
ADOPTION OF COST SYSTEM SOPHISTICATION AND NON-FINANCIAL PERFORMANCE:

Evidence from Democratic Republic of Congo

By

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Thesis in Business Management

submitted at University of Salford

In partial fulfillment for the requirements of the degree of

DOCTOR OF PHILOSOPHY

September 2022

Dedication

I dedicate this thesis and my entire life to the Holy Spirit, the Lord, and Giver of Life.

To Angela Ndongala, as a good soldier of Christ, who fought a good fight of faith,
and now resting in Christ Jesus. Through your poem, the trilogy of us, we give glory
and honor to the risen Lord:

And so, it begins
The loves of life, and deaths declaimed.

A cry,
Sound for truth
Yet sounds for lies.
Laughter to blanket sorrow
It carries joy until the morrow,
Life's not all blue skies
But where is the fun in that?
Take witness to the thunder
One day you 'll bounce back
This day will arrive,
All love, hope, prosperity hall thrives
Now his may come with a tithe
But we are stars, we will survive
Love, life, and death
One nothing without the other
Let the heavens tear open
No need to take cover.
I turn to the stars

For this is what we seek. A safe haven for this life other death. And a love that eterni-
ties shall speak. Because where death is your victory, Where dear death your sting?

Christ Jesus has risen, so to the offspring. And for you in my heart, I will keep. That
for all the empty gold. Without love Both life and death will be plenty cold.

And that is the trilogy of us.

Author: Angela Ndongala (13) Harper Green High School, Farnworth.

Acknowledgements

The completion of this project would not be possible without the unlimited academic and professionalism support I received from Dr Marie Griffiths. She did not give up on me. She empowered me through her advice, guidance, and patience. She had faith in me and believed in my academic resilience and my determination in achieving the degree award. I gratefully acknowledge her. I extend my gratitude also to Michelle Jones. She walked alongside me on the administrative requirements needed to complete this journey. Let this completion be another flower in her garden of goodness. The turning point of this journey was when Dr Ernest Ezeani joined my supervision team. He changed everything. He carried me on his shoulders and in his heart. He encourages me to work hard and acknowledges my effort at the same time. This is what supervision is about. He adds the human touch which was lacking in the process. His mentorship and long hours spent on my draft made me jump the rugged landscape of this journey, and complete. So, I very gratefully acknowledge Dr Ernest Ezeani, a messenger in a mission. I also acknowledge Dr Rasol Eskandari my co-supervisor, and Dr John Brierley who inspired me to conduct this research in costing system sophistication. I extend my gratitude to Professor Abbe Pierre Kiazayila Kingengo, my brother for all his love and support. He believed in me and provided all I needed for my academic success. My gratitude to my brothers, sisters, cousins, nephews, and nieces. To my children, Jonathan Ndongala, Angela Ndongala, Esther Judith Ndongala, Mercy Kuikidi Ndongala. To you, my wife, Lola Ndongala. Your love supported me in each stage of this journey, and you made it happen. Finally, thank you to my parents, Matuasisilua Bendola and Kuikidi Lozita. This is your achievement as well, you made it. Thank you. It is done.

List of abbreviations

ABC:	Activity – Based Costing
ABM:	Activity-Based Management
AIS:	Accounting Information System
AR:	Adequacy of Resources
CFA:	Confirmatory Factor Analysis
CFI:	Comparative Fit Index
CSS:	Cost System Sophistication
C.R:	Critical Ration
df _M :	Degree of Freedom
DRC:	Democratic Republic of Congo
GFI:	Goodness of Fit Index
IFI:	Incremental Fit Index
MK:	Management Knowledge
MS:	Management Support
NFI:	Normed Fit Index
NFPM:	Non-Financial Performance Measurements
OP:	Organisational Performance
P:	P-value
PAR:	Perceived Adequacy of Resources
RMR:	Root Mean Square Residual
RMSEA:	Root Mean Square Error of Approximation
SRMR:	Standardized Root Mean Square Residual
SCS:	Satisfaction with the Costing System
SD:	Standard Deviation

S.E:	Standard Error
SEM:	Structural Equation Modeling
SIZE:	Size
SME:	Small and Medium Enterprise
TCS:	Traditional Costing System
UA:	Uncertainty Avoidance
UCS:	Use of Costing System
UCSDM:	Use of Costing System in Decision Making
X^2_M :	Chi-square

Abstract

This study examines factors that influence the adoption of cost system sophistication (CSS) among Congolese firms and the impact of CSS on non-financial performance. Far from the traditional linear concept of organisation, this study apprehends organisation as a complex adaptative system of non-linear interaction. In this regard a triangulation between contingency and complexity theory is used as a basis of conceptualisation. This is done by looking at the interplay of the combination of a set of factors in the specific case of Congolese businesses.

In view of the nature of these research objectives, a mixed methods' approach was adopted within a critical realism perspective. Data were collected using a survey questionnaire from 201 Congolese firms and from semi-structured interviews. SEM results indicate that the majority of Congolese firms use a simplistic costing system. In addition, results show that the adoption of CSS emerge as a pattern from the interplay between behavioural factors – management knowledge, management support - , organisational factors – perceived adequacy of resources - , and contextual factors- size, uncertainty avoidance. Furthermore, findings show that there are three social structures beneath the constant conjunction of association between factors, adoption of CSS and organisation performance: management knowledge norms, cultural norms values, and business strategic norms. Imbued with causal powers, the appearing or disappearing of patterns emerging from the continuous interplay of these social structures enacts or restrains the generative mechanism leading to a regularity in the occurrence of the relation between factors, adoption of CSS and Non-Financial Performance Measurements(NFPM).

This study made a significant contribution to costing system literature by presenting for the first time a mechanism explaining what can be observed in the empirical domain regarding the relationships between factors, the adoption of CSS, and organisation performance. In this regard, this critical realism empirical study fills the gap in literature by providing a holistic answer for the first time to the question of why organisations adopt or design a cost system sophistication; or to the question relative to the extent to which factors influence the adoption of CSS and its effects on non-financial performance. In addition, this study is novel in reviving the simplistic and mechanistic contingency theory by integrating information from the contextual uncertainty and dynamism of nowadays business environment. The study asserts that the fitness between the context and the organisation system is underpinned by the contextual uncertainty landscape in which are embedded all aspects of management accounting control package or the entire business management. Furthermore, the findings have a practical implication on the benefit the adoption or the design of cost system sophistication is likely to bring into the organisation cost management effectiveness among Congolese businesses. The adoption of CSS will yield more net benefit - individual benefit and organisation benefit- to Congolese SMEs processes, and subsequently more profitability. This is likely to advance Congolese SMEs competitiveness to face pressures from the global business environment. Similarly, the framework of complex relationships between factors, CSS and NFPM offers to the managers insights on which contingent factors are related to CSS with which fitness will yield more organisational performance.

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Chapter one: Introduction

1.1 Background and statement of the problem

Recently, there has been a renewed interest in cost efficiency in pursuing organisational effectiveness or increasing firms' capacity to innovate to face the global competitiveness among African companies (Diop, 2018). This interest is because of the challenges most firms are facing, such as a high degree of uncertainty (Rodrigues *et al.*, 2017). Other challenges include greater global competition, greater constraints on cost and cash flow (Nixon and Burns, 2012), a more complex market and a wider range of products. Moreover, these changes lead on to greater overhead costs, a greater proportion of products and processes, more demanding customers, and a greater consumption of various resources (Johnson and Kaplan, 1987). The intensity of the impact of those changes is exponentially higher nowadays compared to the 1980's, when Johnson and Kaplan (1987) raised an alarm about the inadequacy between the simplistic and arbitrary overhead costs allocation of the traditional costing system and the fast-changing business environment. Today, the global business environment is more complex and dynamic. In light of the above, it is becoming extremely difficult for African companies to ignore the necessity of adopting an innovative costing system. This innovative costing system can be qualified as new methods of management accounting control systems- cost system sophistication.

Cost System Sophistication springs up as a methodology for more precise cost information to facilitate decision making. It is a part of the activity-based management (ABM) and implies a management of the organisation based on the cause effect premise that activities consume costs. Thus, CSS, through Activity-Based Management,

enables the satisfaction of customers' needs and uses less organisational resources (Drury, 2008). CSS views organisation as the sum of interplay of activities in order to ultimately add customer value and generate appropriate cost information for decision making. In addition, CSS also emerges as a solution to address the issues of cost distortions raised against the Traditional Costing System (TCS), which tends to be orientated to the conservation of the status quo, and cost containment rather than cost reduction (Drury, 2008).

Indeed, in the 1980s, disapprovals were raised regarding the Traditional Costing Systems (TCS) in providing accurate information relevant to managerial decisions. Taking into consideration the changes in the competitive environment of business and the fast-paced movement of capital and technology, Johnson and Kaplan (1987) argued that the previous approaches to Management Accounting Costing Systems of the 1920s were unlikely to be useful in the 1980s. In this regard, efforts were made in the 1990s to modify management accounting techniques and implement more effective approaches for the changing manufacturing environment. The activity-based costing methodology received substantial awareness in many countries as an alternative methodology to Traditional Costing Systems (Abernethy and Bouwens, 2005). It has broadened and became more universally applicable in various sectors (Bjørnenak and Mitchell, 2002). It is also the dominant accounting system innovation discussed in textbooks and an important management accounting costing system used worldwide (Pietrzak *et al.*, 2020; Berg and Madsen, 2020).

The literature on product costing system sophistications can be divided into three streams (Drury and Tayles, 2005). The first group focuses on the dissemination of activity-based costing methodology, its development, and theory (Cooper and Kaplan, 1992; Johnson and Kaplan, 1987). The second stream investigates the

characteristics and usage of ABC (Innes *et al.*, 2000; Innes and Mitchell, 1995). The third stream focused on the determinant impacting the adoption of Activity Based Costing methodology (Al-Omiri and Drury, 2007; Cinquini *et al.*, 2015; Boukr, 2018). Generally, most of the product costing contingency-based research has emphasised the factors affecting the adoption of Activity Based Costing (Bjørnenak, 1997; Brown *et al.*, 2004; Al-Omiri and Drury, 2007; Hadid and Hamdan, 2021). At the time when product diversity was found significant in some of the studies (Malmi, 1999; Booth and Giacobbe, 1998; Krumwiede, 1998), it was also found not significant in other studies (Bjørnenak, 1997; Clarke *et al.*, 1999). Cost structure was found significant by Bjørnenak (1997), and Booth and Giacobbe (1998). In contrast, different studies found no significant association between cost structure and the adoption of a more sophisticated costing system (Malmi, 1999; Clarke *et al.*, 1999). The level of competition was found significant by Malmi (1999) and not significant by Bjørnenak (1997), and Booth and Giacobbe (1998). Regarding the contextual factor, 'size' studies have reported contradictory findings. For instance, 'size' was found by most studies to be related to the adoption or the use of a more sophisticated costing system (Aiken and Hage, 1971; Blau and McKinley, 1979; Kimberly and Evanisko, 1981; Ettlie *et al.*, 1984; Joshi, 2001; Chenhall, 2003; Bjørnenak, 1997; Krumwiede, 1998; Drury and Tayles, 2005; Al-Omiri and Drury, 2007; Cinquini *et al.*, 2015; Boukr, 2018). However, other studies found no relationship between organisation size and cost system sophistications (Gosselin, 1997; Libby and Waterhouse, 1996; Baird, 2007; Cohen *et al.*, 2005).

Although there is an increase in interest in CSS, the extent to which factors influence the adoption of CSS is not yet clear. Bjørnenak's (1997) study on the diffusion of innovative accounting systems among Norwegian firms reveals that the adoption of CSS is explained by the contagious diffusion model. Norwegian firms adopted

such a system as an innovative idea. In addition, Bjørnenak's (1997) findings reveal a statistically significant relationship between size and CSS when comparing two groups of firms with or without prior awareness of an innovative accounting-ABC. This finding infers that firms with an adequate network of communication resources and frameworks will adopt activities-based costing systems.

In contrast, Shields (1995) gives sufficient attention to the point of view of the demand side of the innovative accounting system, as opposed to the supply side of diffusion of such methodology- software designer, and accounting consultants. In addition, Shields (1995) analyses the adoption or the design of CSS as an administrative innovation. Similarly, to Shields and Young (1989), Shields (1995) argues that the end result of the implementation of administrative innovation is not determined by technical resources despite the fact that they might enhance the success rate. Shields (1995) recommends that the future study should focus on singling out factors for future theory development. Particularly, he suggests more focus should be addressed on the effect of organisational culture in providing a context in which are embedded the top management's decision-making relative to which administrative accounting innovation to adopt.

Additionally, Drury and Tayles (2005), in their study on the design of costing systems among UK companies, suggest including other key factors such as top management support, and the perceived needs and awareness of an accounting innovation costing system. Arguably, Drury and Tayles (2005) suggest that, in order to get more insights into the determinants influencing the adoption of a more sophisticated costing system, the management costing system should be considered as part of an overall package of management control systems. In other words, to include in the quest the interactive contingency approach relative to the impact of such adoption on

organisation performance. This could later be measured using users' satisfaction and usefulness of the costing system as proxies to measure organisational performance (Drury and Tayles, 2005). However, none of the above suggestions (Shields, 1995; Drury and Tayles, 2005) has been considered. Neither the existing seminal studies on the effect of contextual determinants on CSS (Al-Omiri and Drury, 2007; Cinquini *et al.*, 2015; Boukr, 2018) integrated within their analysis the level of complexity and uncertainty of today's business organisations.

Generally, most of the studies enumerated in the third stream of CSS literature were management accounting contingency research based. Contingency theory is applied in accounting management research to uncover association between business environment's factors and the design or adoption of management costing systems (Gosselin, 1997; Krumwiede, 1998; Clarke *et al.*, 1999; Hoque, 2000a, 2000b; Malmi, 1999). Subsequently, the adoption of CSS may have an effect on the organisation's performance (Chenhall, 2003; Fisher, 1995). Thus, contingency theory ascertains that only particular frameworks are expected to lead to a higher performance. Any departure from such fit framework cascades to a lower outcome. Ideally, researchers should uncover those factors correlated to CSS, and the underlying mechanisms beneath such an association.

However, the literature indicates that these management accounting contingency research-based studies have resulted in little significant cumulative knowledge (Chenhall, 2003; Otley, 2016; Atkinson *et al.*, 1997). Drury and Tayles (2005) asserted that factors influencing the design or adoption of a product cost system sophistication are poorly understood. In the same way, Otley (2016) and Chenhall (2003) allegedly concluded that results yielded from the management accounting costing contingency-

based research are not set to be found in the complex, uncertain dynamics of management accounting control of nowadays.

Most of the past studies of management accounting contingency-based research followed the selective approach of contingency theory (Gosselin, 1997; Krumwiede, 1998; Clarke *et al.*, 1999; Hoque, 2000a, 2000b; Malmi, 1999). The selective contingency enquiry to discover the existence of a fit design between context and structure. The interactive contingency examines the impact of the variation between context-structure on organisation performance (Drazin and Van de Ven, 1985). Consequently, there is a major part of the organisation strategic goal which is not considered in the quest of analysing the impact of contingent factors on the design or adoption of an accounting innovation system. Otley (2016) suggests that any understanding of the impact of factors on the adoption of an innovative costing system has to be apprehended as part of the overall package of management control. Similarly, Al-Omiri and Drury(2007) recommend adopting the interaction approach of contingency fit by incorporating non-financial performance measures, such as satisfaction toward the costing systems or the usefulness of costing systems. This approach is more appropriate in the context of African companies which are looking for driving forces for change, and for more cost-effectiveness. In this context, Van der Stede *et al.* (2006) argue that when an organisation focuses on innovation strategy, non-financial performance measurements or more subjective measures are the most appropriate. Arguably, the adoption of non-financial performance appears to be appropriate in a highly uncertain environment.

Furthermore, in respect to the discrete alternatives- adopters and non-adopters of costing system sophistication-used in some of the past studies, underestimates the conjoint influences of other factors considered at the same time on the design or

adoption of CSS (Drury and Tayles, 2005). The past survey related studies assumed that product costing system sophistication is made of two discrete choices, whether a traditional costing system- non adopters of ABC - or an ABC system – adopters of ABC (Gosselin, 1997; Bjørnenak, 1997; Malmi, 1999; Clarke et al., 1999; Innes and Mitchell, 1995). Bjørnenak(1997) used as dependent variable the adopters of the diffusion of ABC versus the non-adopters of ABC. Gosselin(1997) used two categorical variables by classifying organisations in two groups – the adopters of activity management approach versus non-adopters of activity management. Malmi(1999) considered as adopters those businesses units using or implementing either ABC or ABM in opposite to the non-users. Similarly, all other seminal studies used the dichotomous variables with value 1 for the adopters and value 0 for non-adopters (Clarke *et al.*, 1999; Innes and Mitchell, 1995). This bivariate approach of classifying costing system in two discrete values of adopters and non-adopters failed to capture the variety of practices within the spectrum ranging from a simplistic costing system sophistication- one cost centre and one cost object- to a more complex costing system sophistication - multiple cost centre and multiple cost objects (Drury and Tayles, 2005; Al-Omiri and Drury, 2007). This narrow focus of dichotomous variables between the adopters and non-adopters is one of the reasons which could explain the lack of understanding of the characteristics of cost system sophistication and inconsistent findings from the previous studies (Drury and Tayles, 2005). This also could explain why those previous studies could not establish a strong link between contextual factors and the adoption or the use of cost system sophistication (Brown *et al.*, 2004; Chenhall, 2003; Otley, 2016). In this regard, Abernethy *et al.* (2001) opted for a multivariate technique. They consider for the first time the design of costing system sophistication along a range of dimension rather than the discrete choice between the adopters and non-adopters.

They considered costing practices varying along three dimensions – the nature of the cost centres, the number of the cost centres and the type of cost centre. Similarly, Drury and Tayles (2005) used the continuous broad perspective of practices ranging from the simplistic costing system sophistication – TCS- to a more complex costing system – ABC. In the equivalent way, this current study aims to capture the various characteristics of product costing system sophistication within the context of developing country, Republic Democratic of Congo business environment by using a broader perspective of costing system sophistication practices.

