied into the agreement with the contractor's client. This means you're not bankrolling the materials. Which will reduce cash-flow problems and allow the contractors company to remain cash-flow positive.

The bigger ticket items, such-as Steel and Concrete on larger jobs can amount to millions of dollars, therefore it is paramount to arrange payment terms across the whole supply chain. Relationships are the key. If the contractor is known to pay well, this builds trust as they pay on-time. If the subcontractor cannot pay on time, which may be due to no payments from the client, they need to save this ripple on for exceptional circumstances. If a contractor can show they are making a conscious and honest effort to pay their creditors on time, the relationships build – this can help to save large cash-flow in the long run.

Larger companies and Tier 1 builders/contractors will set up supplier agreements – this means there are no re-negotiations, and the same rules are set for every project that falls under the umbrella of the company within the agreement.

The problem lies where the payment terms do not match from creditor to the projects contract. The contractor could have 60-day payment terms, which only starts from assessment from the client. If for example, steel is delivered and installed on day 1, the payment claims as per the contract, for the steel could be at day 30, then payment terms are 60-days from when payment claim is assessed. This means the contractor could pay their supplier prior to being paid for <90days. If this is the case, try attain upfront payment, secure the resource, and manage cashflow.

Alternatively, if the project is high risk in regard to supply of materials & payment terms, delegating the supply of materials to the client can mitigate any of the previously mentioned circumstances. For example, if the project is remote and you have no relationships with the suppliers in the area, you may say to the client to supply materials. This takes away risk for delivery, quality, late deliveries,

damaged goods etc. But this approach is only to be taken when the risk is higher than the reward as there is then no margin on top product.

- **Timeframe for contract validity**

Tender validity must be accurate, which depends on what the market is doing. High volatility may have 1 week validity. Understanding of the market is crucial, as with recent times when prices of materials and labour are constantly changing and increasing, you should lower the validity time.

With contract validity, if the duration is over due to the client's delay, the contractor is on 'time at large' which means they are entitled to reprice the job. Prolongation claim – nothing price wise has validity after this period. The contractor will still have to validate the costs changing, and this can be fair and just – protects the contractor from being stuck on a job beyond their own control. The associated cost increases could be inclusive of overheads, EBA updates, insurances, material escalation or the like.

Dispute management

Contracts will stipulate the dispute management process. It will say the exact words needed e.g., 'Declare a Dispute'. The subcontractor needs to follow legislation, which will vary from contract to contract. There will be time bars within the dispute. If the relationship is collaborative with the client, or there is future work to be completed, usually the dispute will be resolved in a timely manner.

If the dispute goes to arbitration, the Arbitrators decision is final, and will be paid immediately. If there is then a non-agreement, the dispute goes to court.

- **Fixed price Vs Cost plus**

Re-measurable contracts can be less risky than a fixed price – there is a fixed price schedule of rates but is measurable pay. For example, if the company is drilling piles, they can arrange to be paid per 'm' drilled.

Fixed-price or 'lump sum' you are deemed to have included everything in the tendered price. As a result, the business would be required to absorb any missed costs during the tender process unless otherwise claimed through a latent condition. In order for a latent condition claim to be successful, sufficient evidence is required which can cost the business time and money that they may not have. Latent conditions – Have to then prove it, which can be difficult and cost a fortune.

Dayworks – Minimise and mitigate risk for negative, but there's no opportunity for positive. If you work quicker, you aren't technically gaining any more money unless there is a 'pain and gain' clause in the contract. The definition of 'Pain and Gain' is that if the project does move quicker than expected, the contractor will be theoretically paid less as they are losing days of pay. By working

quicker, the client is saving money, therefore there may be an agreed rate to pay the contractor until the expected duration is over – still incentivising the contractor to work quickly. The contractor will maximise rates to the best of their ability while remaining competitive. The contractor also cannot do anything that is grossly negligent as they have to be a reasonable specialist contractor, which is the same on any contract.

- **Tipping Points**
    - **Is there a role to manage the debt, how is this managed?**

Yes, accountants and CFO's. There is a global cash-flow programme which shows profit and loss. Looking closely at the forecast ahead, identifying holes in the profit ahead of time, giving the company time to react. No surprise is a good surprise in construction. Ensure the budget is conducted at the start of project and project specific.

- **Project delays beyond control**

Each company will have their own reporting methods. This company uses Internal Production Programmes, this will show a graph with forecast vs actual progress. It is all about management and stopping the amount of money that is lost. Sometimes additional resources, and spending more money is better than trying to cut costs. By throwing more money into a losing may get the job completed quicker, as project Liquidated Damages (LD's) can come into play too.

- **Overleveraging debt**

Talk to supplier and client to pay upfront or increase payment terms as described previously. Bank loans are last resort.

- **Economic Downturn**

Understanding the economy, for example an experienced management team will assess and realise when the industry is about to boom, increase output, on-time. The company doesn't want to start expanding at the peak of the market, as you will only be losing form the downturn. The management team will also notice the downturn in the industry and begin cutting-down the resources. The company needs to expand just as the boom starts – this is all about experience and understanding the economy. Rise clauses in contracts will also protect a contractor if prices increase.

4.1.2.3 Contract/Commercial Manager & MD of Larger Builder

This dissertation interviewed two commercial managers, respondent 6 and 8. The views expressed from them were very similar, regardless of the size of the organisation. The construction industry at

the moment is experiencing unprecedented volatility and price increases. The responses are highlighted below from both respondents.

- **Market volatility**
    - The Construction Market in Australia is currently subject to a level of volatility not seen in decades. One of the biggest issues at the core of the volatile market is the mounting insolvencies in all aspects of the supply chain. Unprecedented numbers of managing contractors & subcontractors have suffered liquidity issues caused by rising costs of materials & labour.
    - The issue is being exacerbated whereby the Australian Government are using various facets of the construction industry as a means to drive the post Covid economy, with unprecedented amounts of large infrastructure projects being driven around the country. This is placing additional pressures on material / labour availability and also contributing to cost increases for both.
    - Australia is unique in that the vast majority of building construction contracts are fixed lump sum. This has placed managing contractors & subcontractors in a position where they are forced to impacts of costs increases which are entirely outside of their control.
    - The industry norm of builders & subcontractors being forced to accept the risk market forces is fundamentally flawed & needs to be addressed immediately to ensure the longevity of the industry.
    - Various Government bodies claim that measures are being taken to ensure that lump sum contracts cease to be used, however this is yet to be seen with contracts from Commonwealth, Local & State Government bodies continuing to include lump sum price mechanisms.
    - As an example, various forms of market standard contracts, GC21, Australian Standard Suite, do not include a mechanism for rise & fall / price escalation.

