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Exploring budgeting as an underlying guidance tool for the management of externally induced crises

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ABSTRACT

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Title: Exploring budgeting as an underlying guidance tool for the management of externally induced crises

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Keywords: crisis management, sensemaking, strategy, strategizing, organizational learning, budgeting

Research question: How can budgeting assist crisis management during the Covid-19 pandemic, using the aviation industry as an empirical context?

Purpose: Drawing upon the contingencies of managing externally induced crises and thus, the inherent lack of a single effective approach, this research attempts to uncover the role of budgeting in assisting crisis management practices, by marrying management and accounting literature.

Method: Using the crisis of the Covid-19 pandemic in the aviation industry as an empirical context, a mixed-method research design was employed, with both qualitative and quantitative techniques. Primary data was collected through interviews with managers for a thematic analysis, and secondary data from interim financial reports was used for statistical accounting analysis.

Conclusion: The alternative budgeting process provides possibilities for forecasting and reference during crisis management and thus, managers can receive practical guidance on their performance. That, in turn, minimizes the complexities (uncertainty, threats and time pressure) of crises and reduces crisis' impact on organizations.

Key contribution: Employing alternative budgeting methods in managing externally induced crises increases the measurability of reactions through budgeting's functions, by quantifying the sensemaking process, strategizing process, and organizational learning, which are discovered to occur simultaneously during crisis management.

TABLE OF CONTENT

1. INTRODUCTION

In this section, the general subject area of crisis management is introduced and reviewed, where the reader becomes acquainted with the contextual background. A problematization is then arrived at, as expressing an interest in the usage of budgeting as a crisis management tool. Lastly, the aim and purpose of this research are stated.

1.1. Background

An essential managerial role in business is formulating strategies to achieve specific goals within a specific period of time. Such strategies are bound by the reality businesses face: the external environment. The external environment consists of all the elements beyond the boundary of an organization that have a potential impact on the organization (Daft, 2008). Miller and Friesen (1983) have long ago delineated the importance of tailoring the content of strategies to the nature of the environment. Today, managers are challenged to fit strategies by adapting to an increasingly dynamic environment (Igielski, 2020), characterized by a complex and unpredictable global context (Jurse & Vide, 2010). Yet changes are unlikely to take managers completely by surprise (Pathak, 2010), because the increasingly dynamic environment has become 'business as usual' (Brauns, 2015). Thus, managers seem to devise goals and strategies knowing that "*If there's one thing that's certain in business, it's uncertainty*" (Stephen Covey, as cited by Adams, 2020).

Weber and Linden (2005) posit that the uncertainty innate in business environments leads to the need for better forecasting. According to Weber and Linden (2005), budgeting has precisely such a purpose - forecasting the development of the organization and its environment. The process of budgeting appears in line with formulating strategies, as it consists of financial plans - budgets - for a certain period of time and determines the objectives to be reached within that time (Weber & Linden, 2005). Thereby, the budgetary process seems suitable for managers to employ, as it enables putting the present and future into perspective (Lorain et al., 2015).

Contrarily, budgeting receives criticism regarding its usage within a dynamic business environment (Libby & Lindsay, 2010). Due to its traditionally annual pre-planned nature, budgeting can be considered inflexible in the face of changing environmental conditions. Albeit relevant, such criticism regards budgeting's inability to comprehend what is lying and appearing within the environment's boundaries, however, budgeting can also take a more flexible alternative form (Batt & Rikhardsson, 2015). Thus, what is not addressed by criticism is whether such budgeting can assist managers when the boundaries of the environment are adjusted, in a situation which reshapes the business reality. Such a situation is apparent in the context of crises.

Crises are defined by Weick (1988) as low probability/high consequence events that threaten the most fundamental goals of an organization. Their low probability characteristic implies that they are not a "certain uncertainty" like the other constantly changing conditions in the environment. Furthermore, their high consequences for businesses makes crises strategic inflection points, thereby marking the start of significant long-term change (Wigmore, 2015). Thus, in the face of crises, managers must reformulate strategies alongside the boundaries of a new reality, whereby the tactical short-term plans - related to setting a budget and its goals - become the basis of a new strategic focus in the long term (Malmi & Brown, 2008) - thus, strategizing.

Another important characteristic of crises is uniqueness: every crisis is difficult and complex (Rosenberger, 2005). It follows that it must be inherently hard to devise an ultimate crisis management response. Thus, it is of interest to study how managers can adapt strategies to a new environment through a process that is constant in businesses, namely budgeting. Nowadays, there is context to conduct such a study, as the environment is currently reshaping itself due to the crisis following the Covid-19 pandemic. The Covid-19 pandemic is an ongoing public health crisis which has severely affected the global economy and financial markets, by causing reduced productivity, loss of life, business closures, trade disruption, and decimation of the tourism industry (Pak et al., 2020), among others. Therefore, the impact of the Covid-19 pandemic is highly relevant, as it impacts all businesses around the world and managers are navigating through a range of unprecedented challenges (KPMG, 2020). The aviation industry in particular is notably pushed to its limits, whereby for a lot of firms within the industry, managing this crisis translates to survival. According to Pathak (2010), the survival of a firm during a crisis depends on its innate strength - resources at its command - and its adaptability to the environment. The challenge of crisis management is therefore to adjust the internal variables in a manner to combat the threats from the external environment.

The Covid-19 context requires enacted sensemaking by managers (Weick, 1988), whereas there is no boundary between formulating a response strategy and implementing it. As Weick (1988) cites in his paper: '*An explorer can never know what he is exploring until it has been explored*' (p. 305). However, The Covid-19 crisis can lead to performance-related stress, insecurity and frustration amongst managers (Goretzki & Kraus, 2021). Thus, although managers will "enact sensemaking", they are likely not in the cognitive capacity to evaluate the effectiveness of their approach. The contingent managerial reactions to crises must be supplemented by something tangible and unbiased, such as budgeting.

1.2. Problematization

Numerous studies have been conducted on crisis management within organizations (Mitroff et al. 1987; Pearson & Clair, 1998; Dubrovski, 2004; Hermann & Dayton, 2009; Kuzmanova, 2016). These literatures present 'effective' crisis management frameworks that should generally aid management through crises. The assumptions accentuating the core crochet of these studies has been systematic and therefore, paved access for understanding the fundamentals of the phenomena. However, the extant literatures have been less operationalized, and perpetually remain untested, to a large extent, until date. Although relevant, the exiguous empirical context of the literatures renders them as customary within the management field and mere speculation beyond the field.

It has been established within the management field that a crisis is subjected to contingencies and therefore, there is no apparent single approach for crisis management. Different types of crises demand different kinds of strategies (Burnett, 1998) - thus, there is a need to separate humanly and internally induced crisis management frameworks from management approaches to economic crisis (externally induced crisis). The extant literature provisions are set to be applicable with indifferences.

In an attempt to individualize the phenomena while providing empirical context (Pearson & Mitroff, 1993; Gonzalez-Herrero & Pratt, 1995), the pivot shifted towards a crisis management framework on human and organizationally induced crises, whilst neglecting management of externally induced crises. Smart and Vertinsky (1984) attempted to incorporate management of externally induced crises. The study amalgamates managerial strategies with organizational external environment during a crisis. However, as much as the study is a crucial building block for further studies of the phenomenon on the externally induced dimension, an important piece for internal strategy guidance is missing. This is because the environment is emphasized as the guideline for crisis management strategies, rather than the trigger.

Budgeting has been widely researched within the domain of accounting. Although acknowledged to be a management control tool, it is accorded less study and/or usage in the field of management research. Therefore, studies from accounting are also drawn to better understand the contributions of budgeting for the management field. For example, a research by Becker et al. (2016) evaluates how an economic crisis affects the usage of different budgeting functions. The findings indicate that budgeting is especially used for planning and resource allocation during an externally induced crisis. However, the effectiveness of these budgeting functions as a crisis response is not addressed by the authors. Building upon the limitation of Becker et al. (2016), it is of interest to understand how budgeting could guide managers during externally induced crises.

In this research, we attempt to provide an empirical basis, building upon the extant literature about crisis management, and adopting budgeting as a managerial tool that guides managerial sensemaking, internal strategy formulation and organizational learning to manage externally induced crises. The research is therefore limited to internal management of externally induced crises. Areas within crisis management such as communication, internally induced crisis management and employee management during crisis are beyond the scope of the study.

1.3. Aim and Purpose

The aim of this research is, by drawing upon management literature, and marrying it with accounting literature, to explore and evaluate how budgeting can be utilized as a guidance tool in crisis management.

The purpose of this research is manifold. First, to provide an understanding of the crisis management process by gathering deep insights from managers amidst the crisis context of the Covid-19 pandemic. Second, to unfold and assess how budgeting can support the crisis management process. Finally, to offer practical and theoretical contributions for managing externally induced crises.

1.4. Research Question

How can budgeting assist crisis management during the Covid-19 pandemic, using the aviation industry as an empirical context?[1]

To answer the research question, a mixed-method design is employed, using both qualitative and quantitative techniques in an abductive research approach. Primary data is collected through interviews, to thematically unfold how budgeting could underlie crisis management. Furthermore, secondary financial data is utilized to identify and assess numerically how a budget and actual outcomes interact during an externally induced crisis.

[1] Note, the authors of this thesis want to reiterate that the aviation industry is used as the empirical context to explore the phenomenon of crisis management strategies; that is, it is not to be confused as a main focus of this study, as the outcomes of this research may also be relevant to managers in other industries.

2. THEORETICAL FRAMEWORK

In this section, relevant literature from both the management and managerial accounting fields is reviewed, and a model marrying the two is arrived at. Thus, this section provides the theoretical basis for answering the research question during the empirical analysis.

2.1. Literature Review of Crisis Management

The economic environment increasingly puts constraints on business operations, which occur with a highly shrinking interval (Mitroff & Shrivastava, 1987). From an economic point of view, crises constitute and can be classified as those that have an impact on the world, an industry, an organization, or the economy as a whole (Dubrosvski, 2004; Wenzel et al., 2020). Examples of recent economic crises include the bird flu induced crisis in 2002, SARS induced crisis in 2003 (Ping et al., 2011), the 2008 financial crisis (Wilson & Eilertsen, 2010) and the ongoing Covid-19 induced crisis (Pak et al., 2020; Wenzel et al., 2020). Economic crises are therefore problems given by the environment (Taylor, 1965; Janis & Mann, 1977) leaving little or no control to organizations (Grewal & Tansuhaj, 2001).

The business environment in which crises occur consists of all the social and physical factors that an organization's decision makers must take into account. These factors, although lying beyond the borders of the organization, have a direct influence on organization's existence (Duncan, 1972). The factors, according to Miller and Friesen (1983) are created by environmental dynamism that are often characterized by the space of change known as uncertainty, hostility, dynamism, and complexity.

The above-mentioned factors, according to Smart and Vertinsky (1984), Billings et al. (1980), Burnett (1998), Grewal and Tansuhaj (2001) and Hermann and Dayton (2009), pose threats to the viability of organizational growth and existence, jeopardize the survival of an organization, and put extreme strains on the different structures and actors (Pearson & Mitroff, 1993). From this perspective, organizations are merely "price takers" and crisis management in organizations is the ability to effectively combine environmental circumstances (Grewal & Tansuhaj, 2001) with internal resources. Yet, according to Burnett (1998), a large number of organizations do not have plans towards managing unanticipated triggers. Organizations that cannot foresee changes in the environment before they occur turn to scout for control measures or operate through the crisis (Smart & Vertinsky, 1984).

Since crises pressurize the operations of organizations (Weick, 1988) and have a high impediment on the fundamentals of organizations, recognizing the nature and the type of crisis given is critical (Billings et al., 1980) towards effective management. An organizational crisis is characterized by low probability which demands swift solutions as a measurement to curtail its effects (Persson & Clair, 1998). Such crises events have an element of surprise, high magnitude, time bound and are beyond the control of

organizations (Pearson & Mitroff, 1993; Hermann & Dayton, 2009). These situations are thus perceived by decision makers as triggers, since the normative way of doing things becomes dysfunctional (Colville et al., 2012).

Time pressure, according to Billings et al. (1980), is associated with the available time to tackle the crisis before it escalates, and a situation is regarded as a crisis when the possible losses associated with it are huge. Thus, time pressure and threat are the main elements with severe effects on crises. Surprise is regarded to have no effect on a crisis since uncertainty is a part of business operation. Billings et al. (1980) stated that it is the degree and the type of a crisis that vary, and therefore, surprise becomes an element if a business has no contingencies for crisis management. However, according to Pearson and Mitroff (1993), due to the numerous varieties of emerging crises, although contingencies could be planned for managing crises, not all crises can be tackled by such contingencies. As explained by Mitroff and Shrivastava (1987), the cardinal rule of crisis management is that no crisis comes as expected and planned for, which makes all prior crisis management plans, general contingencies.