It is also obvious from the past studies that less attention has been given to the administrative side of adopting cost system sophistication (Shields, 1995; Shields and Young, 1989). They neglected to capture within those multiple regression analyses the impact that behavioural, managerial factors with contextual factors are likely to have on adopting an administrative innovation such as cost system sophistication. Finally, none of the seminal studies in this argument have attempted to explain the causal mechanism behind the association between contextual factors and the design or adoption of CSS and organisation performance. As previously argued, those studies ended with inconsistent, inconclusive, and contradictory results. Consequently, the generalizability of much-published research on the impact of the context on the adoption of management accounting cost systems is problematic. The reason may be the lack of a more appropriate theoretical approach (Brown *et al.*, 2004), lack of rigorous research methodology, or rigorous data analysis methodology. Furthermore, a lack of understanding of various predictive variables (Brown *et al.*, 2004) or the lack of contextual information within the data collected using survey methods (Krumwiede, 1998).

In the effort to address these challenges and fill the literature gaps, and not to add to the common criticism of failing to develop the cumulative knowledge, this current study attempts:

- (a) To build upon this research stream and address the problem by developing and testing a model of complex relationships upon a concerted set of factors -, behavioural factors, organisational factors, and contextual factors- with CSS and non-financial performance.
- (b) To unfold the generative mechanism explaining the observed association between factors, CSS, and organisation effectiveness.
- (c) To propose using a more robust statistical model – SEM- a fit model between factors, CSS, and non-financial performance by taking into consideration the degree of the context's uncertainty.
- (d) To use a middle range thinking perspective, which is the most appropriate in the context of uncertainty (looking at the environment in which the systems are embedded) to propose a revived interpretation of contingency theory based on the complexity of today's business environment.
- (e) To suggest a non-mechanistic or non-linear contingency framework through the lens of complexity theory. The new contingency framework includes the uncertainty of the context in the contingency between factors, management accounting system and organisation performance.
- (f) To adopt a more management control perspective by including the interactive contingency as part of this current research.

(g) Thus, this current study analyses further the impact CSS will have on the organisations' effectiveness measured by the non-financial performance measurements.

As pointed out previously, the developments in globalization have led some African enterprises to renew their interest in increasing cost efficiency in the pursuit of organisational effectiveness (Diop, 2018). The goal of adopting an innovative management accounting system places African companies in the perspective of an innovative long-term strategy for more effective performance. In this perspective, non-financial measures can provide a leading indicator of performance in contrast to the lagging indicator of performance of financial measures. On this basis, the quest of this research on the impact of contextual factors on product cost calculation is highly relevant and justifiable. It would provide more insights to practitioners into designing a more effective costing system for cost minimization to face a highly competitive and complex environment. The Democratic Republic of Congo is one of the developing countries that needs an increasing cost management efficiency for their businesses' survival. 95% of the Congolese companies are classified as SMEs (World Bank Group, 2017; Lufuma *et al.*, 2020). Most of the companies prefer a status quo situation of cost containment through practice of arbitrary overhead allocation rather than cost reduction management (Ngokana *et al.*, 2021; Lufuma *et al.*, 2020). Only a few companies attempt to adopt modern practices of cost management. However, the number is largely insignificant (Ngokana *et al.*, 2021). The few studies conducted in the context of Congolese business environment on the impact of factors on the design or adoption of new methods of management control systems (Ngokana *et al.*, 2021; Lufuma *et al.*, 2020) did not attempt to unveil the mechanism beneath the contingent relationships

found. Therefore, the design or the adoption of CSS still remains poorly understood among Congolese firms.

This lack of understanding is even truer as most of the studies published in the high-ranking journals were conducted in the context of developed countries (Drury and Tayles, 2005; Al-Omiri and Drury, 2007; Cinquini *et al.*, 2015). Only a few studies have examined cost system sophistication in the context of developing countries (Özcan, 2020; Wahab *et al.*, 2018; Babu and Masum, 2019; Boukr, 2018). Hence, this research proposes to fill this literature gap by examining the extent to which factors influence Cost System Sophistication among Congolese organisations. Furthermore, it proposes a fit model between factors, CSS, and organisational performance in the context of the DRC.

1.2. Aim and objectives

This study aims to examine the factors influencing cost system sophistication (CSS) and the impact of CSS on the non-financial performance of firms in the Democratic Republic of Congo. Therefore, this research will have the following objectives:

1. To examine the extent to which factors influence the adoption of CSS among Congolese firms.
2. To investigate the effects of cost system sophistication on Congolese firms' non-financial performance.
3. To develop a framework of the relationship between contextual, behavioural, and managerial factors and cost system sophistication.

1.3 Significance and Motivation of the study

African businesses, particularly Congolese businesses, are facing challenges from highly uncertain and dynamic global market putting constraints on their resources and costs (Diop, 2018). In this regard, cost minimisation is the most appropriate strategy for cost efficiency in the pursuit of organisation effectiveness. Activity Based Management, particularly Cost System Sophistication, provides precise cost information, enables satisfaction of customers, and ensures better use of resources (Drury, 2008). In the light of above, cost system sophistication can advance African, especially Congolese SMEs competitiveness and yield more net benefit and profitability. However, less is known on the question of why organisations adopt an innovative management accounting costing system or on the factors influencing the design or adoption of CSS and its consequences effects on the organisation performance.

This study attempts to propose for the first time to fill this knowledge gap in literature by a providing a holistic insight on the why and the extent to which factors influence the adoption of cost system sophistication in the pursuit of cost effectiveness, organisation performance and competitiveness. The implementation of this framework is likely to yield higher performance and keep Congolese SMEs competitive to face the requirements of fast-paced dynamic and uncertain global business environment. Therefore, higher performing Congolese businesses are likely to contribute to the emergence of Congolese economic growth. In addition, this study provides an understanding of the phenomenon equating to factors → CSS → OP as it occurs in naturalistic ways based on the revive version of the contingency framework on the basis of the triangulation between contingency theory and complexity theory. The new understanding is underpinned by assumptions of critical realism paradigm, therefore

suggests for the first time to tackle the issue of the inconsistencies and anomalies of findings from the functionalist paradigm perspective. Consequently, build a cumulative knowledge in the field of costing management.

Additionally, previous studies neglected the role of behavioural and managerial factors in influencing the adoption of costing system sophistication. This neglect might be one of the reasons explaining the inconsistency in findings of the previous studies between the contextual factors and cost system sophistication. Management support can help attract more necessary resources to implement an expensive cost methodology (Wessel and Shotter, 2000, Brown *et al.*, 2004; Himme, 2012). Management knowledge of the advantages that cost system sophistication might bring to the organisation's effectiveness also influences the adoption of a specific methodology such as ABC (Guenther and Gaebler, 2014). Similarly, other behavioural factors can be taken into consideration such as – educational background, special training, or work experience (Chongruksut, 2002). Therefore, this current research suggests that the above behavioural factors are in continuous interconnection as part of the management accounting control system. The study hypothesizes that from the interplay between the mentioned factors emerges the perceived adequacy of resources to invest in an innovative costing system leading to the adoption of CSS. By uncovering the mechanism beneath the emerging adequacy of resources, this research is significant as it fills the gap in literature on the mechanism explaining the regularity of constant conjunction of occurrence between factors, cost system sophistication and organisation performance. In an equivalent way, the findings are significant as they provide for the first-time empirical evidence on the extent to which factors influence the adoption of the cost system sophistication.

Furthermore, the regression model used in the previous studies analysing the impact of contextual factors on the adoption of cost system sophistication (Al-Omiri and Drury, 2007) was designed in tune with a less uncertain and complex business environment of developed countries' context. According to Granlund and Lukka (2017), uncertainty has always been at the core of most theories based on contingency. Neglecting to include the factor of uncertainty would have biased the findings as it is not going to consider a core factor explaining the contingency theory itself. Therefore, there is a lack of contextual information within the data collected (Krumwiede, 1998). To address this issue, this research includes uncertainty avoidance as a contextual factor, reflecting the influence of the Congolese environment in adopting a costing system. This is novel as it integrates for the first time the impact of societal values- cultural value- on the management accounting values and practices as recommended in the literature for a better understanding on the costing system management (Drury and Tayles, 2005; Otley, 2016).

Moreover, today's organisation operates in a continuous uncertain and turbulent environment, in which changes can come from various sources – globalization, technology, and innovation (Grobman, 2005). In these circumstances, as the degree of complexity increased, the degree of uncertainty is also higher. To better integrate the entire degree of uncertainty within the Congolese business environment, this study proposes to consider contextual uncertainty as a landscape in which are embedded businesses' external and internal environments. This finding is novel as it helps to integrate the information from non-controllable factors – contextual uncertainty- and therefore meets the limitation of the previous studies for not being able to integrate the information from the business environment(Brown *et al.*, 2004; Drury and Tayles, 2005; Otley, 2016).

By attempting to address the issues as enumerated above, this study is motivated in filling the void in literature on the empirical explanation within a non-functionalist perspective on the why of the adoption of CSS and on the impact of contextual factors on the adoption of costing system sophistication. In addition, the study proposes a contingency theoretical framework integrating information from a complex and dynamic business environment, therefore meets the limitations of the simplistic and mechanistic contingency framework of the past studies. The study hypothesises that, in the process of self-organisation, the perceived occurrence of an event is a pattern resultant from non-linear interactions of a combination of factors – contextual, behavioural, managerial, and organisational.

Furthermore, while most previous research was limited to analysing the impact of contextual factors on the adoption of cost system sophistication, this study attempts to include the interactive aspect of the contingency by integrating the subsequent effect on the organisation's performance outcomes (Drazin and Van de Ven, 1985). This study opts for non-financial measurements - the level of satisfaction with the cost system, usage of the cost system in cost management and use of the cost system in decision making – to measure the performance outcomes. For Kaplan and Norton (1996), non-financial aspects provide a leading indicator for performance, contrarily to financial measurements which provide only a lagging indicator. Cost system sophistication can be considered in the context of the Democratic Republic of Congo businesses as an administrative innovation in the pursuit of organisational strategic goals. In this circumstance, for Van de Stede *et al.* (2006), non-financial measurements are the most appropriate to evaluate organisational performance. Finally, all the insights from this current study findings are tools in the hands of Congolese SMEs top

managers to advance their competitiveness through cost effectiveness in face of a complex global business environment.

1.4 Research contribution

This study has made a knowledge contribution relative to management accounting costing system adoption in the context of developing country, Democratic Republic of Congo. These contributions are displayed in the following sections.

1.4.1 Empirical contribution

Previous studies on the adoption of cost system sophistication were sold out of inconsistent and contradictory findings (Otley, 2016; Chenhall, 2003; Drury and Tayles, 2005). Therefore, the questions of why organisation adopt a more sophisticated, and also the extent to which factors influence such adoption and its consequences effects on the organisation performance remain unanswered. In addition, these seminal studies (Gosselin, 1997; Krumwiede, 1998; Clarke et al., 1999; Hoque, 2000a, 2000b; Malmi, 1999) conducted in developed countries business environment did not attempt to provide the explanatory mechanism explaining the correlation findings between the contingencies and the organisation management costing system. Furthermore, generally all of the previous studies did not consider the adoption of costing system as part of management control package(Otley, 2016), therefore integrate the information from the uncertainty and dynamism of nowadays business environment.

This current study seeks to remedy to the above by providing for the first time an explanatory mechanism on the association between factors and the adoption of

costing system and its consequent effects on non-financial performance. The findings provide for the first time a holistic view of the cost system sophistication by integrating the contextual dynamism and uncertainty of business environment. From the findings, we can for the first time analyse the impact of fitness between factors and costing system would have on the non-financial performance measurements. Instead of using the bivariate approach between the adopters and non-adopters, this study captures for the first-time various practices of costing system management in the context of developing country – Democratic Republic of Congo, therefore establish a more accurate and strong relation between context and organisation costing system. In addition, instead of focusing solely on the technical antecedents of the adoption of an innovative costing system, as used in most of past studies, this research argues that the emerging patterns observed in the empirical domain emerges from the combination of various factors- behaviour, organisational and contextual factors. The emphasis is more on the behaviour factors as prerequisites for adoption of a management accounting innovation costing system. This study provides for the first-time empirical evidence within the perspective of critical realism, therefore answer to the question why organisations adopt a more sophisticated costing system and the means by which factors influence such adoption and organisation performance.

1.4.2 Theoretical Contribution

This current dissertation is based on contingency theory, underpinned by the assumption that environmental and organisational factors impact the management accounting system differently. However, using the basic linear contingency framework has produced few significant results(Otley, 1980) or a less cumulative body of knowledge (Otley, 2016). This argument might be that contingency theory was

adopted as a theory based on a less complex organisational environment compared to today's dynamic and complex business environment. In this regard, the theoretical contribution of this current study consists of suggesting a new interpretation of the contingency framework through contextual uncertainty in which firms are evolving. The study would argue that, for better understanding of the effect of contextual factors on the design of cost system sophistication, we have to integrate the contextual uncertainty landscape information. There is a necessity to elucidate the patterns that emerge from the interaction between different environmental dimensions impacting an adaptive organisation. For this, a triangulation of contingency theory and complexity theory seems the most appropriate theoretical framework to use as a basis for testing hypotheses. The likely association between context and organisation is understood through the lens of a contextual uncertainty landscape (Uni). This proposed model is likely to include the whole context information-internal and external- within the collected data.

1.4.3 Methodological contribution

This study proposal is going beyond the philosophical objectivism and methodological positivism stances of previous management accounting contingency-based research. Traditional contingency-based enquiry consisted merely of establishing correlation between various conjunctions of events and consequences. This current study seeks an explanation of the mechanisms or of the structure beneath the occurrence of such phenomenon and its consequences. Thus, the current study would be testing empirically the existence of an association between contextual factors and the adoption of CSS. It will also attempt to explain how the observed relationship occurred. In this regard, this current study proposes to adopt critical realism. Hence, by seeking to

identify the generative mechanism from which emerge the generalized instance and the occurrence of the patterns, an attempt will be made to advance costing management field by proposing a methodology which tunes the most with business reality dimension, actual dimension, and empirical dimension. Subsequently, it is likely to build a cumulative knowledge in this field.

Additionally, the application of a triangulation between contingency and complexity theory, and a mixed methods design are complementary. This enhances the formation of a cumulative body of knowledge by overriding any methodological barriers in the process of uncovering truth. This mixed method approach provides a better understanding of the extent to which a concerted set of factors influence the design or adoption of costing systems. Furthermore, this current study proposes to capture the contextual information from the collected data through the contextual uncertainty landscape in which are embedded organisation management information systems, management control systems or management accounting practices.

1.4.4 Practical contribution

For practitioners, the proposed framework of complex relationships between factors, CSS and organisational performance provides a managerial tool for an effective cost management and higher performance. For the top managers as the strategies makers, the findings of the generative mechanism offer more insights on the strategies to generate more organisation effectiveness, create more values in each activity-process, in costing practices and in creating net benefit. In addition, the contextual uncertainty landscape framework can be used by SMEs to design a simulation software facilitating decision making in cost management and cost reduction. At the country level, policy makers, can trigger the cognitive capacities of knowledge and

awareness of top managers in adopting innovative management control tools through institution consequences such as improving education curriculum of the accounting degree, or building a legal framework facilitating filing annual accounts or building a stronger accounting professional body. All these consequences will have an impact on the management accounting values and practices. Strategically, this will result to more competitive Congolese SMEs and enhance the country economic growth. For the accounting body, this research findings contribute to improving understanding on the impact the critical approach in management accounting research. The critical approach contributes to conceptualising the adaptive contingent relation between the context- organisation structure – organisation performance- as they occur in the real world characterised by higher uncertainty and complexity. Therefore, it is a calling for further consideration for the critical approach to answer to the anomalies and inconsistencies of the positivist survey questionnaire results.

1.5 Overview of the methodology

This study attempts to draw a relationship between contextual, organisational, and behavioural factors and cost system sophistication. This quest seeks to uncover the mechanism or the structure of the real domain from which emerge patterns and their effects on the management costing system and organisational effectiveness. Critical realism, which incorporates an interpretivist epistemology, seems the most appropriate philosophical stance. Indeed, critical realism seeks to uncover the structure of events or the mechanism generating the occurrence of the phenomenon.

Furthermore, Creswell and Sinley (2017) suggest that it will be more appropriate within a complex and dynamic environment to adopt a methodology fitting with the

way in which people live. In this regard, mixed methods design allows, through qualitative research, to give more insights from the lack of detail of quantitative results. To reveal relevant facts on the generative mechanisms beneath the object of this current research study, a combination of contingency theory and complexity theory appears to be the most appropriate. The sample framework is extracted from the list of officially registered companies from “ the federation of Congolese enterprises”. Data are collected through a survey questionnaire and semi structured interviews. Data are analysed using Structural Equation Modelling and thematic analysis.

1.6. Main findings

The findings from the structural equation modelling reveal that 97% of firms are SMEs. In this configuration, we found that 74.6% of firms use a simplistic costing system. 17.9% of Congolese businesses adopt a middle complex costing system with 2 cost pools and 2 methods of overhead costs allocation. The other 7.5% adopt a more sophisticated costing system. In addition, SEM reveals that a good fit model equates to factor and CSS (CMIN/Df=1.499, $p=0.003$, GFI=0.924 , CFI=0.953, NFI=0.875, IFI=0.955, RMR=0.155, RMSEA=0.050). The perceived adequacy of resources emerges from the interactions between behavioural, organisational, and contextual factors. The R-square indicates that 151% of the variance of PAR can be explained by the model- management knowledge, management support and size.

Notwithstanding, findings from SEM of various associations were not statistically significant. Only the relationship between management support and PAR was significant. Therefore, based on the survey questionnaire, the hypotheses of direct or indirect relationships between behavioural factors, contextual factors and

organisational factors were rejected. The relationship between Size and CSS; UA and CSS; PAR and CSS; MK and CSS; MS and CSS were statistically insignificant.