Downturn in work and desperation for cash-flow, even with little opportunity

- The industry is seeing fluctuation in the various sectors. Residential & commercial construction activity has declined in 2023 in contrast to previous surges in activity.
- For contractors & subcontractors who are aligned to deliver this kind of work, it is placing significant pressures to secure more work. Eroded margins are evident in the market with contractors / subcontractors who are in declining sectors pursuing

projects with lesser margins as their thirst for cashflow increases. The cashflow pressures not only stem from the downturn in work, but also the requirement for contractors / subcontractors to remedy project cost overruns on completed projects due to market forces.

- The shift to reducing margins in order to secure work is not new to the industry, however this is exacerbating an already tight market.
- Wise Contractors / Subcontractors are diversifying their workbook to market sectors less affected by the downturn, i.e., Government pipeline, Health, Defence & large infrastructure to lessen the impact.

- **Risk management at contract stage**
  - Prudent parties should undertake vigorous contract reviews prior to entering into any building contract to understand the risk profile of the project/ contract. Given the volatile construction market, additional consideration needs to be given to:
    - Understanding the financial standing of the party being contracted with. It is becoming more frequent in the current market for contractors to engage third party credit reporting agencies to undertake due diligence financial checks on the contracting party to ensure they have an appropriate financial stability to fulfil their financial obligations under the Contract.
    - Protection for insolvencies – What measures are in place in a party defaults / goes insolvent during the Contract. Ensuring that sufficient security is in place to protect the non-defaulting party in the event an insolvency event occurs (often governed by the findings of point 1 above)
    - Understanding the Contract pricing structure – i.e.:
      - Is the Contract Sum Fixed?
      - Is there a provision for rise and fall / escalation to account for market fluctuations for material / labour? Inclusion of a sufficient provision in the current volatile market is paramount.
    - Validity of pricing / protection for time impacts – Contracts in the current market should consider the validity on pricing. If a project is subject to prolonged delays, the contract needs to include a sufficient mechanism to entitle the affected party to recover the associated costs of the delay.

- **The legislations which aid and deter the commercial dispute process.**

- The Security of Payments (SOP) Legislation provides contract parties an alternate means of resolving a dispute rather than utilising the dispute mechanism in the contract.
- SOP legislation is favoured by Subcontractors as it is a quick process, requiring an adjudicator to decide within 14 days of the parties submitting the particulars of the disputed matters.
- SOP legislation is also a cheap process and avoids costly litigation which is why it is favoured by the Subcontractors.
- The SOP Legislation was introduced to remove "pay when paid" provisions from contracts and the previous industry norm of subcontractors carrying the payment risk of the entire contractual chain. This legislation does however by virtue disproportionately favour Subcontractors insofar as they are afforded more generous time frame to prepare adjudication submissions and the onus is generally on the respondent to prove beyond any doubt the reasons for withholding payment.
- Given the disproportionate favouritism of the SOP act, this legislation undermines the dispute resolution mechanism in a typical construction subcontract as SOP is more than likely to be triggered in the event of a dispute.
- Most typical tiered dispute resolution mechanisms involve an iteration of the following order of resolution:
    - Conference between the parties
    - Referral to Senior Leaders
    - Expert Determination
    - Arbitration
- The problem with this tiered approach is a dispute is often not resolved in a timely fashion, having cashflow implications on the affected party, and it is costly as significant time can be expended progressing through the stages. Most often only the final step (and not always) is a decision binding on the parties (and even so can be subject to interlocutory / litigation proceedings). Significant legal costs mostly likely result which deters most parties from using the contract actual dispute resolution process.

Length of time disputes can be on hold, unresolved – the effects.

- As above, each stage of a typical tiered resolution process involves a period of time for the claimant to submit particulars & a respondent to render a response. These are typically within the vicinity of 5-10 Business Days per stage. By the time the dispute progresses through to a stage where a binding decision may be made by an expert / arbitrator, 30-45 Business Days may have elapsed since the initial dispute was raised. An expert / arbitrator may then take up to 30 days to render a determination.
- Even after the entire contractual dispute resolution process is exhausted, a party may wish to commence litigation proceedings on the matter. Given the significant volume of construction disputes in the current market, the Australian Court system is significantly backlogged. Disputes of significant quantum may take over 12 months in some instances to be heard in the Supreme Court.
- The above can have significant cashflow impacts to the affected party as it could potentially be months before they are made financially whole again.
- Often any dispute will give rise to the Main Contractor / Principal, as the case may be, seeking immediate recourse to the Security of the other party. Conversion of Security to cash, or retention being cashed can have a significant impact on the capacity of the other party to tender future work, straining their ongoing workbook.

4.1.2.3 Administrator

The Administrator respondent for the research had limited time to give. However, they gave useful insights for 'alarm bell' signs, which should be monitored closely by contractors. In future research, it could be beneficial to interview numerous administrators.

- If the principal or person paying the contractors invoices are constantly missing payments, or seem to have cash-flow issues, this is a sign that they are not managing the cash-flow properly or have some debts elsewhere which require greater attention.
- Trying to re-negotiate payment terms whilst already the job has started. This shows that they do not believe they will meet these requirements and deadlines. If the terms are deemed to be reasonable and standard, this will highlight an issue.
- Changing, stopping, and suspending works to contractors without explanation – generally will be due to the fact that they know it cannot be paid.
- Laying off workers, especially key personnel, and project management teams
- Communication is lacking and progressively becoming worse.

4.1.2.4 Project Managers

The interviews conducted with respondents 4, 5 and 9 are outlined below. The Project Manager is often the person who sees the project unfold day by day, they are the ones ringing the alarm bells early on and often seem to feel unheard.

- **Contract types**
    - **How does ambiguity in the contract effect the project?**

Scope gaps – Something that is missed at contract stage, between the specialist contractor's product and the preceding contractor. When there is a scope gap, the Principal Contractor will often pass this onto the initial sub-contractor, and if there is a gap within the scope that directly effects the initial sub-contractor, often it can impact their efficiency with work – forcing them to take on the unpaid 'gap' work.

Scope creep – Leading on from the above point, they can also creep up on the sub-contractor, the incremental effect. For example, if there is earthworks sub-contractor, and spoil removal is not in their paid scope, but nor is it anyone else's, the main contractor may ask for help – utilising the subcontractor's plant and personnel to remove the spoil. This can start off as a one-off agreement, then as mentioned above, if it will impact the sub-contractors work, they can end up continually doing the spoil removal – which is unpaid and not tendered for.

Programme Ambiguity – If there is nothing in the contract regarding Saturday or nightshift works initially, then they are not priced within the tender. Then when/if the project falls behind, the client can push for weekend works, extra shifts – this becomes very expensive. A Saturday in some suburbs is a no financial return day, as there are 8 hour limits limiting production, as well as usually paying the workers double pay. This will incrementally affect the profit margin of the job, as you essentially need double production to validate double pay.

Payment Claims – In today's day, you need to know the contract inside out to put a progress claim together. There are often particularly stipulated items which need to be included in the payment claim, worded in a certain way, issued on a particular day of the month. If anything is remotely incorrect on the payment claim, you are then no longer covered by the Security of Payments Act. Payment claims are the projects cash flow, if you have big cost items, i.e., steel and concrete, you may be cash-negative while floating them relying on this payment claim. This can put a small sub-contractor on the brink of collapse when not paid on time.