Based on the above factors and the lessened possibility to control the environment in crisis situations, the crisis management process is seen as cumbersome to manage. However, crisis management models that begin by identifying events and thereafter, specify relationship processes that allow for strategy formulation to mitigate or avoid crisis, have an enormous potential for managing crisis (Pearson & Mitroff, 1993; Burnett, 1998; Dubrosvski, 2004; Grewal & Tansuhaj 2001). Crisis management is therefore seen as planned measures, strategies, or actions as well as the processes developed to live through a crisis (Glaesser, 2006). According to Persson and Clair (1998), crisis management is the efforts made by organizations in conjunction with external parties to prevent or tackle crises. The management of a crisis is thus, not simply to survive the crisis but the ability to sustain and resume operations while learning from the event towards managing similar events in the future.

Mitroff and Shrivastava (1987), in their model for crisis management, present the first stage of crisis management as the detection stage, where both internal and external environments are scanned to detect upcoming crises. Upon detection, prevention and preparation occur, where organizations continuously test and revise plans which help them cope with the crisis - thus, learning how to "row with the punches". The next stage of the crisis management is recovery, and the last stage is the learning process towards a similar future crisis situation.

Based on Burnett (1998), the process of crisis management, which is consistent with highly recognized models in crisis management, sensemaking is extremely relevant in the beginning of the process. Maitlis and Christianson (2014) also explain that the first stage in the process is understanding the problem and where it is coming from. However, according to Mantere et al. (2012), meanings of events become severely impeded during a crisis and therefore pose interruptions in operation. Decision makers are not

only faced with time constraints, threats, and surprise in crisis but with limited cognition (Persson & Clair, 1998). Weick (1988) expanded that sensemaking during crises particularly became severely impacted due to their unexpected nature which imposes interpretational problems to decision makers.

Nonetheless, sensemaking occurs with the act of noticing the event, the process of interpreting the event and finally providing actions towards minimizing the effects of the event (Maitlis & Christianson, 2014). Nevertheless, when the decision maker's interpretation of the situation is affected, the severity of the crisis increases. Therefore, the ability to break through the impediment and understand the situation provides the possibility to generate meaning to the crisis (Weick, 1995; Weick, 1988). Sensemaking, therefore, depends on environmental clues which are extracted and interpreted (Brown et al., 2015).

According to MacCrimmon and Ronald (1976), in making sense of the event, it must be measured against the usual standards - to identify the alarming differences of infrequences or finding unusualness in the situation. Simply put, in recognizing a situation as a crisis, the infrequences must be beyond the minimal threshold under the usual business environment. When the problem is recognized, understood and interpreted (sensemaking process), the next stage is formulating strategies to manage the situation (Billings et al., 1980; Maitlis & Christianson, 2014). A certainty in the crisis management process across all crisis types is the requirement of strategic actions intended - to either mitigate or avoid disruptive events (Weick, 1988; Dubrosvski, 2004; Burnett, 1998). The acute nature of crises forces management to develop emergency strategies that must be as effective as possible, since actions taken are normally irreversible (Dubrosvski, 2004). Furthermore, due to the difficulty and complexity in managing a crisis, the only outcome is either success or failure (Rosenberger, 2005).

Environmental contingencies, such as uncertainties, affect internal contingencies, such as strategies (Donaldson, 2001); thus, organizations match what is given by the environment with internal strategies to mitigate crisis. The most appropriate strategy is the one whose making process has a fit with the environment (Glaesser, 2006), however, the effectiveness of any actions during a crisis situation, although anticipated to be effective, is unknown until at the end of the crisis (Weick, 1988).

Hambrick (1983) defines strategy as an adaptive mechanism constructed to align with the environment. In other words, it can be seen as patterns within decisions that guide an organization to align its activities with the environment. As much as strategy is positively related to crisis management, Miles et al. (1978) found that strategies, since tested and deemed consistent, turn to be perpetuated in handling environmental changes thereby can inhibit an organization’s response to changes in the environment.

Since actions merge different elements within the environment to provide a clearer picture of the crisis and provide hints on different solutions, the complexity of the crisis is reduced. Moreover, actions slow

down the speed at which the crisis affects (Weick, 1988). Thus, actions during a crisis translate to reducing the complexity of the unknown situation to simplified events that narrow down severity.

It is acknowledged that decision makers in a turbulence-prone environment tend to anticipate risk and therefore implement innovative strategies ahead of events (Paine & Anderson, 1977; Miles & Snow, 1978), however, according to Mitroff and Shrivastava (1987), it is difficult to manage a crisis which has not yet occurred. On the same line of thought, Burnett (1998) explained that crises are usually unexpected events that devour planned strategies. Thus, anticipating risk and implemented strategies will be general contingencies included in a normal business plan to tackle unexpected events but when the actual crisis hits, it is a continuum requiring immediate action appropriate for the specific type of crisis, thereby leaving management with little or no control (Mitroff & Shrivastava, 1987).

As explained by Donaldson (2001), during a crisis the environment becomes uncontrollable and therefore strategies are not meant to control the environment but rather to defend the organization to survive through the crisis. Due to turbulence and complexity classified as high uncertainty, decision makers tend to retrench (Wenzel et al., 2020) and use adaptive strategies in crisis management which is considered as "short-term firefighting".

Although strategies in crisis are short-term and may have negative implications on crisis development, it provides room for learning towards future similar events. Therefore, not acting means less understanding will be gained and errors increase in similar events (Weick, 1988). Following the same line of thought, Pearson and Mitroff (1993) postulate that understanding the nature of the crisis and its characteristics increases the ability to manage similar crises that may occur in the future. Thus, the learning cues from a well-understood crisis facilitate management of similar crises in the future.

Strategy, therefore, reduces the vulnerability of organization during crises. Learning cues are the final stage of crisis after signal detection, preparation (sensemaking) and prevention or handling (strategies), where the crisis is contained to reduce damages, leading to recovery. Crisis management is deemed effective when a potential emerging crisis can be averted (Pearson & Mitroff, 1993). Learning cues are, therefore, not pre-constructed, well-known, or expected ways of doing things, but rather are experiences gathered from a situation which provide better explanation than existing solutions (Dwyer & Hardy, 2016), through which changes occur in organization thus, strategy reformulation as crisis management contingencies.

In summary of the above literature review, management of externally induced crises starts with already existing contingencies (planned adaptive strategies), if any, which assist detection and sensemaking, leading to emergency preventive/preparative strategies development that aid recovery and learning towards strategy reformation for future crisis management. The process is visualized in Figure 1.

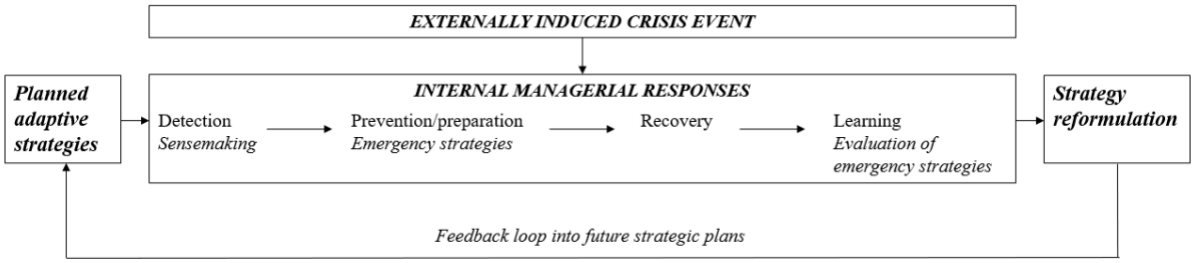

Figure 1: *Sequence of internal management responses to externally induced crisis events.*

2.2. Literature Review of Budgeting

Beyond management accounting literature, the budget is known as a formal financial plan that estimates a firm's income and expenditure for a given future period (Reference for Business, n.d.; Shim et al., 2012). Such nature of the budget makes it appear static and merely a formality that would be of little managerial relevance during a crisis. However, a budget is the outcome of budgeting, which is characterized as a process used to forecast development in future periods, compare prior and current periods, allocate and coordinate resources (Batt & Rikhardsson, 2015). The budgeting process thereby implies that managers are not just users of accounting information (Shim et al., 2012), but are also involved in formulating it, by deciding what course of action is most appropriate in any given set of circumstances (Frow et al., 2010). Therefore, budgets - as a product of budgeting - link the nonfinancial plans and controls of daily managerial operations to the financial plans and controls designed to obtain satisfactory earnings (Shim et al., 2012). As such, budgeting is seen to increase internal control over the immediate environment (Batt & Rikhardsson, 2015).

There are various types of budgets (Shim et al., 2012; Drury, 2012) that require either traditional or alternative budgeting methods – i.e., variable, flexible, rolling and activity-based budgeting (Batt & Rikhardsson, 2015). The alternative methods are an umbrella term for budgets that adopt different perspectives than the traditional annual budget (Batt & Rikhardsson, 2015), namely shorter in times of environmental turbulence, as budgetary practices must become oriented towards greater flexibility and adaptability (Lorain et al., 2015).

Coulmas and Law (2010) note that traditional budgets and budgeting processes have been identified as frustrating and inflexible, especially in chaotic economic environments. Thus, Coulmas and Law (2010) suggest that alternative budgeting methods are better adapted to meet the ever-changing needs of businesses, whereby many of the principles of traditional budgeting become less useful. Furthermore, within the conditions of environmental uncertainty, there is a need for continuous managerial engagement with, and commitment to, the organization's strategic direction and priorities (Frow et al., 2010). By the very nature of traditional budgeting – also known as annual budgeting (Drury, 2012), it cannot contextually be studied within this research, as the externally induced crisis requires continuous

managerial involvement and the reaction spans for less than a year in scope. Therefore, the concept of budgeting within this thesis is operationalized to encompass alternative budgeting methods, as they are continuous, thereby allowing to break down the fiscal year in shorter periods and adjust accordingly (Drury, 2012). Albeit, further distinguishing between the alternative methods is not relevant, as the literature covers characteristics of budgeting in general.

A budget is developed for the future within the context of both ongoing business and previous strategic decisions (Drury, 2012). The budget therefore allows for previous decisions to be followed up on through variance analysis from the historical financial data (Batt & Rikhardsson, 2015) – i.e., the preceding budget – so that managers can measure the performance before taking it as the basis for subsequent decision making (Drury, 2012).

Connolly and Ashworth (1994) provide an approach to develop a successful alternative budgeting, where the present, future, and past are clearly linked to budgeting activities – starting with an external assessment for adjusting anticipated strategy to the current market reality, following with an internal resource management to review the options available, and finally arriving at a financial summary to establish the impact of the decisions. If the outcome is unacceptable, the previous stages provide a basis for re-examination when repeating the process.

Dubrovski (2004) criticizes the final stage of the budgeting process regarding ongoing crises, as arguing that financial accounting reports are solely recorded consequences of the past and as such are not trustworthy reflections of a company's present conditions. However, what is inherent from both the definition of budgeting (Batt & Rikhardsson, 2015) and the budgeting process, is that budgeting serves the manifold purpose of planning, resource allocation and performance evaluation (Becker et al., 2016), among others. Thus, the financial summary – performance evaluation – cannot be seen apart from the other two functions; it provides a necessary feedback loop (Drury, 2012). Fisher et al. (2002) posit that the combination of several budgeting functions can create more value than one function separately. Nonetheless, it is worth unfolding budgeting from a unitary concept as to provide a better understanding of each function during a crisis (Becker et al., 2016), thus planning, resource allocation and performance evaluation will be reviewed in turn.

Planning

A plan is a detailed outline of activities to meet desired strategies and to accomplish goals (Shim et al., 2012), thus planning involves forecasting to determine actions (Drury, 2012). Forecast data can guide strategic decisions, and budgeting leverages that opportunity, thereby relieving the struggle of syncing forecasts and strategic plans (Hagel, 2014). Although strategy itself is a long-term plan, planning through budgeting makes it more precise and attainable by breaking it down into shorter periods (Drury, 2012) as action plans (Malmi & Brown, 2008). Before looking ahead, planning a budget requires

considering current internal and external factors (Shim et al., 2012). Especially in times of turbulence and increased uncertainty, organizations must rapidly adapt their strategy (Batt & Rikhardsson, 2015). As such, planning seems to provide the flexibility of adjusting strategy better to the changing business conditions. Thereby, Becker et al. (2016) posit that the planning function of budgeting is emphasized during crises, as it reduces uncertainty and ensures that an organization does not deviate from its strategic goals when pressured by the external environment. In an uncertain environment, planning a budget provides a set of references to serve as a stable framework (Lorain et al., 2015), thus reducing uncertainty.

Resource Allocation

Upon planning activities, resources must be coordinated (Shim et al., 2012). Especially within a rapidly changing business environment, managers must deploy increasingly scarce resources (Connolly & Ashworth, 1994). Budgeting provides such a function by allowing for resource allocation to match circumstances (Frow et al., 2010). Becker et al. (2016) propose that when organizations are threatened by crises, the resource allocation function of budgeting becomes important as to ensure the productive use of resources and liquidity management. This is because budgets can keep expenditures within defined limits (Shim et al., 2012) by providing an opportunity to evaluate alternatives. According to Lorain et al. (2015), revenues influenced by external factors are difficult to control, thus achieving budget targets requires focusing attention on the cost structure. The budgeting process therefore allows for periodical adjustment of the operating costs to the level of income (Lorain et al., 2015). This resource allocation function thereby contributes to the managers' capability for rapid and creative responses to unforeseen contingencies (Frow et al., 2015) by allowing for command of resources.

