Nexus of Heuristics and Accounting Information in Capital Investment Decision Making

by

Victoria Grech

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FACULTY/INSTITUTE/CENTRE/SCHOOL Faculty of Economics, Management and Accountancy

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Abstract

TITLE: Nexus of Heuristics and Accounting Information in Capital Investment Decision Making

PURPOSE: The objectives of the study are to (i) analyse the capital investment decision-making process and the factors influencing the decision-makers during this process, (ii) understand how concepts of heuristics and bounded rationality impact capital investment decisions in local food manufacturing and processing businesses, (iii) investigate to what extent, if any, do heuristics and bounded rationality take precedence over management accounting information in capital investment decisions, and (iv) investigate the role of the accountant as an adviser and the role of the accounting information provided by the accountant in the decision-making process.

DESIGN: To achieve the objectives of the study, a qualitative approach was adopted where semi-structured interviews were held with twenty-one participants (decision-makers, accountants, and advisory consultants) to gain an insight into the capital investment decision-making processes in SMEs and how these decisions are guided by heuristics and/or management accounting information.

FINDINGS: The findings indicate that decisional heuristics and bounded rationality are ingrained in the capital investment decision-making process in the businesses interviewed. Factors such as resource (cost and time) constraints, cognitive limitations, and pseudo-perceived usefulness or uselessness of management accounting information impinge on the process and results thereto. Insofar as there is no identified need for involvement of the accountant and use of management accounting information, heuristic decision-making supersedes more rational forms of decision-making. Where more resources are available, management accounting information is given precedence in discussions on capital investments.

CONLUSIONS: The study concludes that capital investment decision-making guided by heuristics is not erroneous, rather it makes sense where limitations exist and the decision-makers' knowledge and bias are rooted in experience. As companies increase in size, more accounting techniques and information are usually involved since there are more decision-participants, more resources available and there is a shift in mindset towards more professionality. The nexus of heuristics and accounting information describes where both bounded rational means of decision-making and some form of accounting information is used to drive capital investment decisions.

IMPLICATIONS: This study sheds light on the decision-making processes in local SMEs and acknowledges that in some cases, there is no need for further involvement of an accountant and the decision-maker knowledge is sufficient. Notwithstanding, the importance of using both heuristics and accounting information was identified, and this serves as encouragement for accountants to provide consultancy services, governments to push their fundings for such services and decision-makers to seek information.

KEYWORDS: Capital investment decision-making; heuristics; bounded rationality; management accounting information

Dedicated to my dear Grandpa Victor,

who continues to guide, inspire, and protect me from the heavens

1946 - 2022

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List of Abbreviations

BoD – Board of Directors

CapEx – Capital Expenditure

CGMA – Chartered Global Management Accountant

CI – Capital Investment

CIDM – Capital Investment Decision-Making

DM – Decision-Making

EEG - Electroencephalogram

ESG – Environmental, Social and Governance

FMCG – Fast-Moving Consumer Goods

HACCP - Hazard Analysis Critical Control Point

MA – Management Accounting

MAI – Management Accounting Information

SMEs – (Micro), Small and Medium-sized Enterprises

Chapter 1: Introduction

1.1 Introduction

The introductory chapter of this dissertation provides an overview of the study, defines key terms, and sets the tone. A background to the topic is presented whereby notions discussed throughout the dissertation are defined and rationalisation for the study is provided. The objectives are set and limitations to the study are also identified. Finally, an overview of the dissertation is provided at the end of the chapter.

1.2 Background to the Study

Aiding management in decision-making (DM) is a fundamental function of management accounting (MA) (Drury 2020). The provision of MA information (MAI) regarding the financial implications of a decision aids managers in taking informed decisions. A lack thereof and other factors such as time and resource constraints, education and contextual factors result in the employment of heuristics and concepts of bounded rationality to arrive to conclusions regarding capital investments (CIs) (Morales Burgos, Kittler et al. 2020). The nexus of heuristics and accounting information will be explored in this study among local food manufacturing and processing companies.

1.2.1 Capital Investment Decision-Making

Capital Investment Decision-Making (CIDM) involves decisions on

> "*substantial investments that involve high levels of risk, produce hard-to-quantify (or intangible) outcomes, and have a significant long-term impact on corporate performance*" (Alkaraan, Northcott 2006, p.150).

CIs involve investing in new machinery, business acquisitions, adoption of new processes and development of new products (Emmanuel, Harris et al. 2010). The working definition of CI decisions used in this study will emphasise on decisions which have a strategic implication on the operations of the company.

The definition is not limited within a monetary threshold since a relatively small investment for a medium-sized company may be a major investment for a micro company.

The study will analyse the CIDM process from the lens of bounded rationality and heuristics in order to understand the implication of these cognitive limitations on the CIDM process. The various stages of the CIDM process, and how these are impacted by heuristics will be defined on the basis of the results of the primary research. Established literature, such as the circular-iterative model suggested by Liberman-Yaconi, Hooper et al. (2010) will support this understanding.

1.2.2 Bounded Rationality

Herbert Simon initially introduced the notion of bounded rationality in 1955 as a "*theory of the behaviour of a human individual or of groups of individuals who are making decisions in an organisational context*" (Simon 1955, p.114). Bounded rationality refers to the cognitive limitations which hinder decision-makers from taking optimal decisions and pursue decision which are satisfactory (Niittymies 2020). Rationality as opposed to bounded rationality are the two antithetical dimensions on the spectrum of the DM process. Most decisions are taken with some element of rationality but are also impacted by heuristics and cognitive biases when information available is incomplete or limited (Jokhu, Rokhim et al. 2019, Liberman-Yaconi, Hooper et al. 2010). Incompleteness of information may be internally or externally imposed. This study will look into the extent to which CI decisions among local decision-makers are rationally bounded and what factors result in the divergence from rationality.

1.2.3 Heuristics

Heuristics are *rules of thumb* decision-makers employ to abbreviate the DM process on the basis of their knowledge, experience, and biases (Burmeister, Schade 2007, Cruciani 2017, Gigerenzer, Gaissmaier 2011). Diverging opinions

of heuristics are often a topic of debate within the theoretical framework of organisational cognition neuroscience. Gigerenzer's (1991) school of thought argues that heuristics are not a lesser means of arriving to decisions but are a means which facilitate DM. On the other hand, Kahneman and Tversky (1973) argue that heuristics are bounded ways of thinking which limit rationality and consider them a source of error in the DM process (Forbes, Hudson et al. 2015, Hands 2014, Petracca 2017). This study will take an objective stance and consider both sides of the argument during the research process.

1.2.4 Management Accounting Information

> "*MA is the sourcing, analysis, communication and use of decision-relevant financial and non-financial information to generate and preserve value for organisations"* (Chartered Global Management Accountant [CGMA] 2017, p. 8).

CGMA (2014) define one of the key functions of MA as the provision of timely information for DM. Notwithstanding, the utility of MAI is contingent on a number of factors, such as presentation and relevance (Hall 2010, Saukkonen, Laine et al. 2018). This study will determine the extent to which MAI is used in the CIDM process.

1.2.5 Role of the Accountant as an Adviser in the Decision-Making Process

When acting as advisers, accountants are bound to provide financial figures so as to aid management in taking CI decisions which best align with the achievement of corporate goals (Frémeaux, Puyou et al. 2020). Accountants are often the main source of advice for small businesses and hence play a key role in strategic planning and DM. External accountants are often seen as a *one-stop shop* for small businesses and provide management consulting services as necessary for their clients (Gooderham, Tobiassen et al. 2004). This study will endeavour to understand to which extent accountants are involved in the CIDM process, their evolving role as advisers, what information they are requested to provide, and how they fit in the overall CIDM process.

1.3 Need for this Study

This study will illustrate the processes undertaken in terms of CI decisions in a number of companies in Malta. It will show to which level accounting information is esteemed among the interviewed decision-makers. The study will endeavour to understand the extent to which decision-makers are influenced by their preconceived notions, heuristics, and limited by bounded rationality. This study aims to understand the role and involvement of the accountant in the DM process.

The study aims to define and describe the intersection between heuristics and accounting information in the CIDM process. By understanding the extent to which the two are used in the DM process, and the connection (nexus) between them, conclusions can be drawn on their use and how they are related in the CIDM process.

The study can help decision-makers understand the importance of a more holistic approach to CIDM. By understanding the drivers behind their decisions, decision-makers can make mindful decisions by considering all necessary information. It may also deduce the need for more professional business plans, forecasting and involvement of the management accountant throughout the process which would increase their eligibility to benefit from government schemes, such as the *Micro-Invest Scheme*[1], and access to credit facilities.

The research will also help to provide literature in the realm of bounded rationality, heuristics and accounting information, and their impact on decision-makers, which is an area where no previous dissertation was carried out.

[1] The *Micro-Invest Scheme* is a governmental scheme operated through the Malta Enterprise which incentivises micro companies to expand and develop their operations by offering tax-credits for CIs (Malta Enterprise 2021).

1.4 Dissertation Objectives

The objectives of this dissertation are as follows:

1. Analyse the CIDM process and the factors influencing the decision-makers during this process.

2. Understand how concepts of heuristics and bounded rationality impact CI decisions in local food manufacturing and processing businesses.

3. Investigate to what extent, if any, do heuristics and bounded rationality take precedence over MAI in CI decisions.

4. Investigate the role of the accountant as an adviser and the role of the accounting information provided by the accountant in the DM process.

1.5 Scope and Limitations

This study will aim to develop an understanding of the employment of heuristics and bounded rationality, in connection with accounting information in the CIDM process.

Micro, small and medium-sized companies (referred to in this study as SMEs) within the food manufacturing and processing industry will be the subject of the study. The definition of SMEs employed will be as per the EU recommendation 2003/361 (European Commission 2003).

Company category	**Staff headcount**	**Turnover**	or	**Balance sheet total**
Medium-sized	< 250	≤ € 50 m		≤ € 43 m
Small	< 50	≤ € 10 m		≤ € 10 m
Micro	< 10	≤ € 2 m		≤ € 2 m

Figure 1 SMEs definition (EU recommendation 2003/361)

SMEs have been chosen since resource limitations and owner-manager involvement may increase the use of heuristics in the DM process. The SMEs definition is broad enough to allow the study to capture a large spectrum of varying capabilities vis-à-vis DM. The exclusion of large companies is a limitation to the study as no understanding will be gathered on these companies, however, medium-sized companies will allow for differences to be drawn between companies of varying sizes. In the *Food and Beverage Sector Insight* report by Trade Malta (2016), 53.9% of the participants attributed their competitive advantages to their innovative productions. The food manufacturing and processing industry was therefore chosen as CI is imperative for companies to maintain their success in the industry. The industry deals with fast-moving consumer goods (FMCG) and is characterised by the nature of heft and changing dynamics of the market for such goods. Albeit being a limitation in scope, a homogenous population was chosen as more meaningful comparisons may be drawn due to the coherency in the domain of the industry.

1.6 Dissertation Overview

This dissertation is divided into six chapters, all of which are subsequently divided into sections as required. The first chapter has served as an introduction to the dissertation, providing key definitions necessary to understand the rest of the dissertation. Chapter 2 provides a literature review, presented in terms of the objectives of this dissertation, and the third chapter outlines the methodology undertaken in an effort to achieve the set-out objectives. Chapter 4 presents the findings from the primary research undertaken and the fifth chapter provides a discussion of these findings. The fourth and fifth chapter are divided into seven sections, the first and last present an introduction and conclusion to the chapters, whilst the five other sections tackle the four objectives of the study. Finally, Chapter 6 includes concluding remarks on the dissertation, bridging the gap between the extant theoretical framework and findings of the study. An overview of the dissertation is presented in Figure 2.

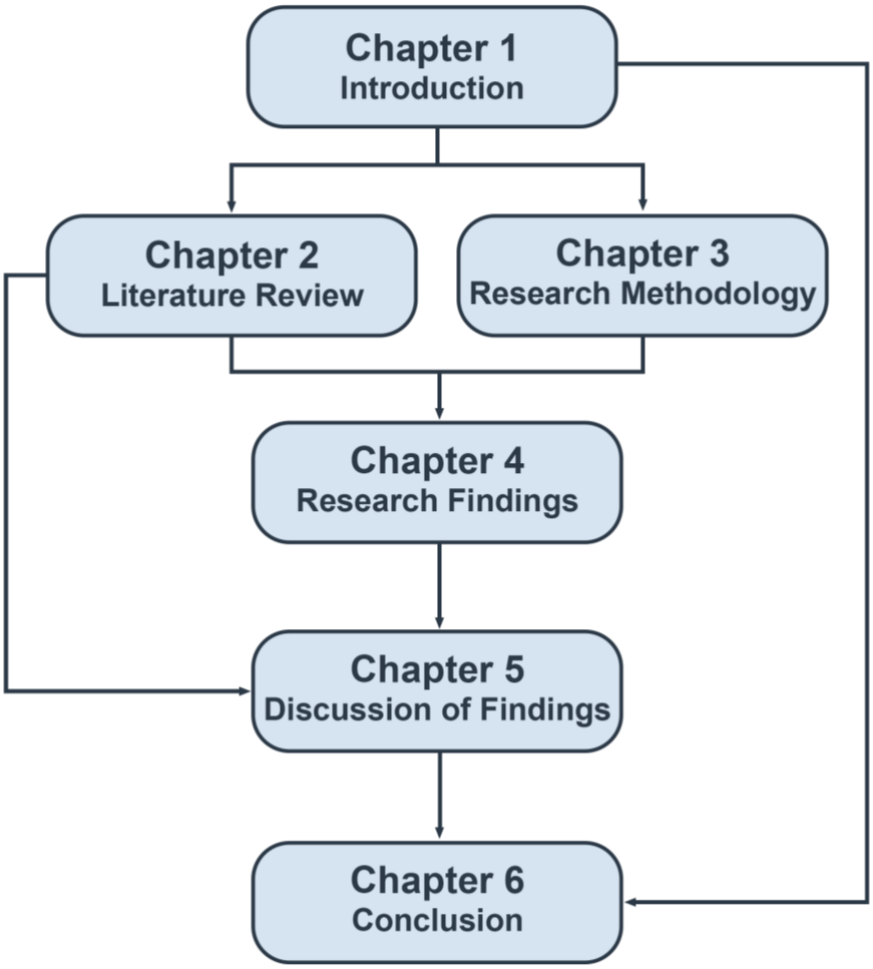

Figure 2 Dissertation Overview

Chapter 2: Literature Review

2.1 Introduction

This chapter duly explores the extant literature on CIDM and how the latter is impacted by heuristics, bounded rationality, and employment of MAI. Studies on the role of the accountant in the CIDM process are also explored.

Section 2.2 delves deeper into the definition of CIDM and explores literature on models of DM and factors impacting DM. Section 2.3 explores the concept of bounded rationality, which is an essential prerequisite to Section 2.4 since an understanding of bounded rationality is necessary to understand the notion of heuristics' implications on DM. Section 2.4 explores the scholarly debate which commands literature in this field, provides examples of heuristics, as well as the rationality behind employment of heuristics. Section 2.5 presents existing literature on MAI, its utility and reliability and how these may be impacted by a number of factors. Section 2.6 goes on to establish the current understanding of the role of accountants in the CIDM process. Finally, Section 2.7 rounds off the literature presented and provides an insight on how the study will further literature in the area.

Figure 3 shows an outline of the chapter which links the sections as described above to the objectives set out in Chapter 1, Section 1.4.

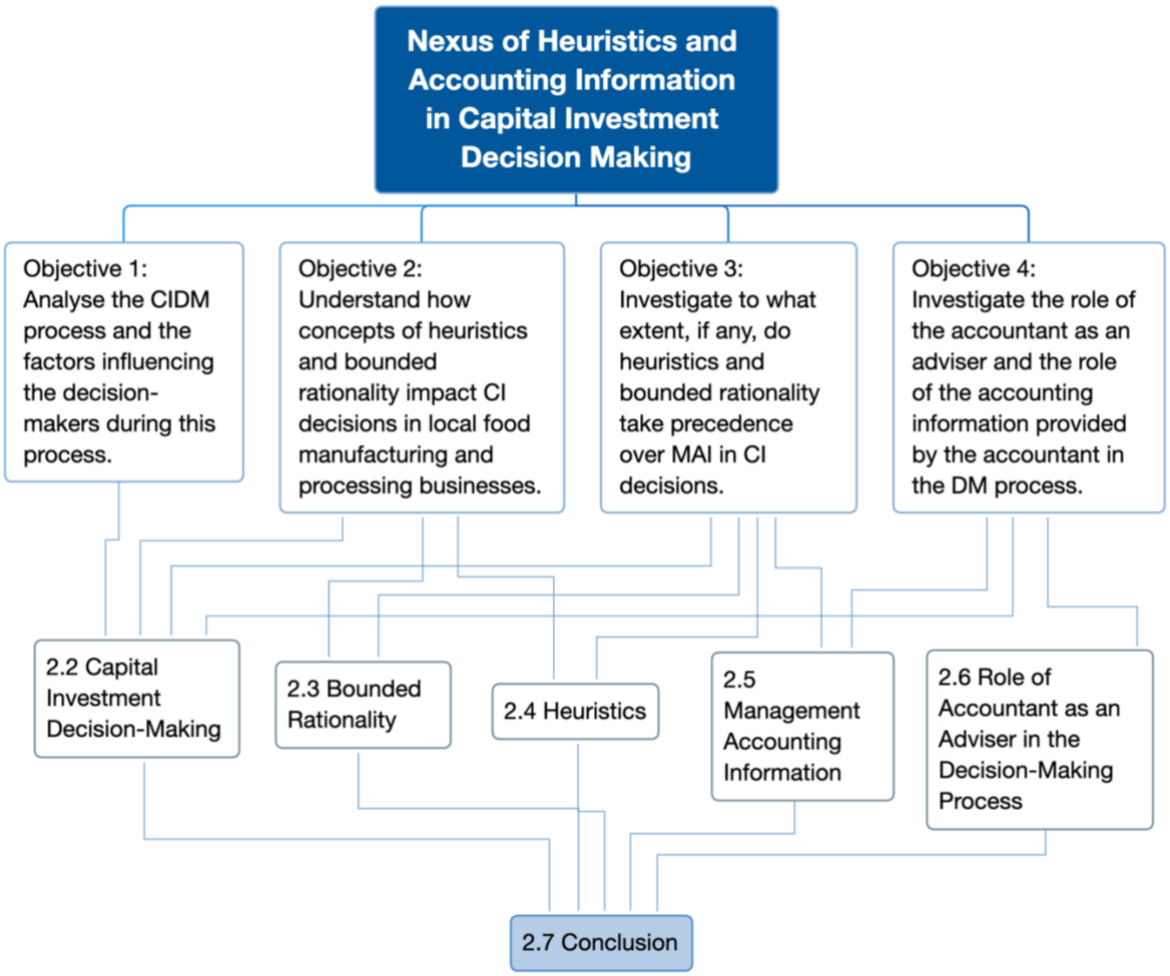

Figure 3 Literature Review Overview

2.2 Capital Investment Decision-Making

CI decisions alter the strategic trajectory of a company and often seek to provide enhanced competitive advantage and improved performance in the form of increased future cashflows over a long period of time; these include investing in new machinery among others (Emmanuel, Harris et al. 2010, Liberman-Yaconi, Hooper et al. 2010, Morales Burgos, Kittler et al. 2020). Such investments involve the outlay of a large sum of money and hence require appraisal prior to undertaking (Shepherd, Williams et al. 2015). Capital appraisal tools (such as *net present value*, *internal rate of return* and *payback period*) enable project ranking and DM based on objective financial data (Drury 2020, Pike, Neale et al. 2018). However, the negative implications of over-simplifying CI decisions to

purely financial data have also been reported (Shepherd, Williams et al. 2015). Lima, da Silveira et. al (2017) noted how formalisation is not often necessary in smaller companies and complex analytical and prediction tools are unnecessary for investment decisions, unless required by credit institutions for financing purposes. *Gut-feeling* DM is predominant among smaller companies and simple DM schemata are preferred over complex rational methods due to the logistics of smaller companies (Lima, da Silveira et al. 2017, Jokhu, Rokhim et al. 2019, Liberman-Yaconi, Hooper et al. 2010).

2.2.1 Decision-Makers in SMEs

The participants in the DM process vary according to the size and management of the company. Smaller companies' decision-makers are usually one or two individuals who also own and/ or manage the company. As companies get larger, more decision-participants are involved, ranging from management to members on the board of directors (BoD) (Musso, Francioni 2012, Alkaraan 2020, Liberman-Yaconi, Hooper et al. 2010).

2.2.2 Model of Decision-Making Process in SMEs

Liberman-Yaconi, Hooper et al. (2010) sought to gain an understanding of the DM process in micro companies. In their research they noted discrepancies in DM processes between small and large companies. Firstly, an asymmetry of information exists due to internal constraints, especially in terms of resources for information gathering and processing for DM purposes. The latter supports their findings that micro companies tend to satisfice, and their decisions are bounded rationally with employment of owner-manager's heuristics, experience, and idiosyncratic characteristics. A number of researchers have all deduced that SMEs have a higher tendency to employ a bounded rationality approach to DM where intuition prevails over rational methods of DM (Busenitz, Barney 1997, Jokhu, Rokhim et al. 2019, Liberman-Yaconi, Hooper et al. 2010, Penney, Vardaman et al. 2019). Liberman-Yaconi, Hooper et al. (2010) also identified a

possible model of DM among micro companies. This model (see Figure 4) describes the circular-iterative DM process resulting from their research; the process involved decision-makers pondering on an investment after a trigger is presented and going through the informing, option-generating and deliberating stages a number of times until a decision is taken. The steps are influenced by the owner-manager's idiosyncratic characteristics and the companies' resources.