If client relationship is strong – The relationship between the subcontractor and the client makes a huge effect on the fight which will be had for the money. If the subcontractor knows the client has another large project in the pipeline, they may take a small financial hit, retaining the relationship. Again, these incremental effects, will affect cashflow long term.

- **Which gaps in contracts cause the most issues on site?**

Claimable – Understanding whether or not the claim you want to make is claimable for the client is important. For example, if you have a latent condition, which is also a latent condition for your client, who is the principal contractor for TMR, they are much more likely to help push the claim through. If the claim however is not claimable to the subcontractor's client, they then have to work much harder to prove a latent condition and the client will generally fight back or reduce the cost.

Error in Contract – Bank guarantee or security of retention held for any amount of time. You need to specify amount of time held for money, which could be timeframe of the entire project. If there is a clause in the contract which states the bank guarantee is held for the duration of the project, and the subcontractor is on the project for ~6months, but the main project runs for ~4years, the bank guarantee is held for ~4years. If the Project Manager, or Commercial Manager has not identified this, it can be detrimental to smaller/medium sized businesses, as it will negatively impact the company's net position and money will be tied up for years. The knock-on effect is cash-flow issues which are caused if retentions held. Poor management from not chasing the retention, needs education.

- **Are there any notice periods which are hard to meet/result in financial loss?**

Yes. Contract specific.

Tier 1 – An example for a claim: Extension of Time, you must meet a clause from the contract, name the clause, then there will be a time-bar (submit by certain timeframe i.e., 2 days from event), the clause will state 'with items including' which will be the exact items needed in the claim, then in some contracts you will need to submit repeat notice. These all end up as hooks to be able to push back on you. For example, weather, if the client is continually pushing back on all of your claims, and you are delayed out of control, you will be liable for LD's which can be ~$10,000.00 per day or even more.

When submitting a claim, ensuring specifications, time bars & clause reference are detrimental in ensuring the approval of the claim to prevent any rejections due to a non-compliant submission.

Notices, repeat notices, registers – The client/head contractor will send through huge packages of information when there are changes. They will send through sometimes hundreds of new drawings with changes highlighted, or even not. You then may need to respond within 24hours with variation, with approximate time and cots, then extra 5 days to provide substantial documentation. This will take several man hours to correctly reprice sometimes, as it can actually lead to an entire new pricing of the job depending on the changes. This is done specifically to catch you out and loose a claim. It is a time-poor strategy from larger builders and principal contractors to ensure the sub-contractor loses the claim timeframe.

Definitions to understand - Authorised Signatories: PM/Site manager are always named in the contract as the person who can instruct a variation– Then on site if the incorrect person has given you a site instruction. They will say not authorised signatory. Large piece of work that you deem a variation, it is not a claimable variation if not authorised signatory – usually in writing. Often, they will tell a Site Engineer to instruct another Site Engineer or Supervisor to continue the works as instructed by the signatory, then the signatory person will deny. There is then no cover for the subcontractor in the contract.

- **Tipping points**
    - **What stage of the project is the most time crucial?**

Pre-Planning Phase – If given a job which was tendered poorly, you can try to mitigate the loss.

The Project Manager needs to have a relationship with the clients to understand their needs, be able to communicate the subcontractors needs and then help plan together a reasonable way to execute the job. The Project Manager also needs full understanding of the scope, constraints, resources, risk assessment. Suprises = delays = reduced margin or profit loss.

- **Does meeting a client's critical path ever effect the efficiency of the project?**

Goes back to planning – You need to understand their critical path, you need an agreement. To show efficiency, allowing your job to move effectively and trying to achieve the client's needs as much as possible. You have to understand the client's needs in order to be able to work together effectively.

Changes become critical path – Design changes effecting the duration of the project, if not planned well at the start and managing the risk. This can hugely impact the subcontractors cash flow, for example if they have already planned to do work and purchased products and materials, then if not planned correctly and change arises which now needs more materials and time, the client pay not be paying for these materials until they are installed – delaying cash flow.

- **Is there enough support to PM's with commercial and financial reporting?**

You get what you pay for – Support can be sub-optimal, can be more of a hinderance than help.

If there isn't enough support, the job will suffer as a result s they are doing more than their capacity.

- **What is usually over-sighted in your experience?**

Reforecast – Materials and time and resources are usually correct. The job just is not moving on time, then you see a forecast, then told to reforecast. Sometimes they (the bosses) would rather see the positive profit figures. Therefore, they will ensure the forecast looks profitable for them to be able to report up the line – even if it is farfetched and not accurate. Then the end of a job is a huge shock when you are at a loss.

No responsibility taken – Happens early on when the issues and finances can go downhill. Within first couple of months. Depends on the project team being proactive, experience.

Chapter 5 Conclusion

5.1 Conclusion

The conclusion this research has come to, is there are several differing stressors which lead to a company's failure in construction. However, there are some mitigations which can be implemented, which were highlighted during the interviews.

This research found very similar findings to the research conducted by Dunuwilage Kanchana Nandasena and Skaik (2022) from the literature review chapter. They reviewed and concluded a prediction model – this would only relevant and suitable if there were appropriate procedures in place to help mitigate the factors – unfortunately if you have a really poorly educated or unskilled workforce, it is hard to train them overnight. The gap in knowledge and further research conducted has improved their hypothesis, as it aids the stressor before mismanagement and lack of experience can have a catastrophic effect.

The objective of the paper has been to establish a proactive approach for the problem rather than a reactive one. Predicting a liquidity or insolvency is reactive and the damage is almost certainly done by then, rather, training the future personnel of the industry from the beginning, mitigates in a proactive manner.

The general consensus is lack of experience, knowledge and skill can be the leading contributing factors that are controllable. The uncontrollable factors are the obvious, the economy, lack of personnel in the workforce, government initiatives, government spending etc. By focusing on the stressors which can be controlled, the risk of liquidation should be minimised.

Market volatility in the current economical cycle, this can be managed by rise and fall clauses in the contracts. If the commercial manager and management team are experienced enough to pick up on this, they will ensure that they are covered – especially if the project runs for a longer duration. A solution to aid the companies who are not as savvy, would be to implement a mandatory rise and fall clause with projects longer than a certain duration. This solution takes the risk from the contractor and places it onto the principal, these can be negotiated to ensure the principal isn't absorbing too much risk. The negotiations would include, capping the amount to be claimed, only allowing key resources into the rise and fall, ensuring there is enough proof supporting the change in price.

The limitations of a rise and fall clause, however, would be that there is too much room for ambiguity. The fall part of the clause will almost certainly not be dealt with in an ethical manner, as everyone in

the industry is trying to make a profit. Therefore, is clearer and more appropriate to address the controllable stressors.