Performance Evaluation

Evaluating financial indicators of the implemented decisions from planning and resource allocation can provide managerial guidance (Lorain et al., 2015). What is referred to by Drury et al. (2012) as "control" evaluates budgets by looking back to ascertain actual outcomes and comparing them to the planned outcomes. Feedback loops are thus created, thereby budgeting allows to take corrective action where necessary (Drury et al., 2012). As such, the performance evaluation function of budgeting implies a systematic "trial and error" review of crisis management decisions, through the analysis of variances between forecasted and actual figures (Lorain et al., 2015). Becker et al. (2016) criticize the performance evaluation function during crises, as the innate uncertainty means that meeting targets depends more on uncontrollable factors than managerial effort. Nonetheless, the historical financial data reflects the outcomes of the decisions taken by managers. The very goal of accounting is to provide information useful for decision making, and managers need "feedback value" to confirm past financial results and adjust for future activities (Franklin et al., 2019).

Lorain et al. (2015) point out that traditional corporate budgets were developed and implemented throughout the Great Depression, as means to help companies overcome the conditions of economic crisis (Berland et al., 2009), i.e. budgeting is reinforced in managing crises (Chenhall, 2003). According to Batt and Rikhardsson (2015), the greater the uncertainty, the greater the reliance on management control systems like budgeting, as an attempt by organizations to 'control' what they can per se. Lorain et al. (2015) further suggest that budgeting remained essential in Spanish firms during economic crises. Overall, a reasonable takeaway from extant literature is that crises do not hinder the usage of budgeting – despite some contradictions as discussed by Becker et al. (2016). Nonetheless, Becker et al. (2016) point out how budgeting plays a role in weathering economic crises. Thereby, it is of utmost interest to establish whether, and how, budgeting can act as a crisis management tool. According to Abernethy and Brownell (1999), research should not ignore the potential of management control systems to be used more actively for formulating and implementing changes in strategy.

In summary of the accounting literature review, the three budgeting functions taken together resemble a sequence, thereby forming the unitary budgeting process that would take place in organizations during crisis events. The latter is visualized in Figure 2.

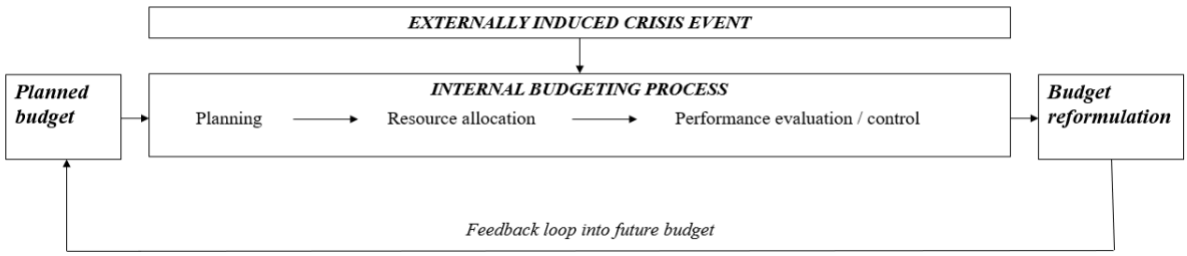

Figure 2: *Sequence of the budgetary process during an externally induced crisis.*

2.3. Theoretical Model

Crises occur in the environment, and as a factor from the environment, they are beyond the control of organizations, but as established, have a huge influence over organizational functioning. The ability to manage crises is thus emphasized, thereby: **a crisis induced to an organization from the external environment requires crisis management internally**. This is the first and most important takeaway from the literature review.

However, crisis management cannot be standardized, as it is contextually bound. Therefore, the crisis management contingencies could hamper the decision-making of managers, due to their limited cognition of the situation. Sensemaking is extremely relevant in the beginning of the crisis management process as it enables managers to understand the situation and generate meaning from it. Sensemaking

is therefore the first aspect of crisis management, relating to the detection and preparation stages from the process model by Mitroff & Shrivastava (1987).

What follows is strategic actions, where organizations match what is given by the environment with internal strategies to mitigate the crisis. The most appropriate strategy is the one which has a fit with the environment. Strategy, as the second aspect of crisis management, therefore, leads to the prevention stage in the short run and recovery stage in the longer run.

The last stage from crisis management is learning, especially in terms of recognizing potential similar cues from the environment and including learning cues as an aspect of crisis management provides the notion of identification and reflection upon the ongoing or a potential crisis.

To provide an overview, corresponding to the sequential stages of the process, crisis management in this paper is operationalized to include three aspects: **1) sensemaking, 2) strategy, 3) organizational learning**, as these are inherently distinguishable from the literature review.

The problem with all the three aspects of crisis management, as explicit from the extant literature, is that their effectiveness cannot be measured until the crisis wears off. Therefore, how can managers evaluate their decision-making throughout a crisis?

By following financial data, managers can evaluate the effectiveness of their decisions, as budgeting provides measurability of actions. Therefore, in a crisis situation, budgets realistically represent the condition of the organization. Furthermore, budgeting as a process is a constant practice within organizations - although influenced by the environment, its structure is not necessarily affected. Therefore, it is reasonable to assume it can underlie management during a crisis as it would under normal circumstances. With its three functions, budgeting can be linked to crisis management.

Planning a budget, where external factors are considered, corresponds to the detection and prevention stage of crisis management. Therefore:

Proposition 1: Planning as a function of budgeting is related to, and assists, the sensemaking process of crisis management.

Resource allocation within the budget rearranges internal resources as to fit with the demands from the environment. This corresponds to the crisis management stage of evaluating alternatives for prevention in the larger puzzle of recovery. Therefore:

Proposition 2: Resource allocation as a function of budgeting is related to, and assists, enacting strategy during crisis management.

Lastly, crisis management involves learning from the environment and situation. Budgeting finishes off with performance evaluation, in the form of control and variance analysis. Therefore, it allows us to spot mistakes which are stored in historical data. As such:

Proposition 3: The performance evaluation function of budgeting is related to, and assists, organizational learning in crisis situations.

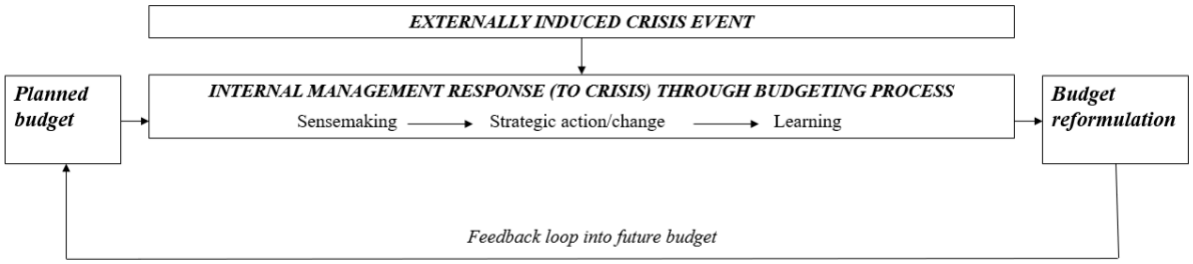

Figure 3: *The overarching theoretical model of this research, built upon the entire literature review.*

The provided summary of the literature review, as well as the propositions derived, are represented in a conceptual model for this research, illustrated in Figure 3. Due to the constructional resemblance of budgeting to crisis management, it is reasonable to assume some managers already employ it, be it so unconsciously.

3. METHODOLOGY

This section describes in detail how the thesis research was conducted. Each methodological choice made throughout the process is addressed, and its suitability is argued for. The aviation industry is introduced as the empirical context for data collection. Finally, the methodology as a whole is evaluated upon quality criteria.

3.1. Research philosophy

Identifying our own philosophy was the starting point of the methodology, thereby setting a consistent frame of beliefs and assumptions about the development of knowledge throughout the research. Saunders et al. (2019) present five types of philosophies within business and management research: positivism, critical realism, interpretivism, postmodernism and pragmatism. Upon understanding the basic assumptions of each, we determined that our views are similar to the critical realism philosophy.

According to Saunders et al. (2019), critical realist research focuses on providing an explanation for observable organizational events, by looking for the underlying causes and mechanisms that shape them. In other words, critical realism looks for a bigger picture when only a small part is seen (Saunders et al., 2019). As such, the philosophy strongly corresponds to how we apprehended this research, as crisis management, although widely observable amidst extant literature, appears empirically incomplete. We therefore proposed to fill the inherent gap with budgeting, which although structurally similar to crisis management, was previously unobserved in this context. That may be because not all the structures of experienced phenomena are in fact observable (Zachariadis et al., 2010). Thus, in line with the critical realist traditions, we envisaged that explaining crisis management more extensively requires identifying and making explicit the mechanisms underlying it (Mukambang, 2020).

3.2. Research approach

According to Saunders et al. (2019), there are two contrasting approaches to reasoning within research - deductive, which is concerned with theory testing, and inductive - concerned with theory building. This research restructured existing theory and subsequently collected data to verify it, by exploring the phenomenon for a deeper understanding, ultimately to generate new theoretical insights. Thus, it leaned towards neither the purely deductive or inductive side, and rather required a mixed approach which combines the latter. The suitable alternative to theoretical reasoning was therefore the abductive approach, known also as retroduction (Saunders et al., 2019; Mukumbang, 2020), as it goes back and forth between theory and data.

The first step of abduction is observing a "surprising/puzzling fact" which emerges when a researcher encounters an empirical phenomenon that cannot be explained by the existing range of theories (Dudovskiy, n.d.; Saunders et al., 2019). As discovered and problematized in the preliminary literature review, an important piece for internal strategy guidance seemed missing when managing externally induced crises, thereby proposing a theoretical model in this thesis to account for the limitation. Attempting to provide such a "best prediction" for an apparently incomplete observation is the second step of abduction (Dudovskiy, n.d.; Saunders et al., 2019). Thereafter, the prediction is tested by collecting relevant data to create a meaningful understanding, and lastly, if verified, the product is an originate idea that can be further developed (Mukumbang, 2020). According to Mukumbang (2020), the theoretical products of abduction also provide improved usable evidence in relation to the initial phenomenon, which was a desirable outcome for fulfilling the tangible purpose of this research.

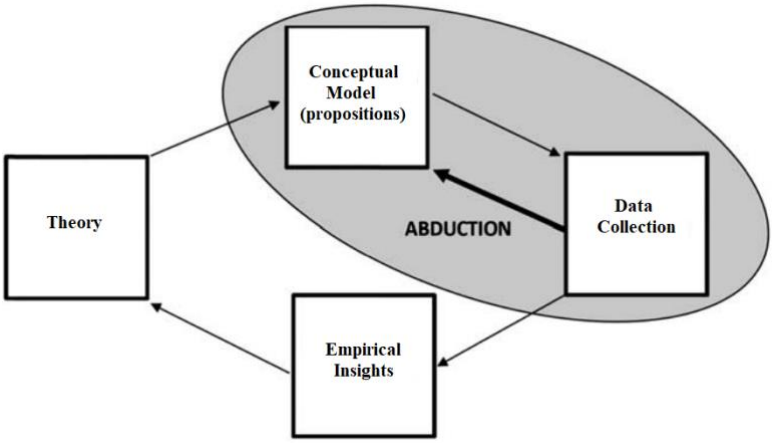

Figure 4: *The abductive approach to theory development (adapted based on Alemany Oliver & Vayre, 2015).*

Overall, the abductive process to theory development (illustrated in Figure 4) was evidently a suitable logical pathway to accomplishing this thesis. Furthermore, it is consistent with the underlying philosophy because abduction moves from the surface of a phenomenon to a deeper understanding, and involves recontextualizing (Mukumbang, 2020). In that light, Eastwood et al. (2014) refer to it as "*the hallmark of realist reasoning*" (p.7).

3.3. Research nature

The nature of a study is defined by identifying the appropriate research purpose. Choosing to fulfill an exploratory purpose appeared most compatible with this thesis (Saunders et al., 2019). Exploratory research is useful for clarifying the understanding of a phenomenon, by delving into its nature and discovering insights (Saunders et al., 2019). As such, exploratory research is unanimous with the critical realist traditions and for abductively tackling the novel theoretical agency between crisis management and budgeting, to provide openness, depth, and flexibility (Saunders et al., 2016) while laying the groundwork leading to future studies (Dudovskiy, n.d.).

Dudovskiy (n.d.) outlines several limitations to fulfilling an exploratory purpose, including that such research is hardly generalizable, subject to bias and inconclusive. Thus, exploration impairs tangible outcomes. To bridge the latter gap within this research, an evaluative purpose was also fulfilled. The complementary evaluative nature allows to produce a theoretical contribution where emphasis is placed on understanding 'how effective' something is (Saunders et al., 2019), which strengthened the practicality of the insights gathered in this research. Combining more than one purpose was achievable using multiple methods in the research design (Saunders et al., 2019).