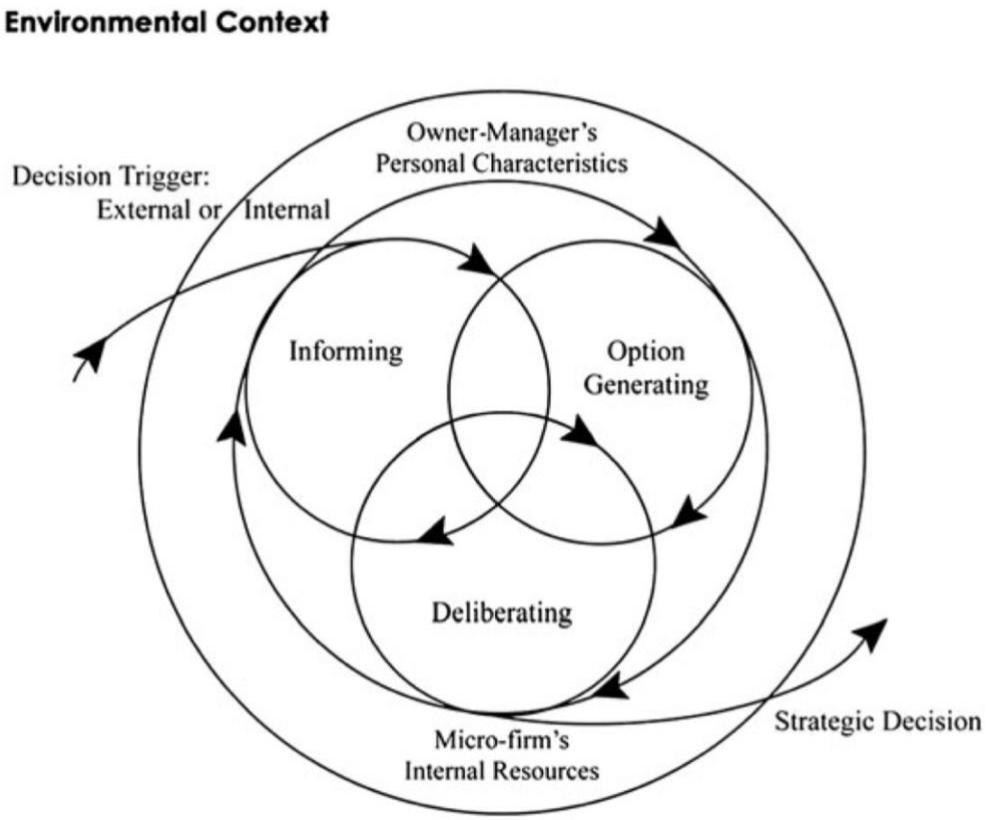

Figure 4 Model of Micro Companies Strategic Decision-Making (Liberman-Yaconi, Hooper et al. 2010, p.87)

Larger companies having access to more resources and a more rigid organisational hierarchy are likely to employ a more structured approach to DM utilising established techniques and less biases since the process is subject to more scrutiny and involves more decision-participants (Liberman-Yaconi, Hooper et al. 2010).

2.2.3 Factors impacting Decision-Making

Factors impacting the DM process and resulting decisions may be external or internal to the decision-maker. Conditions of uncertainty in the business environment, industry conditions and other extraneous variables impact DM (Harris, Northcott et al. 2016, Lévesque, Minniti et al. 2009) as well as decision-makers' idiosyncratic characters such as education, training, experience, confidence, skills, time available, family involvement, intuition, biases, and heuristics (Cassar 2010, Davidsson, Honig 2003, Morales Burgos, Kittler et al. 2020, Shepherd, Williams et al. 2015). Management accountants may provide a more objective stance, less clouded by biases, based upon a framework of accounting studies.

2.2.4 Bounded Rationality in Capital Investment Decision-Making Processes

Northcott (1991) suggests that decision-makers do not often act rationally in terms of CI decisions. This study, similar to the Morales Burgos, Kittler et al. (2020) study, will employ a qualitative approach to analyse the CIDM process among decision-makers as opposed to the present plethora of studies employing quantitative techniques (Harris, Northcott et al. 2016).

2.3 Bounded Rationality

In 1955, Herbert Simon suggested that cognitive limitations, environmental complexity, and satisficing rather than optimising, i.e., the theory of bounded rationality, heavily impacts the DM process in situations where information is incomplete (Gigerenzer, Selten 2002). Rational choice theory describes DM with the ultimate aim of optimal decisions whereas bounded rationality describes DM under conditions of uncertainty with the employment of heuristics (Jokhu, Rokhim et al. 2019). Hands (2014, p.396) notes how "*the focus on DM has led naturally to the question of rationality*". Shepherd, Haynie et al. (2012) note that heuristics is superior to bounded rationality in entrepreneurial contextual studies, however,

in obtaining an understanding of the heuristic process employed in DM, it is first necessary to understand the theory of bounded rationality and how this realm of cognitive science led to heuristic theories of DM.

2.3.1 Bounded Rationality and Satisficing

"*Bounded rationality is not irrationality*" (Gigerenzer, Selten 2002, p.15). Gigerenzer and Selten (2002) describe how in the theory of bounded rationality decision-makers must look for alternatives when taking decisions and once a satisfactory alternative arises the decision-makers *satisfice* by choosing that option. *Satisficing* is when decision-makers are satisfied with an option that is sufficient in their business context. The aim is not to take the optimal decision which considers perfect information and all facets of economic rationality; but to take adequate decisions with the information available, cognitive constraints and resource limitations (Morales Burgos, Kittler et al. 2020).

Gigerenzer (2002) introduced the concept of the *Adaptive Toolbox* in which he defined visions of bounded rationality DM in terms of 3 premises:

1. *psychological plausibility*: obtaining an understanding of cognitive processes humans use in their DM process,
2. *domain specificity*: heuristics and cognitive building blocks which could impact the DM process, and
3. *ecological rationality*: normative process of optimising rationality to the environment in which humans operate (Hands 2014, Gigerenzer, Selten 2002).

Ecological rationality emphasises that in the business reality many decision-makers operate in (information asymmetry and resource constraints), moving away from complex techniques for simpler heuristics is not a *lesser than* choice but the ideal choice. The original Simon (1955) theory influenced numerous papers and diverging opinions on bounded rationality and employment of heuristics have been heavily commentated on (Forbes, Hudson et al. 2015, Hands 2014, Gigerenzer, Goldstein 1996, Gigerenzer, Brighton 2009,

Gigerenzer, Selten 2002, Kahneman, Tversky 1996, Petracca 2017). Petracca (2017) presented the cognition paradigm clash that exists between the theory of $Simon_1$ and $Simon_2$ which is described in the next sub-section.

2.3.2 $Simon_1$ and $Simon_2$ Debate

The "*$Simon_1$–$Simon_2$ dichotomy describes the current research*" (Petracca 2017, p.23). The original $Simon_1$ (1955) bounded rationality theory is a *scissors version* (see Figure 5) of the theory where both individual cognition and adaption to the surrounding environment are considered. The $Simon_2$ theory presented by Simon (1979) later on in his career ponders on only one of the blades of the scissors; that of individual cognition processes which impact DM. The theory suggests that knowledge and computation limitations of human beings result in divergence from rationality. A homo-heuristic viewpoint (a biased mind) supports the $Simon_1$ theory which exonerates human's cognitive limitations and commends the employment of heuristics as an adaptation mechanism (Gigerenzer, Brighton 2009). The homo-heuristic viewpoint has been conceptualised into a normative framework which in line with Gigerenzer's (1996, 2002) previous work affirms that heuristics are sometimes better than rational models (Petracca 2017). Meanwhile, *Kahnemanism* is a quasi-$Simon_2$ theory which considers only the cognitive limitations which taint DM and enforces the notion that heuristics are portrayals of irrational behaviour which lead to erroneous judgement (Hands 2014, Morales Burgos, Kittler et al. 2020, Petracca 2017).

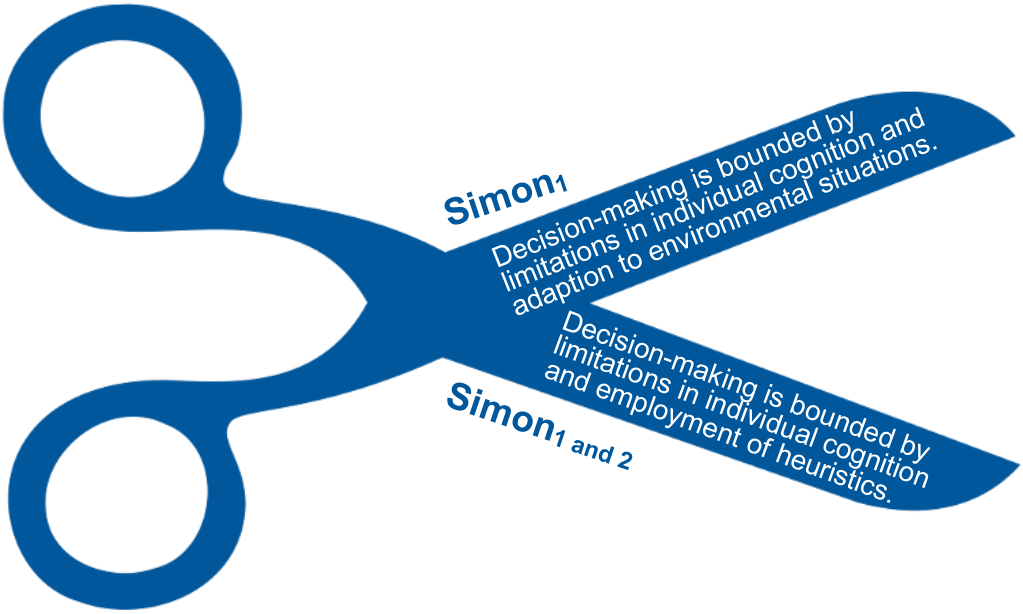

Figure 5 Simon1 and Simon2 Dichotomy

2.3.3 Bounded Rationality and the Resulting Employment of Heuristics

The theory of bounded rationality is a fundamental building block in the standard axioms of DM. Gigerenzer (2002) emphasises that bounded rationality does not simply consider decision-makers as incompetent or irrational but rather describes how unavoidable limitations are compensated for by employment of heuristics.

The tendency to rely on heuristic driven DM processes in the course of business has been confirmed in a number of studies (Gigerenzer, Selten 2002, Petracca 2017, Shepherd, Haynie et al. 2012). It has also been suggested by a number of authors to move away from the irrationality innate to these processes towards more comprehensive DM through the use of traditional economic rationality (Lima, da Silveira et al. 2017, Kahneman, Tversky 1996). The use of heuristics arises from the notion that the

> "*fully rational man is a mythical hero who knows the solutions to all mathematical problems and can immediately perform all computations, regardless of how difficult they are*" (Gigerenzer, Selten 2002, p.14).

Such *fully rational man* is non-existent and hence bounds to rationality exist which lead to use of heuristics. Bounded rationality results from decision-makers' ability to adapt to their cognitive limitations and the ecological reality in which they operate to form DM schemata which are sensible (Forbes, Hudson et al. 2015).

2.4 Heuristics

Heuristics are tools employed for DM, often criticised for being a hurried way to arrive to conclusions based on previous experiences and inherent biases (Emmanuel, Harris et al. 2010, Forbes, Hudson et al. 2015). However, in particular environmental contexts, the employment of such short-cuts is not sub-par to other DM tools as they may be a sensible response to the environment decision-makers operate in; they are employed in some measure of *ecological rationality* as defined in Section 2.3.1 (Cruciani 2017). A scholarly debate exists in the organisational cognition neuroscience realm where opposing notions in terms of the employment of heuristics for DM exist.

2.4.1 Gigerenzer vs Kahneman and Tversky Debate

Financial literature and teachings perpetuate the notion that rational models are better than heuristics and biases (Forbes, Hudson et al. 2015, Hands 2014, Lima, da Silveira et al. 2017). The school of thought led by Gigerenzer argues that the employment of heuristics is a measure of reducing the complex and seemingly daunting task of DM (Busenitz, Barney 1997, Cruciani 2017, Gigerenzer, Gaissmaier 2011, Gigerenzer, Selten 2002, Slovic, Finucane et al. 2007). Gigerenzer (2002) perpetuates the belief that the frugality, speed, and straightforwardly DM processes which result from the employment of heuristics support their use in business. Complexity is not necessary if heuristics are working (Forbes, Hudson et al. 2015, Gigerenzer, Selten 2002). On the other hand, Kahneman and Tversky (1979) argue that the employment of heuristics does not arise out of optimisation rationality but due to humans not using the most appropriate means to achieving goals and hence their behaviour is biased,

irrational and results in erroneous decisions (Hands 2014). Their criticism of Gigerenzer arises from their belief that humans are irrational; they allow their biases and intuition to override rationality resulting in erroneous decisions clouded by their judgment, overconfidence, and experiences (Forbes, Hudson et al. 2015, Hands 2014, Kahneman, Tversky 1996). Both Gigerenzer and Kahneman agree that heuristics are employed in organisational DM, however, their axioms of ideal DM and rationality diverge (Forbes, Hudson et al. 2015).

2.4.2 Types of Heuristics

Individuals use heuristics to take decisions which require minimal cognitive effort and little information (Burmeister, Schade 2007). A heuristic frame of reference for DM fundamentally contradicts with economic rationality (perfect information and insight), however, opportunities and constraints faced by management may result in the amalgamation of both means to exercise judgement; where employment of heuristics aids the rational DM processes to arrive to decisions in the most economical and effective way (Emmanuel, Harris et al. 2010, Gigerenzer, Gaissmaier 2011). The following sub-sections detail examples of heuristics as discussed in the existing framework of literature.

2.4.2.1 Representativeness, Availability and Anchoring

Three heuristics often referred to in papers (Cruciani 2017, Emmanuel, Harris et al. 2010, Forbes, Hudson et al. 2015, Lima, da Silveira et al. 2017) discussing heuristics and DM were originally presented by Kahneman and Tversky in 1973:

- *Representativeness*: initial impressions on stimuli used to guide decisions.
- *Availability*: taking decisions based on what is known and steering away from the unknown; similar to the status-quo bias discussed in Section 2.4.2.3.
- *Anchoring and adjustment*: using a benchmark and adjusting the value to yield the estimate results of a decision.

2.4.2.2 Fast and Frugal Heuristics

Gigerenzer and Goldstein (1996) introduced the concept of *fast and frugal* heuristics which amalgamates concepts of ecological rationality, framework of cognition and emotion to describe optimal DM. Slovic, Finucane et al.'s (2007) study of the affect heuristic encapsulates the latter.

- *Affect*: a fast and automatic emotional response to stimuli guides DM through recollection and attachment of mental images to events and the surrounding environment (Cruciani 2017).

2.4.2.3 Status-quo Bias

The status-quo heuristic refers to a bias for maintaining consistency when and where possible, focussing on the notion of experience. Shepherd, Zacharakis et al. (2003) noted that experience is a double-edged sword having two opposing effects. More experience can result in a nuanced way of DM where increased knowledge and expertise sharpen one's ability to take a decision; notwithstanding that increased experience increases susceptibility to conform with the status-quo bias and one risks becoming cemented in a cycle of repeated decisions based on what is known and certain (Burmeister, Schade 2007).

2.4.3 Rationality for Heuristics

SMEs often have less access to information and limited resources, and hence prefer shorter DM processes with the employment of heuristics (Jokhu, Rokhim et al. 2019, Liberman-Yaconi, Hooper et al. 2010). Conditions of uncertainty, as opposed to risk, justify the employment of heuristics over rational methods since strategic planning is not possible under such circumstances and decisions are often the by-product of circumstances rather than based on the dictum of rational choice theory (Forbes, Hudson et al. 2015).

2.4.4 Heuristics and Use of Management Accounting Information

Gigerenzer and Kahneman do not stand on opposite sides of the argument, and both agree on the centrality of heuristics in the DM process, however, they disagree on whether the presence of heuristics results in better decisions or is simply an *easy way-out* (Forbes, Hudson et al. 2015). The employment of MAI, backed by rational-choice theory, in tandem with heuristics, may be the most efficient and effective way to make CI decisions.

2.5 Management Accounting Information

MAI plays a number of different roles in terms of supporting management in their DM processes (Chapman 1997, Saukkonen, Laine et al. 2018). Saukkonen et al. (2018, p.181) describe MAI as "*translating complex phenomena into calculations*". Managers request the preparation of MAI to support their decisions and reduce the level of uncertainty. Such information ought to be prepared in a timely manner, and consider both financial and non-financial data, whilst also taking into consideration business context and uncertainty of the environment. MAI prepared with adequate data may help to translate dimensions of DM (cost, quality, and time) into financial units which allow for comparison and facilitate coordination (Saukkonen, Laine et al. 2018). However, the reduction of business phenomena into numerical form may contradict with the notion that MA is a learning machine which constantly provides detailed and updated information based on dimensions as they come to fruition (Wouters, Verdaasdonk 2002).

> "*Accounting information regarding decisions aims to translate as many as possible of the diverse consequences of a decision alternative into a single financial unit of measure. This makes such information both powerful and weak: various sources of information are integrated to allow trade-offs, but operational richness gets lost in the translation"* (Wouters, Verdaasdonk 2002, p. 82).

Different roles and utility approaches to MAI may help to shed a light on the various manners in which such information may be utilised in CIDM.

2.5.1 Role and Utility of Management Accounting Information

2.5.1.1 Role of Management Accounting Information

MA may play a number of roles within companies, which are dependent on the utility it ought to serve. Drury (2020) lists the four possible purposes of MAI in the context of DM:

- *Rational purpose:* Role of MAI is to aid decision-makers in taking decisions based on data and objective information.
- *Symbolic purpose:* MA's role is to depict a veil of professionalism in the manner DM processes are undertaken, by presenting data to backup claims made, which data is not necessarily used in the DM process.
- *Political purpose:* MA is a bargaining tool used to cement ones' opinion among other decision-participants.
- *Retrospective rationalising purpose:* MA serves to justify and legitimise decisions already taken.

2.5.1.2 Management Accounting Information Utility

A number of studies refer to two different ways to approach the utility of MAI, namely the analytical and actor-based approaches (Arbnor, Bjerke 2009, Nielsen, Mitchell et al. 2015, Saukkonen, Laine et al. 2018). The analytical role refers to rational and calculative procedures in DM; a centralised DM process wherein complex MA techniques are employed to arrive to rational decisions (Arbnor, Bjerke 2009). Data is collected and processed using established MA techniques and DM processes are supported by such information; there is an underlying assumption that such data is available, and MAI can be produced at managements' request (Nielsen, Mitchell et al. 2015, Saukkonen, Laine et al. 2018). The actor-based approach is based on communication, behavioural intention, and conceptualisation (Saukkonen, Laine et al. 2018). It is a decentralised model of utilising information at various hierarchal levels wherein communication and understanding of decision alternatives and MAI takes place

in iterative stages until all actor(s) are satisfied with the decision, and as a result, increase their insight and business intelligence (Nielsen, Mitchell et al. 2015). These DM approaches are not binary opposites and may be combined as part of a company's DM process to create a process which has some element of rationality whilst also not being entirely based on data hence overcoming the limitations of both approaches and maximising MAI utilisation (Saukkonen, Laine et al. 2018). The approach undertaken to take decisions in light of MAI may also be impacted by the manner in which it is presented.

2.5.2 Management Accounting Information Presentation

The presentation, and consequently relevance, of MAI are often criticised, with authors saying the information lacks the ability to sufficiently support management in the DM process (De Lema, Durendez 2007, Hall 2010, Kattan, Pike et al. 2007, Saukkonen, Laine et al. 2018). The complex dimensionality of MAI necessitates the multidimensional visual representation of data (such as graphical representation through bar graphs and trend charts) to aid in increasing DM accuracy and MA utility. Multivariate data represented in graphical form aids the DM process through facilitation of examination of data and understanding of relationships and interaction between variables in the data (Dull, Tegarden 1999). Despite efforts to ensure presentation of MAI is suited for DM, the reliability of MAI may still be jeopardised for reasons beyond utility approaches and presentation techniques.

2.5.3 Reliability of Management Accounting Information

Literature refers to the notion that with increased volatility, environmental uncertainty and uncertainty of outcomes, the reliability of accounting information diminishes and accounting tools, such as capital appraisal techniques, lose value for decision-makers (Chapman 1997, Kattan, Pike et al. 2007). This notion was confirmed in the Kattan, Pike et al. (2007) study analysing reliance of accounting information in situations of high environmental uncertainty (in Palestine).

Reliability of MAI may be diminished due to the changing economic environment companies operate in and hence goes beyond the choice of approach or presentation.