The interview discussions defined the need for mandatory professional development for Engineers. There is no current push from Engineers Australia for this to be mandatory unless you are a registered Engineer – to which most are not. The management team of any construction company is generally made up of Engineers/Project Managers who have climbed up the corporate ladder, rather than accountants. The managements lack of experience with financial business becomes a real issue when assessing risk if they do not understand profit and loss and simple accounting sheets.

Assessing risk was also an issue raised by almost every respondent, being able to manage the risk from every stage of the project cycle. The risk begins the moment the contractor or builder engages in the work, however, the risks should be highlighted, raised, and minimised much sooner than engaging in the work. This loops back into professional development and experience within the industry, if the people managing this crucial part of the process are not proficient, they may make mistakes that cost the companies substantial amounts of money, which is then a roll-on effect.

Professional development for employees is seen as an overhead, as it will cost the company money and will not be paid by a client or project. The government could release grants to upskill workers, from the ground up. This would vastly improve the quality of work, which then has an effect on the cost of the re-work, the management of the project and the entire circle.

Procurement and supply-chain management, also highlighted throughout the interviews as a major risk. The supply chain and resources involved are where the debts are harnessed for a contractor. This needs to be managed from a supply level to have items in-stock and readily available, maybe incorporating a ‘just-in-time’ (JIT) model like the automotive industry. The JIT model will reduce waste and allow for projects to have far less money wasted on materials that perhaps were never required, or over-ordered. Obviously, one of the limitations of the JIT model would be for the larger ticket items which need to be ordered months in advance.

In the law industry, there is the bar exam, which ensures practising lawyers have passed their law school, a moral interview, and further exams. The bar holds lawyers accountable, as once they have been disbarred, they may never practice law again. This is not to say the same approach should apply to engineering, but definitely a similar approach, there is still a level of ethical practice and professionalism which needs to be upheld throughout an engineering career.

If there was a standard held, like a bar exam, this would stop people from moving into positions that they most likely are not trained to be in. Unfortunately, this does not work for smaller builders and sub-contractors who may not use engineers. However, they may need mandatory third-party advice on contracts.

Australia already has a large amount of emphasis on training, schooling, university courses, and licenses. However, it needs to be assessed if these courses best set up to ensure the person is qualified to the highest degree. Potentially, it is worth noting that, many people are not trained to run a business due to the lack of courses within the licenses or degrees they already hold. To conclude, there could be benefit in having better structured courses implemented into the already standing licenses and degrees.

The original research questions which were defined at the beginning of the project were answered:

- Are cost-plus contracts the way forward?

Cost-plus contracts work in a companies favour when there is an unquantifiable amount of risk, or a risk that cannot be afforded to be taken on by the engaging contractor. These allow for companies to still engage in the area of expertise, but off-set the risk back onto the principal contractor. Cost-plus contracts work for risk; however, people need to be competent in assessing risk. Managers need training into risk assessment and realising the magnitude of consequences when a risk turns into reality. When there are larger sums of consumables such as steel, concrete and formwork over a longer duration, this contract type may be beneficial. Another area of need may be remote work or where the contractor does not necessarily have relationships with suppliers. Again, this comes down to management assessment.

    - Can there be a legislation on the time-frame validity of fixed-price to protect companies?

Timeframes would depend on economic stability; it would be too challenging constantly changing the timeframes. Management needs to understand economics to a degree, they need to know how long their tender, pricing or contract term should be valid for, without jeopardising the profit of a project. If management were trained or did necessary CPD, they would constantly be learning and informed of the current market. Professionals should all contribute to helping each other learn, sharing experiences of how the economy and pricing is helping or deterring the profit of a company. Engineer's Australia provide CPD conferences, which could be made mandatory for all Engineers in the profession. This would hold professionals accountable and up to date on market trends and legislation.

There could be a place for legislation on solicitors reviewing contracts, contracts are legally binding documents. Without the advice from a solicitor or any legal representative, how can a small builder or sub-contractor make an informed decision. These signatures can place a company in a world of hurt, simply due to not understanding the magnitude of what they are signing.

- Is there a tipping point?

The tipping point starts when an untrained professional is put in a position, they maybe are not yet ready for, without the relevant training or competencies. Unfortunately, in people-poor time, many employees are being pushed up the corporate ladder, maybe sooner than they should be. This leads to mismanagement and poor leadership. The tipping point begins when someone does not recognise their need to upskill and ensure they have the knowledge and skills to provide the role with the experience needed.

- Would more auditing and regulated reporting structures help?

Reporting structures and applications are only as accurate as the data they receive, professionals need to understand the importance of the data they are providing and ensure it is accurate to give a proper and true result. Ensuring that only accountants who are qualified are able to provide financial support, would help to a degree, however, it is expensive to mandate the need for in-house accountants. Engaging with third parties and accounting firms who specialise in construction and liquidity would aid the situation.

- Should there be mandatory education on financial reporting?

Reporting and reading profit and loss statements is a crucial part of management and knowing when a company is in a bad financial position. If training was regulated onto engineering companies, then the quality of reporting may improve.

- Would mandatory third-party financial reporting help?

Some businesses may not be able to afford this, however, third party training would ensure a legislative standard of practice for companies to report too. This would also set a standard for Engineers to follow.

- Do the government's current legislations help?
  - SOPA

SOPA does aid contractors; however, it favours contractors over the principal builder. Therefore, the usual payment disputes over quality issues etc, are almost suffering due to the level of authority the SOPA holds. However, this only is helpful if the principal contractor has the money to pay, if they don't, then you are chasing for something they may not have. There needs to be more regulations around ethically trading whilst knowing the company is on its way into administration. There is a definite lack of transparency across the industry, which can result on devastating knock-on effects onto the smaller sub-contractors, who are ultimately torn down when a builder goes into administration.

Legislations are only as useful as the person implementing them, the Commercial Manager and team need to know exactly what steps to take to ensure that they have the best chance of a positive outcome and being paid.

- Alliance model

Further research needs to be done in this area, none of the respondents had too much experience in this area. Two of the respondents had previously worked joint venture major projects as a subcontractor, for an alliance project. The respondents seemed to believe there was still usually a divide between the companies who have joined the alliance. There was finger-pointing and sometimes competition between them – this defeats the purpose. However, this would come down to the way the project is managed and how the staff are all treated. Further research can be done into this topic as a standalone project.

- Government grants

Government grants help to drive the economy in some respects. However, the shift in government spending is often so radical, companies struggle to adjust with it. For example, the government is cutting investment into infrastructure and instead investing into energy. For civil and building construction companies, this could mean huge decline in work. Managing the decline in work is indicative of whether a company survives these changes. Again, if Engineers and managers had to attend mandatory training on current affairs and economic factors, cash-flow modules etc. they may be far better equipped to deal with these stressors.