Further investigation of the semi-structured interviews reveals that there are three generative mechanisms beneath the occurrence of the constant conjunction between factors and CSS. These are the three norms' circles or social structures which are in a continuous interplay: management knowledge norms circles, cultural norms circles and business strategic norms circles. The findings show that causal powers start with the cognitive knowledge of the top manager, then later spread to other employees through the shared values process and are amplified later by the innovative cultural norms toward organisation effectiveness. The adoption or design of CSS is other than the instrument of success of shared knowledge value in action. This generative mechanism achieves its maximal causal power when interacting and aligning with business strategic norms circles. This later reinforces the mechanism and explains the regularity of the tendency observed in the empirical domain. It is the business strategic norms circles that perpetuate the occurrence of the association found between perceived adequacy of resources, cost system sophistication and organisational performance.

Moreover, the non-statistically significant relationships found from the survey can be explained by the liabilities or the restraining effects caused by the cultural norm's circles or lack of innovative business strategy among Congolese firms. In addition, the rugged contextual uncertainty landscape of the Congolese business environment caused the causal powers of the generative mechanism to be continuously in liability mode to other norms circles, therefore restraining any regularity in the occurrence of events. In this regard, it is understandable to have non-significant relationships among this research's findings.

Furthermore, SEM results indicate the existence of relationships between the adoption of CSS and the use of a costing system (estimate=0.267); between adoption of CSS and the use of a costing system in decision making (estimate = 0.125); and between adoption of a costing system and users' satisfaction with the costing system (estimate =0.180). A good fit model was identified with a statistically significant chi-square (CMIN/Df=3.673; GFI=0.911; CFI=0.906; NFI=0.878; IFI=0.908; RMR=0.462, RMSEA=0.116). However, those relations had a p-value more than 0.05. Therefore, the hypothesis 4 on the direct relationship between CSS and non-financial performance was rejected. Similarly, this result is explained by the generative mechanism of the three norms circles enumerated above – management knowledge norms circles, cultural norms circles and strategic norms circles. The cultural norms circles play the restraining role. Within the highly contextually uncertain landscape, Congolese businesses adopt more conservative accounting values and practices and are reluctant to adopt any innovation. Despite the non-significant relationships, those findings can be explained and supported by contingency and complexity theory.

Based on the results uncovered in Chapters 7 and 8, a good fit framework of a combination of a set of behavioural, organisational, and contextual factors with cost system sophistication and non-financial performance was developed. Contingency theory can explain that the non-alignment between contingencies and innovative strategic approach weakens the relationship between factors and CSS-OP. The departure of fitness between the shared knowledge and cultural norms circles-strategic business norms circles weakens regularity and relationships found in the empirical domain.

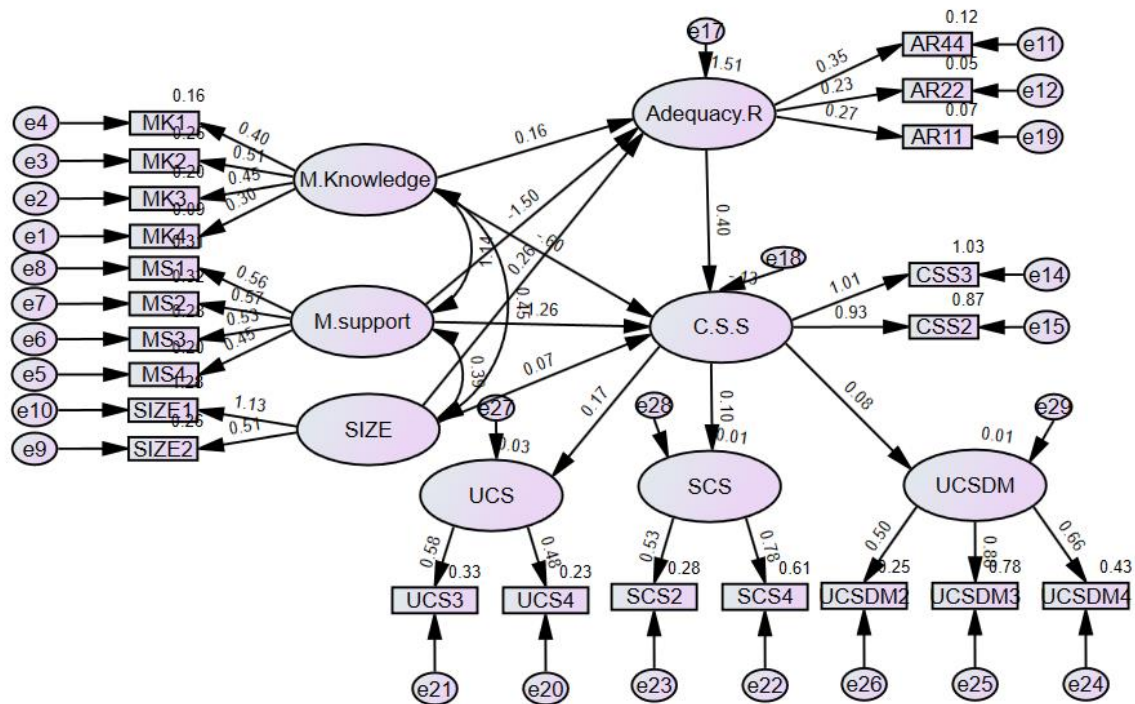


Figure 1. 1 Overall SEM-Factors, CSS, OP

To have a deeper insight into the interpretation of this current study, we would recommend a further longitudinal study of the same topic. It will help to scan the full uncertainty-context landscape of Congolese businesses through a simulation modeling software designed on the basis of the theoretical equation model proposed in this current study, $Z_i + f(X_i, B) + e_i = Un_i$ (where Un = Contextual Uncertainty landscape, Z_i = organisation effectiveness, $f(x_i)$ = relationship between cost system sophistication and contextual variables). The simulation model will help to visualise the contingency complexity between context-costing system-performance in its naturalistic situation, and therefore facilitate decision making for practitioners.

1.7 Structure of the thesis

Chapter 2 presents the business environment contextual landscape of the Democratic Republic of Congo. Based on macro-information, this current study proposes to include this information in the findings deriving from the analysis and discussion of the empirical chapters (Chapters 7 and 8). Chapter 3 provides an overview of the theoretical foundation underpinning this study, a triangulation of contingency theory and complexity theory. This chapter attempts to present a new understanding of contingency theory more in tune with the dynamic environment of nowadays. The new contingency framework includes the concept of contextual uncertainty as the landscape underpinning business activities ($Z_i + f(X_i, B) + e_i = Un_i$). Chapter 4 critically discusses the existing empirical literature on the factors influencing the adoption of cost system sophistication. The chapter starts by providing a literature review on the Activity Based Costing or costing system sophistication (CSS). This is followed by a literature review on behavioural factors, organisational factors, and contextual factors. Chapter 5 presents a literature review on the impact of cost sophistication on the non-financial performance. Chapter 6 presents a methodological overview of this research. It covers the research philosophy, sample size and data collection technique, the empirical model and econometric procedure.

Chapter 7 presents the findings and discussion on the factors influencing the adoption of a Cost System sophistication. Chapter 8 presents the results and discussion on Cost system sophistication and Non-financial performance. Both chapters 7 and 8 provide empirical findings in the perspective of critical realism. Finally, Chapter 9 summarizes the main findings of the study. It circumscribes the study limitation and proposes recommendations for further research.

Chapter Two: The DRC Business Environment Context

2.1 Introduction

The contingency theory asserts that firms' structures and practices are determined by the contextual factors. In this regard, cost system sophistication has been suggested as being contingent on a country's context (Askarany and Yazdifar, 2015). Thus, the macro-context - political, social, legal, and economic- is likely to influence the adoption of an innovative management accounting system such as an Activity Based System. For that reason, this chapter on DRC business environment context will provide the contextual understanding required to apprehend the effect of a conjuncture of factors on the adoption of management accounting costing systems and performance outcomes. It presents the Congolese business environment's contextual landscape and proposes to include the macro-information within the data collected (Krumwiede, 1998), and subsequently to interpret findings through the lens of the Congolese uncertainty landscape in Chapter 7 and Chapter 8.

2.2 Congolese societal context, accounting values and systems

The DRC gained its independence from Belgium in 1960. The country evolved through a decade of political and social turmoil characterized by a strong central government regulating private sector activities through local cultural norms and practices. From 2018, since the election of new president Felix Tshisekedi, there is a change in terms of rule of law affecting other societal dimensions- the legal, economic, and cultural environment. Those societal dimensions, consequently, have an influence on

management practices in general, and management accounting systems and practices particularly (Salter and Niswander, 1995) (see Figure 2.1).

One of the illustrations can be drawn from cultural context. According to Salter and Niswander (1995), countries with low degree uncertainty avoidance are apt to adopt well-built independent auditing professions. In contrast, countries with strong uncertainty avoidance adopt a more conservative stance regarding the measurement tools used or adopt a more uniform accounting system. Thus, the Congolese national culture, through uncertainty avoidance and power distance, could influence accounting values and accounting systems (see Figure 2.1). Therefore, this current study investigates whether there is an established relationship between uncertainty avoidance as one of the Congolese cultural values and the design or adoption of a cost system sophistication. Empirically, Ngokana *et al.* (2021) demonstrate that, alongside the influence of contextual factors, socio-cultural factors such as national culture, the weight of family or ethnic workforce, inhibit the adoption of new methods of management accounting controls among Congolese SMEs.

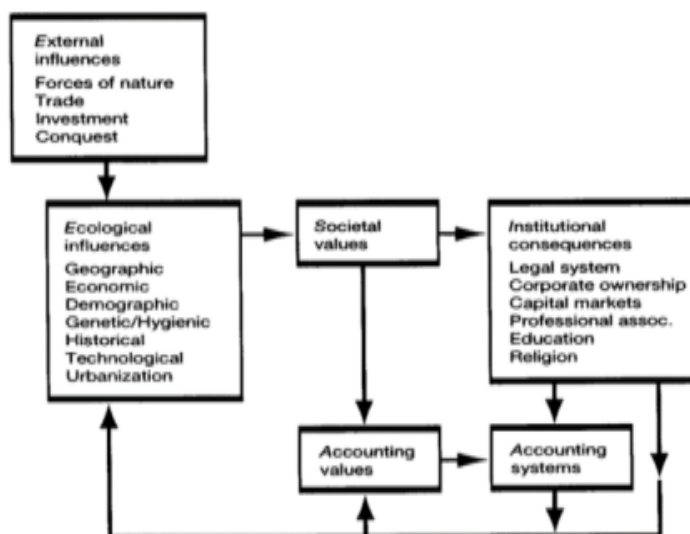


Figure 2. 1 Culture, values, and accounting. *Source: Salter and Niswander (1995)*

Similarly, the political and economic context would have an impact on the societal values and management accounting practices. The Democratic Republic of Congo is suffering from recurrent social unrest caused by armed groups which are used as proxies of different neighbouring countries (CIA, 2020). These groups aim to create chaos which benefit their stakeholders in illegally exploiting the country's abundant resources. Consequently, these conflicts keep destabilizing and damaging the DRC's economy. The country has one of the lowest GDPs per capita (Word Bank Group, 2017). 77% of the DRC population live in appalling poverty (Word Bank Group, 2017). The country is classified 184th out of 190 countries in term of difficulties faced in doing business (World Bank Group, 2017).

Therefore, the Congolese political and economic context can be characterized as poor, highly uncertain, or unpredictable. In this circumstance, middle range thinking seems to be the most appropriate reasoning process (Otley, 2016). As such, there is a need to theorize based on the context in which are embedded the phenomena of the study – factors impacting the adoption of CSS and organisational performance. Through the lens of Congolese contextual uncertainty, this research aims to discover the rate of adoption of an innovative costing system among Congolese firms. Do Congolese businesses have adequate resources in order to invest in an innovative cost management system for more organisational effectiveness?

As demonstrated by Salter and Niswander (1995) (see Figure 2.1) political and economic dimensions impact societal values, which in return have an impact on institutional consequences, accounting values and accounting systems. CSS requires a higher investment for its implementation. Thus, based on the poor economic context of the DRC, as described above, one may argue that it will take time for CSS to become a mainstream system in the DRC. Nevertheless, in the situation of economic

and political uncertainty, it is also possible that, within a complex system of interplay of various factors, patterns may emerge leading to the adoption of CSS. Firms can adopt new or innovative practices which, when fit with the environment, can generate higher performance. For this reason, this study attempts to find out the extent to which CSS is adopted among Congolese firms within the context of the highly uncertain economic and political landscape. In this context, Congolese firms are apprehended as a complex and evolutive system.

2.3 Congolese geography and accounting systems.

The DRC is vast and has 26 provinces. The provinces have a high degree of political and administrative autonomy. Each province is endowed with legal personality; therefore, each can enter into its own treaties or organize its own institutions without injunctions from central government. Therefore, within the same country you may have a variety of accounting norms and practices shaped by the institutional context of each province across the country. Ngokana *et al.*, (2021) suggest that the localization of the organisation influences the adoption or rejection of new methods of management accounting controls in the context of Congolese SMEs. In addition, the proximity to different countries and the attractiveness of its natural resources implies a variety of knowledge transfer regarding management accounting practices. This means that the adoption of cost system sophistication can vary across regions. Notwithstanding, for generalizability of this study's findings, data was collected from the Kinshasa region, which is the capital of the Democratic Republic of Congo. Therefore, the conclusion drawn from data analysis would represent the management accounting practices of the targeted region.

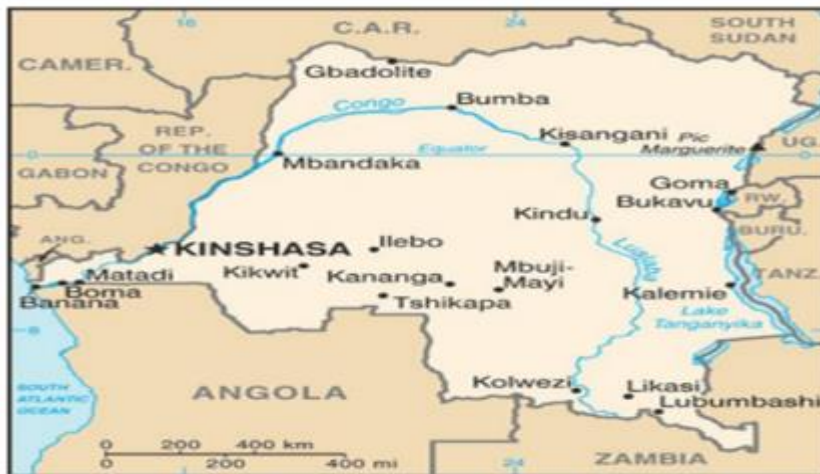


Figure 2. 2 DRC map. Source: CIA.(2020), World Factbook, DRC.

2.4 Congolese demographic profile and accounting systems

The Democratic Republic of Congo has a population estimated at more than 100 million inhabitants. The population has a growth rate of 3.18%. The urban population represents 45.6% of the population with a rate of urbanization approximating 4.53% (CIA, 2020). The World Bank Group (2018) classifies the DRC as the 3rd largest urban population in the Sub-Saharan hemisphere. An increase in the urbanization rate implies a change in the country's economic framework. This implies more infrastructure, education, social services, health services to respond to the urban population's needs. Henderson (2000) suggests that urbanization is correlated to the economic growth. He continues by arguing that each level of development corresponds to an optimum level of concentration of urbanization. The hypothesis is that the continuous growth of urbanization concentration indicates, at the same time, a shift from the agricultural economy to an industrial service sector of the economy. Subsequently, this implies more manufacturers or service firms within the more urban provinces. Therefore, from the perspective of an accounting costing system, it suggests more indirect costs as manufacturers and services sectors are growing, and also a need of

management accounting innovation systems (Ngokana *et al.*, 2021). From this perspective, it is apprehensive to suggest that adopters of new methods of costing systems would be located in more urban provinces, such as the province capital of Kinshasa, Lubumbashi, Goma, Matadi, and Boma. For this reason, this current study's population was extracted from firms located in the province capital of Kinshasa.

2.5 Congolese economic environment and accounting systems

The economy's indicators show that the country is performing poorly despite the potentials of its natural resources and human resources (CIA, 2020). Among the causes of this mediocre performance, there is the institutionalized corruption, uncertain legal framework, political instability, bad governance, and a lack of foreign direct investment. These causal issues are stopping the country from arising from its ashes, and consequently perpetuating a widespread poverty. More than 63% of the population are living below the poverty threshold (CIA, 2020; Word Bank Group, 2017). In 2017, the DRC's Gross Domestic Product per capita was estimated at \$ 800 dollars (CIA, 2020). It is reported to have an industrial growth rate of 1.6% with a workforce capacity of 31 million. In addition, the Congolese economy has a significant informal sector. However, despite the high rate of informality, there are more than 14,000 firms which are registered with the government authority (Hyland *et al.*, 2020). Hyland *et al.* (2020) assert that, within the context of Congolese businesses, social norms prevail over legal frameworks. Therefore, systems or practices are resultant from interaction between the cultural norms, economic factors, and organisational requirements. In this circumstance, a good apprehension of the contingency between context, CSS and performance practices must be interpreted through the lenses of patterns emerging

from the interaction of contextual factors, organisational factors, and behavioural factors.

Furthermore, the Congolese business environment is a nebulous mix of a vast number of micro businesses and informal household-led businesses (World Bank report, 2017). Indeed, 95% of businesses are considered as small enterprises (World Bank Group, 2017; Lufuma *et al.*, 2020; Ngokana *et al.*, 2021). According to the World Bank Group it is because of contextual uncertainty that entrepreneurs are apt to avoid taking the risks of growing or expanding by hiring a larger workforce or investing more. Consequently, the poor business environment shapes the level of sectoral concentration of industries, organisational size, and growth (World Bank Group, 2017). One may hypothesize that the higher level of contextual uncertainty of the Congolese business environment plays an inhibitor role by reducing the level of influences which contextual factors – such as size- may have on the adoption of CSS. Thus, to capture the influence of the uncertainty of the Congolese business environment, this current study attempts to propose a new contingency framework which goes beyond the linear relationship to capture information from various dimensions of the business environment. Therefore, the findings from a Structural Equation Modelling can be understood through the lens of the complete context of the DRC, which is characterized by elevated level of uncertainty. This is likely to have an impact on the likelihood of a relationship between contextual factors and costing system sophistication and predictable performance outcomes.