3.4. Research method

It was advantageous for this thesis to employ a mixed method research design. Besides fulfilling a combined set of purposes, mixed method research provides a better understanding of a phenomenon and yields more complete evidence (Emerald Publishing, n.d.). Such design also accommodates the critical realist traditions, which require a range of methods and data types to fit the subject matter (Saunders et al., 2019). Furthermore, mixed method research enables the combination of theory testing and theory building within a single study, thereby environing the abductive nature of this research (Emerald Publishing, n.d.).

This mixed method research integrates the use of quantitative and qualitative data collection techniques and analytical procedures (Saunders et al., 2019). Specifically, the concurrent mixed method research design (Figure 5) was chosen, as suitable for the limited timeframe (Saunders et al., 2019). It involves a single-phase of data collection and analysis where quantitative and qualitative methods are used separately, with the goal of comparing how these data sets support one another (Saunders et al., 2019). The latter constitutes triangulation - ascertaining if the findings from one method mutually verify the findings from the other method (Saunders et al., 2019), thus overall strengthening the research findings (Emerald Publishing, n.d.). Essentially, bringing two diverse data sets together for interpretation allows for a richer response to the research question through different levels of analysis (Zachariadis et al., 2010).

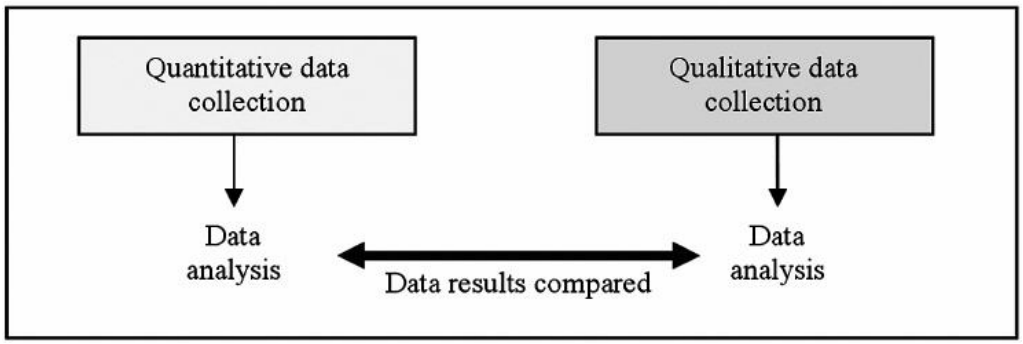

Figure 5: *The Concurrent Triangulation Strategy (from Sankey & St. Hill, 2008 as adapted from Creswell, 2003).*

Saunders et al. (2019) posit that critical realists would use qualitative methods to explore perceptions, which in the case of this thesis related to practitioners' experience of crisis management. Further, a quantitative analysis of official documents would allow to explore the underlying causal structures of the managerial perceptions (Saunders et al., 2019), potentially unfolding crisis management through budgeting.

3.5. Empirical context

As indicated in the research question, this thesis used the aviation industry as a working context. The aviation industry includes airlines, airport operators, civil aerospace, air navigation service providers and other on-airport businesses (ATAG, 2020). According to Dube et al. (2021), the aviation industry's capacity to deal with external crises remains low, which in our opinion constituted a gap in practice corresponding to the problematized theoretical limitations. Considering that the industry is especially sensitive to external stresses (Dube et al., 2021), the aviation context during the Covid-19 pandemic also provided the possibility to highlight the learning aspect of crisis management as a takeaway. Therefore, unfolding budgeting in this crisis management context would yield relevant and novel practical insights.

Nonetheless, exploring the phenomena from the conceptual model was the focus of the thesis, not exploring this specific industry. The main reason to choose it was to set a clear boundary of the research, as the narrower a study is made, the more manageable it becomes (DiscoverPhDs, 2020). Thereby, the aviation industry as an empirical context is merely a delimitation for collecting relevant and testable data, yet the insights are still meant to be transferable to other industries and external crises contexts. Since the aviation sector is one of the worst hit by the Covid-19 pandemic (Dube et al., 2021), testing budgeting under its extreme conditions is also an assessment of its general effectiveness for crisis management.

The time horizon covered in this thesis is a "snapshot" of the year 2020, as it encompasses the period when Covid-19 crisis hit and unfolded. Therefore, the research is cross-sectional, studying the phenomenon at a particular time (Saunders et al., 2019). Notably, the chosen time horizon involved reasoning backwards - retroduction - thereby in line with both the research approach and the critical realism philosophy (Saunders et al., 2019).

3.6. Primary data collection

For this study, there was an evident need to collect primary data of qualitative nature. Primary data is the kind that is collected directly from the source, with the purpose of addressing a particular research problem (Formplus Blog, 2020). Qualitative primary data, in turn, is open-ended and allows respondents to fully express themselves (Formplus Blog, 2020), essentially providing direct and rich narratives, tailored to the phenomenon of interest.

Interviews were chosen as the instrument to obtain such data. More specifically, semi-structured interviews were deemed favorable as environing the abductive reasoning, by both applying the predetermined theoretical themes in a consistent way and allowing for new insights to emerge (Saunders et al., 2019). From our critical realist stance, semi-structured interviews as a tool further allowed us to systematically discover truths which are external to the interpretations of the participants (Saunders et al., 2019).

The interviews were conducted between two interviewers and one interviewee. Although such a basis could be perceived as intimidating by the interviewee, we believe it benefited the social context and minimized threats of formality by attaining a group rapport. The process was digital and Internet-mediated, through the video-conferencing software Zoom or Microsoft Teams, per the preference of the participant. The guiding questions included predetermined themes emerging from the crisis management literature review (Table 1), but also implicitly concerned the proposed complementary notion of budgeting, thereby enabling testing, exploration, and assessment of the conceptual model.

Table 1: *Thematic operationalization of the guiding interview questions based on the literature review*

Theme	Questions	Connection to literature/ Motivation for asking
Externally induced crises	1. How has the Corona pandemic impacted your organization and the aviation sector? 2. How prepared were you and your organization for this crisis? 3. What type of pressures and threats did you and your organization experience during this crisis?	To establish how the Covid-19 crisis is perceived by managers (Dubrosvski, 2004; Wenzel et al., 2020), to recognize their level of surprise and preparedness (Pearson & Mitroff, 1993; Colville et al., 2012), and how they perceive the threats posed by the crisis (Smart and Vertinsky, 1984; Billings et al. 1980; Burnett, 1998; Grewal and Tansuhaj, 2001).
Sensemaking	4. Could you tell us how you – and your colleagues – have made sense of the corona situation over the past year?	To explore how managers initially interpreted the problem from the environment (Maitlis and Christianson, 2014) and whether their cognition increased the severity of the crisis

	5. Would you classify your sensemaking amidst the crisis as effective now that you have a clearer picture of the situation?	(Persson & Clair, 1998; Weick, 1995; Weick, 1988).
Strategic actions	6. Can you tell us the strategies you implemented to deal with the crisis? How successful have these strategies been and what way have they been successful? 7. Can you give us some examples where the initial strategies have been changed over the past year, expand?	To identify what emergency strategies managers developed (Dubrovski, 2004) and whether those were fit with the environment (Glaesser, 2006; Hambrick, 1983), as well as evaluate managers' perception of strategic actions as the crisis unfolds (Weick, 1988; Miles et al., 1978).
Learning from crises	8. How has the pandemic affected your approach to strategic design for future crisis management? 9. What have you and your organization learned from managing the Corona crisis? 10. Could the lesson learnt during this crisis affect your flexibility in managing a similar future crisis? Thus, since tested and deemed effective could hinder you from trying new strategies in similar situations.	To evaluate the effectiveness of crisis management strategies based on their perceived usability in the future (Pearson & Mitroff, 1993; Weick, 1988), as well as how environmental learning cues contribute to the managerial experience (Mitroff & Shrivastava, 1987; Dwyer & Hardy, 2016)
Budgeting in crises	11. How has your organizational budget been affected during the crisis? 12. Has budgeting been used to evaluate your crisis management process? If yes, how did you use budgeting? If no, could you see budgeting as a potential helping tool in crisis management?	To explore the usage of budgeting during crisis events (Berland et al., 2009; Chenhall, 2003; Becker et al., 2016) and specifically whether it contributed to understanding the impacts of strategic actions as the crisis unfolded (Drury et al., 2012; Lorain et al., 2015; Franklin et al., 2019).

Participants for interviewing were gathered through sampling from the population. The target population subset comprises managers in the international aviation industry who practiced in organizations during the Covid-19 pandemic crisis, as delimited based on the empirical context. To address this particular subset, the sampling procedure was purposive.

Purposive sampling is a non-probability technique, and it is suitable for an in-depth study where participants must be selected particularly for a purpose, as to gain specific information-rich insights (Saunders et al., 2019). For sampling, the social media platform LinkedIn was used. We found two groups on the platform - *Aviation Crisis Management* and *Aviation Management*, which were deemed representative of the international target population, containing a total of 16262 members from different countries at the time of sampling. Personal messages were sent to a total of 117 people from the groups. This was the initial stage of reach to potential participants, as we briefly noted the research purpose and

inquired of their interest to take part as interviewees. Fifteen people replied expressing an interest. In the following stage of reach, we sent those a letter of intent (see Appendix 1) as an official invitation to participate. Five people confirmed and thus comprised the resulting sample. The profile of the final respondents, based on relevant demographics, is summarized in Table 2 below. Therefore, in total, 5 interviews were conducted, where each lasted between 25 and 40 minutes.

Table 2: *Demographic profile of the semi-structured interview respondents.*

Participant	**Country**	**Managerial position held**	**Years of experience in the industry**
P1	The United Kingdom	Duty Shift Manager	33
P2	The United States of America	Station Manager for line maintenance	26
P3	Germany	Head of Airport Partnerships	15
P4	Saudi Arabia	Operations Department Manager	25
P5	India	General Manager - Air Operations	20

Since ethics is a critical aspect of successful research, and ethical concerns are greatest when human participants are involved (Saunders et al., 2019), certain ethical principles were guiding our conduct of the interviews for data collection. As adapted from Saunders et al. (2019), those included researcher integrity, showing respect, ensuring confidentiality, and providing the right of withdrawal. As agreeing to participate upon reading the sent letter of intent (see Appendix 1), participants were made explicitly aware of the ethical guidelines prior to their involvement in the study, thereby providing informed consent.

Throughout the primary data collection, we as researchers and active parties in the interviews were weary of biases. Saunders et al. (2019) highlight three biases related to interviewing: interviewer, response and participation. To avoid the interviewer bias, which could mislead the interviewee's answers, we were objective and regarded the process independently of our own beliefs. To avoid response biases, the guiding questions were sent to the participants in advance, to ensure that no sensitive issues would be explored or could emerge. Lastly, the participation bias is bound by the industry delimitation, and is related to the wider quality of the study (section 3.9).

3.7. Secondary data collection

In line with the established mixed method design, document secondary data is often utilized quantitatively in addition to collecting primary data (Saunders et al., 2019). To best situate the quantitative aspect, financial statements were chosen as they provide numerical information relevant to

the research. More specifically, the secondary data was collected from interim (quarterly) reports, as to accommodate the cross-sectional analysis of the year 2020. As secondary data, financial statement reports can be characterized as both compiled and structured (Saunders et al., 2019), notably in such a manner that was suitable for direct usage in this research.

According to Saunders et al. (2019), documentary sources allow the analysis of critical incidents or decision-making processes, and also help evaluate different policies. The latter opportunities in studying financial reports were deemed consistent with the quantitative analysis prospect of exploring and assessing budgeting as a complement to crisis management.

Essentially, budgets as a source of data would be most relevant to this research, however they are not publicly available. Although outside parties might be interested in such managerial accounting information, companies put efforts to keep it secret (Franklin et al., 2019). Nonetheless, according to Slavova (2011), firms make assumptions for the planning period based on an analogy from the previous period, thereby financial reports are suitable for inferencing about the budget plan. Therefore, the working assumption when gathering data from the interim reports is that the previous period provides the budgeting baseline for the following (Franklin et al., 2019).

Saunders et al. (2019) highlight a major limitation of secondary data. Since it is originally collected for another purpose, it might not match the extant research's needs. However, as noted, managers are also users of financial reports for decision making. Thus, in the case of this research, the secondary data served the same purpose - that of accounting in general. It is just the perspective of the researchers that changed - from typically external users to explorers of its internal utilization.

To obtain a representative list of companies for the empirical context, the EASA Aviation Industry Charter for Covid-19 was chosen as a sampling frame, as including airlines and airport operators per the target population requirements. Thereafter, quota sampling was conducted, as to ensure variability in the sample characteristics, thereby taking five airlines and five airport operators. The chosen organizations are presented in Table 3 below:

Table 3: *Sample of organizations chosen as sources of interim financial report data.*

Airlines	1) Lufthansa, 2) Aegean, 3) Pegasus, 4) TAP Portugal, 5) IAG Group
Airport operators	1) Copenhagen Airport, 2) Swedavia, 3) Fraport, 4) Vienna International Airport, 5) TAV

The names of the companies are used since financial statements are accessible for external users. Lastly, since financial statements conform to common accounting standards, all data was evaluated as to be of acceptable and consistent quality, also with precise suitability for the analysis (Saunders et al., 2019).