Government grants can also become a hinderance and an aggravation to an already worsening issue. The homebuilder grant amounted to large amounts of people signing onto building new homes as they received a $25,000 grant. This meant that an industry who was already struggling from supply-chain issues was about to feel a lot more heat. Leading to amounting delays and inability to source the materials needed.

To conclude, there are a magnitude of factors that directly contribute to the ultimate failure of a company within the construction industry. The industry is experiencing a 10-year all time high in rates of liquidation. This paper identified through interviews, the main contributing factors and from this has realised mitigating measure that can be implemented to deter the rates of liquidation.

Mitigating measures:

1. Education – this is paramount to a company's success, input, and financial results out are only as accurate as the data input. Management across the industry need access to crucial financial reporting training, risk management training, and basic economics understanding.
2. Abolishment of Fixed Price/Lump Sum – this will allow for fairer pricing, and the ability to move with the unpredictable economy.
    a. If this cannot be achieved, mandatory rise/fall clauses.
3. Accountability for Engineers – there is an ethical duty to behave and report in a manner that is accurate. The knock-on effects of a larger company's collapse, tear down smaller companies with them, and creditors and employees are left owed millions of dollars.
4. Government Grants – in construction, these need to follow the trends of the economy. The government tends to hand-out grants to the consumer rather than a business. When the economy is thriving, and builders are struggling to keep-up with the exacerbated industry, grants to aid the builders will help. This will push the economy even further, allowing for more projects to be taken on.

There can be more measures to mitigate the problem, these are a starting point, found from this study. Future research can aim to investigate on a wider scale, interviewing governing bodies and larger institutes who can offer help. The importance of this study essentially is to help the Australian economy and try benefit the construction industry's ruthless nature.

5.2 Limitations

This study was conducted once the researcher had extensively researched the proposed topic, and realised the research done prior had been very specific to each issue, rather than looking at the whole larger picture. Limitations relate to the areas of the research which can be improved, and need to be considered when analysing the data as they are considered weaknesses in the study and may influence the results.

One limitation would be that there were only males interviewed, this is a male dominated industry. Only 12% of the construction industry are female (Davies 2022). Females do think differently and may of have a different viewpoint on the matter. There were three females who were asked to participate, but due to personal circumstances, couldn't participate in a timely manner.

Another limitation was the size of the study, there were only 10 people interviewed. This does not diversify the answers enough, if the research had conducted more interviews Australia wide and included 10 people from each role, there would be reason and evidence to conclude a definite pattern seen.

Interviews also pose a threat to personal bias; people will often lean toward an answer that they believe the interviewer is looking for. This can cause skewed results – there is a grey area when there are no numbers involved and quantitative data. The responses from the interviews are subjectively true and based on opinion.

This is a dissertation project, therefore there is a time constraint. Interviews are a very time-consuming process, they have taken 10 hours to conduct the interview, as well as a further 1 hour per interview to collate the notes into a format that's presentable. Interview based research is solely dependent on the experience of the interviewer – therefore this can be perceived as a limitation.

The data is not easily presented either, seeing as it cannot be put into tables and graphs. There are masses of opinions, which ultimately have led to a very similar conclusion in this case. With qualitative data, the way the data is presented is paramount to ensure the reader can conclude the similar or same conclusion as the researcher.

4.4 Significance of Work

The significance of this work is the current issue of companies entering liquidation and administration in Australia is unprecedented, non-sustainable and alarming. Australia is currently in the midst of a construction insolvency crisis, which needs addressing.

This dissertation has found through interviewing, a similar trend within every facet of construction businesses, there is a severe lack of training, knowledge, and professionalism in this industry. The industry is not regulated for professionals, there are licenses and degrees which are obtained, then there is no further need to educate.

This dissertation could be published once complete, as there are findings which are useful to a governing body, like Engineers Australia. Queensland is currently the only state which holds mandatory registration of Engineers; however, this only holds for certain positions within the company.

This research could enable a push for more regulation regarding the professional status of practising Engineers, further training into facets of a person's professional development. If the people who are managing the risk, cash-flow, contracts, and people are fully trained and competent, potentially there would be a decrease in the quantity of bankruptcies in the construction industry.

4.5 Further Research

There is still an overwhelming amount of research which can be conducted on this topic. The first and most obvious space for research would be to interview more participants – although it would be expected to find similar answers. The research could also be conducted at a different time in the economy, as this will affect the way people view the issues and positives, psychologically the responses would vary hugely.

There could also be further research around the differences between companies who do upskill and train their workers, against companies who do not. Comparison of the quality of financial reporting, this could also give quantitative data. The quantitative research could be:

- Percentage of profitable projects.
- Margin between budgeted (forecasted) profit vs actual profit.
- Margin between tendered profit vs actual profit.

Quantitative research does make simpler reporting, it removes room for speculation or opinion. It is straightforward to stipulate with figures and graphs unless the data provided isn't correct.

Further research could also be conducted with smaller builders and small subcontractors. It is evident and obvious that they have the least amount of training and knowledge around accounting and legal matters with contracts. However, the option of mandating professionals within those industries to enter their business may not be feasible cash-wise. The building license does not require any financial training, potentially the building license needs to be more difficult to obtain. By incorporating business training modules and basic accounting modules, businesses will be better equipped to carry out running their small business. Further research would include, giving extra training to building license holders, then interviewing what they have learned from the courses, and will it help or change the way they run their business.

Appendix A – Project Specification Document

ENG4111/4112 Research Project

Project Specification

For: Thea Lennon

Title: Stressors and Failures of Companies in Construction

Major: Civil Engineering

Supervisors: Steven Goh

Enrollment: ENG4111 – EXT S1, 2023

ENG4112 – EXT S2, 2023

Project Aim: Identify the main reasons construction has the highest liquidity rates of any industry. Assess the procedures currently in place (Alliance projects, SOPA), procedures that have been tried and failed – is there a solution?

Programme: Version 1, 19th March 2023

1. Review existing literature on the topic
2. Examine the existing procedures in place
    a. Alliance projects
    b. IPD projects
    c. Security of Payment Act
3. Theoretical Framework
    a. Basis for research
    b. Gaps in knowledge already conducted
    c. How to advance the theory
4. Find an existing survey and conduct a focus group to analyse the survey and adapt to assure more specific responses
5. Design my own questionnaire/survey
    a. Distribute to a pilot group initially
    b. Conduct 2-3 interviews as a test
    c. Review and revise questions asked
    d. Collect qualitative data
    e. Analyse
6. Compile results
    a. Answer the main questions of the thesis
        i. Is there a way to improve the issue?
        ii. Where is the threshold for liquidity – can this be monitored and better predicted to mitigate?
        iii. Is there a way to protect subcontractors further down the multitier structure?
    b. Conclusion from the above
7. Communicating with Steven via Teams call every 2 weeks – as discussed