2.6 Accounting in the Democratic Republic of Congo

The profession of an accountant is in its infancy in the DRC with respect to the accounting practices. There is not, as yet, a clear legal framework for the auditing of financial accounts (Report on the observance of standards and codes, 2010). Despite the law numbered 08/009 of 07 July 2008 on the submission of annual account statements, there is a complete absence of specific legal text on the accounting profession. Some accounting professionals are grouped in private associations, such as the regional counsel of accounting experts (COREXCO) or the national order of accountants and fiscal counsellors' experts (ONEC) (ROSC, 2010). In addition, the academic curriculum in accounting and financial audit does not allocate enough credits for the accountancy modules. This academic weakness leaves the graduates with a deficiency in the expertise needed to face market demand (ROSC, 2010). Consequently, there is a scarcity of well-equipped accountants. Similarly, there is a lack of academics and researchers in accounting.

The poor economic context – the substantial number of SMEs – when coupled with the lack of a clear legal framework in accounting, reinforces the lack of credibility in the profession of accountancy. People prefer to pay penalties to the officers rather than meeting their obligation on annual accounts and audits (ROSC, 2010). This practice of overpassing the legal requirement for corporation tax obscures the management accounting profession and badly hurts the reputation of Congolese businesses.

This report shows that management accounting is suffering from neglect, and is, consequently, understated and overrun by other business functions. One may conclude that management accounting, particularly costing system management, does not take, as yet a strategic role in business management among Congolese firms. This

study aims to investigate the impact of adoption of a costing system sophistication on organisational effectiveness which is measured by:

- (a) the use of a costing system sophistication in costing management.
- (b) the use of a costing system sophistication in decision making.
- (c) the satisfaction which the new methods of costing systems procure for the users.

Results from this empirical quest will reveal the extent to which costing management is considered in business decision-making among Congolese enterprises. The following section presents a brief summary of the few studies conducted within the third stream of costing management literature among Congolese firms and African firms.

2.7 Academic research in costing systems - DRC and other African countries.

Cost system sophistication is considered among the administrative and technical innovations in management accounting. Generally, the new techniques of cost management accounting information systems, such as activities-based costing (ABC), are referred to in literature from francophone countries as “new methods of management accounting controls” (Diop, 2018; Ngokana *et al.*, 2021; Lufuma *et al.*, 2020). They are considered as such in literature to differentiate them from the traditional methods of management control. So far, in the context of Congolese companies, there is a lack of academic studies on the impact of contextual factors on the adoption of product cost system sophistication and organisation performance.

Among the rare studies, there is a study conducted by Ngokana *et al.* (2021) on the determinants influencing the practices of management control systems among Congolese companies. The findings reveal that among the small and medium enterprises most of them adopt a traditional management accounting control system based on the preservation of status quo in which costs are checked against the budget. In addition, Ngokana *et al.* (2021) found that structural contingency factors – size and sector of activity- were positively associated with the use of less sophisticated management control systems or with traditional management control systems. The study reveals also that behavioural contingency- the academic level and experience- are related to the status quo of the traditional management accounting control systems. Moreover, the authors emphasize the influence coming from the socio-cultural factors, such as the manager's nationality, or family-oriented business or geographical location of the company, will have on the preservation of traditional management accounting control systems. Within a sample of 157 companies, the results indicate that 65.6% of SMEs do not use costing system methodology for costs calculation. In most of the cases, they use budget as a tool for management control system. Only 34.4% of SMEs use accounting systems as part of their management control systems.

Similarly, Lufuma *et al.* (2020), in their study on the contingent factors influencing the adoption of tools enhancing performance among SMES, concluded that the factor size influences the adoption of management accounting control practices among small and medium enterprises in the city of Matadi (one of the cities of the Democratic Republic of Congo). With a sample of 50 SMEs, the authors concluded that most SMEs use traditional management accounting systems. In addition, they argue that the level of education and the field of the study of the managers play a significant role in the choice of the management accounting control practices.

Alongside the few attempts among DRC researchers, there is also increased interest from some of African countries on conducting research on the adoption of the new management accounting methods. In Senegal, Diop (2018) concluded that, among organisational factors which stop the adoption of new methods of cost calculation, are: management's satisfaction with the traditional cost calculation (60%), enterprises consider that the current method (the traditional costing systems) is effective (58%), lack of sufficient information on the new methods of cost calculation (52%), organisational priorities are on things other than the effectiveness of cost management (48%), the organisational uncertainty or the uncertainty of the use of the new methods of cost calculation (40%). Similarly, Al and McLellan (2011) found that Egyptian manufacturers rely more on the traditional costing systems with a low level of adoption of new methods of management control. According to Ahmad and Leftesi (2014), the adoption rate of management accounting information systems in Libya is still low and slow.

The Congolese context, which is more similar to other African countries' context, can be compared in this perspective with Diop's (2018) study conducted among Senegalese enterprises, or with Ahmad and Leftesi's (2014) study among Libyan enterprises. The findings of those studies show that most companies in Congo (Ngokana I., 2021; Lufuma I., 2020), in Senegal (Diop, 2018) and Libya (Ahmad and Leftesi, 2014) adopt what can be considered as traditional costing systems (Ngokana *et al.*, 2021; Lufuma *et al.*, 2020; Al and McLellan, 2011; Diop, 2018; Ahmad and Leftesi, 2014). However, there are some companies which are adopting new methods of management controls, but the number remains insignificant. In this regard, there are calls among African companies to adopt more viable management accounting control systems, such as costing system sophistication, in the pursuit of organisational

effectiveness (Diop, 2018; Chapellier, 1994). The adoption of the new methods of management accounting controls might lead to higher organisational effectiveness or to success (Lufuma *et al.*, 2020). Therefore, CSS as an innovative costing system, and the factors impacting its design, remain one of the central issues to resolve for better effectiveness among Congolese companies.

This current study attempts to elucidate the practices of management costing system among Congolese companies. The study attempts to establish if there is a link between factors and CSS. Moreover, the current study proposes to provide the mechanisms leading to the occurrence of such constant conjunctions of events. However, because of the novelty of the quest, there are some limitations this study needs to go over. Firstly, there is not a study of the literature investigating the mechanisms influencing the adoption of new methods of cost calculation in the context of the DRC. Secondly, there is not a study of the literature incorporating a triangulation of contingency theory and complexity theory to explain the impact of contextual factors on cost system sophistication. Thirdly, there is not among previous studies, even conducted in the context of developed countries, a focus on uncovering the mechanism explaining the relationships between context and structure in a complex and dynamic environment.

2.8 Summary

The aim of this chapter is to present the context of the Congolese business environment. It summarizes how the shaping of societal context influences accounting values and systems. The DRC's culture is classified among countries with high uncertainty avoidance. This uncertainty avoidance might have influenced the conservative

approach in management accounting measurement's tools with a low level of disclosure. In addition, the poor economic context of the DRC suggests that businesses are likely to struggle in improving their performance. Consequently, it is likely that the rate of adoption of an innovative costing system will be low and slow. Nevertheless, within that dynamic context, Congolese businesses still can evolve in the process of self-organisation and develop the usage of effective management accounting practices such as costing system sophistication. In addition, the poor economic situation results in a high rate of SMEs operating in the informal sector of the economy. 95% of Congolese companies are small companies. This is one of the consequences of the important level of uncertainty- unpredictability- within Congolese businesses' environment. In conclusion, practices within Congolese enterprises derive from the interaction of cultural norms, economic context, and organisational requirements. Therefore, it is suggested that the emerging of cultural norms with their causal powers be taken into consideration regarding the occurrence of events in the empirical domain.

For this, the following chapter consists of laying the theoretical background which explains the conceptualization and relationships between a range of factors in consideration.

Chapter three: Research theoretical framework

3.1 Introduction

This chapter presents an overview of the theoretical foundation of this study, which is a combination of contingency theory and complexity theory. Since the aim of this study is to examine how contextual factors influence the adoption of CSS, it relates to the contingency stream of management accounting research. Contingency theory is considered to be the theory of theories as it has nested in its assumptions a set of behavioural theories (Fielder, 1964). Therefore, in the face of a growing environmental changes, a new understanding of contingency conceptual framework will be proposed. Thus, this study proposes a new conceptual framework drawing evidence from the literature. The chapter ends with a summary.

3.2 Contingency theory

In the third stream of literature relative to the influence of determinants on CSS, most of the seminal studies used contingency theory as a way of establishing association between factors and costing management system, and subsequently with organisational effectiveness (Gosselin, 1997; Krumwiede, 1998; Clarke *et al.*, 1999; Hoque, 2000a, 2000b; Malmi, 1999; Chenhall, 2003; Fisher, 1995). According to contingency theory, it is only a certain design framework that could anticipate yielding higher performance, any departure from it will result in lesser performance. So, research seeks to unveil those factors which align with organisational structures or systems for higher performance. Based on the findings, a framework of relationships will be developed between factors, structure, and performance. Thereby, there are in literature two types of contingencies – selective contingency and interactive contingency (Drazin and Van

de Ven, 1985). While selective contingency searches for an alignment design between the context and the organisation structure – context → structure; the interactive contingency examines the variation in the performance achievement from every unit change in fitness between context and structure (Drazin and Van de Ven, 1985). The majority of studies in management accounting contingency-based research adopted a selective approach (Hoque, 2000a, 2000b; Clark *et al.*, 1999; Krumwiede, 1998; Gosselin, 1997).

The theory of contingency evolves from the work of Burns and Stalker (1961) and Thompson (1967) on the theory of organisation. According to Donaldson (2001), organisational effectiveness is controlled by its fitness with contingencies (Thompson, 1967; Chandler, 1962; Bulk and Stalker, 1961); Child, 1975; Child, 1972a). The theory is built around the three core elements: (1) a relationship exists between contingency and structure; (2) how context prescribes organisational structure; (3) there is an alignment between an organisation's characteristics and its contingencies.

However, there are various criticisms on the contingency theory for lack of consistencies. While product diversity was found significantly related to CSS in some studies (Malmi, 1999; Booth and Giacobbe, 1998; Krumwiede, 1998), at the same time it was found non-significant in other contingency studies (Bjørnenak, 1997; Clarke *et al.*, 1999). Bjørnenak (1997) concludes that there is a significant association between cost structure and cost system sophistication, contrary to the non-significant association found by Malmi (1999) and Clark *et al.* (1999). Although the organisation size was persistently found significant in its *association* with cost system sophistication in many studies (Aiken and Hage, 1971; Blau and McKinley, 1979; Kimberly and Evanisko, 1981; Ettlie *et al.*, 1984; Joshi, 2001; Chenhall, 2003; Bjørnenak, 1997; Krumwiede, 1998; Drury and Tayles, 2005; Al-Omiri and Drury, 2007; Cinquini *et al.*,

2015; 2018; Boukr, 2018; Hadid and Hamdan, 2021), other studies established no relationship at all (Gosselin, 1997; Libby and Waterhouse, 1996; Baird, 2007; Cohen *et al.*, 2005).

For Otley (2016), contingency theory has produced little in building a cumulative knowledge. He points out that results from management accounting contingency-based research are not supposed to exist in a context of a complex, dynamic and faster paced changing environment of management control system. He suggests that, to look forward, researchers have to base their reasoning process on the middle range thinking. By that, he means to look at the environment in which the systems are embedded. Additionally, he also argues that for a good apprehension of the contingency, it is necessary to look on the information system as part of the overall management control package. Hence, this current research considers the recommendation above and proposes a revived interpretation of contingency theory based on the complexity of today's business environment. This interpretation proposes to include information regarding business environment contextual uncertainty in the contingency between factors, management accounting systems and organisational performance.

3.2.1 Contingency in the context of the Democratic Republic of Congo.

The majority of empirical studies conducted in research of the contextual factors' impacts on the adoption of costing systems were conducted among developed countries (Malmi, 1999; Booth and Giacobbe, 1998; Krumwiede, 1998; Innes *et al.*, 2000; Innes and Mitchell, 1995; Drury and Tayles, 2005; Al-Omiri and Drury, 2007). Thus, less attention has been given within the literature in investigating the contingency in the context of developing economies. The DRC is a good example of a country that is searching for a way out towards development. It has a complex and unpredictable business environment. It is a classic example when looking to integrate the

dynamic of the business environment in findings. The macro-environment context of the DRC is likely to have a tremendous impact on societal values, which also include accounting values and practices. Purposely, this current study seeks to integrate the influence of the macro-context into the theoretical framework of this investigation. Although the proposed framework will be at its explorative stage, the interpretation of this research's findings will provide significant insights on the relationship context, CSS, and organisation performance through the lens of the Congolese contextual uncertainty.

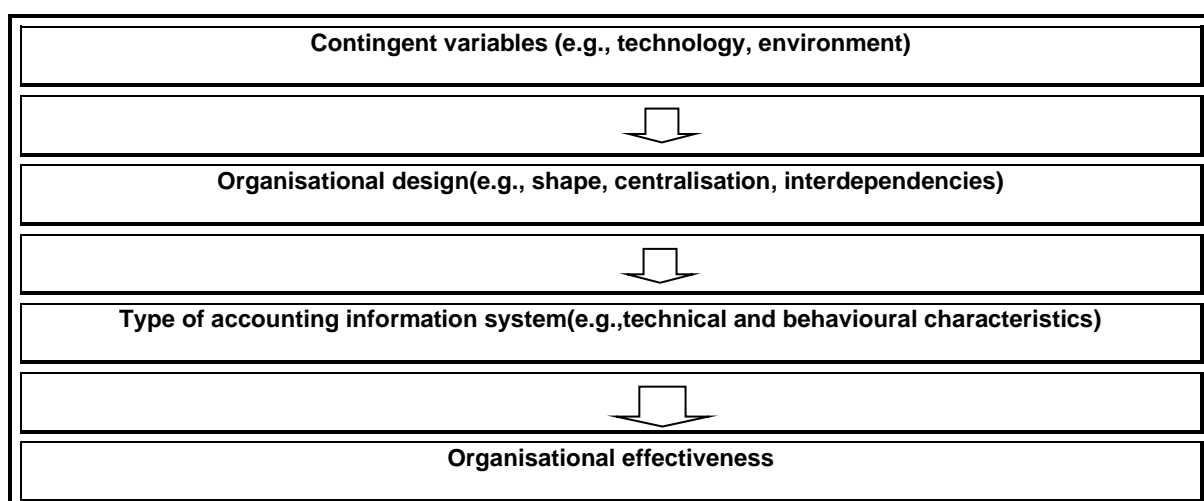
3.2.2 Contingency framework studies in management accounting costing systems.

Contingency theory is built on the assumption that the universally appropriate systems or practices in an organisation do not exist. In each circumstance or context of the environment, there is an appropriate and contingent organisation structure. Therefore, researchers or practitioners must seek to uncover the specific characteristics in management accounting systems that specifically align with the contextual circumstances (Otley, 1980; Horngren, 1972; Dermer, 1977; Jermias and Garni, 2005; Anderson and Lanen, 1999). In other words, management accounting systems and organisation structures are interdependent. Dermer (1977) was the first to illustrate this assumption in a framework. In its beginnings, it was more about interpreting contingent findings emanating from a universal framework rather than the use of a contingency framework itself (Woodward, 1965; Piper, 1978; Daft and MacIntoch, 1978, Hopwood, 1972; Otley, 1980; Baumler, 1971; Child, 1972b). For example, conflicting findings from universal framework pointing to contingent factors as way of explicating the contrariety: environment (Khandwalla, 1972), technology (MacIntoch, 1978; Piper, 1978; Woodward, 1965), organisation structure (Otley 1978, Baumler, 1971, Child,

1972b; Hopwood, 1972; Daft and MacIntoch, 1978). It was for empirical understanding that researchers sought a contingent explanation to unveil contradictory results. In addition, contingency framework also emerged from the development of the theory of organisation beginning in the 1960's (Burns and Stalker, 1961; Chandler, 1962). It was in the 1970's that contingency theory was instituted as a dominant theory (Child, 1977).