2.5.4 Management Accounting Information and Accountant's Role as Adviser in the Decision-Making Process

As discussed throughout Section 2.5, MAI may act as a reinforcement to decisions if well-presented and reliable, however, it may also be unreliable, irrelevant, and not useful in certain circumstances. It is a matter of judgement determining when MAI adds-value to a decision and what information does not provide any value-added benefit. Accountants have to act as advisers to management and provide support through the provision of information when necessary. The misconceptions surrounding the role of the accountant as a *bean-counter* rather than a strategic aid to management through the provision of relevant information, taking on a stewardship role, and facilitating communication between departments were highlighted in the Kattan, Pike et al. study (2007). MA has since come a long way in ensuring the emancipation of the role of the management accountant and financial controller in companies (Desroches 2013, Kattan, Pike et al. 2007). The role of the accountant as adviser to management in the DM process is explored further in Section 2.6.

2.6 Role of the Accountant as an Adviser in the Decision-Making Process

The role of an accountant, particularly the management accountant, entrusted with providing objective financial figures to guide management in taking decisions is often misinterpreted as one of merely presenting a set of figures which tell the tale without any need for further scrutiny, explanation or setting of the scene. In accounting, "*too often numbers are deemed to speak for themselves and preclude debate*" (Townley, Cooper et al. 2003, p.1062). It is the accountant's responsibility when acting as adviser to use judgement, knowledge, objectivity,

and expertise to harmonise all conflicting interests and work as one unit for the common interest of the company (Jamil, Mohamed et al. 2015). The Nguyen (2018, p.43) study "*provides further empirical evidence of the importance of accountants' participation in strategic DM"*.

2.6.1 SMEs and Advice-Seeking from Accountants

Small companies often look to their accountant as a source of information and business advice, in addition to providing basic accounting services such as bookkeeping and tax compliance (Blackburn, Carey et al. 2018, Gooderham, Tobiassen et al. 2004). Greenwood, Hinings et al. (2002, p.58) described accountants targeting small companies as being:

> "*multidisciplinary practices, one-stop shops for an extensive array of services, including financial advisory, management consulting, and legal services*".

Studies have shown that use of accountants' business advice improved SMEs growth rate, financial performance, and competitiveness (Berry, Sweeting et al. 2006, Carey 2015).

Strategic and corporate goals can be achieved with prolific CIDM based on financial figures provided by accountants when acting as advisers (Frémeaux, Puyou et al. 2020). The involvement of accountants may be contingent on a number of factors, such as company size and resources available. Decision-makers may look to their accountants to provide them with business advice and hence accountants should not be too focused on numbers and use their business knowledge to aid decision-makers in CIDM.

The utilisation of advice is contingent on the relationship between the decision-maker and the accountant. Carey and Tanewski (2016) notes how perceived competence of the external accountant impacts purchase and use of advice, and SMEs require time to verify an accountant's competence to provide advice and hence a relationship ought to develop prior to purchasing such advice.

Confidence in external accountants increases when uncertainty and information asymmetry is minimised (Blackburn, Carey et al. 2018, Carey 2015, Gooderham, Tobiassen et al. 2004).

Breen, Sciulli et al. (2004) highlight that business advisory services provided by accountants are value-adding for both decision-makers and the accountants themselves. These services tend to be more profitable than other services offered and increase customer value. Jarvis (2004) notes how the accountant is central to strategic planning, particularly in the context of SMEs.

2.6.2 Business Knowledge and Market Awareness

The collaboration of the management accountant in the DM process will be useful if the accountant has an understanding on the business context the company is operating in (Tillema, Trapp et al. 2022). Business acumen and market knowledge will increase the utility and use of MAI as the accountant will be in a position to provide future-oriented and broader-scope information which integrates non-financial and financial objectives and takes into account environmental uncertainty (Kattan, Pike et al. 2007, Nguyen 2018, Tillema, Trapp et al. 2022).

Karlsson, Kurkkio et al. (2019, p.833) noted how the accountant is an "*essential actor for the bridging of multiple topoi*" in the "*DM process of strategic CI projects"*. Bridging the gap between the *bean-counter* and *business partner* role involves market awareness and business intelligence.

2.6.3 Accountant as Business Partner and Potential Job Role Incongruence

The management accountant's involvement in the DM process involves the alignment of multiple decision-participants' perspective (Karlsson, Kurkkio et al. 2019). The management accountant's role is evolving; there is a move away from the inspector role to a role characterised by being an assistant to management;

the management accountant is closer to management than other financial controllers responsible for regular bookkeeping and tax compliance tasks (Karlsson, Kurkkio et al. 2019, Morales 2019). Management accountants who have an astute business orientation can act as business partners and not informants of senior managers; they can encourage management to "*internalise frames of financialization*" and hence think as accountants and vice versa management provide accountants with business knowledge and a non-financial perspective of business (Morales 2019, p.275).

There may be job role incongruence in terms of management accountants who seek to provide a "*heroic picture*" of their job as business partners; "*the image of co-pilots or internal consultants who use their financial expertise to help managers to make the right decisions*", but their day-to-day role is more aligned with the traditional role of an accountant (Morales 2019, p.273). The internalisation of the business partner role may depend on various factors, one of which being management confirmation (Tillema, Trapp et al. 2022).

The importance of the management accountant is increasing with the changing business environment and higher utility and usage of MAI is contingent the on involvement of the accountant in the production of information (Nguyen 2018). However, not all companies may have the resources at their disposition to take advantage of MAI (De Lema, Durendez 2007).

2.7 Conclusion

This chapter provided literature on bounded rationality, heuristics, MAI, the role of the accountant in the DM process and how the link between these concepts impact CIDM. Primary research will be undertaken to corroborate this literature as well as explore new avenues not yet researched. The next chapter delves into the methodology employed in this study.

Chapter 3: Research Methodology

3.1 Introduction

The third chapter describes the methodological approach adopted in this study in pursuit of the achievement of the objectives as set out in Section 1.4.

Section 3.2 describes the processes undertaken to complete Chapter 2 of the study, in which secondary research was undertaken to gain an understanding of the existent literature regarding the topic. Section 3.3 details the design of the research and the methodological approach undertaken. Section 3.4 describes further secondary data collection to aid the achievement of the objectives of the study. Section 3.5 describes the primary data collection process (main research tool, sampling method, research participants and interview structure). The following section describes the manner in which data collected will be analysed and finally, Section 3.7 details limitations of the study. These sections follow the process undertaken to complete the study, as per the below figure.

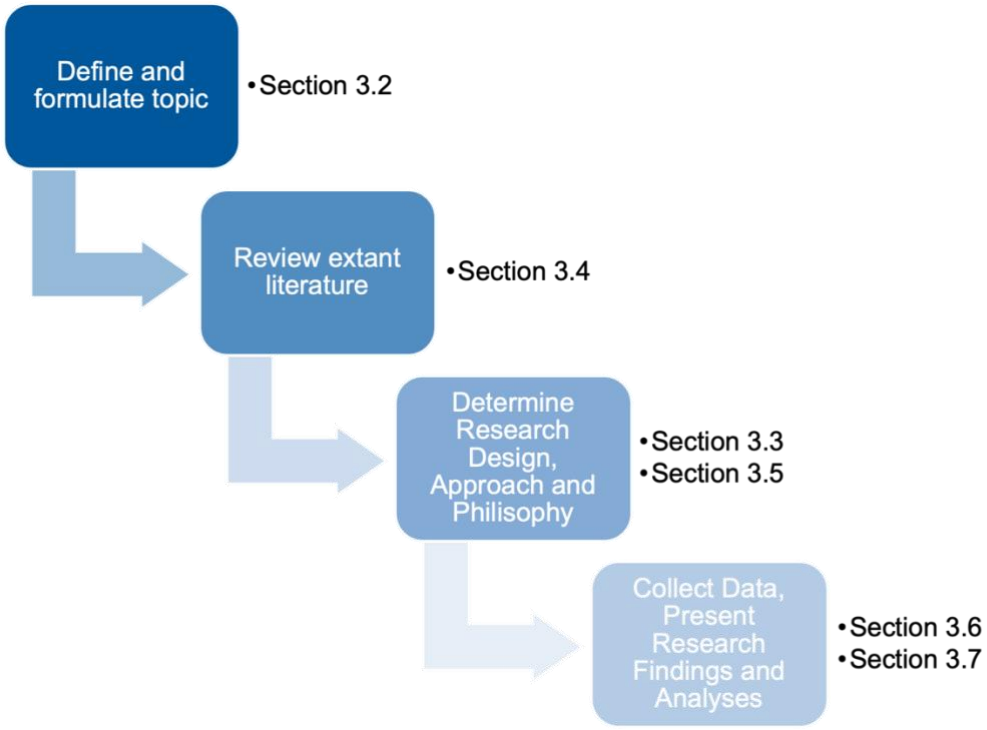

Figure 6 Research Process (adapted from Saunders, Lewis et al. 2019, p.12)

3.2 Preliminary Secondary Research

At initial stages of the study, in order to formulate and clearly define the topic, as well as develop an understanding of the main concepts (as discussed and defined in Section 1.2), preliminary secondary research had to be undertaken.

3.3 Research Design

CIDM processes and concepts of heuristics and bounded rationality are complex and hence call for more in-depth qualitative, investigative approaches (Lima, da Silveira et al. 2017). Hammersley (1989) defines qualitative research as research using unstructured data collection to deduce explanations and descriptions of phenomena rather than quantitative, statistical analyses. The study's subject matter, centred around organisational cognition neuroscience, calls for qualitative research over a quantitative one as the latter tends to overlook the meaning behind social phenomena and attempts to reduce complex circumstantial behaviours into numbers. An interpretivist approach has been deemed most appropriate for the achievement of the objectives of this study since social sciences research requires in-depth understanding of contextual phenomena (Alharahsheh, Pius 2020).

3.4 Secondary Data Collection

Secondary data collection involved a review of current literature in the MA realm, with a focus on CIDM, bounded rationality, heuristics, MAI, and the role of the accountant as adviser. Secondary research was undertaken to review existing literature on the main topics as defined in Chapter 1. This research anchored the focus of the study by delineating what is known and understood, and what the research ought to achieve, in the literature review presented in Chapter 2. Secondary data was analysed in Chapter 5 of the study, wherein, results of primary data collection were corroborated with extant literature to validate the findings of the study.

3.5 Primary Data Collection

In pursuit of achievement of the study's objective, primary data collection through interviews was deemed most appropriate.

3.5.1 Semi-Structured Interviews

The semi-structured interviews allowed the researcher to guide participants on what information was required, ensuring the data gathered was not too wide in scope (which would have been difficult to analyse considering the timeframe for this research) whilst still allowing participants to express themselves in an unconstrained manner. Interviews allowed the researcher to gain a deeper understanding of the subject, to clarify any vagueness in the participants' responses, and participants were willing to participate as it did not require excessive commitment (Handayati, Alhaleh 2021).

The interviews were recorded using a mobile device where consent was provided (eighteen of twenty-one participants consented to being recorded). The recordings allowed for the researcher to be able to transcribe the interviews accurately, hence ensuring no information was absent. They also allowed the researcher to concentrate on the responses in real-time and therefore clarifying any matters or asking more questions as necessary immediately (Handayati, Alhaleh 2021). The interviews were undertaken over a period of approximately five months, with a two-month gap between the Schedule A and B interviews held with the decision-makers and their accountants, and the Schedule C interviews held as part of the validation effort. Interviews lasted approximately thirty minutes.

3.5.2 Sampling

The food manufacturing and processing industry was chosen for this study due to the inherent necessity to innovate and make CIs to remain competitive

(Baregheh, Rowley et al. 2012). Convenience sampling was used wherein the researcher used own knowledge to search up companies and then communicate through email and phone calls to ask for participation in the study.

3.5.3 Research Participants

There were three interview schedules (Schedule A, B and C respectively) used to interview three sets of participants, namely:

> *Participant Type A*: Owner-managers or managers with responsibility to take CI decisions. These decision-makers within their companies provided details on their CIDM process and other matters necessary for the study.
>
> *Participant Type B*: Accountants or financial controllers of the companies (whether external or internal) who provided insight on their involvement in the CIDM process, the MAI they provide and how they act as advisers to SMEs.
>
> *Participant Type C*: Advisory consultants who helped to validate the data gathered from Participants Type A and B and provided further insights.

In some cases, participants who held managerial roles and hence were involved in the DM process, but also held the role of financial controller (or a similar role), were interviewed and asked questions from both Schedule A and B. These are identified as *Participants Type AB*.

Table 1 enlists the participants of the study and other information necessary (such as role and company size) to aid understanding of their contribution to the study. A participant code was assigned to each participant in the coding process. The classification of the company size was made following the SME definition as defined in Section 1.5, by asking the participants about the number of employees and revenue/ assets figures gathered from the last published accounts accessed

from the Malta Business Registry site (refer to Appendix 3.1: Classification of Participating Companies).

Participant Code	Company Size	Participant Role
A1	Micro	Director
B1	Micro	External accountant
A2	Micro	Sole owner
B2	Micro	External accountant
A3	Micro	Director
B3	Micro	External accountant
A4	Micro	Sole owner
B4	Micro	External accountant
AB5	Small	Financial controller
A6	Small	General manager
B6	Small	External accountant
AB7	Small	General manager
A8	Small	Director
A9	Medium	Director
B9	Medium	External accountant
AB10	Medium	Director – Chief Financial Officer
AB11	Medium	Chief Financial & Commercial Officer
A12	Medium	Chief Executive Officer
B12	Medium	Financial controller
Participant Code	**Firm**	**Participant Role**
C1	Medium-Sized Business Advisory	Chief Executive Officer
C2	Big Four	Manager (Advisory Line)

Table 1 Participants Table

3.5.4 Interview Structure

The interviews were semi-structured, hence a set of questions was prepared beforehand and changed, where necessary, according to the flow of the conversation. Refer to Appendix 3.2: Interview Schedules for a copy of the interview schedules used and Appendix 3.3: Interview Structure for details on the structure of the interviews, a summary of which is provided in Table 2.

Section Heading	**Section Purpose**	**Questions**		
		Interview Schedule		
		A	*B*	*C*
Demographic Questions	Establish that the participant is suitable for the study.	A1. – A7.	A1. – A4.	
Decision-Maker Profile	Questions on the decision-participants, information they use, and involvement of accountant.	B1.	B1. – B3.	
DM Process	Questions on the DM process, any formalisation of intentions, main motivations for CI decisions, employment of experience, emotions and bias in DM, search for alternatives, and post-implementation processes.	C1. – C12.	C1. – C6.	
MAI and Role of the Accountant	Questions on data used for decisions, involvement of accountant, information for alternatives and deterrents to requesting information.	D1. – D6.	D1. – D6.	
Service Offering in Relation to CI Decisions	Questions on CI decisions services offered by external accountants.		E.	
Further Comments	Open-ended question to encourage any further discussion on the topic.	E.	F.	

Table 2 Interview Structure

3.6 Data Analysis

The data gathered was analysed using thematic analysis. Saunders, Lewis et al. (2019) noted how this method of analysis is the general approach in qualitative studies. Thematic analysis involves "*search for themes, or patterns, that occur across a data set*" (Saunders, Lewis et al. 2019, p.651). It is useful in accounting to analyse the presence or absence of certain attributes in relation to the subject matter (Kothari, Li et al. 2009). The interview transcripts were coded and sorted

into themes emanating from the responses. Any findings from the interviews were corroborated and supported by available literature (collected as per Section 3.4) to arrive to meaningful conclusions. The workspace software *Notion* was used to log all the interviews, transcripts and then to code the data (refer to Appendix 3.4: Notion Software Use for further explanation of the use of the software and screenshots). Data was coded by listing all responses to each individual question under one another (which had been divided into the different sections of the schedules), eliciting the key points from each response, taking note of any key quotes, and deriving the codes which were then used to structure Chapter 4 and 5 of the study.

3.7 Research Limitations

Qualitative studies systematically enquire into the empirical meaning of phenomena, however, due to the rich and detailed data required to do so and hence small sample size employed, often lack generalisability (Shank 2006). Quality of data in these studies is contingent on the quality of participants (Gray 2019), however, to counter this limitation professionals were interviewed (Type B and C) and validation interviews were carried out to validate the findings of the interviews.

3.7.1 Limitations of Interviews

A limitation of interviews, in the manner in which they were conducted in this study (semi-structured, open-ended question), is that the researcher could manipulate the data gathered by influencing the participants to respond in a certain manner (Handayati, Alhaleh 2021). Reflections and positionality notes informally taken by the researcher after each interview allowed for the minimisation of this limitation.

3.7.2 Limitations of Thematic Analysis

Thematic analysis could limit the reliability and relevance of the study as the researcher may manipulate the results to fit into a personal agenda (Jowsey, Deng et al. 2021). The supervision provided by the supervisor allowed for the researcher to limit biases in analysing data as well as the research design itself. The interviews undertaken with Participants Type C served as a validation process to increase reliability of data, in spite of the participant subjectivity, the findings helped to continue validate the findings in conjunction with the comparisons made to previous literature analysed.

3.8 Conclusion

Preliminary research and review of other papers in the same subject area revealed that an interprevist research philosophy with a qualitative methodological approach is most appropriate. Interviews were chosen as means of gathering data since they made the most strategic sense, considering the participants, timeframe, and researcher knowledge. Thematic analysis was the technique chosen for data analysis. Chapter 4 presents the research findings and discussion of these findings is presented in Chapter 5.

Chapter 4: Research Findings

4.1 Introduction

This chapter presents the findings of the research as carried out in accordance with Chapter 3 of this study. The Chapter is divided into seven main sections, in line with the literature review. Section 4.2 deals with CIDM, which covers the overarching objective, objective 1, as well as tackles all other objectives from a surface level. Section 4.3 and 4.4 deal with Bounded Rationality and Heuristics respectively, both covering the second and third objectives of this study. Section 4.5 also covers objective 3 as well as objective 4, and finally Section 4.6 deals with objective 4 of this study. Discussion points based on these findings will be presented in Chapter 5. Figure 7 illustrates the above:

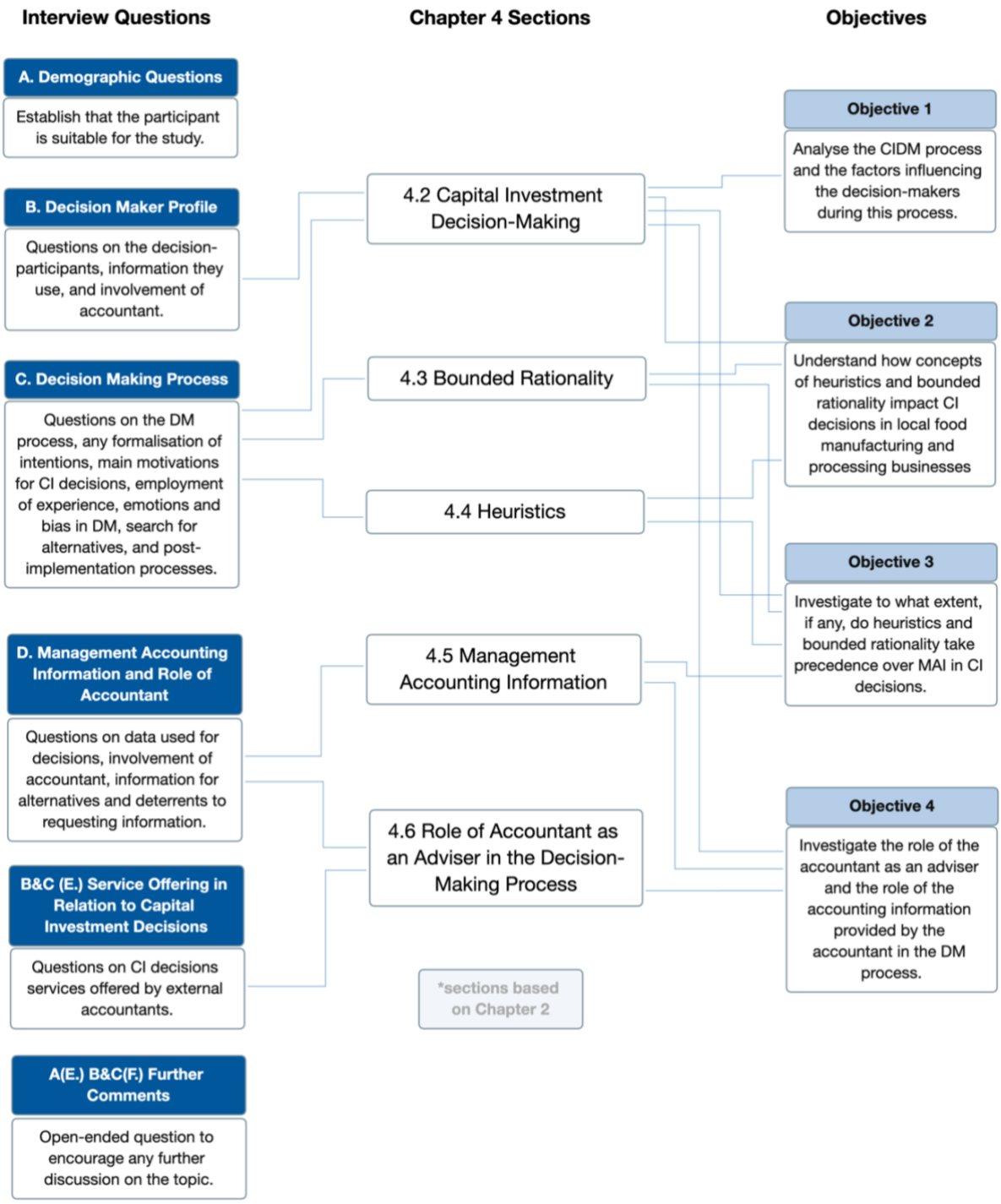

Figure 7 Chapter 4 Outline

In order to comprehend the distinction between the micro, small and medium-sized companies, which this chapter highlights, Figure 8 has been prepared to illustrate under which classification each participant falls. Detailed participant details are found in Section 3.5.3.