Appendix B – Risk Assessment & RDMP

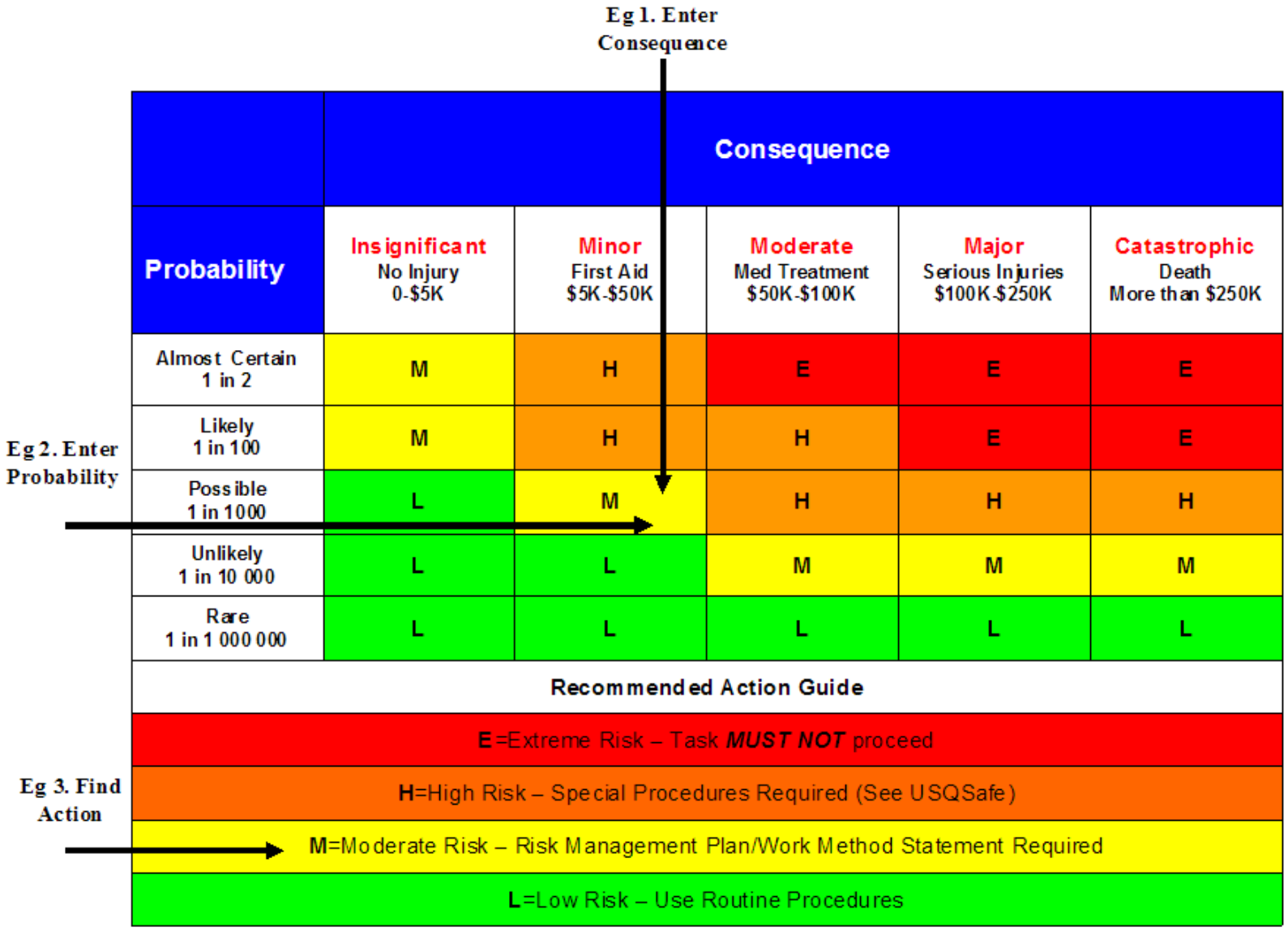
University of Southern Queensland **Offline Version**

USQ Safety Risk Management System

Note: This is the offline version of the Safety Risk Management System (SRMS) Risk Management Plan (RMP) and is only to be used for planning and drafting sessions, and when working in remote areas or on field activities. It must be transferred to the online SRMS at the first opportunity.

Safety Risk Management Plan – Offline Version			
Assessment Title:	Stressors and Failures of Construction Companies – Interviews & Questionnaires	Assessment Date:	24/03/2023
Workplace (Division/Faculty/Section):	ENG4111-4112 – Research Project	Review Date:(5 Years Max)	24/03/2024

Context			
Description:			
What is the task/event/purchase/project/procedure?	Interview / Questionnaire		
Why is it being conducted?	Thesis		
Where is it being conducted?	Queensland, Australia		
Course code (if applicable)	ENG4111 - 4112	Chemical name (if applicable)	N/A
What other nominal conditions?			
Personnel involved	Thea Lennon, Steven Goh, Respondents to questionnaire / interviews		
Equipment	Microsoft , teams , meeting points		
Environment	Office, Library, Interviewing room		
Other	N/A		
Briefly explain the procedure/process	Conduct background research, create questionnaire, distribute to sample, analyse data		
Assessment Team - who is conducting the assessment?			
Assessor(s)	USQ		
Others consulted:			


Eg 1. Enter Consequence
Eg 2. Enter Probability
Eg 3. Find Action
Consequence
Probability
Insignificant
No Injury
0-$5K
Minor
First Aid
$5K-$50K
Moderate
Med Treatment
$50K-$100K
Major
Serious Injuries
$100K-$250K
Catastrophic
Death
More than $250K
Almost Certain
1 in 2
M H E E E
Likely
1 in 100
M H H E E
Possible
1 in 1000
L M H H H
Unlikely
1 in 10 000
L L M M M
Rare
1 in 1 000 000
L L L L L
Recommended Action Guide
E=Extreme Risk – Task MUST NOT proceed
H=High Risk – Special Procedures Required (See USQSafe)
M=Moderate Risk – Risk Management Plan/Work Method Statement Required
L=Low Risk – Use Routine Procedures