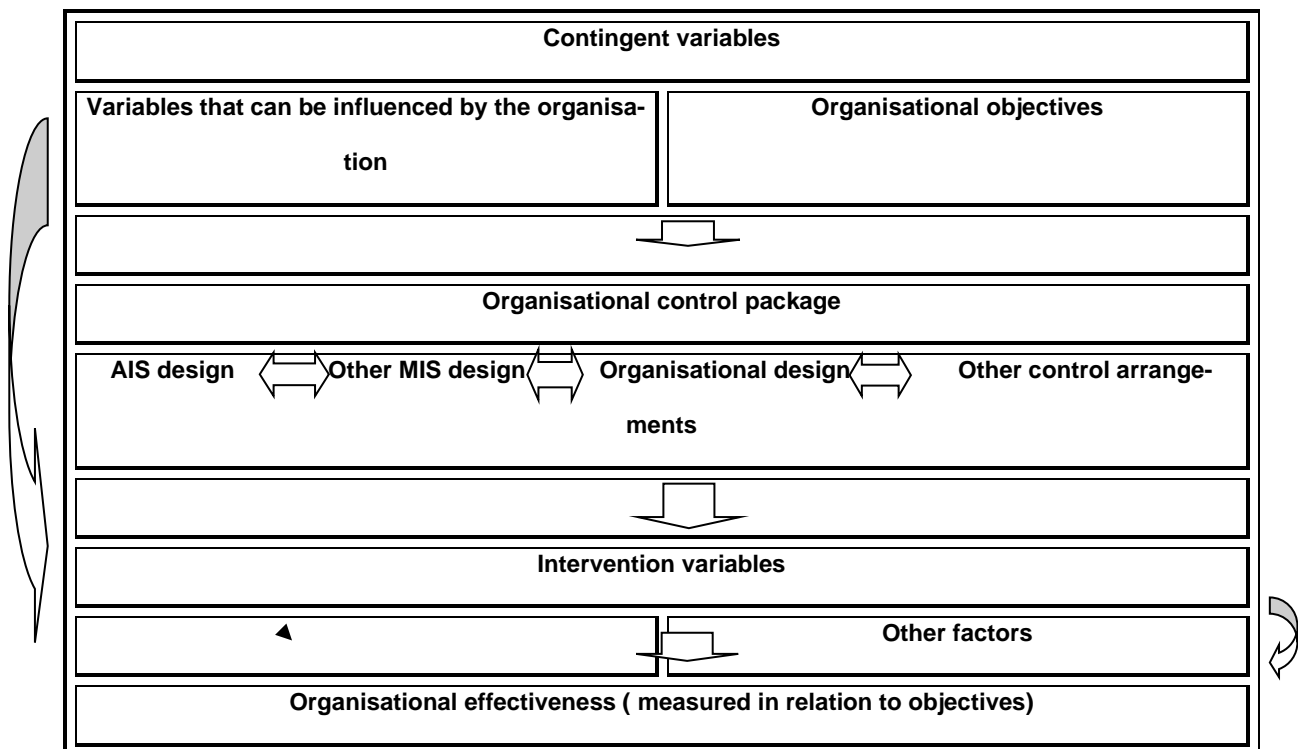
As demonstrated in the literature, contingency theory framework emerged to provide an explanation of contradictory universalist framework findings and from the theory of organisation. Therefore, the assumption forming the basis of the theory itself did not provide specific information on which type of contingencies should lead to which management accounting information system (Otley, 2016). What emerged from numerous studies in the 1970's (Bruns and Waterhouse, 1975; Hayes, 1977; Waterhouse and Tiessein, 1978; Gordon and Miller, 1976; Amigoni, 1978; Dermer, 1977) was the suggestion that the system design, planning, and control systems are contextually oriented. As illustrated in table 3.1, the framework establishes a simple linear relationship between contingent variables with organisation design, type of accounting information system, and organisational effectiveness.

Table 3. 1 Simple Linear Framework.



Source: Adapted from Otley (1980).

Table 3. 2 The minimum necessary contingency framework



Source: Otley (1980)

Among the past studies at that time, only Hayes (1977) conducted a study seeking to measure the impact on the organisational effectiveness. According to Otley (1980; 2016) the simplistic framework omitted to integrate an accounting information system as part of the overall management control package. Otley (2016) improves the framework by including a broader perspective of the accounting information system within the organisation. As indicated in table 3.2, the accounting information system is a sub-system within the management control package which includes other management information system designs, organisational designs, and other control arrangements. The framework also includes other variables which can be under the control of the organisations.

3.2.3 Contingency framework in the perspective of control system.

Additionally, in the perspective of a management control system, the accounting information system is part of a control system. In this regard, the organisational

effectiveness is interrelated with other sub-systems within the organisation to control behaviours and networking with the external world. However, this perspective also emphasises the unpredictability or the uncertainty characteristic within the system in the pursuit of organisational success. Uncertainty has been considered to be one of the fundamental pillars of contingency framework (Burns and Stalker, 1961; Galbraith, 1973; Lawrence and Lorsch, 1967). The environmental uncertainty offers significant challenges to the decision-makers as the characteristics of the information perceived to be necessary for decision-making are simultaneously associated with it. Therefore, the relationship between characteristic of the information system and the organisation's structure is associated with perceived environmental uncertainty (Gordon and Narayanan, 1984, p. 42). Thus, the notion of effective organisational control is connected with unpredictability or uncertainty which is found in every activity, decision, or process in every aspect of an organisation (Granlund and Lukka, 2017). In each of the contextual variables adopted in previous studies, the concept of uncertainty is paramount and determines the effectiveness of the organisation. It is well known that contingencies are driven by what this current study can suggest as a driving force underpinning each system or practice, namely uncertainty. It appears difficult to relate to a specific issue that an organisation is facing, or any associated organisational outcomes without considering the counter-effect deriving from the level of contextual uncertainty. In another words, without uncertainty there is no contingency.

Taking as an example the variable "SIZE", we assert that size is an important element in today's dynamic and unpredictable business environment. It enables an organisation to improve efficiency, to face increased competition by controlling their operating environment and, at the same time, to reduce the uncertainty (Chenhall, 2003). However, today's organisations develop greater relationships with suppliers

and customers through mergers, acquisitions, and integration which, in return, increases the size of the organisation. Thereby, it increases further information complexity and uncertainty. In this perspective of today's globalization, organisations are networked by a myriad of interactions of patterns at the individual level, business unit level, organisational level, and environmental level (Gordon and Narayanan, 1984). Those patterns even affect, or are affected also, by management information system - costing systems. Thus, the idea of examining the contextual factors, such as adequacy of resources, as a set of a combination of factors within a management control package is likely to provide more insights into understanding the phenomenon of contingency between factors and cost system sophistications.

Indeed, based on Otley (2016) recommendation, this current study is proposing a different perspective of contingency framework. The study proposes a concept of a contextual - uncertainty. Rather than a variable, as it is considered in most contingency-based studies, contextual-uncertainty is a layer or a dimension underpinning each of the managerial and operational processes and decisions within an organisation. It is a landscape. This current study suggests that the driving force, namely uncertainty, which is noticeable in each exogenous and endogenous variable, is a landscape or a multiple dimension plan susceptible of explaining and predicting phenomena such as the interactions or the dynamisms between contextual constructs – size, costing system design, technological uncertainty, environmental uncertainty, and organisational effectiveness. This new contingency framework approach displays better contingency in its naturalistic state: $Z_i + f(X_i, B) + e_i = U_{ni}$. This modelling represents better contingency analysis by capturing the etic and the emic perspectives of the eventual relationships between context and organisational structure and organisational effectiveness in the face of a modern complex and dynamic environment.

This current study also asserts that the simplistic linear contingency framework used to interpret findings from various management accounting contingency-based research was set to exist in a predictable and stable environment. In this regard, findings from past studies are inappropriate in the context of high levels of uncertainty as exist within developing countries. The weakness of the basic contingency theory model is still blatant. Within the same context of developed countries, it continues to provide contradictory and inconsistent findings. Just for the contextual factor size, which was persistently found to be related to cost system sophistication in some studies (Bjørnenak, 1997; Krumwiede, 1998; Drury and Tayles, 2005; Al-Omiri and Drury, 2007; Cinquini *et al.*, 2015; Boukr, 2018), in other empirical studies this was found not to be related to the design of the costing system (Gosselin, 1997; Libby and Waterhouse, 1996; Baird, 2007; Cohen *et al.*, 2005; Quinn *et al.*, 2017). Although the multiple regression model is a powerful statistical tool for establishing relationships (Drury and Tayles, 2005, Al-Omiri and Drury, 2007), findings from those studies are still inconsistent. This might explain why Otley (2016) concluded that contingency framework “is sold out with little cumulative knowledge”.

Hence, this study argues that the contingency theory framework does not reflect properly the way the system works, whether in a context of a more stable or less stable environment. The inconsistency in findings breaks the criteria such as reliability or replication of the findings. Whether the results are repeatable or can be replicated is of importance in evaluating the validity of social research (Bryman, 2016). These criteria are important as they reflect the integrity of findings and, subsequently, help to build a cumulative body of knowledge. Therefore, this current study attempts to include into the model the information from the contextual uncertainty landscape of the

Congolese business environment. The following section highlights the limitation of contingency theory in relation to the uncertainty variable.

3.2.4 Limitations of contingency theory and uncertainty.

As previously stated, uncertainty as variable constitutes one of the core concepts in theories based on the concept of contingency (Granlund and Lukka, 2017). However, the concept has lost its emphasis in contingency management accounting studies since the rising in trend of contingency theory. The variable has been used in a paradigmatic manner without questioning its validity. The contingency theory was designed and developed in a context which is totally different to today's organisational environment (Granlund and Lukka, 2017). Therefore, all the variables which were attached to the conceptualisation of the theory itself in the 1960's and 1970's are old fashioned and not fit for purpose. Especially, when facing a modern complex and dynamic environment, the paradigmatic conceptualization of those variables cannot completely express the data needed to study a phenomenon. Therefore, it is legitimate to argue that the concept of contextuality as a simple element in modelling and analysis has to be upgraded to reflect the complexity and the dynamism of today's global environment. This current study proposes considering contextuality as a landscape underpinning management systems and practices in general, management accounting costing systems and control systems in particular.

Hence, a new perspective is needed on the redesign of contingency framework that moves away from the criticisms of being too simplistic (Chapman, 1997). As recommended by Granlund and Lukka (2017), the new framework must integrate the emic and etic approach by examining the phenomenon from the inside as well as from the outside. This study proposes to adopt a more emic approach alongside the etic approach. Consequently, this current study moves away from the close system

approach to an open system approach of management control system perspective – system and practice.

According to Chapman (1997), uncertainty measurements proxies used in previous studies in management accounting research represent only a tiny fraction of the complexity of organisational reality. This misapprehension had led to ambiguous and contradictory findings in management accounting contingency-based research (Chapman, 1997). Hence, this current research proposes another understanding of the contingency framework that considers the modern environmental complexity, which would be likely to explain and predict better unforeseen phenomena. What would be the impact of behavioural, organisational, and contextual factors on costing system sophistication's design or on organisational effectiveness? This current study attempts to explain and predict that, based on the new model (see section below), the impact would vary depending on contextual uncertainty. However, to understand patterns emerging from interactions of different contextual parameters (Ismail *et al.*, 2010) requires the inclusion of other theories alongside contingency theory. The complexity theory which will be introduced in the following section is referred to as method theory, or a theoretical lens for studying a substantive issue (as enumerated above) of the domain theory of contingency.

3.3 Towards a new perspective of contingency framework

The simplistic linear contingency framework results in inconsistent findings (Otley, 1980). Those findings rely on the data collected from the responses of applicable questionnaires (Otley, 2016). Otley (2016) proposed to improve the framework and the approaches by using a middle range thinking process, basing the analysis within the context in which is embedded the object of the quest. The way the framework

stands now, it will not be possible to capture the specificity of the whole context since the framework is linear and mechanistic. For this reason, the minimum contingency theory framework proposed by Otley (1980) in this study is adapted by integrating the function contextual- uncertainty. In its naturalistic mode, the contingency model of this current study proposes to include the function Uni , representing the contextual-uncertainty dimension. The following factors are suggested: legal loophole, technology, and environment to capture the contextual uncertainty.

The three elements are taken in consideration because of their potential major influence on management accounting information systems, which includes management accounting costing system: (1) The legal loophole-uncertainty axis. This consists of factors relative to the legal system and institution which has an influence on the accounting values and systems, as well as the sector of activity. The Legal Loophole-uncertainties range from a soft regulation to a hard legal form (more regulations). (2) The technology-uncertainty axis. This axis represents the uncertainty in the technology advancement capable of switching organisations' eco-systems. (3) The environment-uncertainty axis. This is the main driver impacting business environment. The economic growth can be qualified as fast-paced growth versus low growth. The fast-paced growth might be characterized by a high disposable capital and a high-speed financial transaction. The low growth might be characterized by a low consumer confidence index or a high interest rate. All the three axes are in a continuous state, moving from one state to another between the two extremes, ranging from lower contextual-uncertainty to a higher contextual-uncertainty. These three factors are interdependent and unpredictable. Therefore, the function contextual – uncertainty is measured by calculating the probability of appearance of various variables of each axis. Pr

$(Un_i) = \text{Prob1 (Loophole-uncertainty)} * \text{Prob2 (Environment-uncertainty)} * \text{Prob3 (Technology-uncertainty)} \dots \text{Prob}_n (\text{factors})$.

Given the above, the findings resulting from Structural Equation Modelling on the extent to which contextual factors influence cost system sophistication and performance, would be interpreted through the lenses of various levels of the contextual-uncertainty landscape of Congolese businesses. By landscape, this current study refers to the sum of various dimensions of the business environment. It is a map on which are embedded businesses' realities, including the management accounting control. Figure 3.3 Illustrates various ranks of contextual uncertainty. It ranges from the lowest level of contextual-uncertainty to the highest level of contextual-uncertainty. The proposed framework is an exploratory effort for a future empirical study. At this explorative stage, the study can only provide an interpretative analysis of the Congolese environment based on the country's macro-information. However, for further study, this effort will require longitudinal research in order to capture the different parameters of a system of equations of known and unknown variables – trend components, seasonal components, or others. The effort requires a community of scientists – mathematicians, statisticians, software designers and business managers to come together for this cause.

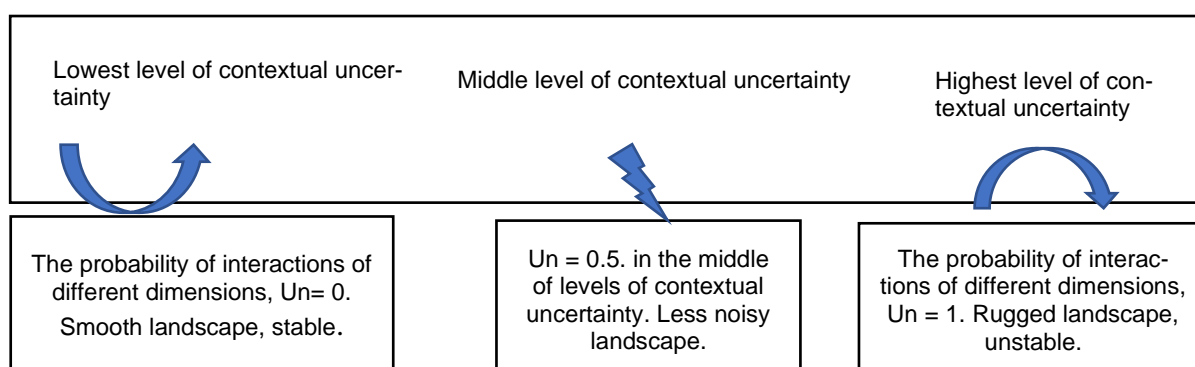


Figure 3. 1 Dimensions determining the varying levels of contextual uncertainty

3.3.1 The proposed theoretical contingency framework

The theoretical framework proposed in Figure 3.2 below indicates a triangulation between contingency theory and complexity theory. The framework shows a concerted set of factors – behavioural, organisational, and contextual- which are in interrelation to each other. From the interaction between those factors emerges the perceived adequacy of resources, which in return influences the adoption of a management accounting costing system. While the contingency theory suggests the appearance of the fitness between factors, cost system sophistication and non-financial performance, complexity theory explains the various patterns emerging from the interactions of sub-systems or constructs. Also, the interpretation of the path analysis model between the variables considered in this study is based on the contextual uncertainty of the Congolese business environment. This framework is the most appropriate with regard to the research questions and the context of this study. Also, the contingency and complexity framework explain better the contingency between context, organisational structure or system, and performance in a more naturalistic way. Therefore, it gives an answer to the question of the how, and to an extent to which, factors influence the adoption of cost system sophistication.

Similarly, Table 3.3 shows the contingency framework adapted to integrate the contextual uncertainty landscape, which is represented by the non-controllable factors- legal loophole uncertainty, environmental uncertainty, and technological uncertainty. Thus, the equation $Un_i = Z_i + f(X_i, B) + e_i$, explains and better predicts the association between factors and accounting information systems and organisational effectiveness within a dynamic and complex environment (Un = uncertainty; Z = organisation performance; $f(X_i, B)$ = factors). Table 3.3 is theoretically conceptualized based on the triangulation of contingency and complexity theory, as explained in Figure 3.2.

Table 3. 3 Contingency framework revived

Contingent Factors		
Non-controllable factors	Controllable factors	Organisational objectives
Legal uncertainty	Behavioural: MK, MS	Cost reduction
Technological uncertainty	Contextual: UA, SIZE	Higher performance
Environment Uncertainty	Organisational: PAR,SIZE	Users' satisfaction
Organisational control package		
AIS design	MIS design	Other organisational design
Other managerial control		
Other factors		
Cost structure	Industry sector
Organisational effectiveness		
User satisfaction with CS	Use of CS in decision making	Use of CS in cost management
CS: Costing system MS: Management support UA: Uncertainty avoidance MK: Management knowledge PAR: Perceived adequacy of resources Source: adapted from Otley (1980)		

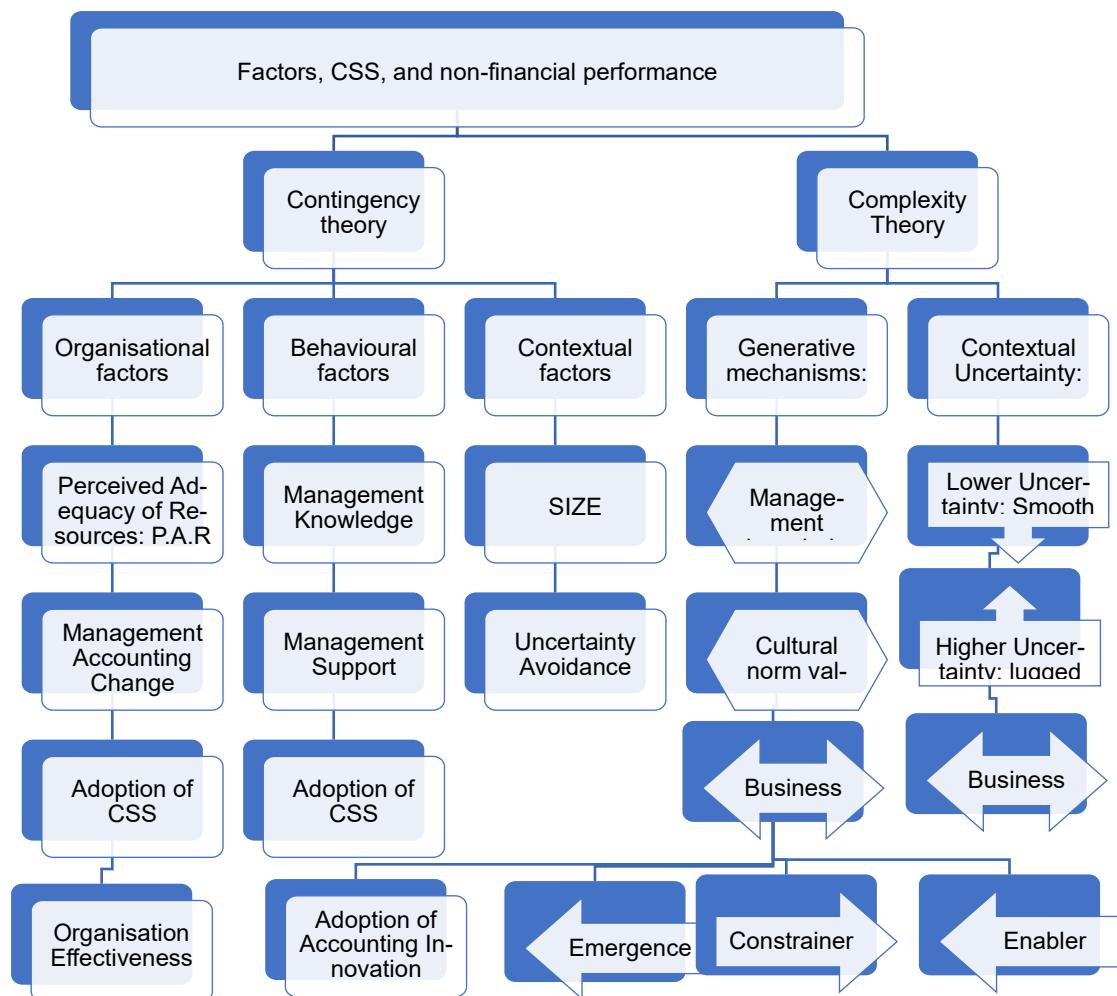


Figure 3. 2 Contingency and complexity theory triangulation

3.4 Complexity theory and organisations.

Emerging from systems theory, complexity theory investigates the random interplay of non-linear relations in a complex system. According to Grobman (2005), complexity theory can be used in examining the organisation design and management design. Within the modern business environment, characterized by a turbulent environment, changes can come from various sources such as globalization, processes, innovation (Bititci *et al.*, 2012). In this nebulous environment of uncertainty, complexity theory can conceptualize the emerging patterns from the interplay of various constructs within the system (Sahin *et al.*, 2013; Stacey, 1995).