3.8. Data analysis

3.8.1. Quantitative analysis

The quantitative analysis employed both descriptive and inferential statistics. All were conducted in the statistical software Minitab. To emphasize, the quantitative analysis collates each of the 10 organizations from Table 3 into a 'whole', thereby ensuring an 'industry' analysis rather than of each organization individually. First, a time-series plot was created using the organizations' profit and costs over the four quarters of 2020, as to develop a visual snapshot of the industry trends in the cross-sectioned period. Second, a budget variance analysis was conducted, by taking the differences in costs and profits between each quarter (Biedron, 2020). Budget variance analysis is a monitoring technique to identify where the actual results deviate from the budget and provides an overall idea of how a business is performing over a period (Biedron, 2020). It was utilized within descriptive statistics because although calculations were made, the results of those merely showcase favorable/unfavorable variances as observational differences between the quarters (Biedron, 2020). Although no sound conclusion could be drawn, it was made evident where the previous period could be useful for predicting the next.

Considering the descriptive insights, a simple linear regression model was then employed to make inferences about the data. The regression model represented a profit equation for each period (the dependent variable Y), where the costs of the previous period were taken as a predictor variable (X). Revenue was not included as it is not directly controllable by organizations. The aim of the regression analysis was to showcase whether what organizations can internally control - their costs, corresponding to resource allocation - could be determinants of the overall performance under external crisis. Hypothesis testing in between the periods provided prompts into that, thereby both exploring the usage of budgeting in this context and evaluating its effectiveness.

3.8.2. Qualitative analysis

Thematic analysis was chosen as the approach for qualitative analysis of the primary interview data. Its purpose is to search for themes that occur across a data set (Saunders et al., 2019), which we deemed suitable for a systematic exploration of the underlying structures of crisis management. Furthermore, due to its flexibility, thematic analysis is appropriate for any research philosophy or approach to theory (Saunders et al., 2019).

The first step of thematic analysis is familiarization with the collected data (Saunders et al., 2019). In this research, that corresponded to transcribing the interviews through the transcription software Otter.ai and reading through them for an initial comprehension.

The second step was coding the data. Coding means attributing labels to relevant units of data (Saunders et al., 2019). To accommodate the abductive approach, we relied on two sources of codes in combination (Saunders et al., 2019). First, we devised codes "a priori" (e.g., *crisis effects, uncertainty, cost cutting*) derived from the theoretical framework, to ensure the identification of relevant data. Second, we also developed labels from the data where theory could not account for its attributes (e.g., *communication, organizational size*). This enabled the emergence of new insights. After the initial coding, each interview transcript was read again and re-coded where necessary.

By coding, units of data were first grouped into categories, and then arranged into themes – ideas relevant to the research question (Saunders et al., 2019). The themes were devised into a coherent set, presented in the Findings and Analysis section, as to provide a well-structured framework for analysis, operationalized around the theoretical model illustrated in Figure 3. Finally, there was a rigorous test of the propositions against the data, but also alternative explanations were sought to refine propositions where necessary (Saunders et al., 2019).

3.9. Trustworthiness

The final and most important aspect of the methodology was to make judgments about the overall quality of this methodological research process, as to establish the extent of trustworthiness of the findings (Saunders et al., 2019).

3.9.1. Reliability

Reliability as a criterion of quality refers to replication and consistency (Saunders et al., 2019). Thus, to evaluate the thesis upon this criterion, we had to make a judgement about whether another researcher, when repeating the described process, would arrive at the same findings. However, it would be unrealistic to attribute such external reliability to the qualitative interview findings, as they are not intended to be repeatable, but rather reflect reality at the time they were collected (Saunders et al., 2019). Alternatively, there is higher internal reliability, as we ensure consistency and full transparency when reporting the methodology and findings. Thus, from the qualitative point of view, trustworthiness does not come from repeatability, but rather from allowing another researcher to make similar conclusions from following the methodology and findings, as those are reported on a dependable account. Therefore, to address the quality of the qualitative aspect, the alternative criterion dependability is more suitable as an attribute (Saunders et al., 2019).

Thereafter, the quantitative aspect enables an external researcher to triangulate the derived conclusions through another level of analysis, as the quantitative method and findings are deemed reliable. Internally, by reporting consistently, we laid out a repeatable quantitative procedure. Externally, that

allows arriving at the same findings. Thus, we believe the mixed methods are complementary in terms of the overall reliability.

3.9.2. Validity

Validity refers to the accuracy of a method, evaluated in terms of what the method intends to measure both internally and externally (Saunders et al., 2019).

The internal validity relates to the appropriateness of measures used and accuracy of the analysis and findings (Saunders et al., 2019). The latter factors are relatively straightforward to judge in terms of the quantitative aspect. There is high measurement validity as the employed secondary data was evaluated against its precise suitability for answering the research question, whereby measurement validity and coverage were assessed upon collection (Saunders et al., 2019). Furthermore, it is reasonable to consider the quantitative analysis and findings of high internal validity, as all statistics were approached with rigorous attention to accuracy, as to ensure avoiding any researcher error threats in terms of testing. The same judgements cannot be easily made on the qualitative aspect because there are no precise measurements for reference. Nonetheless, since the theoretical constructs are grounded in rich theoretical analysis, Saunders et al. (2019) posit that the internal validity of qualitative research is not seen as a problem. Therefore, we assess the interview insights as internally valid, which also covers the alternative quality criterion of credibility (Saunders et al., 2019).

External validity relates to the generalizability of findings (Saunders et al., 2019). Considering the limited size of both the primary and secondary sources, which were relatively small as bound by time constraints, this research notably lacks external validity.

The statistical tests do not allow for making inferences about the entire population. However, their purpose was rather to evaluate budgeting in crisis management. Thus, the quantitative aspect in this research was not designed for reaching generalizations, but to showcase prospective usability.

Furthermore, qualitative methods, no matter the number of participants involved, are not meant for establishing generalizations. Nonetheless, Saunders et al. (2019) suggest that well-planned and rigorous qualitative studies are still likely to produce valuable findings. A better criterion of value measurement would thus be transferability, which is the reader's judgement of how applicable the gathered research insights are to other contexts (Saunders et al., 2019). Considering the high internal reliability and validity of this research, related to both the qualitative and quantitative methods, it allows for a systematic and trustworthy comprehension by the reader. Therefore, it is reasonable to assume the findings would be transferable to other contexts. Notably, transferability, besides a quality criterion, was used as a guideline throughout the entire research process of the thesis, as to ensure producing tangible findings.

4. FINDINGS AND ANALYSIS

This section simultaneously presents and analyses the empirical findings. First is the quantitative analysis of the collected secondary data through descriptive and inferential statistics. Thereafter is the thematic analysis of the primary interview data, also involving a comparison with the concurrent quantitative insights for triangulation.

4.1. Quantitative analysis

The quantitative analysis utilizes the collected secondary data from the sample interim reports (see Appendix 2) and comprises of two accounting variables:

- ***Earnings Before Interest and Tax (EBIT)***: an indicator of a company's profitability. A positive EBIT is equal to profit, whereas a negative EBIT equates to operational loss.
- ***Costs***: encompassing Costs of Goods Sold (COGS) and all other operating expenses.

Both variables are measured in EUR million in this analysis. [2]

The values of these variables are collected and used based on the four interim periods of 2020: Quarter 1 (Q1), Quarter 2 (Q2), Quarter 3 (Q3) and Quarter 4 (Q4).

Notably, some of the values in the collected data appear as outliers. However, they are kept for the analysis, despite being more influential towards the results. The reasoning behind keeping outliers is that the target population, being the aviation industry as a whole, implies there are both smaller and larger organizations in reality. Thus, some naturally would incur much higher/lower costs and EBIT.

4.1.1. Descriptive statistics

To simplify the comprehension of the collected secondary data and its statistical processing, Table 4 below represents the average values for each variable and period from the sample:

Table 4: *Working average values from the sample secondary data (from Appendix 3).*

	Q1 (Jan - Mar 2020)	***Q2 (Apr - Jun 2020)***	***Q3 (Jul - Sep 2020)***	***Q4 (Oct - Dec 2020)***
Costs	1571.2	736.4	873.7	675.0
EBIT	-234.0	-401.1	-437.0	-313.0

[2] Two organizations had not originally reported in EUR, therefore the currencies were converted based on the exchange rates of the data collection day, as indicated in Appendix 2.

Taking the latter values, the time series plot below (Figure 6) provides a visual snapshot of how the two variables change throughout the cross-sectioned period of 2020, whereby each point represents the average value from the data sample corresponding to that quarter for the selected firms in the industry.

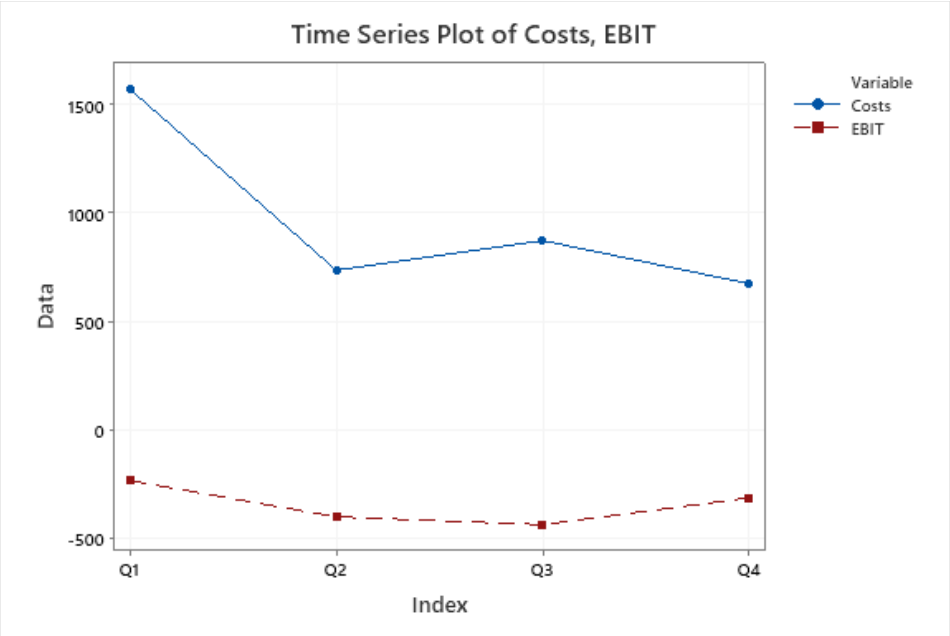

Figure 6: *Time series plot of the two variables during 2020 (from Minitab).*

The observable trend is that both EBIT and costs vary throughout the financial year. However, the variability of costs is more visible compared to that of EBIT. Costs decrease significantly on average in Q2, then rise in Q3 until they stabilize in Q4, showcasing a rather dynamic change throughout 2020. The trend of EBIT appears stable, whereby losses increase on average in Q2 and Q3, eventually improving in Q4, although there are still losses in EUR million. The relationship between the variables that can be observed from the figure is that when costs rise, EBIT losses increase.

To determine the exact change from each quarter to the next, a budget variance analysis was conducted, taking the difference between the values of the preceding period (budgeting baseline; budgeted figures) and following period (actual figures). Table 5 presents the variances and percentage changes of costs throughout 2020, taken as averages from the sample. Cost decreases are marked in green as favorable variances, contrarily red represents unfavorable rises in Costs.

Table 5: *Budget variance analysis of the sample Costs throughout 2020.*

Costs	Q1	Q2	Variance Q2-Q1	%	Q3	Variance Q3-Q2	%	Q4	Variance Q4-Q3	%
Sample Average:	1571.2	736.4	-834.8	***-53.1%***	873.7	137.3	***18.6%***	675.0	-198.6	***-29.4%***

Initially, costs are almost halved on average in the sample. Then, the difference between Q2 and Q3 shows a rise in costs on average. Finally, from Q3 to Q4 costs on average fall further, reaching a similar level to that of Q2. The latter variances are in line with the visual comprehension from the time series plot. However, all the variances in predicted-actual values are too large in between quarters, thus it cannot be assumed from the cost variance analysis that the previous period could have predicted the next, but rather acted as a guideline.

Table 6 shows the budget variance for the EBIT. Decreases in EBIT are marked in red to account for the unfavorable rise in losses, whereas green marks EBIT increases - thus, when losses fall.

Table 6: *Budget variance analysis of the sample EBIT throughout 2020.*

Costs	Q1	Q2	Variance Q2-Q1	%	Q3	Variance Q3-Q2	%	Q4	Variance Q4-Q3	%
Sample Average:	-234.0	-401.1	-167.1	***-71.4%***	-437.0	-35.9	***-8.9%***	-313.0	123.9	***28.4%***

For the EBIT in this sample, Q2 marks a dramatic reduction on average as compared to Q1, with organizations facing substantial losses on average. Contrarily, Q3 showcases a stability in EBIT moving from Q2 - losses are improved on average as compared to the previous baseline period. The predicted values from Q2 therefore account for Q3, indicating a consistency between the budget and the outcome with only an 8.9% variance. Finally, moving from Q3 to Q4, losses are decreased on average, and that favorable variance is in line with the change in costs between those two quarters. Overall, the variance analysis of EBIT corresponds to the visual trend from the time plot.