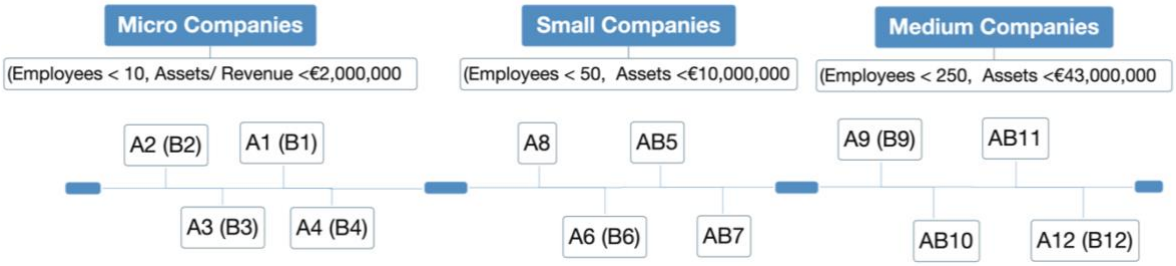

Figure 8 Participant Sizes

4.2 Capital Investment Decision-Making

The CIDM process ought to be understood in a holistic manner in the pursuit of understanding the roles bounded rational mechanisms of thinking, employment of heuristics, incorporation of MAI and involvement of accountant play in the process. An understanding of the people, processes and information involved was obtained through the *Decision Maker Profile* section of the interviews and some of the questions from the *DM Process* section.

4.2.1 Decision Maker Profile

Establishing the person responsible for CIDM is essential to then determine their impact on the CIDM process.

4.2.1.1 Decision-Maker in Micro Companies

The results of the interview show that decisions are taken by owners of the companies themselves in micro companies. The responsibility lies with the "*clients themselves, hence directors of companies, are responsible for CIs in their company*" (B3).

4.2.1.2 Decision-Maker in Small and Medium-Sized Companies

As companies get slightly larger, the organisational structure becomes more complex. The management team presents their Capital Expenditure (CapEx) budget to the BoD for approval, "*the board then take the final decision and ultimate approval is in their remit*" (AB11). Decisions are triggered by responsible management; "*who the responsibility lies with depends on which stem of the business it relates to*" (AB10). A "*committee*" (AB7) is formed based on the type of investment with the responsible manager and the director who prepare their proposal to be presented to the board.

4.2.1.3 Decision-Maker in a Family-Business Dynamic

Wherein companies are owned and controlled by a family, the DM lies at the hands of family members taking part in the management of the company. Matters are discussed roundtable in an "*informal*" (A9) manner; "*since we are a family business, it is a holistic process*" (A8). "*There is always one person who comes up with an idea, but no single person takes a decision, there is always a need for a unanimous agreement or else we cannot walk forward*" (A8). There may be an idea-generator who spearheads the DM process however agreement between family members is necessary both in terms of business-goal alignment, "*we are very focused on what we do, and CapEx keeps focused on that scenario*" (A6) and reducing tension through unanimous agreement.

4.2.2 Decision-Making Process in SMEs

Participants noted that the DM process involves identifying a need, informing oneself by doing the necessary research, option-generating and deliberating on the options available. The participants' DM processes may be represented on a spectrum wherein levels of formality vary from one to the other. On the one end, micro companies described their process as informal, needs-based, and market-driven. These decision-makers may be driven to invest as a need for more

efficient or larger equipment is identified, demand increase propels investment or they want to tap into new markets as their clients indicate this; "*If the client starts asking for certain products and you cannot cater for these due to own capabilities you will need to see how to invest to be able to deal with this demand*" (B2). This hands-on DM process is facilitated through the face-to-face interaction with customers these owner-managers tend to have due to their involvement in the running of the company. The process is informal in micro companies with no future projections, formalised intentions, or standard procedures set in place.

As companies increase in size there are more formalised intentions and standardised procedures which ought to be adhered to.

> "*We have just finished a business strategy plan for the next ten years, so we are already seeing on a longer period what is needed in terms of CI with the objective of business growth; what we need to invest in holistically*" (A12).

These companies have "*a sort of business plan*" (AB10) wherein they plan for these CI decisions, list their procurement procedures and "*give concrete reasons with explanation, backed by figures of what we want to do… and why*" (AB10). They see "*what is there available in the market, what investment do we need, and we put it on the table with our portfolio of projects and we start prioritising*" (AB10) wherein "*procurement comes into play as needed*" (AB11). Nonetheless, AB7 notes how the nature of the industry, FMCG, with short shelf-life products and dynamic, fast-paced environment, there is little necessity for detailed projections beyond annual forecasts. Another participant also noted how "*there isn't necessarily one plan which we follow and remains static. We change according to circumstances*" (AB11). The description of the process by A12 is presented in Figure 9:

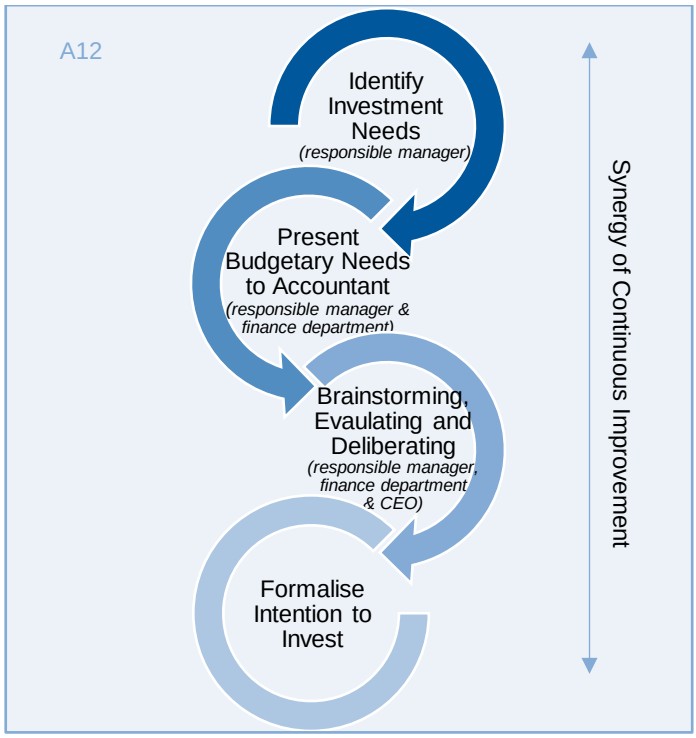

Figure 9 A12 Capital Investment Decision-Making Process

4.2.2.1 The Process for Search for Alternatives

The majority of participants described their process to search for alternatives in a similar manner. The information search varies, and some participants believed there is a lot of information with others disagreeing saying that "*in Malta*" (A4) information is lacking on the types of investment they seek to make.

One participant (A8) delineated the differences between certain investments. For off-the-shelf standardised investments, like IT equipment, there is a lot of information which may at times even be overwhelming; so one ought to be selective in looking for different options. Whilst for other investments, like specialised machinery, there "*isn't many options, so there is little information*" (A8), hence an "*element of trust*" (A2) comes into play. This trust-mechanism is a heuristic which will be discussed in further detail in Section 4.4.1. The idea of trust also comes into play as the "*recommendation system*" (B2), hence word of mouth and personal recommendations, is synonymous with the option-generation process.

Most participants mentioned how their procurement process, whether formalised into company policy or not, involves option-generation by gathering "*a number of quotes*" (A2), "*at least look at two or three*" (AB10), conducting online research, and "*instinct*" and "*experience*" (A9) also play a role. The process involves "*look[ing] at suppliers nationally and internationally*" (A2) and considering a myriad of factors (see Section 4.2.3). As procedures become standardised and companies become larger, this process is shaped by policies like "*drafting an expression of interest to search for alternatives*" (AB11). One of the accountants noted that "*clients have become more selective nowadays"* and the "*incentives from Malta Enterprise automatically lead the clients to find, for example, three quotes*" (B4). These government grants and funding programs propel decision-makers to "*move towards the ideology of transparency*" (AB5). This push towards improved governance structures and conducting proper due diligence was highlighted in the discussions with advisory consultants (C1, C2).

Participants noted how in some cases they have to diverge from their policies as it is "*not always possible*" (AB11) to get those three quotes mentioned. Also, for "*certain items [they] don't look for alternatives*" (A3) since they are loyal to one brand. A recurring theme was that it's better to deal with the devil you know and hence they stick to their "*pool of suppliers and try as much as possible to restrict [their search] to that*" (AB7).

4.2.3 Factors impacting Decision-Making

A number of factors inherent to the decision-maker, relating to the company itself, the industry in which the company operates, and other extraneous environmental factors impact the DM process and the decision itself.

In the DM process, decision-makers noted how they consider many factors, such as "*competition*" (A4), the "*market*" in terms of what clients are demanding (A2)

and what equipment is available (A1), legal requirements (such as HACCP[2] requirements) (A6), financing and "*credit terms*" (A1,A6), and other factors like "*lead time*" (A6), "*technology and efficiency*" (A12). A6 also noted the importance of considering the "*intangible elements of decisions*", such as the impact of the investment on the power infrastructure of the factory. Government incentives, developed locally by Malta Enterprise, are another factor which many of the participants noted they keep in mind (in terms of the CIDM process and decision triggers).

The analysis of "*macroeconomic variables*" (C1) was lacking as most participants noted factors regarding the internal aspects of decision, however they failed to look at the "*market dynamics*" (C2), "*economic trends*" (C1) and in performing the "*benchmarking exercise*" (C2) necessary to bridge the gap between the internal implications of decisions and the environmental context in which they are taken.

The process to search for alternatives has been facilitated through the advent of the internet as comparisons can easily be made where information is publicly available.

A new wave of technologies defining the Industrial Revolution 4.0[3] is another factor which some of the participants have noted as impacting their DM processes. B3 noted that "*nowadays CI is there to replace the human work*". Larger companies are "*looking into investing in robotics and internet of things" (AB10) in terms of machinery as well as incorporating "business intelligence platforms, like Power BI*" (AB10) in the generation of information for the DM process.

[2] Hazard Analysis Critical Control Point (HACCP) is a systematic approach to food safety management (Caswell, Hooker 1996).

[3] Industrial Revolution 4.0 refers to the transitionary period of society wherein technologies such as "*artificial intelligence, machine learning, big data, the Cloud, the Internet of Things, blockchain, smart sensors, robotics, cybersecurity, as well as digital twins and cyber-physical systems*" are shaping innovation in various industries, including food manufacturing and processing (Hassoun, Aït-Kaddour et al. 2022, p.2).

4.2.4 Bounded Rationality in Capital Investment Decision-Making Processes

One of the participants noted that "*there is no decision which is perfect. You can never predict everything; you cannot analyse all the data*" (AB11). It is impossible to consider all factors when taking a decision and hence rationally bounded means of DM do not seem so irrational in business. This will be explored further in Section 4.3 of this chapter.

4.3 Bounded Rationality

In order to gather the extent to which the DM process is limited by bounded rationality a number of questions (in the *DM Process* section of the schedules) focused on the topic of cognitive limitations, information constraints and other resource limitations.

4.3.1 Bounded Rationality and Satisficing

Entrepreneurial studies are often interpreted through the lens of heuristic theories, however, understanding how DM processes are bounded rationally provides a foundation for understating the implications of this realm of cognitive science in DM. A number of participants noted how in their DM processes and their processes to search for alternatives they have "*no time to compare everything on the market*" (A4). This time constraint as well as other constraints like "*human resources*" (A6) coupled with environmental constraints result in a limitation on rationality. Their employment of heuristics like "*trust*" (A4), sticking with the "*same suppliers*" (A1) and emotional involvement describe cognitive limitations which coincide with the theory of bounded rationality.

Most notably, rationally bounded DM is seen through the process of satisficing. They "*take final decision if satisfied*" (A4), often stopping their search for alternatives once satisfied and decide without further deliberation. Larger

companies have a mentality of not satisficing; "*it is an ideology to search for quotes and not just settle once satisfied*" (AB5).

One ought to note that bounded rationality is size-dependent and as companies get larger, rational means of DM (which are more data-driven and structured) overhaul the irrational DM processes inherent to micro and small companies. However, some form of bounded rationality still infiltrates DM processes even in medium-sized companies which in the local context are considered to be on the larger side.

4.3.2 Bounded Rationality and the Resulting Employment of Heuristics

Heuristics are the instinctive contingency plan employed to neutralise the limitations described in the theory of bounded rationality. Heuristic DM is the rational way to react to the irrationality of attempting to be completely rational in the CIDM process. This will be discussed in detail in the next section.

4.4 Heuristics

Heuristics are part and parcel of the DM process, especially in the context of SMEs in Malta which are characterised by cognitive limitations and environmental complexity. Employment of heuristics characterises the DM process to varying extents in the majority of the participants of the study. Some of the questions in the *DM Process* section of the schedules were used to gain an understanding of this DM technique.

4.4.1 Heuristics in the Decision-Making Process

In their descriptions of the DM process, the decision-makers and their accountants noted how in some circumstances short-cuts are taken when it comes to option-generation, information retrieval for use in the DM process, and in the deliberation and comparison of options identified. This alludes to the

employment of heuristics in the DM process. A number of heuristics as identified in Section 2.4 of the study are employed in their DM which have been described in Section 4.4.2 below.

Trust as a mechanism of heuristics also resulted from the study, wherein some participants noted how the short-cuts they use include "*buy[ing] from the same person*" (A1) (may also be referred to as anchoring bias, see Section 4.4.2.1). This "*element of trust*" as described by A4 involves "*development of trust from [the suppliers'] side and also an element of trust from [the companies'] side because you know they are good*". Trust is positive for the decision-makers who feel they will not be made a fool as their "*good due-diligence*" (A12) would have been conducted previously and through their experience with the supplier, and the supplier will also be "*flexible*" (A1) with the decision-makers, especially when it comes to credit terms.

4.4.2 Types of Heuristics

The decisional short-cuts taken by the participants can be grouped into the types of heuristics discussed below.

4.4.2.1 Representativeness, Availability, and Anchoring

The representativeness heuristic describes how initial impressions guide the DM process. All of the participants, except for one, agreed that the initial impression of the investment package, including the person making such a proposal or the supplier, do affect the final decision taken. "*Even though you're not supposed to judge a book by its cover*" (A2) and "*CI is a very complex decision*" (AB7), the first impression has bearing on the final decision. In the medium-sized companies, there was this mentality that albeit the fact that "*you won't have a second chance to give the first impression*" (AB1), subjectivity should be minimised as much as possible. They are trying to take decisions "*in a more professional way*" (AB11), after that initial impression "*you need to do some homework*" (AB7).

The availability heuristic, similar to the status-quo bias discussed in further detail in 4.4.2.3, refers to the short-cuts employed wherein decisions are based on readily available information decision-makers possess like their experience.

The anchoring and adjustment bias refers to the use of previous decisions in concluding on current decisions. The majority of participants stated that they do use previous CI decisions to a certain extent, some stating that "*if you had good reasoning, you should still use that good reasoning*" (A3). They use past decisions as a guide, learning from previous mistakes because "*experience teaches you*" (A8), and looking at what can be done better, since "*you're always trying to improve*" (A2). In smaller companies this reasoning, and other non-financial factors were the benchmarks used to affect new decisions whilst in larger companies the rates of return, KPIs and other data are the benchmarks used.

4.4.2.2 Fast and frugal heuristics

Fast and frugal DM, which involves the use of the affect heuristic refers to decisions which are taken based on emotions and other mental images attached to phenomena. For the majority of SMEs, emotions played a role in their business; "*it's a family-run business, it comes with the territory*" (AB10). In some cases, their investments were emotionally driven; "*that would be my dream to invest in them*" (A3). Most agreed that emotions are part and parcel of business, "*fruit of the passion of the company*" (AB10). Nonetheless, some stated that they "*[don't] let emotions run wild*" (A3) and ideally keep emotions at bay and not "*let them take over*" (A12). One of the participants noted that despite their efforts towards subjectivity and emotion-detachment were possible, "*sometimes what happens is that someone is so dedicated to their idea, attached to a wish… pride may play a role*" (A9).

The motivator of decisions also has a bearing on the affect heuristic. If an investment is seen as a necessity; "*keeping the business alive*" (A2, A3), or a

means for personal improvement (gains such as having a "*better working place*" (B2)), emotions will inevitably play a role in the DM process. Where "*motivation is driven by the vision we aim to achieve*" (A6) and "*strengthen[ing] the name and brand of the company*" (AB5), the mental image of success will drive decisions. Even if financial gain and "*bottom line of the profit or loss*" (A12) are motivators, these decisions can still be shaped by the decision-makers' cognitive tendencies.

4.4.2.3 Status-quo Bias

As explained in Section 4.4.2.1, the status-quo bias, similar to the availability heuristic, refers to when decision-makers stick to what they know (experience) and steer away from the unknown.

All participants acknowledge the use of their experience or that they avail themselves of others' experience in the DM process. "*I think that it comes naturally that through your own experience you affect the decision*" (AB7). Experience is both the body of knowledge the participants possess and the mechanism which provides them with the knowledge. Albeit acknowledging the importance of formal education, participants noted that "*[it] doesn't give you the necessary tools to make certain decisions, those come from experience*" (A2); "*what helps most is the experience of everyday*" (A8).

"*Only you know the ins-and-outs of your business and hence the needs you have*" (A1). As companies increase in size there is the realisation that one's experience on its own may not be the most holistic way to take decisions and hence it ought to be paired with other data and the experience of other professions, "*we also use suppliers and other consultants for their experience*" (AB11). "*We have a mixture of experience and information technology to gather information."* (A9)

Experience is useful to "*give numbers context*" (AB10). This emphasises that one cannot simply look at numbers solely as sometimes they do not tell the whole story. "*If sales increased because of marketing effort it does not justify a CI*"

(AB10), hence, one must use their business knowledge and experience to make informed decisions. "*It has to be a combination of analysis and gutfeel*" (C1).

When asked whether they tend to steer from the unknown, many participants agreed that sticking to the known reduces risk, "*what you know is always safer, when you have the unknown you always have greater risk*" (A8). However, some also mentioned that the unknown holds opportunities; "*it's easier to stick to what you know but it will not always work. I would rather expand than be afraid of the unknown as I do not want to limit my growth*" (A2).

"*The trick of business is to turn uncertainty into a risk. Which means we [can] quantify it, then we manage that risk"* (AB10). Others also noted how research can help to reduce the unknown to a palatable level. Albeit there being an element of unknown with CIs, the research which goes into making such a purchase decreases the unknown to a certain extent.

4.4.3 Rationalising the Use of Heuristics

Heuristic DM occurs as limitations exist which prevent rational choice theory from occurring. Limitations like information availability, time constraints and cost considerations, among others, result in the employment of heuristics in the DM process. Since "*personal know-how is the biggest asset of the company*" (B2), the use of decisional heuristics does not seem irritational at all. "*The bias is not based on thin air but on his capabilities, his knowledge and experience over time*" (B3), so employment of heuristics is positively connotated. Subjectivity is inherent to business and objectivity is difficult to achieve, especially in SMEs, where the owners dedicate their lives to the company and are influenced by what they know and their experiences. What they have been doing has worked out, so it makes sense to continue on this trajectory; they often have a good gutfeel and are not wrong in using that to their advantage.

4.4.4 Heuristics and Use of Management Accounting Information

"*There are people who base decisions on gut-feeling and others who focus more on information and data*" (B3). A myriad of information sources, including accounting information, is used to inform CI decisions. More detail on information sources, particularly MAI, will be discussed in Section 4.5.

4.5 Management Accounting Information

Participants use a variety of information and data, both financial and non-financial, from different sources to inform their decisions. The majority of the questions in *MAI and Role of the Accountant* section of the interview schedule were used to develop an understanding of what kind of information they use, whether accounting information is used, and whether MAI is involved in the DM processes.

4.5.1 Information Sources used in the Decision-Making Process

The participants listed a number of sources from where they obtain information during the CIDM process. All the decision-makers stated that they use the internet as a source of information, researching alternatives and suppliers by looking at "*reviews or testimonials*" (B1). The vast majority of decision-makers mentioned the suppliers of the CIs as a source of information, and they attend "*exhibitions, fairs and seminars*" (A6) to gather information on the products and the manufacturer. "*Laws and regulations*" (A2) are another source of information; some investments are made out of necessity (they are mandated by the law) and not necessarily as a need was identified. Only a few participants explicitly mentioned that they use MAI in their DM process, however, the majority of the participants allude to the use of MAI by stating that they use "*revenue figures and also cost of machinery*" (A3); hence without knowing it they are employing MA techniques in their evaluation of data for DM.