Step 1 (cont)	Step 2	Step 2a	Step 2b	Step 3			Step 4				
Hazards: From step 1 or more if identified	***The Risk:*** What can happen if exposed to the hazard without existing controls in place?	***Consequence:*** What is the harm that can be caused by the hazard without existing controls in place?	***Existing Controls:*** What are the existing controls that are already in place?	***Risk Assessment:*** Consequence x Probability = Risk Level			***Additional controls:*** Enter additional controls if required to reduce the risk level	***Risk assessment with additional controls:***			
				Probability	**Risk Level**	**ALARP? Yes/no**		**Consequence**	**Probability**	**Risk Level**	**ALARP? Yes/no**
Project Preparation Phase											
Thesis proposal	No approval to commence project from USQ	Moderate	Begin having early conversations with USQ Supervisor to ensure project approval is given prior to commencing project	Possible	Moderate	No	Begin proposal with plenty of time	Minor	Unlikely	Low	Yes
Searching for resources and respondents	No resources found	Major	Begin acquiring resources once project is approved	Possible	High	No	Have a pre-conceived plan for sourcing respondents	Minor	Unlikely	Low	No
Modelling of Survey											
Sourcing sample group	Not enough variations and inappropriate size	Moderate	Ensuring the sourcing begins early	Possible	High	No	Ensure the survey is spread amongst differing roles, conduct a filter phase	Moderate	Unlikely	Moderate	No
Question selection	Non concise questions	Moderate	Based upon research and stressors indicated from research. Remain on topic	Possible	Moderate	No	Directly link the questions asked to the goal of the project, revise. Use pilot survey feedback	Minor	Unlikely	Low	No
Emotion issues	Emotional risk – triggering questions	Moderate	Utilise common sense, don't ask personal questions	Possible	High	No	Ensure all respondents are briefed on the premise of the project	Moderate	Possible	High	Yes
Ethical concerns	Ethical concern – respondents giving away sensitive information	Major	Follow ethical guidelines	Possible	High	No	Create a clause stating that all information is to be used for project purposes, therefore no names or sensitive information to be given	Minor	Unlikely	Low	No
Quantity of responses	No/fewer responses given	Moderate	Have contingency respondents	Possible	Moderate	No	Vet the sample group, ensure they are going to return the survey. Prepare for less responses with contingency participants	Minor	Unlikely	Low	No
Risk of meeting a stranger in person	Dangerous situation, safety of myself	Major	Interview in person only known people/referred respondents. Meet in a public place.	Unlikely	Moderate	NO	Preferably interview via teams (online)	Moderate	Unlikely	Moderate	NO
Data Analysis											
Analysing data being timely	Data takes a long time to analyse, qualitative responses are hard to interpret	Moderate	Follow project plan	Unlikely	Moderate	No	Ensure sufficient time has been set to complete. Commence as data comes through	Minor	Unlikely	Low	No
Putting results into thesis											
Time to transfer analysis into thesis	Insufficient time to write up results and communicate them to a high standard	Moderate	Follow project plan	Possible	Moderate	No	Start a draft based off assumptions, regularly committing time each week to writing the thesis. Seek regular reviews from supervisor	Moderate	Unlikely	Moderate	No

Step 5 - Action Plan (for controls not already in place)			
Additional controls:	*Resources:*	*Persons responsible:*	*Proposed implementation date:*
To be confirmed with supervisor			Click here to enter a date.
			Click here to enter a date.
			Click here to enter a date.

Step 6 - Approval					
Drafter's name:	Thea Lennon			Draft date:	24/03/2023
Drafter's comments:					
Approver's name:	Steven Goh	Approver's title/position:	Supervisor		
Approver's comments:					
I am satisfied that the risks are as low as reasonably practicable and that the resources required will be provided.					
Approver's signature:				Approval date:	Click here to enter a date.

Risk Assessment [Ref Number: 2180]

Date Printed: Saturday, 13 May 2023

Name	Stressors and Failures of Construction Companies - Research Risk Assessment	Current Rating	Residual Rating
		Low	
Location	**Off Campus: Gold Coast Brisbane Teams - online**		

Business Unit	Last Review Date	Risk Owner
USQ Council	24/03/2023	Thea Lennon

Risk Assessment Team	Risk Approver
Thea Lennon Participants - not yet found all.	Steven Goh

Additional Notes

Describe task / use

I will be conducting questionaires and interviews with participants. Finding out information relating to my thesis, the issue of liquidity and insolvency rates in construction.

ENG4111 - ENG4112

Risk Factors

Risk Factor	Personal and Behavioural

Description

Meeting someone in person - could be a risk if they are not a known person

- Is there the potential for hazards created by:
- Aggressive behaviour, both physical and verbal? -- Yes
- Harrassment? -- Yes
- Failure to follow policies and procedures? -- Yes
- Inadequate training? -- Yes
- Violence and crime? -- Yes
- Could workers or students be affected by fatigue?
- Could workers or students be affected by experiencing or witnessing traumatic events? -- No

Low	

Existing Controls	Proposed Controls		
	Description	Responsibility	Target Date
• 2 - Substitution: Interview in person only known people/referred respondents. Meet in a public place.	Preferably interview via teams (online)		30/03/2023

Risk Factor	Psychological Organisational Factors

Description

Leaking of people's names and companies and responses - could result in employment issues

- Consider the following organisational factors that may have an impact on a persons mental health in the workplace:
- Role conflict or ambiguity? -- Yes
- Workplace relationships? -- Yes

Existing Controls	Proposed Controls		
	Description	Responsibility	Target Date
• 5 - Administration: Only I will have access to the information. I will not use any names or company names.	I will provide consent forms and ensure all participants know what information will be published.		30/03/2023

Appendix

Documents Referenced

U1129549_RMP_THESIS_THEA_LENNON

Risk Matrix Level	
Very Low	Task can proceed upon approval of the risk assessment by the relevant supervisor, manager or higher delegate
Low	Task can proceed upon approval of the risk assessment by the relevant supervisor, manager or higher delegate
Medium	Task can proceed upon approval of the risk assessment by a Category 4 or higher delegate
High	Task can only proceed in extraordinary circumstances provided there is authorisation by the Vice Chancellor
Extreme	Task must not proceed. Appropriate and prompt action must be taken to reduce the risk to as low as reasonable practicable

ATTACHMENTS

Appendix C – Consent Form and Information Sheet

University of Southern Queensland

University of Southern Queensland
Consent form
Interview

UniSQ HREC Approval number: HXXREAXXX

Project Title

Stressors and Failures of Construction Companies – Interviews & Questionnaires

Research team contact details

Principal Investigator Details

Dr Steven Goh
T: [redacted]
M: [redacted]
E: [redacted]

Co-investigator details

Miss Thea Lennon
M: [redacted]
E: [redacted]

Statement of consent

By signing below, you are indicating that you:

- Have read and understood the information document regarding this project. ☐ Yes / ☐ No
- Have had any questions answered to your satisfaction. ☐ Yes / ☐ No
- Understand that if you have any additional questions, you can contact the research team. ☐ Yes / ☐ No
- Are over 18 years of age. ☐ Yes / ☐ No
- Understand that the interview will be audio/video recorded. ☐ Yes / ☐ No
    - Understand that you can participate in the interview without being audio/video recorded. ☐ Yes / ☐ No
    - If you **do not** want to be audio/video recorded during the interview, please initial here:
- Agree to participate in the project. ☐Yes / ☐ No

Name (first & last)			
Signature		**Date**	

Thank you for taking the time to help with this research project.

Please return this document to a research team member before undertaking the questionnaire.

University of Southern Queensland

University of Southern Queensland
Participant Information Sheet
Interview

UniSQ HREC Approval number: HXXREAXXX

Project Title

Stressors and Failures of Construction Companies – Interviews & Questionnaires

Research team contact details

Principal Investigator Details

Dr Steven Goh
T: [redacted]
M: [redacted]
E: [redacted]

Co-investigator details

Miss Thea Lennon
M: [redacted]
E: [redacted]

Description

This project is being undertaken as part of an Honours in Civil Engineering through the University of Southern Queensland.