4.2.3. Inferential statistics

The inferential analysis tests whether the cost allocation from the prior quarter can predict the EBIT result in the next.

The models are as follows:

$y_i = \beta_0 + \beta_1 x_i + \varepsilon_i$, $i = 1,2, \dots ,10$, where $\varepsilon_i \sim N(0, \sigma)$ and independent (see Appendix 3 for fulfillment of the model assumptions).

y_i is EBIT for the following period (in EUR million) - the dependent (response) variable.

x_i is Cost allocation from the previous quarter (in EUR million) - the independent (predictor) variable.

The regression analysis is summarized in Table 7:

Table 7: *Main findings from the regression analysis (from Appendix 4).*

	EBIT Q2 versus Costs Q1	**EBIT Q3 versus Costs Q2**	**EBIT Q2 versus Costs Q1**
Equation	EBIT Q2 = -34.9 - 0.23307 Costs Q1	EBIT Q3 = 19.8 - 0.62027 Costs Q2	EBIT Q4 = -63.4 - 0.2857 Costs Q3
R-sq / R-sq(adj)	99.02% / 98.90%	99.87% / 99.86%	85.46% / 83.64%
SE Coefficient: Costs	0.00820	0.00779	0.0417
T-value Coefficient: Costs	-28.44	-79.58	-6.86
P-value Coefficient: Costs	**0.000**	**0.000**	**0.000**

Notably, the R-sq values for each of the three models is very high. Since the R-sq measures how well the proportion of variation in Y (next period EBIT) is explained by X (previous period costs), it can be deduced that the linear regression models represent how budgeting enables planning for the future within the context of previous strategic decisions (Drury, 2012). To provide inferential prompts into the latter, the hypotheses to be tested through these models are:

$\boldsymbol{H_0: \beta 1 = 0}$ *(Interpretation*: The cost allocation from the prior period has no linear association with the operating profit from the next.)

$\boldsymbol{H_A: \beta 1 \neq 0}$ *(Interpretation*: The cost allocation from the prior period has a linear association with the operating profit from the next.)

Significance level: 5%

Decision rule: Reject H_0 where the p-value is less than or equal to 0.05.

Since all p-values of costs as a coefficient are below 0.05, the null hypothesis is rejected for all three periods. The inferential conclusion, therefore, indicates empirical evidence on a 5 % significance level of a linear relationship between the next period EBIT and the prior period costs throughout 2020. Thus, the result unfolds that the observed cost trend underlies the variances in EBIT.

4.2. Qualitative analysis

4.2.1. The Corona pandemic as an externally induced crisis

The findings designate the Corona pandemic to have had a severe impact on the economy as a whole and negatively impinged the aviation industry, which is defined as an economic crisis (externally induced crisis) according to Dubrosvski (2004) and Wenzel et al. (2020). Due to the closure of borders around the world, there was a substantial drop in market demand in the industry. P3, for example, accounted for how the booking numbers drastically dropped, which means less flight operations. The different safety, risk and lockdown measures imposed by different states and countries impacted customers' traveling behaviors, while imposing extra demands on operations. For instance, nearly all cargo flights in the USA were retired because factories were shut down, as explained by P2.

Based on P1's account, the daily 109 flight departures and arrivals in their company dropped to 18. In the Middle East, several airlines shut down operations and the 500-600 daily flight operations by the company were reduced to 10-15 flights per day. A flight which normally accommodates 300 passengers could only accommodate 23 passengers, as constrained by the crisis. Similarly, in India, an airport that normally accommodates 70 million passengers could only accommodate 10-20 million passengers. Departures and arrivals around the continent were mainly Covid-19 medication supplies related. P2 recorded that the total contribution of 850 billion dollars GDP by the aviation sector in the USA was drastically reduced. The financial impact of the pandemic was "*really really bad*" (P2, 2021). The interviewees acknowledge the impact of the pandemic on organizational cash flow which led to several cost cutting measures by their organizations - "*the whole system collapsed and no real business to catch in 2020*" (P3, 2021). The cost cutting measures are quantified through the statistical analysis, showcasing the significant costs decrease from Q1, to the outcomes in Q2.

While operations had decreased and negatively impacted revenue, the quantitative results also indicate an increase in costs moving from Q2 to Q3, despite the cost cutting measures, which is also acknowledged by the managers. P5, for instance, explained that costs were heavily burdened in order to maintain the Covid-19 protocols. According to P1, retired and parked aircrafts still needed maintenance in the various countries where they are stationed. Thus, although the flights do not produce income, cost was still incurred. Moreover, once a flight was dispatched to another country, an extra cost was incurred to engage other airlines in those countries to the customers' final destination. All the emerging expenditures, coupled with fixed costs and less revenue flowing in, were a big threat to operations, explained by the managers. The above findings are consistent with Taylor (1965), Janis and Mann (1977) and Grewal and Tansuhaj (2001), who represent economic crises as problems given by the environment with little or no control by organizations.

Jobs in the sector were not spared from the wrought of the pandemic. In the UK for example, 12000 employees of the company where P1 works, including cabin crew staff, engineers, ground handling staff, were forced into compulsory redundancies. P2 stated that in the USA, roughly 2/3 of all aviation related jobs, and 1/3 direct jobs were terminated as a result of the pandemic. Although the magnitude of redundancies differed from company to company, similar trends were recorded by participants in Asia, the Middle East and Europe. This represents the effect of the dynamic environment on organizations' existence as presented by Duncan (1972) and Miller and Friesen (1983). These were emergency measures, according to the managers, to reduce costs - however, the findings show that the more cost is cut through employees, the higher the negative impact on EBIT.

The emergence of pressures and threats by crises, as recognized by Weick (1988), Smart and Vertinsky (1984), Burnett (1998), and Grewal and Tansuhaj (2001) varied as experiences among the participating managers. While some encountered pressures from employees, others encountered pressures from headquarters to ensure alignment of rules and guidelines at the operational level. Most of the participants accounted how pressures from governments regarding recommendations, rules and legal requirements impacted their operations, thereby showcasing the influence of external institutional structures, which notably influence managerial decision making as suggested by Duncan (1972). The common pressure, experienced by all participants, was from customers. The uncertainty and risk level involved in the crisis caused customers to demand safer and risk-free traveling. The latter negative impact on the industry is quantified by the significant decrease in EBIT.

4.2.2. Sensemaking during the crisis

Contrary to Billings et al. (1980), Paine and Anderson (1977) and Miles and Snow (1978), a common theme emerging among all managers was how sudden the crisis hit the industry. All companies where the participants work were unprepared for this type of crisis. Although they all agree that the aviation industry is a risk-prone industry, which had implemented contingencies based on previous occurrences, no one expected the nature and significance of the Covid-19 crisis - thus, consistent with Pearson & Mitroff (1993), Mitroff and Shrivastava (1987) and Burnett (1998) who posit that a crisis devours planned contingencies.

"we have plans for if a biological event happens, but it was all in, a biological warfare attack, what would happen if somebody took out an airport and whatnot, right? Not what would happen for a global pandemic. We were not prepared for that." - P2 (2021)

"nobody could have expected that. It was really like a black swan event that happened probably once in 30 years, or one and a half occurrences in 100 years." - P3 (2021)

Most of the participants unanimously viewed the pandemic situation as significantly confusing and changing on a daily basis, leaving no time for full comprehension, thus increasing uncertainty. It was a struggle to understand the different approaches that were supposed to manage the crisis, which is explained by the variability of both cost and EBIT in the secondary findings. For example, P2 explained that the different rules and regulations in different parts of the traveling destinations made it difficult to implement consistent and uniform strategies towards managing the crisis. P1, following the same line of thought, indicated that communication from senior management, the government and other countries was contradictory, which worsened the entire sensemaking process of the crisis. The manager further indicated that there was a lack of organization-wide understanding of, for example, how costs are handled during the crisis, which made it hard to understand what is meant by corporate as "*the airline was struggling financially*".

In India, for instance, the flight accommodation capacity had increased to 80%, believing the crisis was effectively managed and the normal business was returning. However, the second wave hit, making the country a redline zone for traveling, thus P5 reported that measures were redirected. The above empirical is in line with Mantere et al. (2012), Persson and Clair (1998) and Weick (1988), which explains that sensemaking during crisis became severely impaired due to limited cognition and interpretational problems by decision makers.

"The picture changed so often than the cloud, there was no real clarity. As soon as we got through the first phase, we were told, things would get better, we would start flying, obviously the second wave here and then we were back to square one." - P1 (2021)

P3 however, although confirmed the blurry nature of the crisis, stated that the sensemaking process was pretty quick due to the high magnitude of impact on such an infant company. For example, customers started demanding refunds, coverage and connecting flights to return to their various homes, while canceling bookings, which quickly provided an understanding of what was going on and how to tackle it. This indicates the sensemaking process is affected by the size of the organization - the bigger the size of the organization, the harder the sensemaking process, and vice versa. The organization of P4, in contrast, took an alternative approach in managing the crisis, which corresponded with Burnett (1998), Maitlis and Christianson (2014). The participant stated that when the crisis initially emerged, the first step was to understand its root. According to P4, understanding the root of the mishap helped them to analyze the different strategies that could effectively manage the crisis.

4.2.3. Managerial strategic actions during the crisis

Despite the impeded nature of full comprehension accounted for by the other four managers, all participants agreed on the several actions and reactions implemented during the crisis, which is contrary to the literature suggesting that actions and reactions come after sensemaking. The findings indicate that sensemaking and strategy formulation are simultaneous during crises. It also explains why cost and EBIT changed in between the different quarters. There were several forecasts in between the pandemic to see what is working, what is not working and what needs to be done according to managers - thus, sensemaking, along with strategizing. P3 could, for instance, visualize the correlation between actions taken and outcomes. P3 stated that sales started going up in relation to the measures put in place.

The participants also acknowledged actions were taken rapidly to effectively manage the crisis as the normal management rule was not always applicable (Colville et al., 2012) and flexibility was essential. As presented by P4, some of the strategies adopted were meant for immediate effect, others were implemented on phases based on the changes expected to occur externally, thereby supporting the findings of Weick (1988), Mitroff and Shrivastava (1987), Pearson and Mitroff (1993), Burnett (1998), Dubrovski (2004) and, Grewal and Tansuhaj (2001) on the need for strategy formulation for minimizing the impact and complexity of the crisis.

While some managers developed their measures based on personnel management, perception management and customer feedback, others' measures were drawn from previous experience of crisis management and learning from competitor's actions. Thus, experience and knowledge are the key to effective crisis management, according to P5. Moreover, actions and reactions differed across organizations, due to organizational size. P3, managing a younger and smaller company, experienced less corporate rigid restrictions, which means that action and reaction was flexible, thus aiding rapid decision making. P2 and P1 on the other hand worked in relatively larger and older organizations, noted that strategies are not only management's decisions to make. There are higher control systems that influence managers' decisions. P1 stated an example where department managers wanted to divide the workforce into groups, where the groups will be rotating on a monthly basis between working and furloughed. Such a strategy would ensure that everyone maintained their jobs and competence is preserved and used when required. However, shareholders, CEOs and the corporate department thought redundancy was a better solution. Organizational size has not been considered by the extant literature to influence the strategy formulation process. Several different strategies were employed by the different organizations, for example: closure of terminals due to reduced operations and retiring flights, securing as much cash reserves, etc.

"there was a whole freezing of the aviation industry, nobody would really want to pay out anything big." - P2 (2021)

Younger companies changed the entire business model to match the situation. P3, for instance, deemed the business model change to have helped the company to continue exchanging value with other organizations for survival. This strategic approach was not applicable to older companies.

"we still could exchange value, so for example billboard advertising etc. in exchange for some estate on our website, so that we were still able to exchange values with each other without having to use cash flow, let's say for payments" - P3 (2021)

The consistent strategies across the aviation industry were cost cutting (Wenzel et al., 2020), compulsory redundancy and furlough according to managers. The approach, although used by nearly all companies, varied in usage intensity, which indicated the outcome experienced by different companies. While some organizations used the strategies partially to ensure business continuity after the crisis, other organizations fully employed the strategies. According to P1, whose company fully implemented cost cutting, compulsory redundancy and furlough strategies, the focus was more on saving money which P1 translated as "*spend five pounds to save two pounds, it was ridiculous*". Most of the cost cutting strategies did not make sense financially afterwards:

"*there was an immediate, let's stop expenditure straight away. But decision makers weren't aware of the knock-on effects" - (P1, 2021)*

Additionally, due to the large amount of redundancies, the competence base shrunk to the extent that significant investment was needed to get back competence for post-crisis operations. As the competence base shrinks, performance is negatively affected in the EBIT and signaling wrong strategic actions. P1 stated that this is not uncommon in the aviation sector during the Covid-19 crisis. P2 emphasized that one year of managing throughout the crisis should mean making rational decisions, but the opposite was encountered. The description by managers for fully employing the above strategies is "*a very short-sighted view on investment"* and *"kind of chasing our tails*". This corresponds to the findings of Miles et al. (1978), Maitlis and Christianson (2014), where strategies instead of minimizing crisis effects, turn to intensify crisis impact, and according to Donaldson (2001) become "short-term firefighting". It is also explainable by the quantitative findings where costs had dropped as a solution but intensified the crisis with a significant drop in EBIT thus, quantifying wrong strategic decisions.