In medium-sized companies, "*MA is being used to see how we can finance that investment*" (AB11). "*We try to create our own KPIs, look at past data. Currently we are also using business intelligence platforms, like Power BI.*" (AB10). "*We will have information coming from various departments, finance, procurement, sales*" (B6). Budgets, forecasts, and business plans guide CIs in larger companies, whilst "*information from pool of suppliers, quotations, online research and asking personal contacts*" (B1) is more prevalent in micro and small companies.

4.5.2 Role and Utility of Management Accounting Information

The micro companies interviewed stated that they do not request any MAI from their accountant unless they have to prepare forecasts to present to the bank. However, one of the companies noted that they do consult the accountant informally to "*see whether or not I am in a liquid position to be able to afford the item*" (A4). Half of the small companies noted how they feel competent to take decisions by preparing their own costings and using data they have access to, whilst the others noted how the accountant offers financial advice and prepares projections and other reports to guide CIDM. Despite falling under the same classification, the position on the spectrum of company size (see Figure 8 in Section 4.1) which they occupy affects their employment of MAI in their DM processes. The medium-sized companies involve their accountant from both a financial-accounting and MA point of view. The accountant acts as the controller of finance, but also provides the necessary forecasts, budgets, costings, and projections which increase assertiveness and confidence in the DM process.

The accountants' information provision involves advice as well as preparation of calculations which indicate "*whether it is worthwhile investing in the project*" (B12). In some cases, participants simply skim through the data which was requested for compliance purposes to ensure it aligns with their expectations. In other cases MAI is used to guide DM, used in board discussions, and prepared to address issues which result into data which then helps guide investment intent

and DM. This includes MAI prepared as part of a "*cost-cutting exercise*" (AB10), or to determine shortage of resources, such as "*skilled labour*" (AB10). The MAI prepared is also useful to "*substantiate proposals to the BoD"* (A12).

When information is prepared for compliance purposes, around half of the accountants noted that it is "*used and taken into consideration*" (AB5), whilst others stated that "*the information is used by the banks, they do not use it themselves*" (B2). "*For the most part business owners have a mentality that it is irrelevant what the accountant thinks and if they have an idea in mind, they will carry it out regardless of the accountants' opinion*" (B3). On the other hand, B6 noted that "*they will find certain valuable information that they might not have saw or thought about*" (B6), adding on that regardless of why the information was requested in the first place, once they have the information at hand, they do use the information. In micro companies, MA is seen as a burden, an extra-cost with no added value, recruited only to comply with covenants, however, as they increase in size and mentalities shift, the perceived usefulness of MAI increases.

This notion of MAI uselessness in micro companies is compounded by the fact that "*[accountants'] services are usually sought after the decision is taken*" (B1), further cementing the fact that the information does not impact the DM process. It only affects the process wherein the decision-makers' judgement was erroneous, and a "*discrepancy*" (B3) is noted between expectations. As companies increased in size, the accountant is "*consult[ed] beforehand*" (B4). Decisions are more data-driven so information is used in the DM process, especially when CI is above a certain monetary threshold.

4.5.3 Management Accounting Information Presentation

A discrepancy in how accountants described MAI presentation and what the decision-makers (who do not request MAI) subjectively think this information looks like was noted. The participants stated that they think the information is simply "*a breakdown of the cost to operate the [investment] per day*" (A2). The

information is figures which they may not be able to interpret or make much use of, especially if "*financially illiterate*" (AB11). In reality, the information is transmitted verbally, numerically (reports and forecasts), and through graphical representations to "*visualise data better*" (B1). Meetings to discuss the reports prepared or to have informal conversations about the viability of the investment are another means of how MAI is communicated. The importance of graphical representations was highlighted by AB11 stating that "*in the first meeting I showed them a lot of numbers and they told me you've confused us. They asked me to present it more visibly, so using graphs etc*". The responsibility for "*tailoring [their] presentation to [their] target*" (C2) lies with the accountants.

4.5.4 Reliability of Management Accounting Information

In micro companies, the use of MAI is not identified as necessary and the accountant is not involved in the DM process, unless required for compliance purposes. Hence, MAI is not relied upon in the DM process. The reasons for lack of involvement are discussed further in Section 4.6.1. In most of the small and medium-sized companies, the accountant's input into the DM process is essential, not only for financial calculations but also to provide business insight; "*when it comes to DM of a certain calibre, we look at past decisions and understand what we are trying to solve with this investment*" (AB10). MAI prepared "*is discussed informally at management level and then presented formally to the BoD*" (B12). The nature of MAI, being estimates and predictions, hinges on its reliability and usefulness for decision-makers.

4.5.5 Management Accounting Information and Accountant's Role as Adviser in the Decision-Making Process

When accountants participate in the DM process, MAI provision comes naturally to substantiate the advice they provide. The extent to which MAI is factored into CI decisions often depends on the involvement of the accountant. This is explored further in Section 4.6.

4.6 Role of the Accountant as an Adviser in the Decision-Making Process

The accountants' involvement in the DM process is contingent on the decision-makers' willingness to be advised by them. The role of the accountant in the DM process and to what extent the accountants act as advisers to the management of the company, particularly in terms of CIs, was analysed through some of the questions in the *MAI and Role of the Accountant* section of the interview schedules.

4.6.1 SMEs and Advice-Seeking from Accountants

The micro companies interviewed stated that they do not involve the accountant in the DM process as they see accounting as a "*non-added value service*" (B3). "*An accountant does numbers*" (A2). These companies do not seek advice from their accountants as they have no identified need for accounting information and involvement of the accountant. They are also deterred by the "*cost involved*" (B2). However, the counterargument to fees being a deterrent lies in the fact that "*one can also apply for funds for our consultancy services*" (B6).

There is the "*misconception that the accountant is there to keep the government happy*" (B2). Apart from the cost of involving the accountant, "*everyone is busy, and they do not have time to go to the accountant and spend an hour speaking with the accountant*" (B3). The accountants are mostly involved for provision of advice relating to governmental schemes, rather than to help in the DM process; they are consulted after decisions are taken.

The small companies were divided on the issue, with one of the participants stating, "*I feel competent on my own, I have access to all the data*" (A8) and another stating that they have the internal competency to take decisions and also prepare costings and forecasts demands, the accountant is only involved "*to re-evaluate the costings which I create*" (A6). The other small companies, which

have an internal finance team noted the involvement of the accountant in the DM process. "*The management accountant would tell us the CapEx, how it will affect projected profit and loss, how we should amortise the expense*" (AB7). AB5 noted how they prepare detailed reports on cost of products, productivity and other matters at management level which are discussed with the director.

In medium-sized companies, the role of the accountant is more emancipated. "*I as an accountant on the board act as an adviser*" (AB10). "*The accountant is involved in a lot of number-crunching to ensure that the CapEx is good for business objectives and if he says so, we can proceed*" (A12). The accountant advises the decision-makers at management level and is involved in preparing the data which backs claims which are presented at board level.

Advice seeking from the accountant may be lacking as "*the accountant relevant for this purpose could be themselves*" (C2). In some cases, MAI is unknowingly prepared by the decision-makers themselves. Their experience in business affords them the knowledge and financial literacy to prepare MAI, "*I need to consider how much money I will spend on financing and whether it is worth it to buy that machine; I calculate how long I will take to recoup the investment*" (A3). The involvement of the accountant, in the role of a management accountant, may not be necessary where decision-makers are able to prepare forms of MAI themselves.

4.6.2 Business Knowledge and Market Awareness

As explained in Section 4.6.1, the business owners possess the knowledge necessary to take CIs. Their competency and track record deters them from involving the accountant. They know their business better than anyone else, hence it makes sense to not involve anyone. One accountant noted that "*in businesses where owner the is involved in every aspect, I don't think he is mistaken by not requesting input*" (B2). In larger companies, the financial controller is involved in the day-to-day running of the company, even sits on the

board in some cases. Therefore, "*they know the importance of when taking decisions, if the financial controller thinks it does not make sense, he should stop them*" (B2). In small and medium-sized companies, where the accountant is involved in the DM process, their awareness of the company's operating environment increases their business knowledge and allows for more meaningful input to be given by the accountant.

4.6.3 Management Accountant as Business Partner

The management accountant can be useful to companies by acting as a partner to management. However, when the accountant cannot provide high value information for CI decisions, possibly because no accurate data to produce MAI is held, the management accountant is not seen as a partner but rather as a burden, an undue cost. AB7 remarked how the management accountant is useful in a company to provide figures in relation to the manufacturing side, however, they cannot just sit behind their desk crunching numbers and creating reports as this would be of no value-added, they have to take a proactive stance. "*You involve the management accountant on the basis of how much he involves himself in the business*" (AB7).

4.7 Conclusion

The findings of the study resulting from the nineteen interviews carried out with business owners, c-suite employees, financial controllers, and accountants as well as the results from the two validation interviews (carried out with advisory consultants) have been presented in Chapter 4. Chapter 5 bridges the gap between the findings and the body of literature presented in Chapter 2.

Chapter 5: Discussion of Findings

5.1 Introduction

This chapter amalgamates the results and findings of the research with the present body of literature. In line with Chapter 4, the chapter is divided into seven main sections, which are the main themes arising from the analysis of findings. Section 5.2 lays the foundations by covering the first objective thoroughly as well as touches upon each of the other objectives. Section 5.3 and 5.4 both cover the second objective and make reference to the third objective. Section 5.5 covers the third objective and also touches upon the fourth objective, whilst Section 5.6 focuses on the fourth objective. Finally concluding remarks are presented in the final section. A summary of the structure and main objective each section covers are presented in Figure 10.

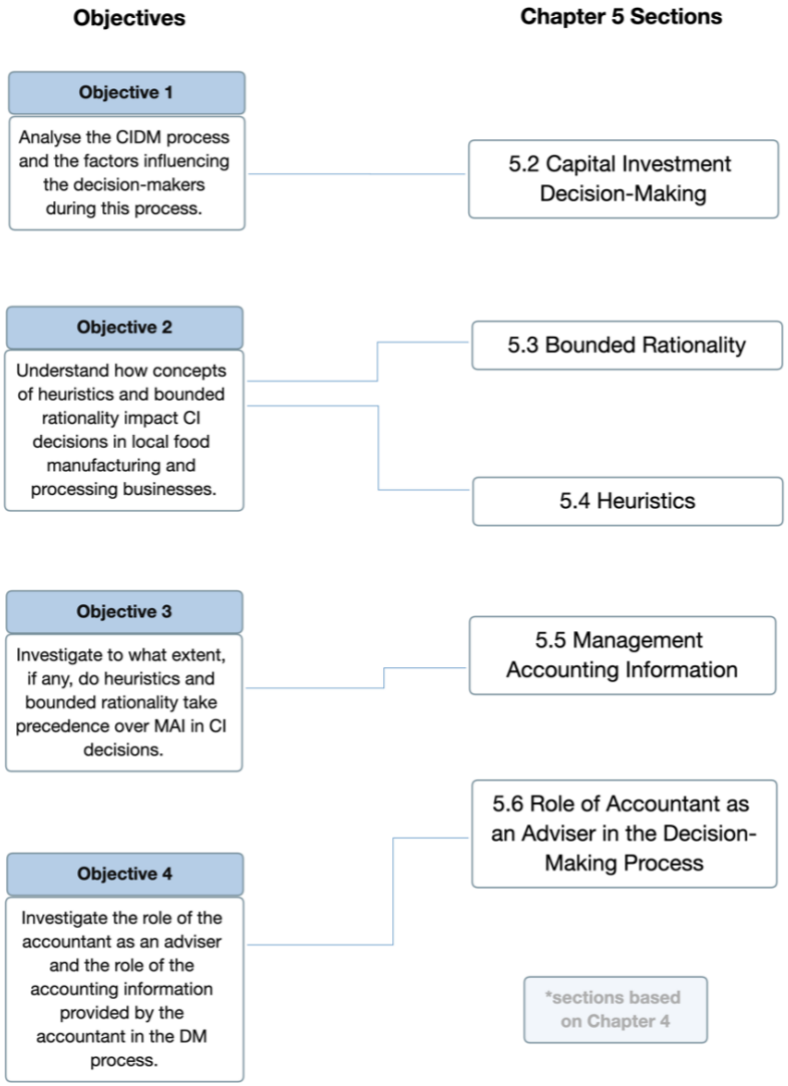

Figure 10 Chapter 5 Outline

5.2 Capital Investment Decision-Making

5.2.1 Impact of Decision-Maker Profile

Understanding the decision-participants (as described in Section 4.2.1) provides the necessary background to then understand the implications this has on the DM process. In micro companies, the sole-owner or directors take capital decisions, so processes need not be formalised to ensure progress is made. As companies increase in size, more decision-participants involved necessitate a more formal, structured approach; this was also observed by Liberman-Yaconi, Hooper et al. in their 2010 study. However, the family-business dynamic in some of the larger companies resulted in a DM process which remained centralised with the family and rather informal even in larger contexts. Familial involvement shaping DM is corroborated in the findings of Morales Burgos, Kittler et al. (2020).

5.2.2 Decision-Making Process in SMEs

The DM process in SMEs varies in formality and structure depending on size. As companies get larger, decision-participants increase and a more structured organisation hierarchy is adopted, the need for a more structured approach to DM is identified. Formalised policies, procedures and techniques start preceding the intuition-driven DM models in smaller companies. The findings corroborate with previous literature identified wherein a consensus was reached that SMEs tend to follow bounded rational DM models but as companies get larger, even within such classification, more resources and increased complexities call for elements of rationality to be embedded into the DM process, like tools and techniques which employ MAI (Busenitz, Barney 1997, Jokhu, Rokhim et al. 2019, Liberman-Yaconi, Hooper et al. 2010, Penney, Vardaman et al. 2019). The circular-iterative strategic DM model in micro companies developed by Liberman-Yaconi, Hooper et al. (2010) is in line with the data collected in this study (see

Section 4.2.2) and may also be employed to some of the participating companies (see Figure 11 for an example).

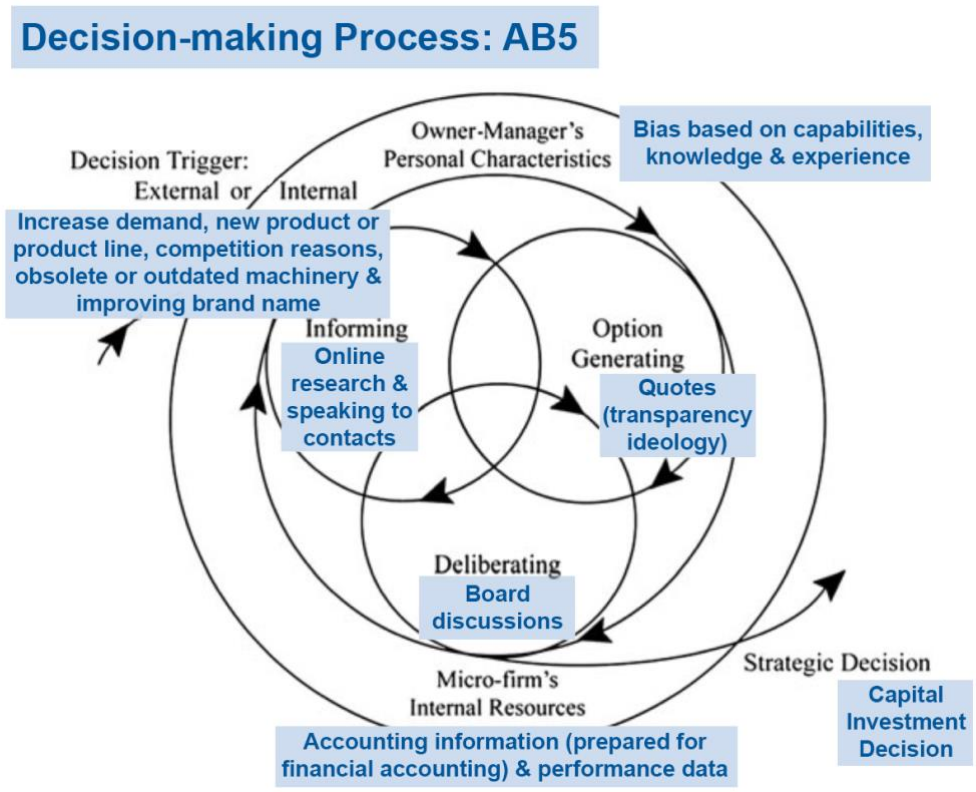

Figure 11 Adapted Model of Micro Companies Strategic Decision-Making (Liberman-Yaconi, Hooper et al. 2010, p.87)

The prevalence of heuristics, like trust and anchoring bias (see Section 4.2.2.1), in the DM process of the participating companies is in line with the findings of Morales Burgos, Kittler et al. (2020), who also investigated the bounded rational means of DM in the food manufacturing industry in Mexico and Canada. The logistics of smaller companies necessitates the use of decisional short-cuts (Lima, da Silveira et al. 2017) and a simplified option-generating process. Industry factors also have an effect on the DM process (Harris, Northcott et al. 2016). The nature of the industry makes it so that it may be difficult to plan for the future and formalise intentions for CIs, in spite one of the participants noting that they have plans for the next ten years.

The option-generating process (explained in Section 4.2.2.1) was characterised by online research, speaking directly to suppliers, and getting a number of quotes before deciding. The deliberation stage varies in length depending on the

tendency to satisfice, which in these micro and smaller companies tends to be the case. These findings are sustained by the literature that holds that under conditions of uncertainty, synonymous with CIs, decision-makers tend to satisfice and settle once an option which satisfies their needs is identified (Gigerenzer, Selten 2002, Morales Burgos, Kittler et al. 2020). Uncertainty may be converted into risk, which risk is then quantifiable and hence manageable; however, this process involves the attainment and employment of data and techniques which are not available to most SMEs.

A difference which can be noted between the findings of this study and the present literature lies partly in the fact that the study was carried out in Malta. The small-state nation characterises the companies in a manner which renders comparisons with international companies less meaningful. Whereas micro and small companies behave in a manner expected from the SMEs category, at the larger end of the medium-sized companies, they show characteristics which seem to indicate they are close to larger businesses. This could be partly due to the broad definition of the SMEs label.

5.2.3 Role of Factors Impacting Decision-Making

The factors which impact the DM process in SMEs, can be divided into the 3 main groups, all of which have been previously identified in a number of papers:

1. Decision-maker dependent (idiosyncratic) factors:
    a. *Family-involvement*: discussed in Section 5.2.1
    b. *Experience*: experience shapes the manner in which decisions are taken, choices made and the process itself. Experience is highly valued as a guide to taking the right decisions and making the right calls (Shepherd, Williams et al. 2015). Findings relating to experience are detailed in Section 4.4.2.3.
    c. *Heuristics and biases*: due to time, money, skills and other resources constraints, decision-makers employ heuristics and allow

their biases to possibly cloud their judgement in the DM process (refer to Section 4.4). This is not necessarily negative since under conditions of uncertainty it is fitting to act in a boundedly rational manner (Morales Burgos, Kittler et al. 2020).

2. Company dependent factors:
    a. *Size*: company logistics (size and resources available) considerably shape the DM process (Liberman-Yaconi, Hooper et al. 2010) as seen in Section 4.5.2.
    b. *Personnel*: the people involved in the company, and consequently in the DM process, shape the process and decisions taken. The latter has been described in Section 4.2.1 and discussed in Section 5.2.1.
    c. *Financing*: the level of financing required for an investment impacts the DM process as if bank financing is required, MAI may be requested and hence used in the DM process (Lima, da Silveira et al. 2017) (as described in Section 4.5.1).
3. Industry factors and other extraneous environmental factors (refer to Section 4.2.3):
    a. *Competition*: competitive forces shape the DM process, since some participants noted how they are driven to invest to keep up with competition (Lévesque, Minniti et al. 2009).
    b. *Market*: as described by participants who are motivated by the market to invest, demand increases induce investment whilst decreases in demand curtail investment.
    c. *Legal requirements*: laws and regulations play a role in the DM process as they may be the decision triggers in some investments.

5.2.4 Bounded Rationality in Capital Investment Decision-Making Processes

This study, looking through the lens of bounded rationality, suggests that decision-makers often act irrationally, and their cognition is bounded by extraneous variables and individual cognition; this is line with Northcott's (1991)

suggestions, and the theory of bounded rationality originally proposed by Simon (1955). The theory of bounded rationality is to be considered in tandem with the CIDM processes of the participants since they are an exemplification of the theory.

5.3 Bounded Rationality

Bounded rationality is observed in the DM processes of the participants. The findings detailed in Section 4.3 indicate that adaptation to the environment and individual cognition impact DM. This is in line with $Simon_1$ theory (1955) of bounded rationality (refer to Section 2.3.2).

5.3.1 Impact of Bounded Rationality and Satisficing

The DM processes in the participatory companies, as seen in Section 4.2, are rationally bounded in terms of the 3 premises as defined by Gigerenzer (2002): *psychological plausibility*, *domain specificity* and *ecological rationality* (explained in Section 2.3.1). In terms of *psychological plausibility* and *domain specificity*, cognitive limitations, such as emotional involvement, anchoring bias, trust, and other heuristics are used in the DM process. Rational optimisation to the environment, in terms of limiting the process to search for alternatives due to resource constraints, such as time and cost, is described as *ecological rationality* in the theory of bounded rationality (Hands 2014, Gigerenzer, Selten 2002). The phenomenon of satisficing as observed by Morales Burgos, Kittler et al. (2020) was also observed among the participating companies, particularly the micro companies, who tend to take a decision once satisfied without considering further options. Bounded rationality is less influential in larger companies (detailed in Section 4.3.1), since more structure and data precede heuristics in the DM process. This is in line with the concept of *ecological rationality*; since larger companies have more access to resources, there is less need for optimisation to the operating environment. Notwithstanding, the employment of bounded rational means of DM are not a lesser than option since decision-makers hold a body of

knowledge which allows them to take decisions which yield results on par with decisions taken on the basis of rational choice theories.