Therefore, the use of complexity theory in studying the phenomenon in an organisation is appropriate. It will provide an explanation of the influence of social structures existing, and the various patterns appearing and disappearing, from those interactions. While some of the patterns emerging from those interactions could be controlled, others cannot be controlled. Some of the scholars suggest that the understanding of the structural and behavioural pattern of each component within a system leads to the understanding of the system through the interaction between components (Anderson, 1999). Among the concepts characterizing the perspective of complexity theory, they are the disequilibrium, the sensitivity to the original state, the feedback- positive loophole vs negative loophole-, interaction between factors from which emerges novel order (Houchin and MacLean, 2005). Complexity theory moves far from the traditional linear concept of the organisation evolving from one state to another, to embrace the concept that organisation is a complex adaptive system of non-linear interrelation overly sensitive to the initial stage of non-equilibrium (Houchin and MacLean, 2005).

The concept of adaptive system is a contingency theory concept. So, the system is in continuous adaptation with the environmental context, in other words in a continuous contingency with the context. Thus, there is a common ground of being adaptive to the context in creating a continuous and transient equilibrium. Murphy (2000) argues that agents, or systems or subsystems or parts are adaptive. In a complexity theory, organisation behaves adaptively to the circumstances not based on the rationale for a long-term view but based on the interaction of numerous factors resulting in a pattern of relationships. Consequently, the complex process might bring a general equilibrium that is temporary and fortuitous. What complexity theory can contribute to studying some of the issues of contingency theory is to provide an

explanation of the way of bringing occurrence of the association between factor and the adoption of cost system sophistication. As a complex adaptive system, the occurrence is unpredictable as it results from a non-linear interaction of several factors. This can explain, within the same context and with the same factors, that some organisations will adopt a cost system sophistication, whereas others will not adopt it.

The more environmental complexity, the less traditional linear contingency can explain the association between context and organisational structure or systems – cost management system. In addition, the growing environmental changes cause organisational outcomes to be unpredictable. The increase in uncertainty (unpredictability) of a dynamic environment makes organisation look clumsy (Murphy, 2000). While the traditional linear contingency cannot explain it, complexity theory can inform that organisation outcomes involved factors that cannot be controlled. As this current study suggested, some of the external uncertainties are not captured by the information collected by the survey questionnaire. Thus, there is a need to readjust the previous regression model by integrating the non-controlled factors. Consequently, the findings of the association between factors and cost system, and organisational effectiveness, will be explained through the theoretical lens of complexity theory.

Furthermore, complexity theory is coevolutive (Houchin and MacLean, 2005). It incorporates the dynamic changes of the environment. It is characterized by a cascade of events' occurrence deriving from the disappearance of, or appearance of, behaviour changes in one of the sub-systems or entities (Houchin and MacLean, 2005). In other words, the organisation is in a continuously adaptive mode. Practically, the management practices should follow the trend by continuously adapting with new normative theories such as ABC, target costing and balance scorecard (BSC). This evolutive model helps in incorporating the changefulness and the uncertainty of a dynamic

environment. In this regard, the equilibrium achieved previously is punctuated equilibrium. In that, one fit between context, cost system and effectiveness creates a stable period. This is followed by a period of turmoil caused by the unpredictable interrelation of factors – internal or external- creating unfitness between the previous context, CSS, and organisational effectiveness. This is followed by a new period of equilibrium, from which novel patterns emerge. Finally, the complexity theory might explain the variety of management accounting practices which might be found in the organisation. Entities can self-organize or evolve to a new order resulting from interaction between numerous factors within the same system. The emerging order cascades from the interactions within the micro-level or the macro-level of the environment. This current study hypothesizes that adequacy of resources to invest in an innovative costing system is an emerging order from the interaction between contextual, behavioural, organisational, and managerial factors. Subsequently, it impacts positively on the design or choice of cost system sophistication and organisational effectiveness.

Extracted from complexity theory, Kauffman's NK can help to conceptualize the Congolese business landscape. Kauffman's NK model was used in biology to investigate the interaction of genes in the development of biological organisms. While factor N of the model represents the number of components within the organism, K indicates the degree of interdependence between components (Chae, 2012). In this study, N represents the number of contingency factors from the Congolese landscape, such as behavioural factors, managerial factors, and contextual factors. K represents the degree of interdependence between those factors. Each factor within the landscape can reach two extreme points, the peak, and the valley. For the construct of uncertainty avoidance, the peak would represent the higher point of contextual uncertainty, while the valley represents the lower point of contextual uncertainty. The former describes

a situation characterized by multiple interdependencies between constructs (where $K=N-1$), every element is influenced by everything else, and the system generates a higher organisational effectiveness (rugged landscape). The latter describes a situation in which the level of interdependence is null (where $K=0$). This may lead to a smooth landscape of the contextual uncertainty. In the lower level of contextual uncertainty, the organisation's goals will be discernible, contrary to a higher level of contextual uncertainty. The landscape has two extremes - lower uncertainty vs higher uncertainty. While low uncertainty represents a situation in which the future is certain or predictable, the higher uncertainty is the highly unpredictable situation. According to Kauffman (1995), in each topography of the landscape there is an appropriate strategy to apply. In the extreme case where $K=0$, a small step by step climbing strategy appears the most effective for reaching a global optimum. On the other hand, in a rugged landscape characterised by $K = N-1$, the incremental strategy will not work. In this regard Kauffman (1995) proposes a long jump strategy for long-term survival.

Thus far, this section argues that complexity theory, when combined with contingency theory, is likely to provide a good understanding of the influence of contextual factors on cost system sophistication and organisational effectiveness. To capture the influence of growing environmental and organisational complexity, organisation has to be seen as an adaptive entity within a non-linear continuous interaction from which patterns emerge. Those patterns are resultant of punctuated equilibrium within a co-evolutive and self-organisation process. This study hypothesizes that the perceived adequacy of resources is a pattern resulting from the interaction of contextual factors, behavioural, and organisational factors. For that, this study proposes for the first time in literature a use of a triangulation between contingency and complexity theory.

3.5 Summary

This chapter shed light on the domain and method theories as applied in management accounting research. The focus was on the contingency research as the basis for this current research's thinking. The main assumption of contingency theory stipulates that the performance and effectiveness depend on the fitness of the organisation within environmental contingencies. Thus, contextual factors dictate organisational structure, management accounting practices-CSS- and control organisation for more effectiveness. Among those factors, there are behavioural factors- management support, management knowledge, or contextual factors – uncertainty avoidance, size; organisational factors-perceived adequacy of resources. However, empirical evidence also reveals inconsistencies in the findings from management account costing system contingency-based research. One of the reasons posited in literature is that the contingency framework emerged from the pressure of empirical findings of the universalist framework by trying to provide an explanation of contradictory results. In addition, it emerged from the development of theory of organisation. Moreover, the business environment of the 1970's, during which emerged the contingency theory, was less uncertain and less dynamic compared to today's environment, characterized by a high degree of imprecision and unpredictability.

Thus, the linear and mechanist framework model used for conducting research, $Z_i = f(X_i, B) + e_i$, was designed in the context of a less uncertain, more stable environment. In this regard, it is inappropriate in the situation of higher degrees of uncertainty and dynamism of today's environment. Therefore, this current study attempts to propose a novel model, $Z_i + f(X_i, B) + e_i = Un_i$. This new model represents better the contingency framework in its naturalistic state. The study hypothesizes that the occurrence of perceived patterns emerges from an interaction of a combination of

contextual, behavioural, and organisational factors, which subsequently impacts the adoption of CSS and organisational effectiveness. From this perspective, contingency theory is studied through the lens of complexity theory. The new understanding of contingency framework is drawn from Kaufman's NK model to represent the contextual uncertainty landscape of the business environment. Therefore, to capture the influence of growing environmental and organisational complexity, organisation must be seen as an adaptive entity within a non- linear framework.

Chapter four: Factors influencing the adoption of CSS among Congolese firms.

4.1. Introduction

One of the aims of this research is to examine factors that influence the adoption of costing system sophistications. Therefore, this chapter provides a literature review on the theme relative to product costing system sophistication. Section 4.2 presents an insight into the Activity Based Costing. Section 4.3 provides a literature review on the costing system sophistication. Section 4.4 provides a discussion on the factors influencing the adoption of CSS– behavioural, organisational, and contextual factors. Sections 4.5 and 4.6 present the theoretical model and hypotheses of this research.

4.2 Activity Based Management and Activity Based Costing

Activity Based Management (ABM) is used to indicate the management application of Activity Based Costing (ABC) (Drury, 2008). ABM started with Activity Based Costing (ABC) and has later been extended to other ranges of cost management applications (Drury, 2008). Activity-based costing system methodology has its origin in the work of Cooper and Kaplan (1999). It was proposed as a substitution of traditional costing methodology (Cooper and Kaplan, 1999; Gosselin, 2006; Alsayegh, 2020). Traditional Costing Systems (TCS) and Activity Based Costing (ABC) are absorption costing methodologies as they both distribute direct and indirect costs to cost objects (see Figure 4.1). Both methodologies apply various degrees of sophistication. The simplistic sophistication allocates costs to one cost pool and applies one allocation method– traditional costing systems (TCS). By contrast, in a complex level of sophistication, the methodology uses more than one cost pool and more than one method of

allocation of overheads (Abernethy *et al.*, 2001; Drury and Tayles, 2005). While the simplistic sophistication is also known as the traditional costing system (TCS), the more sophisticated is known as a product cost system sophistication (CSS) or Activity Based Costing (ABC) (Drury and Tayles, 2005). The idea of arranging the costing systems' design in a continuum line ranging from the simplistic to the more complex, with multiple cost pools and drivers, was proposed by Drury and Tayles (2005). It helps to capture different practices in costing management between the two extremes (Drury and Tayles, 2005; Al-Omiri and Drury, 2007). TCS allocates costs to plants at the first stage of two stages of absorption costing methods, and later to the production output based on the volume based– machine hours, or direct labour. In Activity based costing, however, the overhead costs are assigned to the activity's centres through the use of resources drivers at the first stage of the procedure and to the relevant activity driver at the second stage (Drury, 2015; Blocher *et al.*, 1999) (see Figure 4.2).



Figure 4. 1 Absorption costing methods. *Source: Adapted from Drury (2015)*

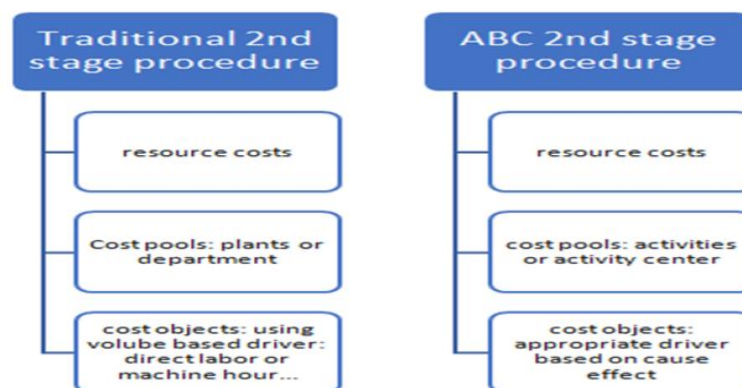


Figure 4. 2 costing Systems two stages procedure. *Source: Drury (2015).*

Activity Based Costing methodology is designed in four steps (Drury, 2008). It first identifies the major activities. This is followed by assigning costs to cost centres or pools. The third step consists of determining the cost driver for main activities. Finally, it assigns cost activities to products according to the demand for activities. As indicated in Figure 4.2, the first two procedures are grouped in the first stage of the two stage procedures. The next two steps are grouped in stage two of the two stage procedures.

Business environment changes - such as change in business process complexity, technological changes, higher global competition, wider range of products, less rules - brought about criticisms on management costing systems (Kaplan and Cooper, 1998; Drury and Tayles, 2005; Alsayegh, 2020). Euske and Vercio (2007) argued that the simplified model of costing system sophistication -TCS- did not calculate accurately the real value of costs as used in the 1980's. Lea (2007) posited that, by comparing the volume and non-volume-based cost drivers for manufacturing and non-manufacturing cost allocation, the more sophisticated costing systems capture better the characteristics and resources when compared to traditional costing systems. In addition, ABC systems result in generating more profit and lesser inventory.

Additionally, assorted studies in costing system management drew the conclusion that TCS disfigures product costs by inaccurately scoring complex processes (Albright and Lam, 2006; Drury, 2015). TCS appears appropriate in cases where direct cost or materials are the main factors of production - stable technology and less product diversity. According to Drury (2015), TCS would assign resources proportionally to the quantity of an individual product. This process is not appropriate for today's dynamic and more complex business environment. Nowadays, resources for activities cannot be traced to the physical volume of product fabricated. With the effects of

globalization, the business environment is becoming more complex, dynamic, and uncertain. The change is so exponential today, in comparison to the 1980's when Johnson and Kaplan raised, for the first time, an alarm regarding the inadequacy between the needs of the business environment and the traditional costing system used for cost calculation. Nowadays, businesses in general, and Congolese firms particularly, are facing pressures from a more competitive global environment, more cost and cash flow constraints, a wider range of products, and greater products' overheads. In these circumstances, to avoid distortion of costs, cost system sophistication, which was proposed as a solution back then as it provides accurate information costs, could be a solution for Congolese businesses in the pursuit of cost effectiveness. This is because it can track costs to cost objects (Drury, 2015). Therefore, it is strategically helpful in boosting organisational effectiveness (Brimson, 1991). In a comparable way, Kaplan (2006) argued that the costing system sophistication gives accurate information for decision making, and offsets disorders and chaos.

Notwithstanding, the implementation of ABC (CSS) is challenging. Most of the difficulties originate from behavioural factors such as the lack of management support, the lack of management knowledge and awareness, the lack of training, and the lack of resources (Al-Omiri and Drury, 2007; Chenhall, 2004; Shields, 1995; Krumwiede, 1998). According to Chenhall (2004) it is the top management support which is the most explanatory factor for yielding success or failure in the implementation of such systems. Alongside behavioural factors, there are also non-behavioural factors such as size, adequacy of resources or uncertainty avoidance. Cohen *et al.* (2005) argue that there is a positive relationship between adequacy of resources – non behavioural factors- and ABC implementation. The adequacy of resources includes financial resources, human resources, and training (Cohen *et al.*, 2005; Innes *et al.*, 2000;

Chenhal, 2004). Innes *et al.* (2000) and Chenhall (2004) added to the list of factors influencing the success or failure of costing system implementation the ownership of the ABC process by the non-accountant, and training. Thus, it appears clear that costing system sophistications such as ABC can produce more benefits such as accurate cost information for decision making in pricing, budgeting, and performance outcome (Brimson, 2007). However, the studies as referred to in previous paragraphs were conducted in the less uncertain context of developed countries. In regard to the behavioural factors, they were conducted within the scope of analysing the determinants of the success or failure of ABC implementation. Thus, none of these studies in literature considered the effects that behavioural factors might have as inputs towards the adoption of CSS as an innovative accounting system. This current research posits that ABC is an innovative accounting system within the context of the Democratic Republic of Congo. In this perspective, behavioural factors in interplay with other non-behavioural factors are the prerequisite inputs for the adoption of a new method of cost calculation. Therefore, they should be included among the determinants influencing the adoption or design of cost system sophistication. This study seeks to fill this gap by including behavioural factors alongside other contextual factors in examining their influence on the adoption of CSS among Congolese firms. The following section presents the literature of CSS.