The purpose of this project is to investigate and analyse the issue with insolvency rates in the construction industry.

Participation

Your participation will involve completion of an online questionnaire that will take approximately 30 minutes of your time.

Questions will include ten to twenty indicative questions of the overall theme of the questions containing within the questionnaire.

Your participation in this project is entirely voluntary. If you do not wish to take part, you are not obliged to. If you decide to take part and later change your mind, you are free to withdraw from the project at any stage. You may also request that any data collected about you be withdrawn and confidentially destroyed.

If you do wish to withdraw from this project or withdraw data collected about yourself please contact the Research Team (contact details at the top of this form).

Your decision whether you take part, do not take part, or take part and then withdraw, will in no way impact your current or future relationship with the University of Southern Queensland.

Expected benefits

It is expected that this project will not directly benefit you. However, it may benefit you in a sense to have a deeper understanding of the main stressors that provoke liquidity.

Risks

In participating in the interview there are no anticipated risks beyond normal day-to-day living.

Privacy and confidentiality

All comments and responses are confidential unless required by law.

- The interviews will be audio and/or video recorded for transcription purposes.
- The recording will not be used for any other purpose
- The only people with access to the recording will be the Principle and Co-investigator.
- It is possible to participate in the project without being recorded.

A summary of research findings can be provided if requested.

Any data collected as a part of this project will be stored securely, as per University of Southern Queensland's Research Data and Primary Materials Management Procedure.

Consent to participate

We would like to ask you to sign a written consent form (enclosed) to confirm your agreement to participate in this project. Please return your signed consent form to a member of the Research team prior to participating in your interview.

Questions

Please refer to the Research team contact details at the top of the form to have any questions answered or to request further information about this project.

Concerns or complaints

If you have any concerns or complaints about the ethical conduct of the project, you may contact the University of Southern Queensland, Manager of Research Integrity and Ethics on +61 7 4631 1839 or email researchintegrity@usq.edu.au. The Manager of Research Integrity and Ethics is not connected with the research project and can address your concern in an unbiased manner.

Thank you for taking the time to help with this research project. Please keep this document for your information.

Appendix D – General Manager interview notes example

General Manager:

What does the company see as the biggest risk items when entering a project?

- Changes depending on different sector:
    - Building (28% of work)
        - Financial viability of the client – credit check. Depends on transparency of the company. Will only pick up if listed on ASIC – or failed debt that has been notified…
        - Cash-flow does not come up on credit check. Check history, call other contractors who have worked there… find out non-payment. Call suppliers eg concrete and steel and see if they've been paid.
        - High return though because we will put margin on top of materials. Uncapped margins – civil maybe 5% capped margin.
    - Product base – they are so risky as there are so many external issues where things can go wrong. Anchoring – can be stuffed, dewatering, excavating and over digging. Reduce works with external stakeholders.
    - Infrastructure
        - Larger clients – typically international, not as much risk
        - Usually well established – well educated.
        - Government client – not high risk..
        - Legislation rolls through on job to job, which means they are happy getting paid and passed down the chain to us.
        - High risk – BIG change (Variation), Commercial Risk.
        - Quality of work risk – concrete placement, liability – placing defective concrete and not being aid.
        - Tendering – QLD highest concrete durability limit, poor placement. Need to raise RFI's initially and be picked up.
    - Global Risk
        - People and education of people

Is there any training or implementation of regulations which is overlooked? E.g., using SOP appropriately

- From online management systems – manage the biggest NCR's and train on these. It shows and adds value when used properly.
- Concrete Risk

- Changeover from 60 y olds to 40 y olds
- Looking after plant
- Time management course – you have to prioritise.
- Upskilling – costs money but great returns

What are the current biggest stressors in the industry/on the business?

- People – industry wide
    - Huge shortage
    - Less engineers
    - Boom going on with no money
- Managing amount of work taken on due to the people you have employed
- Companies grow to quickly
- High margins to ween out the jobs which aren't worth it.
- Different locations – From NT to TAS – diversify to diversify suppliers.
- Suppliers – will only use a reliable contractor. Not depend on location.
- Overpaying – this is warping the industry.

Why does false and misleading reporting happen? Is there anything that can be done to stop it? I.e., austral

- Why?
    - Engineers who get promoted to senior managers without financial education. They need education prior to promotion to senior managers.
    - Explanation of finances and why they are so important – need a mentor.
    - Looking at a balance sheet – accruals, report sales
    - Senior - Financial incompetence
    - Junior level – Younger engineers on micro level (individual project) they are hugely positive people, they want to report the best figures. Naïve and positive – nice bloke attitude. Contractor will keep you happy while you are on site – stay nice until the end.
    - Back charges will come at the end to keep us happy while onsite. Are not seen.
    - Relationship with the accountant – Profit and Loss sheet (P&L). Needs to be done monthly and reporting period years.

- Long-term
    - Understanding external factors – market factors
        - Infrastructure spending – melb off, qld capped…
        - Power, roads, bridges
        - 70% of spend on power will be now
        - 30% infrastructure now
    - 70 to 30% budget

Does the business have a procedure or an idea of when financial distress is on the cards?

- Currently have companies on payment plans… easier than SOP. Depends on the relationship with the client. SOP may send them insolvent..
- P&L sheet
- Live cashflow – online systems – sales and payments through that. Very true idea of what goes in and out.
- Keep a lot of cash in the bank… when the cash isn't there, keep the tracking there.
- Huge upfront costs on large jobs – if multiple jobs at the same time
- Strategy at the front end – don't strain everyone. Keep management in place at all times.

Is there anything in place to help 'subby bashing' culture? / Dispute Management issues

- SOP – enact when needed
- Hardly used to use, currently using SOP
- Back charges and silly claims
- Don't get black mark against your name for using SOP – maybe its used now??
- Cost of stopping won't be paid – better off just working.. Contract in place to continue work.. In act SOP and also in the project contract..
- Come up with a strategy to make the client talk within the contract
    - So you can take everything off site prior to the administration before the gates are locked

Do you tend to see correlations between projects that lose money?

- Yes
    - Job is poorly tendered
        - Try pull in tight at the start, set a budget and try get 5% profit margin. Try and let the PM know at the start it isn't a good job.
        - Could have strategically taken a job for a good client.
        - Company level could be a winner – could be taken for differing reasons.
    - Job is poorly run
        - Good PMs understand risks and costs – control and identify and stay on top of the risk. Loss is taken at tender and delivered at the loss known.
        - Poor/Junior PM doesn't foresee the risk and mitigate the loss. Can have a give up mentality. Horrifically bad losses. If it's broken, not trying to fix it.
- Loose money ethos – keep money tight. Stay lean. No monster profits. Subsidiaries.

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