5.3.2 Bounded Rationality and the Resulting Employment of Heuristics

The findings of the study suggest that a number of heuristics are used to guide DM in the participants, and their rationality is bounded by a number of internal and external factors. This is in line with the theory of bounded rationality discussed by numerous authors (Forbes, Hudson et al. 2015, Gigerenzer, Brighton 2009, Gigerenzer, Goldstein 1996, Gigerenzer, Selten 2002, Hands 2014, Kahneman, Tversky 1996, Morales Burgos, Kittler et al. 2020, Petracca 2017, Simon 1955, Simon 1979).

5.4 Heuristics

Shepherd, Haynie et al.'s (2012) notion that heuristics is superior to bounded rationality in entrepreneurial contextual studies (as explained in Section 2.3) was an intriguing concept and hence this study focused more on heuristics to define their impact on the DM processes and how they compare to employment of MAI.

5.4.1 Heuristics in the Decision-Making Process

The participatory companies, as per findings in Section 4.4, all employ decisional short-cuts in their DM processes. Their CI decisions are often guided by experience and personal know-how, with recommendations taken from personal contacts and suppliers. This irrational model of DM is not necessarily lesser than rational models, rather it is rational to employ these heuristics to reduce the complex task of DM and ensure CIs are being made. This is in line with the findings of numerous studies on the topic (Busenitz, Barney 1997, Cruciani 2017, Gigerenzer, Gaissmaier 2011, Gigerenzer, Selten 2002, Slovic, Finucane et al. 2007), however it opposed the standing of Kahneman and Tversky (1996) who suggest that heuristics are simply humans acting in a biased and irrational

manner to take the easy way out and not to optimise to their environment; which will result in the wrong decisions. One of the participants (A12) carried a *Kahnemanism* philosophy by noting that emotions should not be involved in decisions and although experience is an asset it should not cloud judgements; rather information should be the main factor in the DM process. This suggests that to a certain extent, decision-makers are rational when employing heuristics; the rational heuristic model of DM may sound like an oxymoron, but, maybe unknowingly, decision-makers are using the best weapons in their arsenal (heuristics, bias, experience and personal judgement) to take the best decisions for their companies. Heuristics are not the antagonist to rational choice model; they are the most rational means of DM for companies with several resource limitations led by cognitively limited entrepreneurial-spirited souls.

5.4.2 Types of Heuristics

5.4.2.1 Representativeness, Availability and Anchoring

The heuristics originally presented by Kahneman and Tversky (1973) and later on studied by a number of authors (Lima, da Silveira et al. 2017, Cruciani 2017, Harris, Northcott et al. 2016, Forbes, Hudson et al. 2015) have been identified as part of the DM process in the participating companies (in Section 4.4.2.1).

They comply to the representativeness heuristic by allowing first impressions to shape their decisions, they take decisions based on what they know works in line with the availability heuristic, and they use past decisions as benchmarks for future decisions as per the anchoring and adjustment heuristic. The observations detailed are mostly prevalent in the micro and small companies interviewed. As companies increased in size they moved further away from heuristic DM and more towards quasi-rational models of DM.

5.4.2.2 Fast and Frugal Heuristics

Emotional response to stimuli which then guide DM was prevalent in the DM processes of the majority of the participants, with only some stating they make an effort to keep emotions away from the DM process. This phenomenon is described by Slovic, Finucane et al. (2007) as the affect heuristic, stemming from the fast and frugal heuristics as described by Gigerenzer and Goldstein (1996). The emotional attachment to decisions comes with the territory of family-run businesses which describes the majority of participants. Emotional involvement was also noted in the manner the participants described what motivates their CIs.

5.4.2.3 Status-quo Bias

Experience infiltrates the DM processes of all participants. The use of experience for DM was positively described by some participants, noting how their experience and past decisions help sharpen their DM skills and also helps them to build a rapport with suppliers and other contacts. Experience helps decision-makers to look at things, especially figures, holistically and not taking matters at face-value. On the contrary, it was noted that sometimes experience puts one in a box and conforming to the status-quo is not ideal in business. Business is about facing risks, in a calculated manner, to advance and improve the business. If one becomes too comfortable with what they know works, they will not step out of their comfort zone where CIs of a certain calibre, which will improve the business and possibly change the strategic dimension of the company, take place. The two opposing effects of experience corroborated with those described by Shepherd, Zacharakis et al. in 2003.

5.4.3 Rationalising the Use of Heuristics

The employment of heuristics is rationalised since the decision-makers have:

- limited resources (cost and time constraints relating to the DM process);

- incomplete information (they cannot search the whole internet, speaking to suppliers provides only some of the information necessary for their decisions, and due to other constraints MAI may not be available; so the information available to them for DM capacities is incomplete);
- operate under conditions of uncertainty (due to the nature of the business and the industry these decision-makers operate under uncertain conditions); and
- other cognitive limitations.

Therefore, they prefer shorter DM processes over a complex data processing DM model. This corroborates with existing literature, presented by Jokhu, Rokhim et al. (2019) and Liberman-Yaconi, Hooper et al. (2010) who suggested that SMEs trade rational economical methods of DM for heuristic DM. A distinctive finding of this study relates to its setting in Malta. The findings differ from Jokhu, Rokhim et al. (2019) as they place SMEs under one umbrella, however, in this study it was discovered that medium-sized companies employ fewer heuristics as they have fewer resource constrains. The Maltese business dynamic and the diminutive economy the medium-sized participating companies operate in means that they do not conform to the notions predominately associated with SMEs, and they may be more in line with larger companies.

Another rationalisation for heuristics lies in the simplicity of function. Heuristics require no undue cost or effort, and they work, therefore, it is only logical to continue using them. This finding is corroborated by Emmanuel, Harris et al. (2010) who noted that heuristics are the most economical and effective means of DM in certain companies.

5.4.4 Heuristics and Use of Management Accounting Information

Heuristics are not inherently erroneous, rather it often makes sense to use these short-cuts as opposed to trying to look at all possible options and consider all factors, since no decision is perfect and there is no such thing at the "*fully rational*

man" (Gigerenzer, Selten 2002, p.14). However, the use of MAI may help to move the DM process towards a more rational one if it is backed by data.

5.5 Management Accounting Information

The findings in Section 4.5 and the present literature agree that MAI, both financial and non-financial, is useful in guiding DM in the right direction as it can help confirm the preconceived notions of decision-makers or open their eyes to shortcomings they made in the establishment of their expectations (Chapman 1997, Saukkonen, Laine et al. 2018).

5.5.1 Information Sources used in the Decision-Making Process

The findings in Section 4.5.1 indicate that in micro companies and most small companies MAI is not one of the information sources used to aid the DM process. Their decisions are guided by factors and data other than that which can be considered MAI or even accounting information. However, in some cases, decision-makers are unknowingly employing MA tools and techniques in their DM, even if not with the involvement of the accountant. In the medium-sized companies more accounting data, MAI, and other established tools (like business intelligence platforms) and techniques (projections, business plans etc.) are used in the DM process.

5.5.2 Role and Utility of Management Accounting Information

5.5.2.1 Role of Management Accounting Information

As companies grow, they use more MA as they have more resources available (such as an in-house management accountant), their CapEx is greater so there is more utility for it, and they see the value of such information. Where no data is requested, or it is requested solely for compliance with bank requirements, the data is not used in the DM process and is prepared for a symbolic purpose. In some cases, where the accountant is requested to prepare forecasts which are

compared with those prepared by the owner-manager, MAI serves a confirmatory purpose. There is a bargaining utility to information which is prepared to cement the opinions of others in board discussions; it serves a political purpose to substantiate claims made by management. MAI has a retrospective rationalising utility to information which is prepared to legitimise decisions already taken. The different roles MAI plays are described in detail in Drury (2020).

5.5.2.2 Management Accounting Information Utility

MAI is not requested from the accountant in micro and small companies; however, some MAI and other accounting data is used to guide decisions inadvertently. This usually involves more communication and informal usage of MAI to understand alternatives available. This observation fits the actor-based utility approach described by Saukkonen, Laine et al. (2018), which is useful for the decision-makers to increase their business knowledge and ensure satisfaction within the stages of the process. In medium-sized companies MAI is used in a more formal manner, with complex techniques and procedures used. This is in line with the analytical utility approach described by Arbnor and Bjerke (2009) which is useful when such data is available to decision-makers and the DM process is centralised within upper-management and the BoD.

5.5.3 Management Accounting Information Presentation

The misconception that MA is just figures, with little utility to management is in line with the findings of numerous authors who criticise the relevance and presentation of MAI (De Lema, Durendez 2007, Hall 2010, Kattan, Pike et al. 2007, Saukkonen, Laine et al. 2018). The findings suggest that graphical or tabular presentation of MAI may be more useful aids in the DM process, especially when financially illiterate decision-participants are involved.

5.5.4 Reliability of Management Accounting Information

Since MAI may include estimates and forecast demands, a forecast remains a forecast and hence even in pursuit of rationality, giving precedence to MAI as opposed to heuristical DM may still not result in better decisions. Estimates are inherently tainted by bias, personal judgement and cognitive limitations of the persons making the estimates. This begs the question, why should a business owner, who knows the ins and outs of his business, what sells and what does not, what the clients are requesting, the suppliers' tendencies, ask advice from an accountant and base his decisions on forecasts? The findings of the study suggest that the financial and non-financial (such as time and energy) cost of MAI may not outweigh the benefits for certain CI decisions. In the case of some CIs, which although costly and important may not be strategy-altering, there seems to be no need for MAI to guide DM. In these situations, heuristics and bounded rational means of DM should take precedence since these somewhat irrational methods are the most logical to employ. This finding is in line with Chapman (1997) who noted how MAI may lose reliability under conditions of uncertainty of outcome, which is characteristic to forecasts and similar projections.

5.5.5 Management Accounting Information and Accountant's Role as Adviser in the Decision-Making Process

The use of MAI in the CIDM process is almost always correlated with the involvement of the accountant; except for the cases where the participant had the experience and knowledge to create such MAI on their own. The involvement of the accountant, in the management accountant sense, can help decision-makers separate their emotions from the decisions and take a more objective stance; however, if the *bean-counter* role of the accountant prevails in the minds of the decision-makers, there is no perceived benefit of involving the accountant (Desroches 2013).

5.6 Role of the Accountant as an Adviser in the Decision-Making Process

The role of accountants in the DM process depends on the involvement afforded to them by the decision-makers. Where involvement of the accountant is seen as non-value adding, the accountant is not involved, and the DM process is less data-driven and more heuristic-driven. On the other hand, where the accountant works hand-in-hand with the decision-makers in a holistic DM process, MAI is a key factor in the DM process. These findings are detailed in Section 4.6. The importance of accountant involvement was described in the Nguyen (2018) study, however, in some instances the findings of this study contrast with Nguyen's (2018) findings. The heuristic-driven DM process, spearheaded by the owner-managers who possess the necessary information about their business, did not necessitate the involvement of the accountant.

5.6.1 SMEs and Advice-Seeking from Accountants

The micro companies participating in the study do not involve the accountant in the DM process or seek advice from their accountant. Some of the small companies seek advice from their accountant, even if not necessarily complex MAI, to aid their DM processes. Others, who are larger in size and lean more towards medium-sized also use MAI in their DM process. The findings in Section 4.6.1 are somewhat in line with Greenwood, Hinings et al. (2002) who noted how the accountant is a *one-stop shop* for small companies. In some of the participants this was the case, however, in others the accountant was not involved at all. The recurring theme that the accountant knows numbers and does not know the ins and outs of the decision-maker's business suggests that Carey and Tanewski's (2016) findings that the perceived competence of the accountant impacts purchase of advice are comparable to this study. The participants may not seek advice from their accountant as they do not see any value in doing so, since they believe the accountant is knowledgeable in book-keeping and cannot aid in CIDM.

In contrast, the medium-sized companies all involve the accountant in the DM process. The advisory services provided by the external accountant or in-house

accountant are seen as value-adding and essential in pursuit of rational CIs. This finding is in line with Breen, Sciulli et al. (2004) who noted the value in advice-seeking from accountants.

One ought to note that the involvement of the accountant does not necessarily mean involving a third party. In some cases, the business-owners were knowledgeable enough to create MAI in some form and hence were acting as quasi-accountants and adopting the management accountant role themselves.

5.6.2 Business Knowledge and Market Awareness

Tillema, Trapp et al. (2022) discussed how the involvement of the accountant in the DM process will only be useful if the accountant has an understanding of the business context, including market knowledge and business acumen. This was noted in the study as well since the hesitation to involve the accountant stemmed from the notion that the accountant has no knowledge on the business realities the companies operate in. It is also corroborated by the fact that all the participating companies who involve their accountant in the DM process have an in-house accountant, who hence has a level of business knowledge and market awareness external accountants with a portfolio of clients may not have.

5.6.3 Management Accountant as Business Partner

Management accountants can fulfil their role as business partners by involving themselves in the running of the business, taking a proactive stance and going beyond creating reports. One of the participants described their negative experience with a management accountant who failed to internalise the role of business partner since they did not involve themselves in the business. The possible positives related to having a management accountant are undermined if they do not move away from the inspector role. This was described by Karlsson, Kurkkio et al. (2019) who wrote about the proximity to management, as opposed to the financial controller, management accountants should have.

Possible job role incongruence may occur wherein the accountant in the companies, due to their size, has to act as both the traditional *bean-counter* as well as the evolved management accountant who has a *business partner role*. The latter was described by Morales (2019) and Tillema, Trapp et al. (2022), who noted how management confirmation may help the accountants to internalise their role as business partners.

5.7 Conclusion

This chapter discussed the findings of the study presented in Chapter 4 and bridged the gap with the literature provided in Chapter 2. The next chapter provides concluding remarks on the study.

Chapter 6: Conclusion

6.1 Introduction

This chapter provides concluding remarks on the study. Section 6.2 provides a summary of the key findings as presented, analysed, and discussed in Chapters 4 and 5 respectively and Section 6.3 highlights the conclusions of the study based on the key findings. Section 6.4 enlists the recommendations emanating from the study and Section 6.5 discusses areas for further research. Finally, Section 6.6 contains concluding remarks on the chapter and the study itself.

6.2 Summary of Key Findings

A brief overview of the key findings is presented hereunder, which are then evaluated in Section 6.3. Section 6.3 takes a holistic view of the objectives and concludes the study by presenting a model which describes the nexus of heuristics and accounting information in CIDM.

6.2.1 Objective 1: Analyse the CIDM process and the factors influencing the decision-makers during this process

The data suggests that the CIDM process involves informing oneself of the need for investment, generating options and possible alternatives, and deciding after a period of deliberation. Factors such as resource (cost and time) constraints, cognitive limitations, and pseudo-perceived usefulness or uselessness of MAI impinge on the process and results thereto.

6.2.2 Objective 2: Understand how concepts of heuristics and bounded rationality impact CI decisions in local food manufacturing and processing businesses

The data supports that decisional heuristics and bounded rational theories of DM are ingrained in the CIDM process in the businesses interviewed in the study. The scale of the business and scale of the investment impinge on the extent to

which decisions are guided by heuristics or more data-driven rational means of DM.

6.2.3 Objective 3: Investigate to what extent, if any, do heuristics and bounded rationality take precedence over MAI in CI decisions

The data suggests that insofar as there is no identified need for involvement of the accountant and use of MAI, heuristic DM supersedes more rational forms of DM. Where more resources are available, mentalities shift, and the operating environment changes, MAI is given precedence in discussions on CIs. Increased use of MAI and more formalised procedures indicate stronger governance structures and portray more professionalism in the CIDM process.

6.2.4 Objective 4: Investigate the role of the accountant as an adviser and the role of the accounting information provided by the accountant in the DM process

The data suggests that the accountants act as advisers when they are involved in the DM process and information is prepared by them for use in the CIDM process. In companies where the accountant is not involved in the process, there is no input regarding CIs. In these cases, involvement is usually contingent on needs-basis for MAI (such as for compliance) and hence provides little value to the decision-makers vis-à-vis the decision itself. When the decision-makers are capable to produce MAI themselves, they are the quasi-accountants in this context and need not involve a third party to serve as the management accountant and act as an adviser.

6.3 Conclusions

The use of the word nexus is deliberate in the study as the employment of heuristics and accounting information in the CIDM process was considered in tandem. The connection between the two is pertinent to the question of rationality.

The study concludes that forms of irrationality (bounded rational theories of DM and employment of heuristics) reside at the core of CIDM. However, more resources, professionality, and decision-participants involved in the DM process necessitate the move towards more rational forms of DM which are characterised by the use of data rather than heuristics. The extent to which the bond between heuristics and accounting information is strengthened or weakened resides with a number of factors, such as company size, involvement of the accountant (and hence MAI), decision-participant mentality, and resources at their disposition.

Notwithstanding, the use of heuristics and MAI are not opposites on the scale of rationality in DM. The employment of heuristics may not be irrational, and the use of MAI may not be rational. MAI involves estimates and use of judgment in its preparation, hence is not free of bias. Heuristics, rooted in experience, are not irrational as under conditions of uncertainty and limited access to data, these biases may be the best means of taking decisions.

If no decision is fully rational, why should the business owner bear the cost of the accountant for the accountant's quasi-rational DM, when he could settle for his own irrationally driven decisions. In this context, of environmental uncertainty, the decision-makers' own decisions seem more rational since they have more direct experience in their field and their business. The findings of the study suggest that the cost (financial and non-financial) of MAI may not outweigh the benefits if it is too costly and burdensome to procure. However, in the pursuit of improved governance through professional DM policies and procedures, the advice of a professional may be beneficial.

The nexus of heuristics and accounting information in the CIDM is summarised in Figure 12.

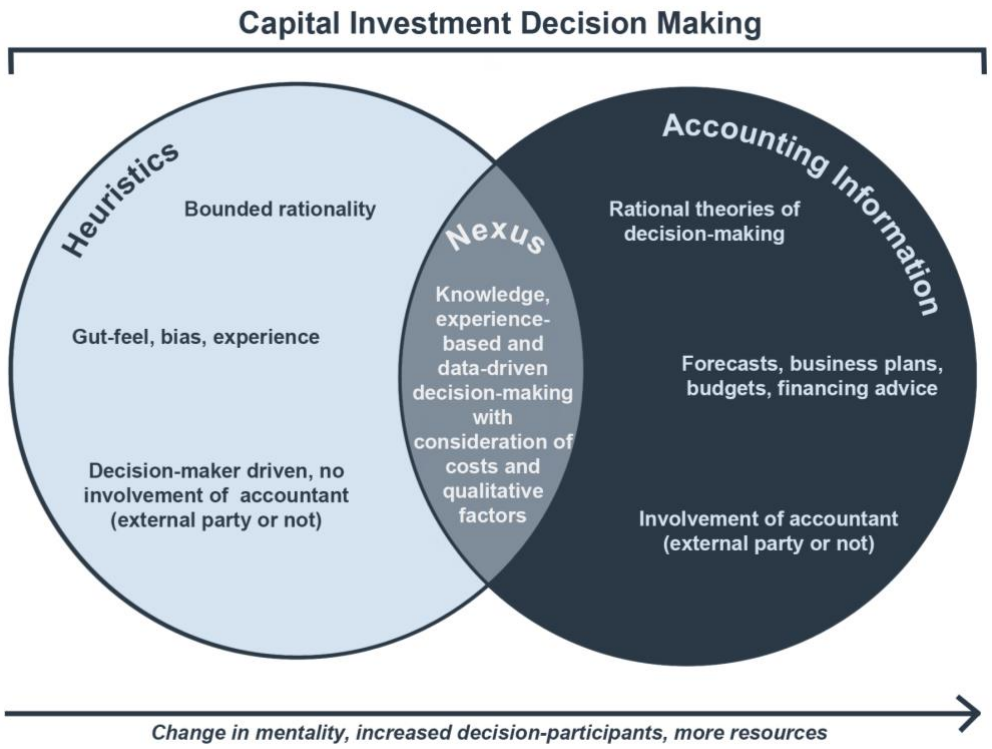

Figure 12 Nexus of Heuristics and Accounting Information in Capital Investment Decision-Making

6.4 Recommendations from Key Findings

Five recommendations have emerged from the findings of this study (presented in Chapter 4 and 5, summarised in Section 6.2):

i. **Governance in SMEs is improved through more professional CIDM policies and procedures** (Section 5.2.2)

The findings suggest that having CIDM processes formalised in company policies aids the DM process in a number of ways. Documentation of policies (such as procurement procedures, approvals from BoD, proposal structure etc.) ensures consistency in the DM processes and improves governance. This consistency also aids in future DM since comparisons can be drawn. Legislation, like Environmental, Social and Governance (ESG) reporting requirements and requirements for state-aid (*Micro Invest Scheme* or *EU funds*) can push towards increased professionalism and motivate business owners to improve their structures.

ii. **Investment analysis goes beyond internal aspects and more focus on macroeconomic variables** (Sections 4.2.3 and 5.5.1)

Internal aspects of a decision (technical and mechanical details of investment, impact on bottom-line and impact on individual) are analysed well during the DM process, however external aspects are usually lacking. Investment analysis should go beyond internal aspects and focus on the macroeconomic variables impacting these decisions. Benchmarking with economic, market and other trends is recommended to provide a link with the outside world and ensure the decision is appropriate not only in the context of the company but also in the operating environment.

iii. **Increased education on accountant's role** (Sections 5.6.1 and 5.6.3)

The hesitation of some participants to involve the accountant stems from their lack of knowledge of the value the accountants' involvement can have on their DM process. Educational campaigns on the importance of structured DM processes, use of historical accounting information, use of forecasting and MAI, and involvement of the accountant can help to change mentalities and highlight the benefits of seeking professional advice in terms of CIDM.

iv. **Proof of accountants' involvement value is in the information presented** (Sections 4.5.3 and 5.5.3)

The accountant is responsible for presenting the data well and tailoring the presentation to the target audience. Improvements (such as those listed hereunder) may help to increase the perceived usefulness of their involvement:

- providing a justification for their input,
- providing advice on grants and other cost-saving procedures,
- providing a vision based on data which the decision-makers may not have been able to provide, and
- acting as an advisor (adopting a *business partner* role).