"*Although we reacted very quickly, we didn't sit down and plan the worst case scenario, there were a lot of knee jerk reactions going on. And some of our competitors kind of watched what we did, and then did the opposite." - P1 (2021)*

Contrary to full cost cutting, compulsory redundancy and furlough, the company of P3 for instance, took an alternative approach. Employees were maintained through external funding. Cost cutting was made on other parts of the business, such as infrastructure. Any unprofitable ventures were released instead of employees. As much as cost cutting was important, holding on to existing contracts for future purposes was more important. P3 stated that management needed to motivate why certain parts of the operations should be maintained - "*So I had to prove that airport business still makes sense. And they said, Okay, yes, it's strategic". This gives the company a better competitive advantage in post covid*". This approach was later seen as effective in the industry leading to "appropriate" cost cutting methods which are quantifiable by lower cost and better EBIT in Q4.

In terms of how successful the different strategies implemented by the companies were, managers' responses varied, and the quantitative analysis showed stability was reached in Q4, despite negatively plateauing. P5 and P3, for instance, acknowledged that although there were challenges with some of the strategies implemented, several were successful in managing the crisis. These were organizations that mostly studied the behaviors of industry giants towards managing the crisis. Thus, contrary to Mitroff and Shrivastava (1987) positing learning as the last stage of crisis management, learning occurs during and after the crisis, as evident from the empirics. P4's strategies, based on understanding the core root of the crisis, were deemed to a certain level as effective in managing the crisis, since the company is gradually recovering and returning to normal, according to the manager. P3 specified that one can never know the full effectiveness until after the event, as indicated by Weick (1988). However, the findings of the budgeting process suggest alternative approaches that measured the effectiveness of management during the pandemic, thus contrary to the findings of Weick (1988). The manager also explained how a clearer picture has been ascertained as the crisis progress-

"the bookings are slowly but steadily going upwards again, therefore, now I think we have a pretty good picture of what's going to happen, or at least much better picture." - P3 (2021)

P1 classified most of the strategies for managing the pandemic as unsuccessful. The strategies according to P1 can be defined as "*counterproductive*".

The organization of P2 on the other hand, whose main strategies were focused on customer feedback, recognized the shortcomings of some implemented actions. Nonetheless, P2 conceded most of the strategies for managing the crisis were effective, as at least 20% of customers became recurring during the crisis period and covered 60% of operational cost. Thus, most expenses to sustain the station during the pandemic were covered. The above findings support Donaldson (2001) and Glaesser (2006) who state that the most appropriate strategy is the one whose formulation process has a fit with the environment. The findings, however, contradicts Rosenberger (2005), who states outcome can either be success or failure, indicating the outcome of crisis management can be both success and/or failure.

4.2.4. Learning from the Covid-19 crisis towards future crisis management

As agreed by all participating managers, there were shortcomings associated with the management process of the Covid-19 crisis. Some stated the fiasco had intensified the severity of the crisis.

"we made some fundamental, really basic grass root errors, and we will, as an airline, we're going to pay for that going forward." - P1 (2021)

The errors common to all participants concerned communication as a strategy during the crisis management. A deficiency was recognized by most managers regarding both internal and external communications, therefore the need emerged for improving future communication during crises. As stated by P2, "*As time progresses, we learn things, we adjust for what we learn*". This corresponds to the finding above stating the learning process occurs during and after the crisis. It also supports the quantitative findings where constant strategic change produced different results in each quarter, thus variability of both cost and EBIT representing the learning, gaining knowledge and experience process in the crisis. The stability attained in Q4 is also an indication of learning in the process.

Participants who work in older and larger companies noted the lack of flexibility in decision making. According to them, the time pressures associated with crisis management demand an urgent reaction - consistent with Hermann and Dayton (2009) - and therefore, the top-down management approach was inappropriate. As per these managers' accounts, department managers who faced the situations daily had a better understanding of the crisis, but less authority to act without approval of top management, which increased the impact of the crisis. Organizational structure has not been recognized by crisis management literature to have an impact on crisis management outcome. As to how this can be introduced into strategy reformulations, managers hoped senior management had learnt from this crisis and allow for flexibility in future crisis management.

Managers also noted that towards future crisis management, their first approach towards strategizing would start with identifying key resources, skill sets and relationships. P3, for example, explained how important relationships (business partners) could have been better treated, since partner dissatisfaction could be a threat for future operations - "*each partner counts, and that if you burn your trust once and they will not come back*". Moreover, providing early simple solutions is also a key explained by the managers. In the case of Covid-19 for example, they claimed providing early virus testing for workers to reduce the spread among the workforce could have made a huge impact.

"there was no COVID testing in place. And we didn't get that until about months, six months seven. So, when somebody became positive, it affected the crew." - P1 (2021)

As much as the pandemic had negative impacts on the sector, managers stated that some positive improvement also arose for better performance in post-crisis. For instance, customer service migrated

to chatbots, with more self-services to reduce human intervention and cost. Contingency plans have been developed towards future similar crises, supporting the findings of Dwyer and Hardy (2016). Thus, learning is derived from experiences that provide better alternative solutions.

All participants, although acknowledging the need for situational adaptations in crisis management, agreed that knowledge accumulated from the management of the Covid-19 crisis will be relevant for future crises. On P4's account, every crisis situation has its own unique circumstance that demands unique measures - therefore, it all depends on the similarities between future crises and the Covid-19 crisis. According to P3, there is always a new normal after every situation which is why adoption is essential. However, the Covid-19 crisis provides a picture on how to manage a similar future crisis, thus supporting the research of Weick (1988), Pearson and Mitroff (1993) and Dwyer and Hardy, (2016) who present learning cues as contingencies for future crisis management. Nonetheless, it is not the final stage of crisis management based on the findings, as learning took place even during the crisis, which is both qualitatively and quantitatively visible. Moreover, the above findings represent the different ways through which learning occurs during and after a crisis.

"we can say it is one of the examples we can include as our study cases. And consider these study cases in our forthcoming planning and forthcoming preparation of any emergency situation". - P4 (2021)

4.2.5. The budget and budgeting process during the crisis

Most managers, especially those working in well-established companies within the industry, had little experience with the budgeting process during the crisis, compared to managers in younger companies. This finding is not surprising, as Abernethy and Brownell (1999) note that control systems such as budgeting should be used more actively for strategic changes. However, all managers accounted for some experiences with the process during the pandemic. Common among all managers was that the planned budget for the 2020 financial year was nearly non-functional - the budget was "*pretty wrong*". That represents the limitation of annual budgeting as suggested by Coulmas and Law (2010): alternative shorter-period budgeting methods are better adapted to chaotic environments, as providing greater flexibility (Lorain et al., 2015) for continuous engagement with strategic priorities (Frow et al., 2010). P2, P3 and P5 are managers who used the alternative budgeting approach during the pandemic.

The panic within the industry hindered visibility and forecasting was impeded. This provided the need for the budgeting planning function during crisis (Becker et al., 2016) as it leverages the opportunity to produce forecast data (Hagel, 2014) using current internal and external factors (Shim et al., 2012) which according to the managers, helped to see the current picture of the situation by providing a set of references (Lorain et al., 2015). It is also apparent in the quantitative finding where although EBIT decreases, the variances are usable as guidance for upcoming quarters, thereby enhancing the

sensemaking process and increasing the effectiveness of the crisis management, by providing quantifiable figures for sensemaking. This presentation supports **proposition 1**: *Planning as a function of budgeting is related to, and assists, the sensemaking process of crisis management.*

As sensemaking is made more explicit through planning, appropriate measures were also formulated to manage the crisis:

"with a budget, you can see how things are and then you can see how you need to adjust things and change things to be able to make it better going forward" - P4 (2021)

Resources include capabilities, employees, and capital resources. It is visible in the variance analysis that cost cutting through employee redundancy for example, had a huge impact on EBIT in the first quarters of 2020, however, the final quarters saw cost cutting in other parts of organization rather than human resource. The latter supports the resource allocation function of budgeting, as providing the capability for rapid and creative responses in crisis (Frow et al., 2015) and deployment of scarce resources (Connolly & Ashworth, 1994). According to P2, most important regarding budgeting in the organization during the pandemic, was to stay on and under the budget. Thus, managers had to re-learn by using the little resources left to "*make it stretch or figure out what to do with it*". The latter corresponds to the resource allocation function of budgeting, as it allows to keep expenditures within defined limits (Shim et al., 2012) by providing an opportunity to evaluate alternatives. The effectiveness of the crisis management was achieved according to P3. The manager stated that as time progressed, sales increased - although not to satisfaction, but better guided the path of actions. Thereby, P3's account covers the definition of budgets given by Shim et al. (2012) - financial controls designed to obtain satisfactory earnings. Moreover, the budget was used to lower all inefficient activities in the company, which highlights its usage for productive resources and liquidity management, as noted by Becker et al. (2016).

"First, you are too optimistic or too pessimistic. And then you will shift a bit and see where the market goes." - P3 (2021)

The finding therefore indicates that budgeting quantifies strategy formulation during crisis, thus supporting strategy formulation and increasing effectiveness when managing externally induced crisis - in line with **proposition 2**: *Resource allocation as a function of budgeting is related to, and assists, enacting strategy during crisis management.*

P4 accounted for the budgeting process as a feedback provider, and as per Franklin et al. (2019), considering budgeting as an accounting tool is useful for decision making by providing "feedback value". P2 for example explained that the budget is a reflection of the historical expenditure which guided the expenses incurred during the crisis, thus, assessing if expenses need to be adjusted:

"But we have to substantiate everything in the budget. And as what typically happens, anything you don't use gets removed from your budget for the next year." - P2 (2021).

The budget variance also quantifies how current period provided feedback for the next period thus, the finding ascertains the necessity of budgeting's performance evaluation function during the crisis, contrary to the criticism by Becker et al. (2016). Performance evaluation allows you to take corrective action when necessary (Drury et al., 2012) by evaluating strategic decisions as "trial and error" (Lorain et al., 2015). The empirics further support **proposition 3**: *The performance evaluation function of budgeting is related to, and assists, organization learning in crisis situations.*

According to P3, what to learn from all this for future situations is having a rolling budget and forecasting is essential during crisis times, in line with Coulmas and Law (2010), Lorain et al. (2015) and Batt and Rikhardsson (2015). P3 explained that during a crisis, there is no visibility in the long term, but rolling forecasting makes it possible to budget for shorter periods for example, on a three month basis. This, according to him, helps to always adapt to the market environment and readjust goals where it's needed. Overall, P3's experience showcases how budgeting increases control over the environment (Batt & Rikhardsson, 2015) during crisis situations, by quantifying internal actions to make crisis management effective. All managers, although not entirely familiar with the budgeting process, accounted that budgeting could effectively improve crisis management.

5. CONCLUSION

By discussing the emerging insights from the empirical analysis, this section provides an answer to the research question and an adjusted final theoretical model. Limitations of the research are addressed as avenues for further research. Finally, as relating back to the purpose of the research, theoretical and practical implications are concerned.

Based on the analysis, the research question: *How can budgeting assist crisis management during the Covid-19 pandemic, using the aviation industry as an empirical context?* is answered. Contrary to previous research, indicating that the effectiveness of crisis management is unknown until after the crisis, this research demonstrates that alternative budgeting methods increases the effectiveness of crisis management by providing measurability during the crisis and general contingency for managing future crises through organizational learning. Thus, budgeting as an underlying structure is seen as a standardized internal practice in this context, compensating for the inherent lack of a uniform crisis management approach.

It is also established that the association of uncertainty, threats and time pressures during crises makes crisis management cumbersome. The lack of control over the external environment during a crisis could intensify the crisis. All of these factors reduce the effectiveness of crisis management and put management under constraint. However, according to Pearson and Mitroff (1993) the effectiveness of crisis management is attained when emerging factors that intensifies the crisis are averted, as well as when an emerging crisis can be averted. Although the effectiveness of the Covid-19 crisis management is not fully ascertained by participating managers, a management process was considered successful when managers were able to minimize the impact of the crisis. Therefore, crisis management is deemed as effective in this research when crisis, crisis factors and crisis impact are averted and or minimized.