4.3 Costing system sophistications.

Literature on product costing system sophistications focuses more on ABC systems (Drury and Tayles, 2005; Brierley, 2008). Indeed, both terms – CSS and ABC – are interchangeably used in literature to mean the same thing. CSS literature can be divided into three streams (Drury and Tayles, 2005). The first stream regroups studies

on the development and theory of ABC methodology (Cooper,1990; Cooper and Kaplan, 1992; Datar and Gupta, 1994; Yahya-Zadih, 1997; Noreen, 1991; Alsayegh, 2020). The second stream regroups studies relative to the characteristics and application of ABC (Innes and Mitchell, 1995; Innes *et al.*,2000). The third group focuses more on the factors influencing the adoption of ABC or CSS (Bjørnenak, 1997; Krumwiede, 1998; Malmi, 1999; Shields, 1995; Malmi, 1997; Drury and Tayles, 2005; Al-Omiri and Drury, 2007). In the third stream, there are also studies investigating the effect of ABC on the improvement of organisational effectiveness (Cagwin and Bouwman, 2002, Gordon and Silvester, 1999). It is in this stream that contingency theory framework was introduced to investigate the effects of the environmental factors on the adoption or non-adoption of CSS. The main question shaping myriad studies in the third stream is relative to why the costing system sophistication is adopted or implemented. What are the direct or indirect effects of cost system sophistication on the activities of adopters or non-adopters? And what are the reasons for adopting costing system sophistications?

Bjørnenak (1997) attempted to answer those questions by conducting an explorative study among Norwegian companies on the diffusion of an innovative accounting information system. He concludes that the contagious theory model can explain the diffusion process of such systems as just an adoption of a new idea. The findings also indicate that the factor size was significant in determining the diffusion or not of CSS. Bjørnenak's (1997) results also indicate that capital related costs, proportion of export, perceived change of the degree of competition, and strategy and production process are among the significant factors influencing the adoption or not of activity-based costing systems.

Shields (1995) focused more on the demand side of an accounting innovation system rather than on the supply side of diffusion of accounting innovation methodology. He argues that sufficient attention must be directed into behavioural and organisational factors. Shields (1995) gives more weight to considering ABC systems as an administrative innovation rather than a technical innovation. Findings indicate that the success of such systems depends more on the concerted use of a set of behavioural and organisational factors as part of an overall package of an integrated implementation strategy. He places more emphasis on the factors such as top management support, competitive advantage, performance evaluation and compensation, training, ownership by non-accountants, and adequate resources. Shields' (1995) approach - looking at the combination of factors - was in contrast to the previous studies which investigated the impact of each factor in isolation to other factors. However, Shields (1995) examined the combination of behavioural and organisational factors within the scope of implementation of ABC.

Shields (1995), in congruence with Shields and Young (1989), argues that the implementation of administrative innovation does not depend on technical resources. Therefore, further studies must focus on identifying variables for future theory development (Shields, 1995; Shields and Young, 1989). He also suggested to emphasis on the impact of organisational culture, as it provides a context underpinning top management's decision on adoption or not of CSS. Shields' (1995) suggestions have not been taken into consideration so far in the literature. Therefore, as the literature stands, the acknowledged reasons leading to adoption of CSS are unclear.

Another significant study explicating the effects of factors on the level of complexity of costing systems came from Drury and Tayles (2005) and Al-Omiri and Drury (2007). They push further by examining the extent to which various contextual factors

influence the design of product costing systems among UK companies. Their studies adopt widened perspectives by including various practices of costing systems ranging from the simplistic sophistication system- TCS- to the highly sophisticated system – ABC. The widened perspective of CSS moves the literature away from the previous dichotomous studies analysing just the adopters or non-adopters of costing system sophistications. Findings show that the importance of cost information, cost structure, and level of market competition were not significant in explicating the design or adoption of CSS. Size was found to be significant in influencing the adoption of CSS. They recommend, for further study, to incorporate factors which are likely to influence the adoption, such as top management support, and the perceived need for an accounting innovation system. They also suggest using an interactive approach by investigating the impact of CSS on organisational effectiveness using proxies such as users' satisfaction.

These studies as referred to in previous paragraphs were conducted under contingency theory. Indeed, the contingency researchers attempt to investigate the impact of contingencies on the adoption of CSS. Some of the generic contingencies considered in literature are size, structure, technology, and environment (Woodward, 1965; Lawrence and Lorsch, 1967; Perrow, 1970; Galbraith, 1973; Otley, 1980). Drawing from the organisational theory, researchers asserted that accounting information systems are context oriented (Chenhall, 2003). They also attempted to link the mentioned variables with the effectiveness of management control (Chenhall, 2003; Langfield Smith, 1997; Brierley, 2008; Drury and Tayles, 2005). For example, Chenhall (2003) attempted to establish a link between specific strategy fit with an organisation's structure, or between national culture with a particular aspect of management control system. Similarly, Al-Omiri and Drury (2007) demonstrated the impact of various

contextual factors on the degree of sophistication of product costing systems. They designed a four-dimensional model of product costing systems based on the number of cost centres, on the number of types of cost drivers (second stage of the two stages procedure), the number of cost drivers (second stage of two stages procedure), and the use of direct allocation in the first stage of the two stages procedure.

In summary, the literature in the third stream mostly revolves around technical antecedents' effects on the dichotomous choice between adopters and non-adopters - size, product diversity, cost structure, Just in Time, lean production, TQM, automation, - competitive strategy and organisational structure, quality of information technology, manufacturing industry type level of competition, and the degree of customization (Bjørnenak, 1997; Malmi, 1999; Booth and Giacobbe, 1998; Hoque, 2000a,b; Clarke *et al.*, 1999; Krumwiede, 1998; Gosselin, 1997; Drury and Tayles, 2005).

According to Otley (2016) and Chenhall (2003), these studies have produced little cumulative knowledge. They were inconsistent and contradictory. They are not set to exist in the dynamics and uncertainty of the fast-changing management control of nowadays (Otley, 2016). While product diversity was found significant in some of the studies (Malmi, 1999; Booth and Giacobbe, 1998; Krumwiede, 1998), it was found not to be significant in others (Bjørnenak, 1997; Clarke *et al.*, 1999). Cost structure was found significant by Bjørnenak (1997) and Booth and Giacobbe (1998), while it was found not to be significant by Malmi (1999) and Clarke *et al.* (1999). The level of competition was found significant by Malmi (1999), and not significant by Bjørnenak (1997) and Booth and Giacobbe (1998). While the contextual factor "size" was found to be associated with the adoption or the use of cost system sophistication (Aiken and Hage, 1971; Blau and McKinley, 1979; Kimberly and Evanisko, 1981; Ettlie *et al.*, 1984; Joshi, 2001; Chenhall, 2003; Bjørnenak, 1997; Krumwiede, 1998; Drury and Tayles,

2005; Al-Omiri and Drury, 2007; Cinquini *et al.*, 2015; Boukr, 2018); other studies found no association between organisation size and cost system sophistications (Gosselin, 1997; Libby and Waterhouse, 1996; Baird, 2007; Cohen *et al.*, 2005).

Consequently, despite the rise in interest relative to CSS and its popularity, truly little is known regarding the question of why the systems are adopted. What is the effect of those systems on the actions taken by the adopters? Therefore, as long as those questions are unanswered, the field of costing systems remains fertile for any research trying to provide more understanding. This is what this current study proposes to enquire about: to what extent, and how, business environmental factors influence the adoption or design of CSS and its impact of non-financial performance?

Following Drury and Tayles' (2005) recommendation, this current study will provide for the first time, in the context of developing countries, the various practices on the degree of sophistication of product costing systems ranging from a simplistic sophistication – TCS- to a highly sophisticated system – ABC. By doing so, this current research will fill the gap of knowledge in the context of African countries. At the same time an answer will be sought to respond to the criticisms of the bivariate statistical test between the adopters and non-adopters by uncovering the interplays between a combination of set of factors (Drury and Tayles, 2005). Using SEM, this current study establishes a more accurate snapshot of contingency between factors, CSS, and organisational effectiveness (Abernethy *et al.*, 2001; Drury and Tayles, 2005; Al-Omiri and Drury, 2007; Brown *et al.*, 2004; Hadid and Hamdan, 2021). Additionally, the current research suggests filling the gap of knowledge of the lack of behavioural factors in investigating the determinant's effects on the adoption or design of CSS. Based on the recommendation of Shields (1995), Drury and Tayles (2005) and Malmi (1999), this current study opts to investigate CSS as an administrative innovation. In other

words, to integrate behavioural factors, managerial factors (organisational factors) as well as contextual factors as prerequisites in investigating their impact on the design or adoption of CSS. In the same way, based on the recommendation of Otley (2016) and Drury and Tayles (2005), we attempt to examine the accounting information system as part of the overall package of the management control system. This study adopts the interactive contingency by not only looking on the fit between contingencies and costing system characteristics, but further on the impact the fit between factors and CSS has on the non-financial performance (Drazin and Van de Ven, 1985).

Moreover, this current study tries to answer what the past seminal studies omitted to uncover by proposing, for the first time in literature, the generative mechanisms beneath the association observed in empirical domain between factors, CSS, and organisational performance. This first attempt might provide more insight on how business environment factors influence the design or adoption of costing management systems. The following section discusses the factors influencing the adoption of CSS – behavioural factors, organisational factors, and contextual factors.

4.4 Factors influencing the adoption of CSS

Past studies attempted to group factors influencing the adoption of management information system into three main categories – environmental factors, macro-context factors and micro-organisational factors (Boukr, 2018; Hoque and Hopper, 1994; Innes and Mitchell, 1990; Fisher, 1995; Granlund and Lukka, 1998). The environmental factors refer to factors which are out of the control of, and external to the organisation (Hoque and Hopper, 1994). It includes political factors, economic factors, and social factors. According to Innes and Mitchell (1990) management accounting control systems can be influenced by social, political, and economic factors.

Subsequently, the influence can also be reflected in the adoption or a design of costing system. In the same way, Slater and Niswander (1995) argue that political and economic dimensions influence societal values, and indirectly, accounting values and accounting systems. This current study integrates the environmental factors throughout its analysis and discussion of the Congolese uncertainty landscape, such as proposed in Chapters 2 and 3.

Similarly, macro context factors are factors related to the external environment in which an organisation operates. In this regard, Granlund and Lukka (1998) argue that the macro factors converge in the form of economic pressures, normative pressures, and mimic pressures in directing management accounting practices. In this current research, this group of factors are categorized among the contextual factors. It includes factors which are external to the organisation, but which exercise a pressure on the adoption or design of CSS – uncertainty avoidance and size (which is an external as well as an internal factor).

The last category is the micro-organisational factors. These are the internal factors related to the organisation's structure (Innes and Mitchell, 1995). They are also known as contingent factors (Boukr, 2018). This current research categorises the internal factors or micro-factors into two sub-categories: the behavioural factors and the organisational factors. Behavioural factors refer to those factors which are related to the employee's behaviour within an organisation – management knowledge and management support. In contrast, there are non-behavioural factors such as the organisational factors. Organisational factors are factors related to an organisation's managerial resources' capacity other than human resources – adequacy of resources. The following sub-sections present each sub-category as used in this current study– contextual factors, behavioural factors, and organisational factors.

4.4.1 Contextual factors -SIZE and CSS.

CSS is apprehended within the context of the Democratic Republic of Congo as a management accounting innovation system. From this perspective, this current study attempts to include size as an external factor susceptible to influencing the adoption of an accounting innovation system. Indeed, as previously argued, globalization did not only bring greater constraint on costs, and wider product overheads, but also greater integration of businesses of all sizes. So, the internal factor size is becoming more important to the extent of being considered as a strategic external factor. It strategically augments accessibility to resources; therefore, it has the capability of controlling the level of uncertainty of the business environment. Hence, organisational size is incredibly important for cost effectiveness among Congolese enterprises.

Previous research revealed that organisational factor size has been found among factors influencing the adoption of innovation systems (Drury and Tayles, 2005; Ettlie *et al.*, 1984; Blau and McKinley, 1979; Aiken and Hage, 1971). Aiken and Hage (1971), by investigating the characteristics of organic organisation, concluded that size was related to innovation. Similarly, Kimberly and Evanisko (1981) argued that size was associated with technological and administrative innovation. Ettlie *et al.* (1984) posit that traditional structural settings could be used for radical innovation depending on the size mediation effects. In the same way Blau and McKinley (1979) argue that structural complexity and a wider range of tasks are correlated with organisational size dimension. The same trend of findings linking size with innovation has been found among research conducted in developing countries. In South Africa, Waweru *et al.* (2014) discovered that technological change and global competition are related to

organisation size. Joshi (2001) links size with the conservative attitude in management, autocratic leadership, and management accounting information systems.

Size is also found associated with management control systems. Earlier studies in management accounting contingency-based research concluded that an association exists between size and organisational structure (Lawrence and Lorsch, 1967; Burns and Stalker, 1961). Khandwalla (1972,1977) uncovered an association between size and the use of sophisticated management controls. Bruns and Waterhouse (1975) associated the organisation size with management controls. Merchant (1984) provided more specific explanation by associating organisational characteristics, market factors and production with the departmental size. Merchant (1984) posits that as the number of employees increases – size-, so will the communication channels flow of information, and budget increase. Therefore, as the organisation size increases, so managers will adopt a more formal budgeting approach and formal administration (Bruns and Waterhouse, 1975).

Apart from influencing the management control behaviour, size was also found associated with the methods and managements of management control systems (Hoque and James, 2000). Organisation size was found associated with Activity Based Costing (Innes and Mitchell, 1995; Bjørnenak, 1997; Malmi, 1999; Drury and Tayles, 2005; Al-Omiri and Drury, 2007), which is one of the methods within the overall package of management of organisation control systems. Innes and Mitchell (1995), by investigating 1000 UK companies, argued that size is associated with the adoption of ABC. Malmi (1999) found that size influences the diffusion process of activity-based systems (ABC). Drury and Tayles (2005), by adopting a broader perspective in explicating the relation between factors and CSS, concluded that size was statistically

significant at a 1% level. Al-Omiri and Drury (2007) confirmed the same conclusion two years later.

This current study opts to take this task by empirically testing the direct and indirect relationship between size and CSS. As previously argued, contingency based research in accounting information system has resulted in inconsistent findings (Chenhall, 2003; Otley, 2016). While most of the studies concluded for a positive association between size and CSS, other studies argued the absence of such a relationship (Gosselin, 1997; Libby and Waterhouse, 1996; Baird, 2007; Cohen *et al.*, 2005). Therefore, for more insights, the contextual factor of size will be included among other contextual factors in this investigation. The following section presents another contextual factor- uncertainty avoidance.

4.4.2 Contextual factor- Uncertainty Avoidance-, and CSS

The adoption of cost system sophistication has been considered to be country context orientated (Askarany and Yazdifar, 2015). Similarly, Brown and Brignall (2007) argued that the construction of accounting systems derives from social, legal, and political relationships with agents and power distribution throughout the system. Therefore, the cultural context of the country is likely to influence the process of diffusion of an innovative accounting system. According to Slater and Niswander (1995), uncertainty avoidance countries are likely to have uniform accounting systems and be conservative in measurement tools. Slater and Niswander (1995) conducted a study on the cultural impact on the development of accounting and concluded that Gray's (1988) model was a statistically significant power in explaining various patterns of accounting internationally. They concluded that management accounting practices were subject to the influences of environmental factors - national culture. Indeed, Gray's (1988) model proposed a model of accounting values that was linked with Hofstede's

(1991) societal values. In return, these accounting values influence the structure and management accounting practices and measurements tools. By relying on Hofstede's cultural construct, Gray (1988) wanted to demonstrate that culture affects the organisational structure of society, organisational behaviour and theory, economic patterns, and model of accounting control (Hamilton and Biggart, 1988; Boycacigiller and Adler, 1991; Jaeger, 1986; Franke *et al.*, 1991).

Hofstede (1991) proposed four cultural constructs – individualism vs collectivism; large vs small power distance; strong vs weak uncertainty avoidance; masculinity vs femininity. Hofstede (1991) described the uncertainty avoidance as the degree to which people within a society feel uncomfortable with uncertainty (unpredictability) and ambiguity. Societies characterized with strong uncertainty avoidance have conservative behaviour and beliefs and are intolerant of deviant persons or ideas (innovation). In contrast, weak uncertainty societies are more relaxed with new practices and more tolerant with deviation. The issue for this construct is how a society will react, faced at a point in time, with one-way dimension for an unknown future. Does the society attempt to control the future or let things happen as they come? Similarly, Gray(1988) model drew from Hofstede's (1991) model by hypothesizing that societal values have an implication for the legal, political , economic, and organisational patterns, and the capital market. He proposes four accounting values – professionalism vs statutory control, uniformity vs flexibility, secrecy vs transparency and conservatism vs optimism.

Uncertainty avoidance, according to Gray (1988), explains 80% of a country's profile in terms of accounting values of professionalism, uniformity, conservatism, and secrecy. According to Salter and Niswander (1995) the desire for certainty or the willingness to control the uncertain future is the strongest cultural construct in influencing

the design or adoption of accounting structures or systems, measurements, and the volume of information. They continue by positing that conservatism, which carries the cultural construct of strong uncertainty avoidance, determines the final accounting systems.

Notwithstanding, the discussion above did not extend further by looking into the impact which the cultural context - uncertainty avoidance – will have on the accounting values and practices at the organisational level. So far, there is not a study among the published research from high-ranking journals which has attempted to consider uncertainty avoidance as a cultural determinant on the adoption of CSS. This current study seeks to integrate uncertainty avoidance as a contextual factor, which plays a key role prior to the adoption of an accounting innovation at the business unit level. The next section presents the behavioural factors – management knowledge and management support.

4.4.3 Behavioural factors - management support - and CSS

Behavioural factors refer to the influence of human interactions on influencing an organisation's activities. Management support was considered in the literature of CSS as one of the behavioural factors determining success or failure of CSS implementation (Chenhall, 2004; Wessels and Shotter, 2000). It is classified among behavioural factors as it involves human interactions. The construct management support is considered in literature as a challenge that organisation might face in implementing a CSS. According to Kaplan(2006), CSS is an expensive methodology for implementation. Therefore, after the decision to adopt was made, researchers wanted to find out what are the prerequisites for a better implementation. In this perspective, management support alongside other behavioural and non-behavioural factors – lack of management support, lack of adequate resources, knowledge, and awareness of the

usefulness of the innovative cost methodology – was mentioned (Shields, 1995; Krumwiede, 1998; Chenhall, 2004; Al-Omiri and Drury, 2007). In addition, management support would attract resources needed for a successful implementation of CSS (Brown *et al.*, 2004; Himme, 2012; Guenther and Gaebler, 2004).