Taking on an advisor role means involving oneself and being available to the client as needed. This applies both for external accountants, who should ensure they are providing a good service to their clients and being available as well as for internal accountants, who should involve themselves and make an effort to understand how the business is run and how it may be improved.

v. **Move away from notion that heuristics are less-than without undermining importance of accounting information** (Section 5.4.1)

The study recommends that the notion of heuristics should not be seen as an irrational and a negative approach to DM. Heuristics are rooted in data gathered subconsciously by the decision-makers from their experience in business. Nonetheless, the benefit of using accounting information should not be underestimated. Combining the two results in the most cost and time efficient and effective decisions bearing in mind the resource constraints. There needs to be mutual respect from both sides. The accountants ought to respect the decision-makers who know what works for their business and have their success to show for it. On the other hand, the decision-makers should respect the accountants and their profession and understand that the accountant may provide value through an independent opinion on the decision.

6.5 Areas for Further Research

Four areas requiring further research have been identified from this study:

i. **Longitudinal Case Study of CIDM in Maltese SMEs**

A case study approach can be taken over a longer period of time to understand in-depth the full CIDM process in a company. All the steps of the process can be observed and analysed as well as any post-implementation processes and evaluations of the decision. The impact of the CI may also be observed and analysed. The real-life example of a CI may help to show a more accurate view of an incidence of a CI and the processes undertaken.

ii. **The Impact of Decision-maker Characteristics on the CIDM Process**

It would be interesting to analyse the impact specific decision-maker characteristics have on the CIDM process. The idiosyncratic characteristics analysed could include age, decision-style, experience, education level, and personality among others. A mixed-method approach may be useful to deduce any correlations between variables (for example succession plans may impact one's CIDM as they get closer to retirement age), and then develop an in-depth understanding of the reasons behind these correlations. This study would delve deeper into the personal factors impacting the DM process as explored to some degree in Section 5.2.3.

iii. **Developing a Practical Framework for CIDM**

Increased education on the utility of employment of accounting techniques in the DM process may enhance the process and consequently improve CI decisions. Using grounded theory, wherein data is gathered from decision-makers, accountants, and advisory consultants (similar to this study) researchers may be able to develop a framework which can then be the foundation of an educational campaign to improve CIDM among Maltese businesses. This resulting framework may be on the lines of the Liberman-Yaconi, Hooper et al. (2010) model as discussed in Section 5.2.2.

iv. **Cognitive Brain Mapping of Decision-Makers during the Deliberation Stage**

An interesting study akin to the subject matter of this study may be conducted to increase literature in the neuroaccounting realm. The use of an electroencephalogram (EEG) can be made to identify brain wave patterns and electrical activity of the brain during the DM process in a number of decision-makers. Particular focus on the deliberation stage by presenting a number of investment proposals to decision-makers would allow for identification of patterns in neurological activity.

6.6 Concluding Remarks

The nexus of heuristics and accounting information in CIDM is reliant, to some extent, upon the degree to which DM is guided by rationality. CIDM is complex and many factors shape the investment process. The study concludes that heuristics are inherent to the CIDM process, however the use of MAI may help to justify the gutfeel and bias-driven investment ideas and back the heuristics by data. An accountant should be involved wherein the decision-makers are unable to bridge the gap between the technical and financial aspects of a decision. Where the decision-makers are able to produce MAI of some sort on their own, the involvement of the accountant (and cost related thereto) may be unnecessary. Nonetheless, the advice of an accountant, whether for informing or rationalising purpose, may help to professionalise the CIDM process, improve governance structures, and shift the CIDM ideology from a consequential to a proactive one.

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Appendix

Appendix 3.1: Classification of Participating Companies

In order to classify the companies into the micro, small and medium-size companies definition as per EU recommendation 2003/361, the participants were asked about the number of employees in their companies and data on assets/ revenues was gathered from the Malta Business Registry (where applicable). Where the companies were not registered as companies, hence no documents were available from the Malta Business Registry, verbal confirmation was obtained that their revenues or assets figures fell within the thresholds of the SMEs definition. The table below details the classification of companies to ensure they fit the purpose of the study (i.e. being SMEs). The figures (of number of employees and assets or revenue figures) in the table have been replaced with the thresholds defined in the EU recommendation 2003/361 so as to protect the anonymity of participants.

Company Code	**Participant Code**	**Number of Employees**	**Assets/ *Revenue***	**Therefore, Company Size**
1	A1	<10	<€2,000,000	Micro
2	A2	<10	*<€2,000,000*	Micro
3	A3	<10	*<€2,000,000*	Micro
4	A4	<10	<€2,000,000	Micro
5	AB5	<50	<€10,000,000	Small
6	A6	<50	<€10,000,000	Small
7	AB7	<50	<€10,000,000	Small
8	A8	<50	<€10,000,000	Small
9	A9	<250	<€43,000,000	Medium
10	AB10	<250	<€43,000,000	Medium
11	AB11	<250	<€43,000,000	Medium
12	A12	<250	<€43,000,000	Medium

Table A3.2 - 3 Participating Companies Classification

Appendix 3.2: Interview Schedules

This appendix contains the interview schedules used to collect data for the study, this includes:

- Schedule A: used in the interviewing of Participant Type A (owner-managers or other managers in companies which are involved in the capital investment decision-making process)
- Schedule B: used in the interviewing of Participant Type B (external accountants or internal accounts or financial controllers of the companies interviewed)
- Schedule C: used in interviewing of Participant Type C (advisory consultant who possess industry knowledge necessary to serve as part of the validation efforts of the study)

Schedule A

This interview schedule was used with Participant Type A.

a) Demographic Questions
    1. What is your age and what gender do you identify as?
    2. What is your role and responsibility within the company?
    3. What is the highest level of education you have achieved, and do you have any accounting education?
    4. How many years of experience do you have in the field?
    5. Can you describe your company's main trading activity?
    6. Can you provide a proxy of your company's size (number of employees)?
    7. What is your company's target market (import/ export)?

b) Decision-Maker Profile
    1. Who is responsible for making capital investment decisions in your company?

c) Decision-Making Process
    1. Can you walk me through your decision-making process, particularly in terms of capital investment decisions?
    2. Do you plan for these decisions beforehand/ formalise your capital investment intentions?
    3. What are the main reasons or motivators for capital investment decisions?
    4. Do you use information which you are in possession of (your wisdom) and past experiences when taking decisions?
    5. Do you tend to steer away from the unknown?
    6. Do you consider first impressions of a person proposing the investment or the capital asset of the asset itself important?

7. Do you used previous capital investment decisions as a basis for future decisions? (Meaning, do you use benchmarks for rates of return, spend etc.; adjust value to yield results of a decision)
8. Do you think you allow emotions to take involvement in your capital investment decision?
9. What is the process you go through to search for alternatives (to generate different options)?
10. How many alternatives do you look for (how long do you persist in finding information)? At what point do you take a final decision?
11. Do you feel overwhelmed when searching for alternatives, by too much information and alternatives in the market?
12. Once the capital investment was carried out, are there any post-implementation processes carried out? Do you analyse any requested data to check if they match with results and ensure that it was a valid decision?

d) Management Accounting Information and Role of the Accountant

1. What information do you use to take capital investment decisions?
2. Do you involve your accountant in the decision-making process? Do you request any data from your accountant when taking capital investment decisions?
3. How do you use the accounting information gathered for your decisions?
4. Where do you gather information for alternatives? Do you request from your accountant regarding alternatives?
5. If you do not request information, what are your deterrents?
6. If you do not request information, what do you think such information would look like?

e) Any other comments or suggestions from your end?

Schedule B

This interview schedule was used with Participant Type B.

a) Demographic Questions
    1. What is your age and what gender do you identify as?
    2. What is your role and responsibility within the company?
    3. What is the highest level of education you have achieved?
    4. How many years of experience do you have in the field?

b) Decision-Maker Profile
    1. Who is responsible for making capital investment decisions in your client's company?
    2. What information do they use?
    3. Are you involved in the process?

c) Decision-Making Process
    1. Can you describe, from the best of your knowledge, your client's investment decision-making process?
    2. Do you know whether they have any formal procedures in place for major investment decisions?
    3. What do you think are the main motivators for their decisions?
    4. Do you think your clients are influenced by personal biases, heuristics, past experiences, the status-quo bias, and other rationally bounded means of decision-making when taking capital investment decisions?
    5. Can you describe, from the best of your knowledge, your client's search for alternatives process? How many alternatives do they look for? At what point do they take a final decision?
    6. Do you think they have any post-implementation processes in place?

d) Management Accounting Information and Role of the Accountant

1. What kind of information are you asked/ do you prepare in terms of capital investment decisions?
2. How do you present the data?
3. Are you asked to prepare information on alternatives?
4. Do your clients use the information you are asked to prepare? Do they use it formally or informally?
5. Are decisions taken before the information is provided; or is it used to evaluate effectiveness of the decisions?
6. What do you think are the factors which hold back clients form requesting accounting information related to capital investment decisions?

e) What are the services you offer in particular relation to capital investment decisions?

f) Any other comments or suggestions from your end?

Schedule C

This interview schedule was used with Participant Type C; the questions were loosely asked followed by a briefing by the researcher on the findings of the study, since this interview served as a validation process.

a) Demographic Questions:
    1. What is your age and what gender do you identify as?
    2. What is your role and responsibility within the company?
    3. What is the highest level of education you have achieved?
    4. How many years of experience do you have in the field?

b) Decision-Maker Profile
    1. Who do you think is the main decision-maker in terms of capital investment decisions in SMEs?
    2. What information do you think is used by these decision-makers?
    3. Do you think these companies involve their accountant in these decisions?

c) Decision-Making Process:
    1. What do you think the capital investment decision-making process looks like in SMEs? What do you think can be done to improve this process?
    2. Do you think there are any formal procedures to plan and take such decisions?
    3. What do you think are the main motivators for their decisions?
    4. Do you think these decision-makers, and their accountants, are influenced by personal biases, heuristics, past experiences, the status-quo bias, and other rationally bounded means of decision-making when taking capital investment decisions?

5. What do you think the search for alternatives process is like? How many alternatives do you think they seek prior to taking a final decision?
6. Do you think they have any post-implementation processes in place?

d) Management Accounting Information and Role of the Accountant

1. What kind of information do you think these companies request their accountants to prepare in terms of capital investment decisions, if any? What other information do you think they use to arrive to such decisions?
2. What do you think affects whether they request and or use (formally or informally) this information? What factors may affect the latter (presentation, education levels etc.)?
3. Do they actually use the information for decision-making purposes or is it prepared for other purposes?

e) Consultancy Product Offerings

1. Do you have any service offerings in terms of consultancy for such investments within SMEs? Business plans/ forecasting/ feasibility studies service offerings aimed at capital projects within SMEs?
2. How popular are these offerings? Why is it so and why do you think this is so?

f) Any other comments or suggestions from your end?

Appendix 3.3: Interview Structure

The structure of the interviews is detailed hereunder.

The interviews each started with the first section which deals with demographic questions to establish that the participant is in line with the requirements of the study. The final question was also the same for all interviews, wherein an open-ended question was asked which allowed participants to provide any further insight as they deemed necessary.

Schedule A for Participant Type A: The main section of the schedule was split into 3 parts. The questions under *Decision-Maker Profile* were aimed at starting to develop an understanding of the DM process, the information they use and whether the accountant is involved or not. This section therefore helps to establish an understanding in terms of each of the objectives of the study. The next section *DM Process* was aimed at gathering an in-depth understanding of the DM process, particularly probing on the employment of heuristics in the process. This section therefore focused mainly on the first, second and third objectives of this study. Finally, the *MAI and Role of the Accountant* section was prepared to gain an understanding on the third and fourth objectives of the study. This section was aimed at understanding the extent of use of MAI, if any, by decision-makers and the extent of involvement of the accountant in the DM process

Schedule B for Participant Type B: The main section of the schedule was split into 4 parts. The *Decision-Maker Profile* section was aimed at an understanding of who, from the accountant's point of view, is the main decision-maker in the company in relation to CIs and whether he/ she is involved in the process. The questions under the *DM Process* section were aimed at developing an understanding of the DM process undertaken by decision-makers from the point of view of the accountant of the company.

The next section, *MAI and Role of the Accountant*, was aimed at understanding what MAI, if any, the accountant is asked to prepare and whether s/he thinks the information is actually used in the DM process. The fourth section, targeted mainly at accountants which are external to the company, was asked to understand what offerings are available in the market for those companies seeking guidance on regarding CI decisions. This schedule covered all objectives of the study, particularly focusing on the fourth objective of the study.

Schedule C for Participant Type C: The main section of this schedule was also split into 4 parts. The first 3 sections, also named *Decision-Maker Profile*, DM-Process and *MAI and Role of the Accountant* were aimed at validating the information provided by Participant Types A and B. The fourth section was also aimed to understand what offerings are available in the market for those companies seeking guidance on regarding CI decisions. This schedule will provide insight for all four objectives but will also serve to validate the responses gathered in the above schedules. The questions in this schedule were followed loosely as the intent was to validate the responses gathered, hence, the interview was more conversational with the researcher discussing the findings of the study with the participants.

Appendix 3.4: Notion Software Use

The workspace software *Notion* was used throughout the dissertation process to organise and assemble all things related to the dissertation in one place.

The homepage is home to different pages within which different data for different parts of the dissertation are contained. A timeline if the dissertation and other key information needed at different points in time (like the current to-do list and dissertation checklist) were available on the homepage.

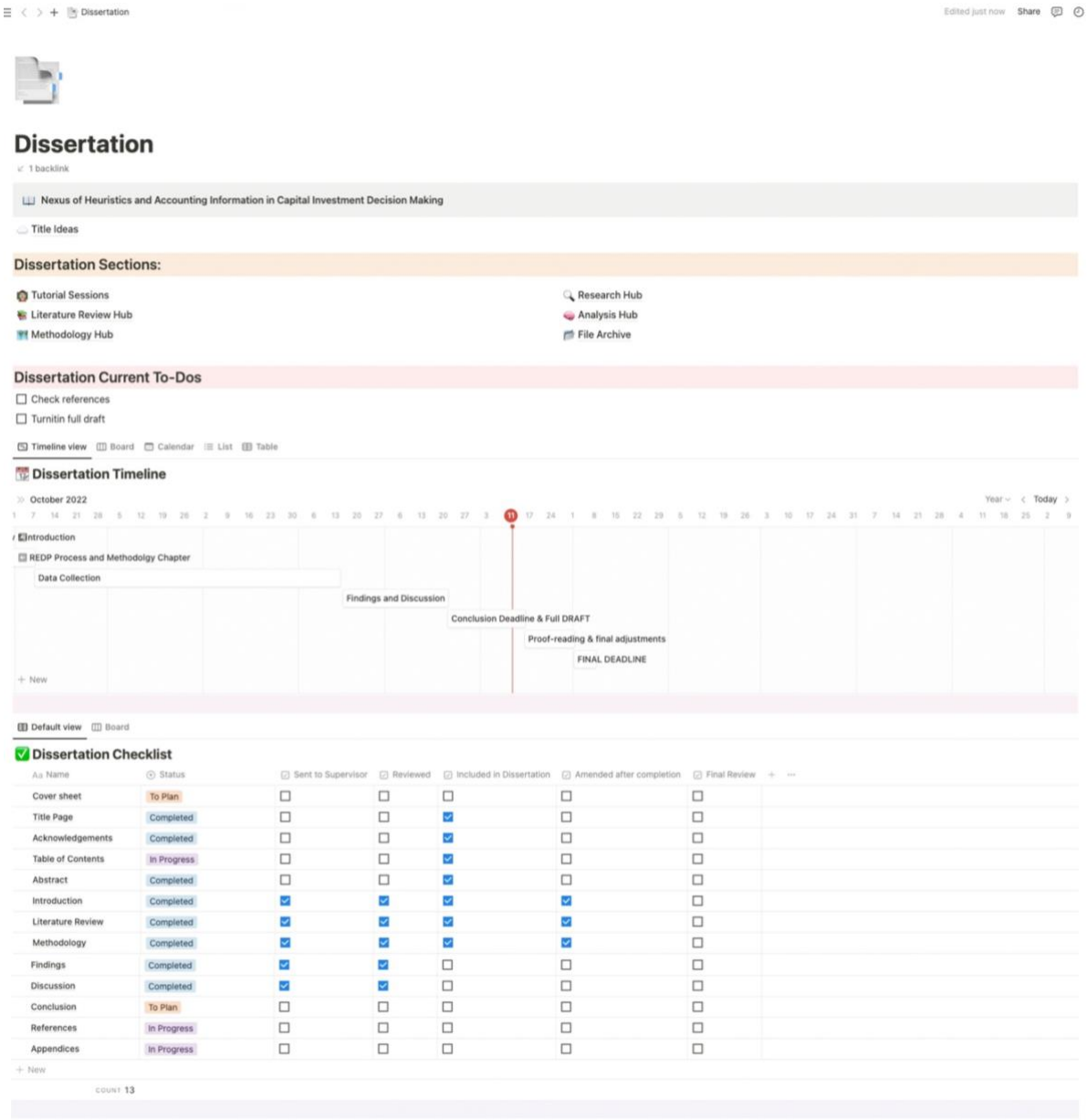

Figure A3.4 - 13 Notion Dissertation Homepage

The Tutorial Sessions page is where notes from tutorial sessions were logged, and other key items discussed in these sessions.

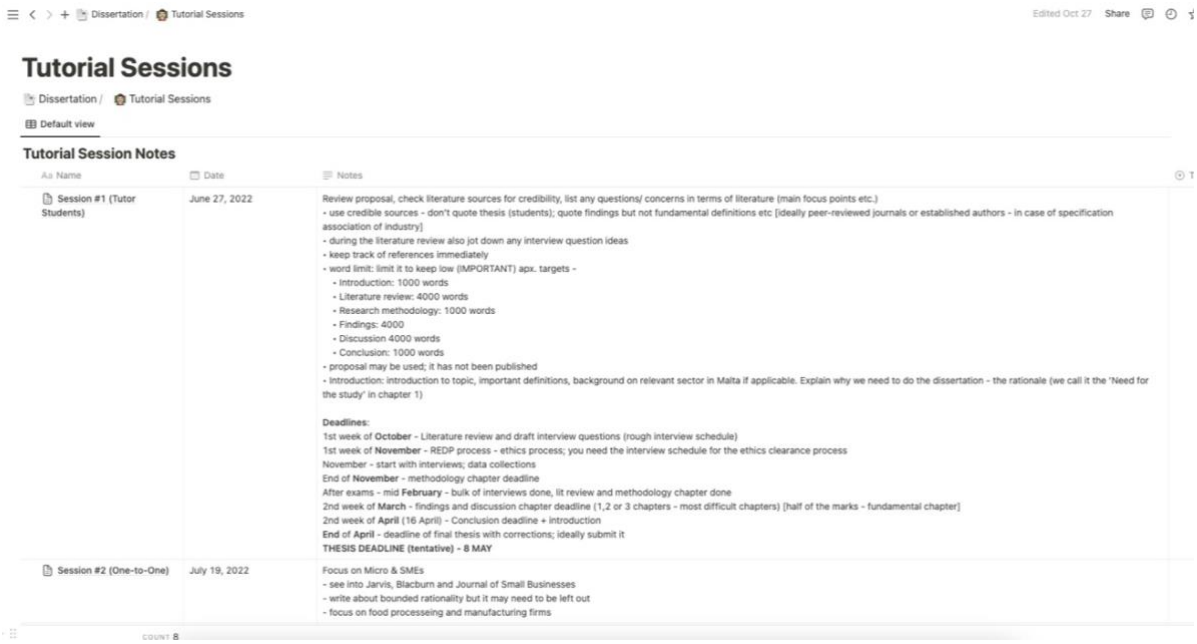

Figure A3.4 - 14 Notion Tutorial Sessions Homepage

The Literature Review Hub is where secondary data research was housed as part of the preliminary research process used to develop understanding of topic and draft the literature review section of the dissertation.