The alternative budgeting method and its functions, according to the findings and analysis, quantifies the traditional crisis management process of sensemaking, strategizing and organizational learning by aiding comparability and readjustment during the crisis, thus increasing the ability to foresee, avert and or minimize crisis and crisis' impact. Moreover, the extant crisis management literature regards the crisis management process as a systematic process where one action leads to the other - sensemaking, strategizing, and learning towards future crisis management are seen as consequential. However, according to this research, sensemaking, strategizing and learning occur simultaneously during the crisis. These crisis management practices correspond to the functions of budgeting, as confirmed by the propositions, as it is inherent that the combination of several budgeting functions increases value. The image below (Figure 6) visualizes the crisis management process with budgeting as an underlying tool to assist and increase effectiveness during crises:

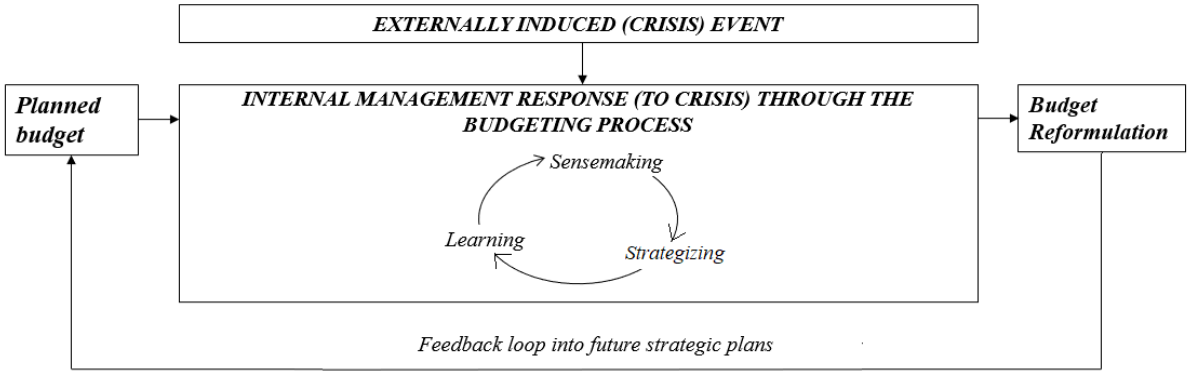

Figure 6: *The final theoretical model, as a result from this research.*

Additionally, the research discovered factors such as different types of strategies, institutions, organizational size and structure, had a severe impact on crisis management during the Covid-19 crisis. These factors, however, have not been considered in the reviewed relevant literature of crisis management.

5.1. Limitations and future research

Although an answer to the research question is provided, it is arrived at within the limits of this thesis, thus certain gaps emerge from the constraints as novel discoveries.

Firstly, regarding strategy formulation, the findings suggest that different strategies produce different outcomes. It is addressed how budgeting underlies strategy formulation overall, however, strategies made during an externally induced crisis is a topic of interest on its own for further research, whereby the variability of approaches can be covered. As such, communication, cost cutting, and employee redundancy can be more vigorously examined.

Second, this research conceptualized budgeting around three functions only, as those are directly relevant to externally induced crises, based on the extant literature. Other functions of budgeting, such as communication, coordination, and motivation, can be studied further in this context, thereby addressing indirect relations between crisis management and budgeting.

Third, the findings indicate that organizational size and structure have an impact on how externally induced crises are managed. These factors are not fully considered in the thesis, as the interest falls on unfolding budgeting's general usage in such context. Further research could enrich the theoretical implication of this research by uncovering the impact of varying organizational sizes and structures on crisis management. Moreover, the findings concerned institutional theory, as governments, social

structures and other regulatory bodies had an impact on crisis management. Future research could attempt to uncover the role of institutions and business networks on organizational crisis management.

Finally, the sample sizes from both data collection methods are limited due to time constraints. Therefore, considering the novel theoretical implications emerging from this research, a wider sample study could allow generalizability to the findings.

5.2. Managerial and theoretical implications

The study is drawn from the experiences of different management positions and financial data within the aviation industry from Europe, Asia, Middle East, and the USA. Although the empirical context is delimited to the aviation sector, the transferability of the study to other sectors is established. Thus, the research provides practical insight to managers on how to effectively manage externally induced crises through utilizing the functions of alternative budgeting techniques. Considering the latter managerial insights, this research fulfils its manifold purpose by offering practical contributions to managers.

The final theoretical model, as a key contribution, provides novel theoretical implications, attaining a deeper understanding of the crisis management process by building upon the problematized gaps in extant literature. Firstly, marrying management and accounting literatures and empirically testing the aviation sector offer a contribution to crisis management practice and thus, complements the lack of operationalization and empirical testing in crisis management literature. Secondly, budgeting underlies the management of most organizations, this research provides evidence for its usage in increasing effectiveness of crises management in the context of externally induced crises. This research, therefore, fulfills its purpose of providing a deeper understanding of crisis management and a theoretical contribution in crisis management research and practice.

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APPENDIX 1: *Letter of intent for interviewing*

Mälardalen University

FOA243: Bachelor Thesis in Business Administration

Spring 2021

Letter of Intent for Interviews

We are students of the department of Business, Society & Engineering at Mälardalens University, Sweden, and contacted you previously concerning our bachelor thesis.

We are writing to formally request for an interview with you to obtain insight regarding your position as a manager in the aviation industry, specifically during the Covid-19 pandemic.

The purpose of the interview is to gain a practical understanding of actions and reaction to unanticipated events in the wider business environment during crises. We therefore aim to gather in-depth insights from you on how you managed, or are managing, amidst the Covid-19 pandemic crisis.

The interview will be approximately 30 minutes long, and you can choose a date for the interview at any time between the 19 – 29th of April 2021. This will occur digitally via zoom or Microsoft teams based on your preference.

All data and information will be treated with confidentiality in the project (by teachers and fellow students). And your feedback will be included with other managers in different companies to obtain a general picture of how the pandemic has affected management – and the industry – as a whole, i.e. your company is not the focus of our assignment. It is our hope and conviction that the result of the study can be useful to you, your organization, and other industries for crisis management. If you are interested, we would gladly send you the thesis upon its completion!

Important:

• At any point during the interview, you have the right to withdraw from the study.

• Your answers will be anonymous.

• The interview must be recorded for the purpose of transcribing it.

Best Regards,

Naomi A. Akelmu

Mihaela D. Mihaylova

APPENDIX 2: *The collected secondary data*

Organization	Variable (EUR million)	Q1 (Jan-Mar 2020)	Q2 (Apr-Jun 2020)	Q3 (Jul-Sep 2020)	Q4 (Oct-Dec 2020)
Lufthansa	Costs	8162.0	3907.0	4276.0	2359.0
	EBIT	-1622.0	-1846.0	-2389.0	-1080.0
Aegean Air	Costs	222.8	92.8	191.8	135.9
	EBIT	-70.6	-52.1	-34.7	-53.4
Pegasus	Costs	309.0	100.0	191.0	209.0
	EBIT	-17.0	-78.0	-10.0	-70.0
TAP Air Portugal	Costs	738.5	335.1	377.8	573.5
	EBIT	-155.3	-272.3	-182.6	-354.6
IAG - International Airport Group	Costs	5120.0	2106.0	2539.0	2468.0
	EBIT	-535.0	-1365.0	-1300.0	-1165.0
Copenhagen Airport	Costs	90.9	86.3	95.4	83.5
	EBIT	13.9	-7.9	-27.4	-74.7
	**originally reported in DKK million; converted to EUR based on data provided by Morningstar for Currency and Coinbase for Cryptocurrency as at 25.04.2021*				
Swedavia	Costs	142.4	102.7	97.9	145.8
	EBIT	27.1	-64.1	-33.6	-86.3
	**originally reported in SEK million; converted to EUR based on data provided by Morningstar for Currency and Coinbase for Cryptocurrency as at 25.04.2021*				
Fraport	Costs	669.7	495.6	782.4	557.1
	EBIT	12.3	-222.5	-360.8	-137.1
Vienna International Airport	Costs	137.4	80.4	109.9	97.0
	EBIT	26.4	-42.6	-27.4	-42.9
TAV Airports	Costs	119.8	58.2	75.5	121.5
	EBIT	-19.8	-60.4	-4.0	-66.2
	Costs	**1571.2**	**736.4**	**873.7**	**675.0**
Average	**EBIT**	**-234.0**	**-401.1**	**-437.0**	**-313.0**

Sources:

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APPENDIX 3: *Regression analysis*

EBIT Q2 versus Costs Q1

Regression Equation

EBIT Q2 = -34.9 - 0.23307Costs Q1

Coefficients

Term	Coef	SE Coef	T-Value	P-Value	VIF
Constant	-34.9	25.1	-1.39	0.203	
Costs Q1	-0.23307	0.00820	-28.44	0.000	1.00

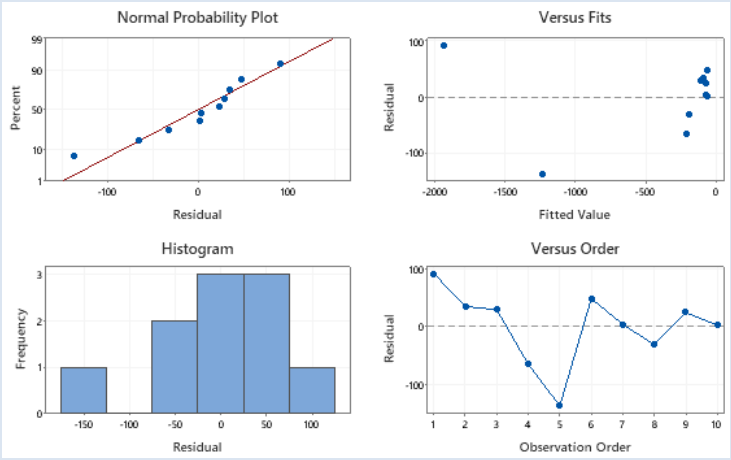
Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Regression	1	3767033	3767033	808.77	0.000
Costs Q1	1	3767033	3767033	808.77	0.000
Error	8	37262	4658		
Total	9	3804295			

Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
68.2474	99.02%	98.90%	95.78%

Residual Plots



Source: Minitab; testing by the authors using the secondary data from Appendix 2

EBIT Q3 versus Costs Q2

Regression Equation

EBIT Q3 = 19.8 - 0.62027 Costs Q2

Coefficients

Term	Coef	SE Coef	T-Value	P-Value	VIF
Constant	19.8	11.1	1.79	0.111	
Costs Q2	-0.62027	0.00779	-79.58	0.000	1.00

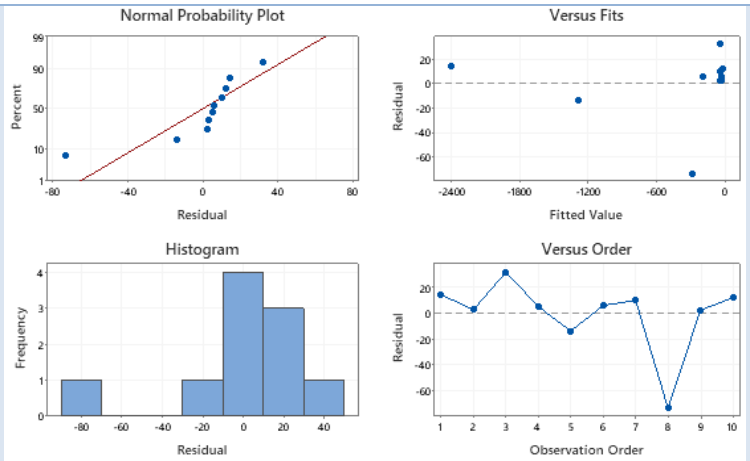
Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Regression	1	5648403	5648403	6332.98	0.000
Costs Q2	1	5648403	5648403	6332.98	0.000
Error	8	7135	892		
Total	9	5655538			

Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
29.8648	99.87%	99.86%	99.76%

Residual Plots



Source: Minitab; testing by the authors using the secondary data from Appendix 2

EBIT Q4 versus Costs Q3

Regression Equation

EBIT Q4 = -63.4 - 0.2857 Costs Q3

Coefficients

Term	Coef	SE Coef	T-Value	P-Value	VIF
Constant	-63.4	66.7	-0.95	0.369	
Costs Q3	-0.2857	0.0417	-6.86	0.000	1.00

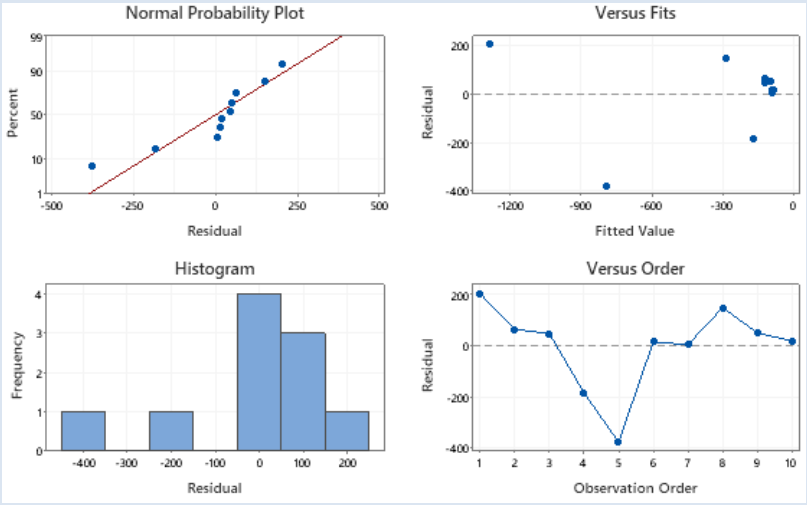
Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Regression	1	1465910	1465910	47.01	0.000
Costs Q3	1	1465910	1465910	47.01	0.000
Error	8	249439	31180		
Total	9	1715350			

Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
176.578	85.46%	83.64%	42.78%

Residual Plots



Source: Minitab; testing by the authors using the secondary data from Appendix 2