Figure A3.4 - 15 Notion Literature Review Hub Homepage

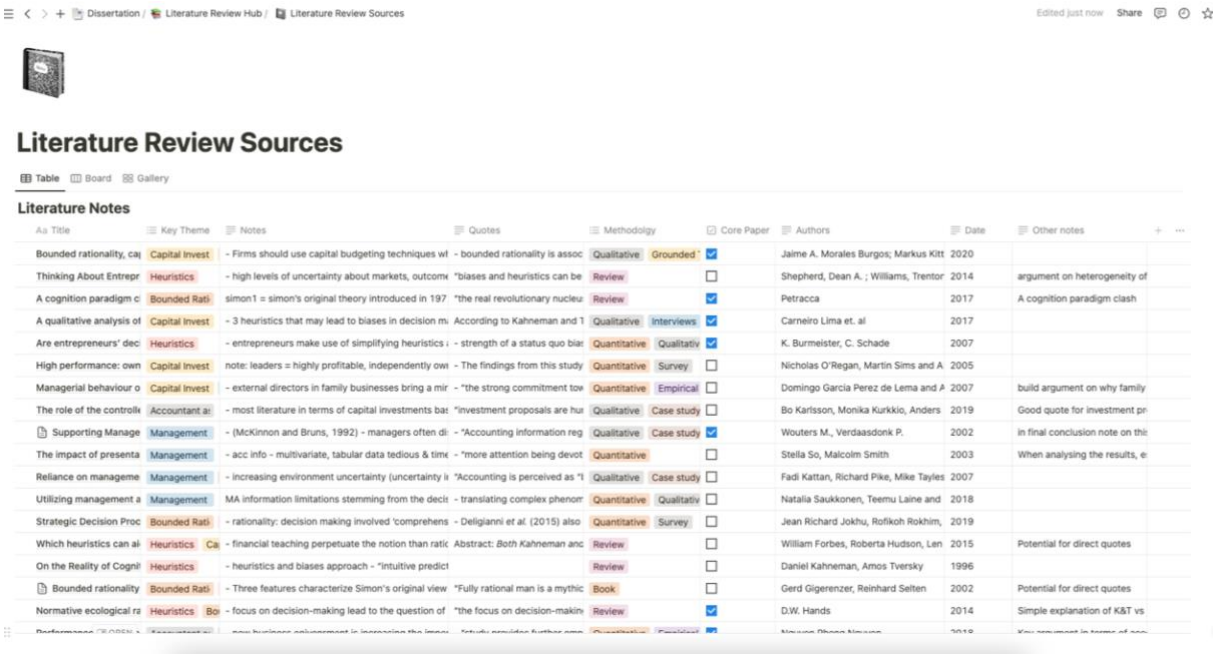

Figure A3.4 - 16 Notion Literature Review Sources Subpage

The Methodology Hub page is where Chapter 3 was drafted and other notes on the process were held.

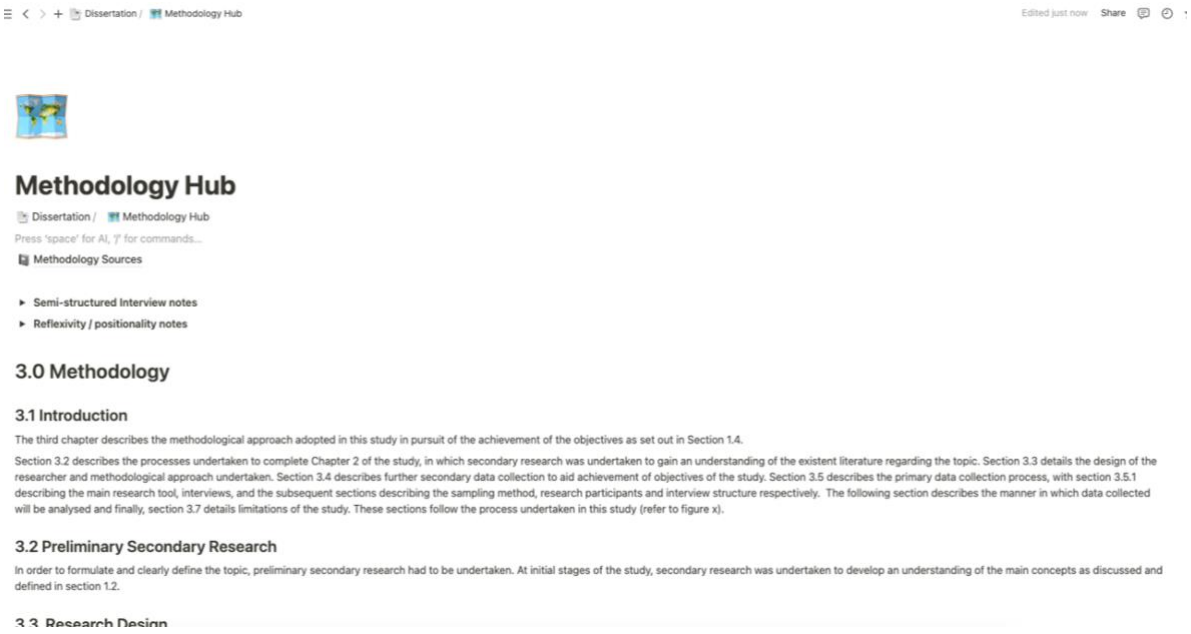

Figure A3.4 - 17 Notion Methodology Hub Homepage

The Research Hub page housed the list of participants and other key information on the participants. Each participant had a dedicated page where notes taken during the interview were logged and the interview transcriptions were held.

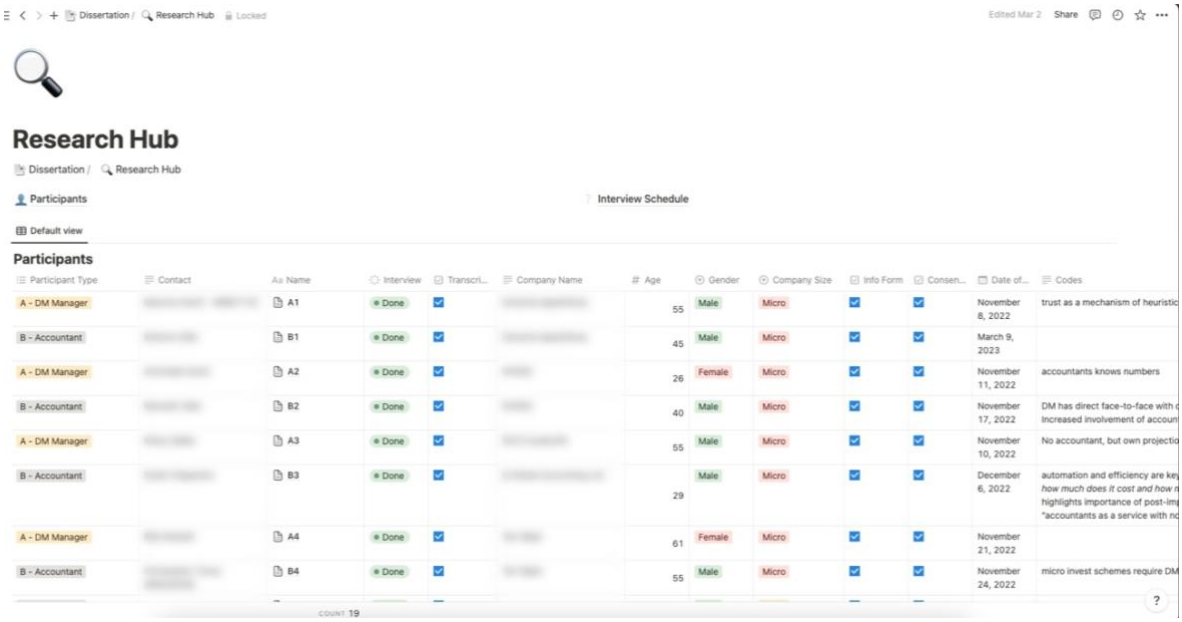

Figure A3.4 - 18 Notion Research Hub Homepage

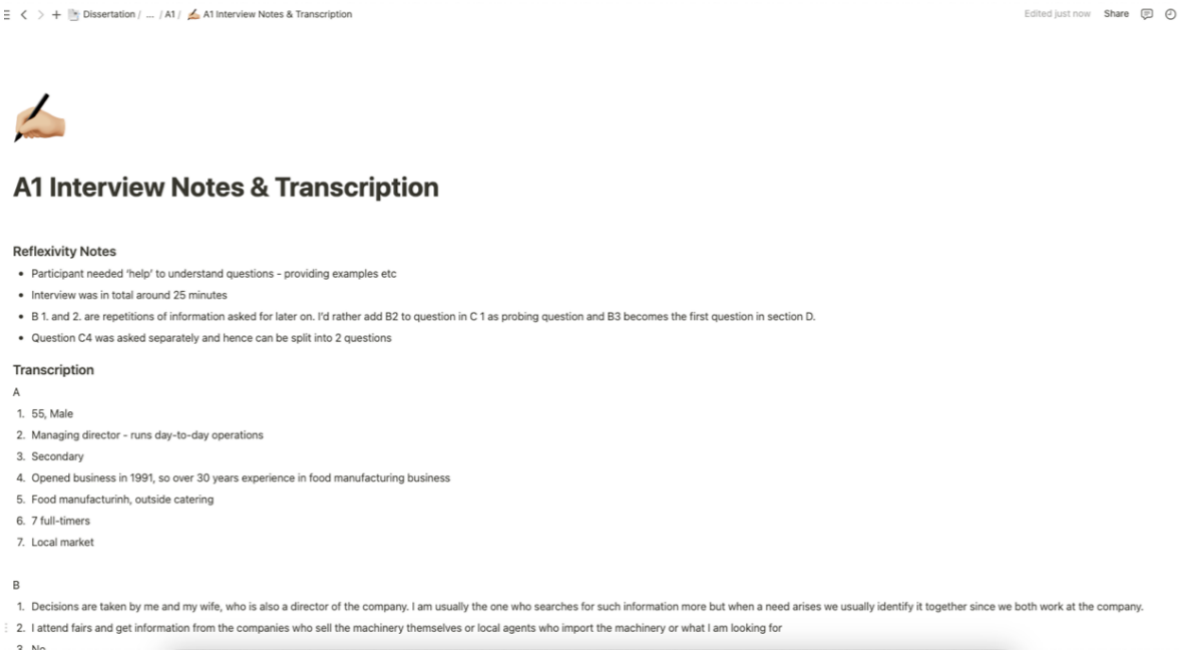

Figure A3.4 - 19 Notion [Participant Code] Interview Notes & Transcription Subpage

The Analysis Hub is where the data analysis and coding took place. The different sections of the interview had dedicated pages where the analysis of findings took place. The answers for each question in the interview were listed under one another, a summary was prepared, and then key points and codes were extracted from each answer. Key quotes were also highlighted.

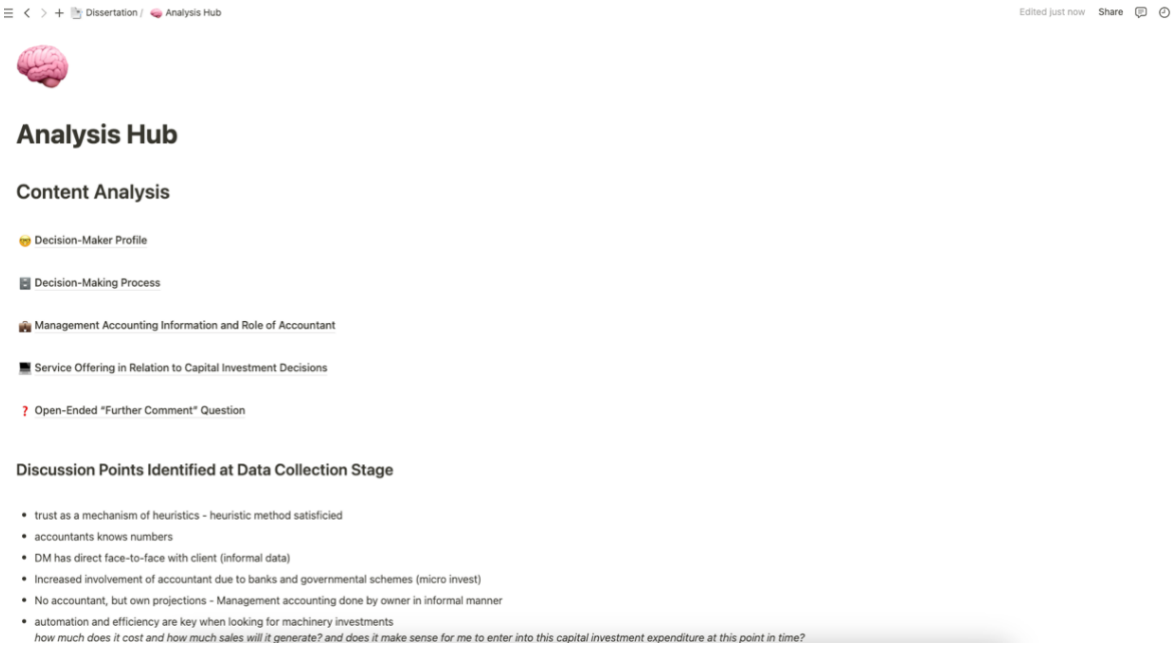

Figure A3.4 - 20 Notion Analysis Hub Homepage

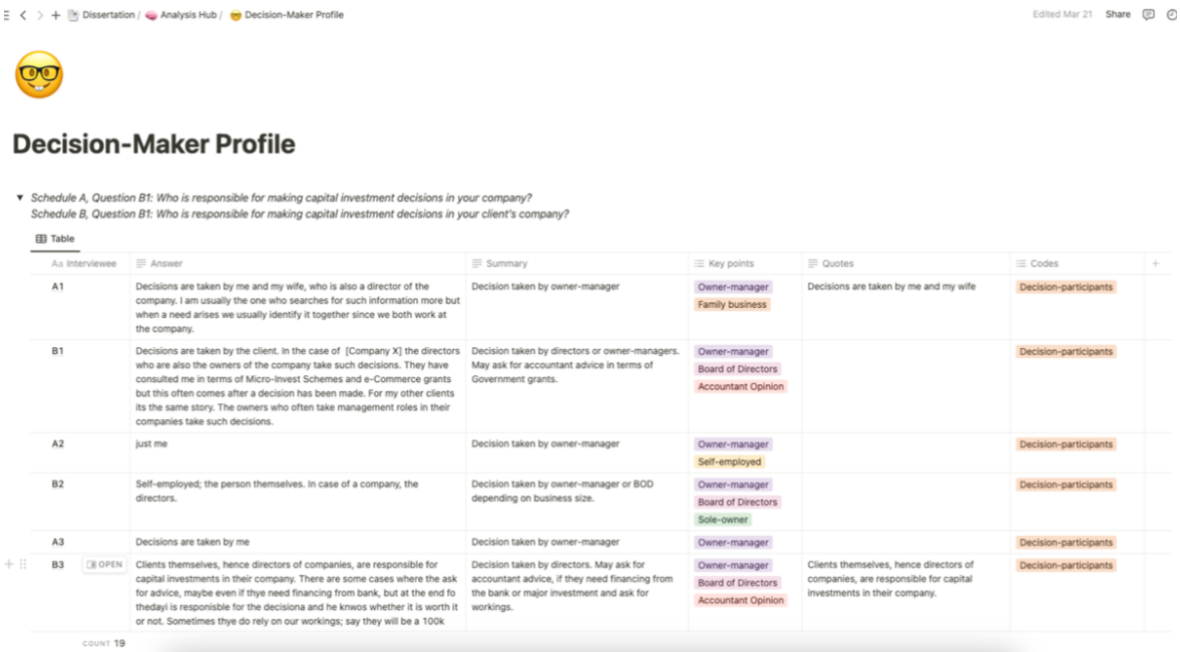

Figure A3.4 - 21 Notion Analysis Hub [Decision-Maker Profile] Subpage

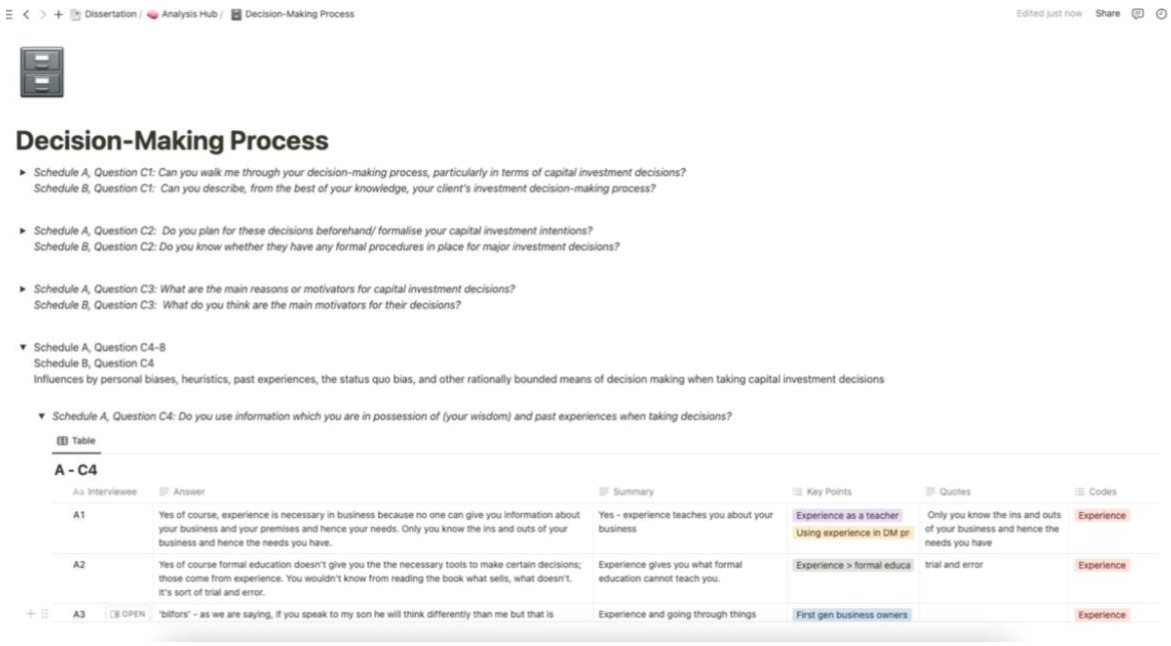

Figure A3.4 - 22 Notion Analysis Hub [Decision-Making Process] Subpage

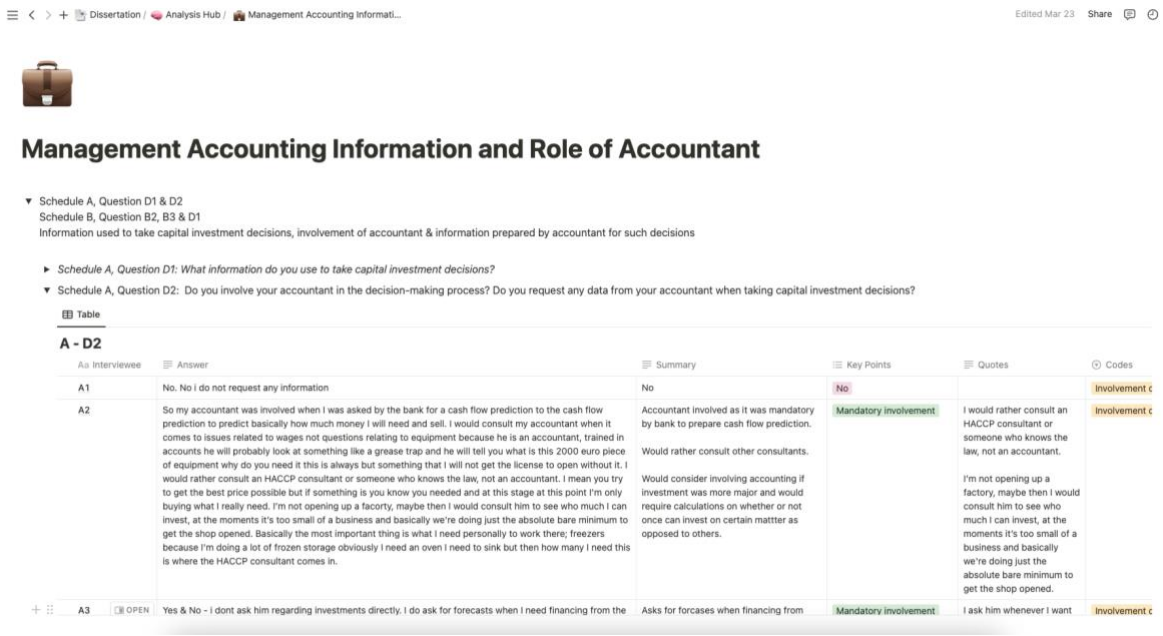

Figure A3.4 - 23 Notion Analysis Hub [Management Accounting Information and Role of the Accountant] Subpage

Figure A3.4 - 24 Notion Analysis Hub [Service Offering in Relation to Capital Investment Decisions] Subpage

Finally, the File Archive page is where files housing different documents and data was held, such as:

- MBR Documents (Last publish accounts of participating companies)
- Literature and Methodology Sources (Paper, Dissertations and Books)
- Interview Recordings
- Interview Schedules, Letter of Introduction
- Consent Forms