However, these studies, as mentioned in previous paragraphs, considered management support as a factor influencing the implementation of CSS. None of them has attempted to look at it as a prerequisite for adoption or a design of CSS. Liu and Pan (2007), in their rare study on the influence of national culture on CSS, indicated that management support affects the success of the diffusion of CSS. Similarly, Shields (1985) found that management support is correlated to the adoption of costing systems. Thus, for more understanding on the impact management support will have on the adoption of CSS, this current study proposes to include it among those behavioural factors influencing the adoption of CSS. The current study hypothesizes that management support enters into an interaction with other factors from which emerges the perceived adequacy of resources to invest in an innovative accounting system- CSS. The following section presents another behavioural factor, known as management knowledge.

4.4.4 Behavioural factor - management knowledge -, and CSS.

As previously argued, CSS is considered to be an accounting innovation costing system within the context of developing countries, especially that of Congolese businesses. As with any other type of innovation, its adoption follows a process based on two perspectives – the input perspective and the output perspective (Rogers, 2003). Rogers (2003) argues that the output approach is related to the absorptive capacity of acquiring that capacity, and later adopting it. Both perspectives of the innovation - input and output - are influenced by environmental and social factors

(Askarany and Yazdifar, 2015). Hence, this current study opts to include, among those factors influencing the adoption of CSS as an innovative costing system, the factor management knowledge.

Knowledge and awareness of the system's usefulness is classified in the literature of CSS among the behavioural factors enhancing the success or failure of the implementation of CSS (Shields, 1995; Krumwiede, 1998). To answer the question from the literature as to why CSS was implemented, Bjørnenak(1997) argues that prior knowledge and awareness of CSS (or ABC) is indirectly related to the adoption of CSS. It means that large companies with adequate knowledge and awareness of the innovative accounting system are likely to adopt a more effective costing system – CSS. However, previous research, as referred to above, did not extend further on the impact of knowledge and awareness as a prerequisite input prior to the adoption or design of CSS. This current study considers management knowledge as a prerequisite input factor needed in order to adopt or design an innovative costing system. The current study hypothesized that the interplay between management knowledge and other non-behavioural factors results in the emergence of patterns which equate to factors, CSS, and organisational performance. The following section presents the literature of an organisational factor- Perceived Adequacy of Resources - which is hypothesized as the emerging pattern from the non-linear interaction between behavioural, contextual, and organisational factors.

4.4.5 Organisational factor- Perceived Adequacy of Resources -, and CSS

There is not, in the literature, a clear definition of the meaning of the concept of adequacy of resources. Sometimes it is related to the concept of business's annual revenue, at other times to the concept of the number of employees. Thus, it can be described as having adequate financial or human resources. Even in that case, the

aspect of having adequate financial or human resources depends on many other factors. In this regard, it is a result of managerial perception of what could be considered as adequate resources in the process of adopting an innovative costing system. Therefore, the latent construct is considered in this current study as a “perception of having adequate resources” – Perceived Adequacy of Resources - by the organisation’s top management.

Adequacy of resources was referred to in cost system sophistication literature as a logical explanatory factor explicating the relationship between size and the adoption of CSS (Al-Omiri, 2003; Drury and Tayles, 2005, p.62; Al-Omiri and Drury, 2007, p.407;). Al-Omiri and Drury’s (2007) findings regarding the determinants of CSS concluded that size is positively related to CSS. To explain the why of this relationship, the authors asserted that it is because large firms have adequate resources to invest in a more sophisticated costing system. Similarly, Cohen et al. (2005) refer to human and financial resources – adequacy of resources - as an inhibitor of successful implementation of ABC. They continue by supporting the view that the adequacy of resources is positively correlated with almost all other variables. However, Cohen *et al.*’s (2005) study was not focused on investigating the impact of contextual factors on the adoption of CSS, rather it focused on the factors permitting the success or failure of ABC implementation. Another attempt in the literature relative to adequacy of resources came from the work of Innes and Mitchell (1995) and Wessels and Shotter (2000). They argued that adequacy of resources was not a main reason justifying the failure or success of CSS implementation.

For Innes and Mitchell (1995) the main reasons for UK companies rejecting the use of ABC were the resourcing capabilities to initiate or design an ABC or the lack of availability of resources to undertake such a project. In a similar way, Wessels and

Shotter (2000) argued that it is the lack of adequate employee resources that constitutes the stumbling block hindering the implementation or the start of ABC among South African listed firms. They continued in arguing that, for a successful implementation of such a system, employees need to provide adequate time needed for an ABC initiative or to be able to gather resources from all departments within the organisation.

Hence, there is not, among the published studies from high-ranking journals, a study relative to the influence of adequacy of resources on the adoption or design of CSS. The previous research which used the concept of adequacy did not empirically investigate the extent to which the adequacy of resources influences the cost system sophistication. This research attempts to fill this gap. We suggest that the perceived adequacy of resources is made up of four social structures. In other words, perceived adequacy of resources emerges from the interplay between behavioral factors- MK and MS and contextual factors – uncertainty avoidance and size. Thus, it is a pattern which is likely to lead to the adoption of CSS. The organisation which perceives that it has enough resources or means to achieve its goals, will adopt a more sophisticated costing system to reach cost effectiveness and performance efficiency. The following section propose a theoretical model conceptualizing the relationship between factors and CSS.

4.5 Theoretical model

Contingency theory ascertains that the environmental factors influence the management accounting systems. Therefore, the adoption of a cost system sophistication cascades from those factors from a business environment such as contextual, behavioural, and managerial factors. Among contextual factors there are organisation size and uncertainty avoidance. Empirically, Size was found to be associated with the

adoption of CSS (Drury and Tayles, 2005). Large organisations have more complex and various assets facilitating the adoption of innovation (Ettlie *et al.*, 1984) or the use of various innovations (Blau and McKinley, 1979). The adoption of a costing system has been considered to be country context oriented (Askarany and Yazdifar, 2015). In a similar way, the design, or the adoption of an accounting system cascades from the legal, economic, or cultural relationship of agents and power distribution within the system. Thus, cultural dimensions, such as the uncertainty avoidance, has an implication on whether or not an innovative accounting system is adopted (Salter and Niswander, 1995). Indeed, countries with a higher degree of uncertainty avoidance tend to adopt more conservative and uniform accounting systems, contrary to low uncertainty avoidance countries (Salter and Niswander, 1995).

Moreover, the adoption of an innovation refers to a new knowledge and the process that follows persuading those involved to adopt this new system - cost system sophistication (Rogers, 2003). As an administrative innovation, CSS requires a prior management knowledge and support for such as system in the process of adopting or designing it (Chenhall, 2004; Shields, 1995; Krumwiede, 1998). However, previous studies on the determinant of the adoptions are limited and concentrated more on non-behavioural factors such as size, product diversity, cost structure, level of competition, and competitive strategy (Bjørnenak, 1997; Malmi, 1999; Hoque, 2000). The reasons for this are many and varied. One such reason is that CSS is considered, in most of the studies, as a technical innovation rather than an administrative innovation. Thus, less attention has been given to the administrative side (Shields, 1995) which requires the human aspect prerequisite for adoption of newness. Therefore, given the above, a theoretical model was developed including a concerted set of factors: size,

uncertainty avoidance, management knowledge, management support and adequacy of resources. The theoretical model is shown in Figure 4.3.

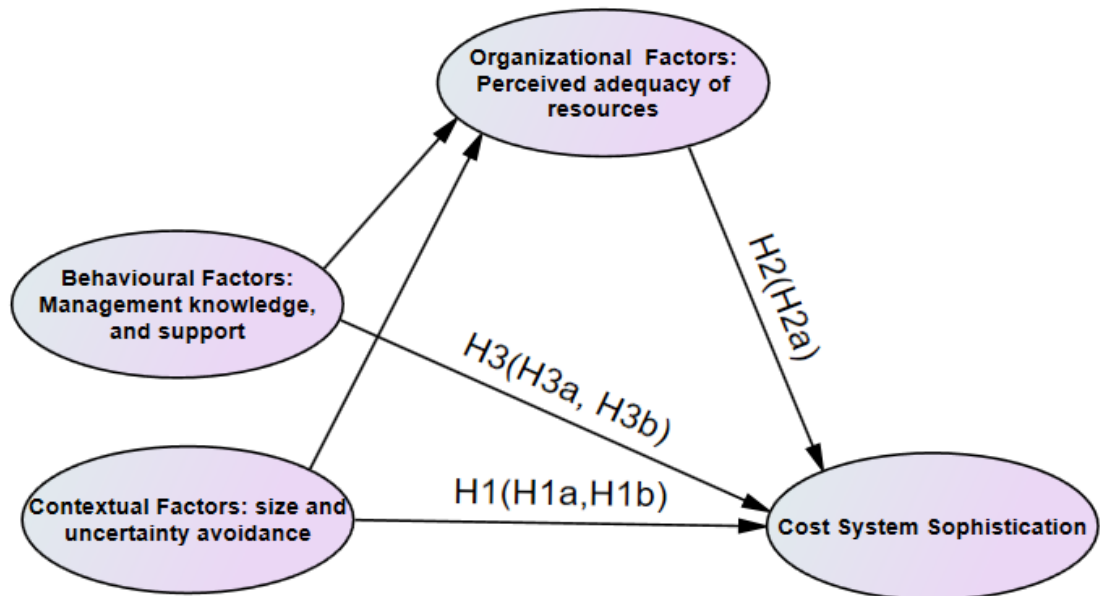


Figure 4. 3 Theoretical model

4.6 Hypotheses development

To meet this current study's objectives, hypotheses were proposed and later tested. In relation to objectives 1 and 2, hypotheses were formed to test constructs that infer understanding of the contingency influences of a set of factors on the adoption of a product costing system sophistication. These constructs are grouped in three major categories: contextual factors – Size and Uncertainty avoidance-, behavioural factors- Management knowledge and management support-, and organisational factors- perceived adequacy of resources. The hypotheses tests were followed by further analyses based on contingency and complexity theories to gain more insights into the occurrence of the event – factors → CSS.

4.6.1 Organisation size

Among the antecedents explicating the adoption or the design of a sophisticated administrative system, size was found to be an important predictor (Chenhall, 2003). In addition, size was consistently positively related to the adoption of cost system sophistication (Aiken and Hage, 1971; Blau and McKinley, 1979; Kimberly and Evanisko, 1981; Ettlie *et al.*, 1984; Joshi, 2001; Chenhall, 2003; Bjørnenak, 1997; Krumwiede, 1998; Drury and Tayles, 2005; Al-Omiri and Drury, 2007; Cinquini *et al.*, 2015; Boukr, 2018). Bjørnenak (1997) suggests that size facilitates the diffusion of innovative accounting systems ABC. Similarly, Malmi (1999) establishes a positive correlation between size and the adoption of an innovative accounting systems. Drury and Tayles (2005) found that size was the highest predictor among the independent variables influencing the degree of complexity of cost system sophistications. Cinquini *et al.* (2015) associated size's effect with the usage of CSS.

Similarly, within the context of developing countries, Boukr (2018) argues that adequacy of financial resources is one of the most influential predictors of an adoption or design of CSS among Libyan companies. Therefore, size is indirectly related to the adoption of CSS. In the same way, using a logistic regression model, Arora and Raju (2017) suggested in their study the effect of size on the adoption and implementation of ABC among 28 manufacturers in India. In Bangladesh, Babu and Masum's (2019) findings corroborate with the previous seminal studies in regard to the inclination of larger companies to adopt ABC. They argued that, as ABC requires high access to resources and economies of scale, companies with low capital are not likely to adopt it. The explanation given in literature is that large companies have adequate resources in order to invest in more sophisticated costing systems contrary to small companies (Al-Omiri, 2003; Drury and Tayles, 2005, p.62; Al-Omiri and Drury, 2007, p.407; Ismail

and., 2010, p.29). Thus, due to constraints, smaller enterprises are likely to choose or design a costing process significantly different to that of larger enterprises, such as traditional costing systems (Drury and Tayles, 2005, p.62).

Similarly, Ngokana *et al.* (2021) found that organisation size was positively associated with the use of traditional costing systems among Congolese enterprises. This was in congruence with another study conducted in 2020 by Lufuma *et al.*(2020). Lufuma *et al.* (2020) concluded that when size is measured by sales revenue or the number of employees, it influences the adoption of management accounting practices among Congolese SMEs. Therefore, the following hypothesis is tested:

H1: There is a direct or indirect relationship between contextual factors and the adoption of CSS.

H1a. Size has a direct and an indirect positive association with CSS through adequacy of resources to invest.

4.6.2 Uncertainty avoidance

The management control system depends on the contemporary settings (Chenhall, 2003) such as national culture (Harrison and McKinnon, 1999). National culture influences behaviours and perceptions. It also affects social life including attitudes in regard to the conceptualization of costing systems (Hofstede, 1991). In this perspective, Nagirikandalage and Binsardi (2017) found that CSS is influenced by coercive normative cultural norms and institutional isomorphism. Noravesh *et al.*'s (2007) study on the cultural impact on accounting values among Iranian businesses concluded that there is an existence of association between culture and accounting values. In the same way, Gray(1988) theorizes that those societal values influence organisational patterns. Moreover, he concluded that strong uncertainty avoidance is related to a

more conservatism management accounting practice. Therefore, the hypothesis below is tested:

H1b: Strong uncertainty avoidance is positively associated with simplistic CSS.

4.6.3 Adequacy of resources to invest in an innovative costing system.

For Drury and Tayles (2005) the reason explicating the positive association between the organisation's size and the sophistication of management costing systems is that larger enterprises have extensively greater access to resources to choose to opt for the introduction of a more complex costing system. They argued by extrapolation that, because larger firms have access to more resources to design innovative accounting systems, or have a complex network of communication, and the infrastructure needed for introducing such a system, therefore they are likely to implement a costly sophisticated costing system (Al-Omiri, 2003, P.6-12; Drury and Tayles, 2005). This assertion, which emanates from a logical thinking extrapolation rather than from an empirical finding, becomes a core truth that researchers refer to in literature or in textbooks. Hence, prior research has not taken this issue further by testing empirically the extent to which the adequacy of resources to invest influence the adoption of CSS. Therefore, the following hypothesis is tested:

H2. There is a positive relation between organisational factors and the adoption of CSS.

H2a. The perceived adequacy of resources to invest is positively related to the adoption of CSS.

In addition, Al-Omiri (2003) argued that there are factors that preclude businesses from adopting a more sophisticated system. Indeed, as an expensive methodology for implementation (Kaplan, 2006), a cost system sophistication has to eliminate

some barriers for adoption, such as information technology (Peacock and Tanniru, 2005); behavioural factors (Al-Omiri and Drury, 2007; Chenhall, 2004; Shields, 1995; Krumwiede, 1998). Cohen *et al.* (2005) argued that those behavioural factors constitute the driving force at the stage of the implementation of cost system sophistications. In their attempt to examine the problems faced by adopters of costing system sophistication (ABC) among Greek organisations, Cohen *et al.* (2005, p.991-992) suggested that the adopters do not face serious difficulties during the implementation stage. The problems emerge when the human or financial resources, such as lack of top management support, are not adequate. They continue by arguing that the concept of adequacy of resources is positively correlated with all other variables – software selection, personnel's resistance to ABC, lack of top management support. Therefore, it is likely that direct or indirect links exist with other variable drivers in relation to CSS adoption. In addition, these variables, when they interact with each other, are likely to be susceptible to create patterns such as perceived adequacy of resources to invest, In turn, when or if these fit with CSS, they might result in a higher organisational performance outcome.

Cohen *et al.*'s (2005) study provides a glimpse of understanding of how the variable adequacy of resources influences the success or the failure of the implementation of a costing system. However, the study, which was focused on the implementation rather than on the adoption, did not consider the extent which the interaction with other variables would have on the design of CSS. Furthermore, there is a limitation from the previous studies' econometric model when using the bivariate statistical analysis in investigating the relationship between factors and CSS. The dichotomous choice of adopters or non-adopters (or between users or non-users) has the risk that spurious relationships may be reported. This is important, especially when

investigating a combination or a network of variables which may be in continuous inter-relationship between themselves, as with the case of those driving force variables around the construct adequacy of resources to invest. In this regard, there is a need to use a more robust or high-powered statistical test, such as Structural Equation Modelling. With path analysis or structural analysis, SEM as an econometric model systematically analyses the impact of those driving variables on the perceived adequacy of resources, as well as on the impact of PAR on CSS, and consequently on NFPM. Therefore, this study seeks to propose a set of variables as a complex network of interactions from which emerges the perceived adequacy of resources. Thus, alongside hypothesis 2, the following hypotheses are tested: H3a and H3b (see the following paragraphs).

4.6.4 Management knowledge

Cost sophistication is often linked to a combination of variables that are likely to enhance the success of such a system. Indeed, studies indicate an interconnection between management knowledge of the advantages of CSS with the adoption of such systems (Guenther and Gaebler, 2014). Chongruksut (2002) added other variables alongside management knowledge - specialist training, educational background, and work experience in costing management. According to Bjørnenak (1997), infrastructure of knowledge might represent the information field of the potential adopters of CSS. Bjørnenak (1997) found that larger firms with larger networks of communication channels, adequate infrastructure and adequate management knowledge adopt a more sophisticated costing system compared to the small firms. Thus, Bjørnenak's (1997) study illustrates that the adopters of CSS have more resources in terms of knowledge and awareness such as from training, from other departments within the

organisation, from propagators and from institutions. Therefore, the following hypothesis is tested:

H3. Behavioural factors have a direct and indirect positive relationship with CSS through perceived adequacy of resources to invest.

H3a. Management knowledge has a direct positive and indirect relationship with CSS through adequacy of resources to invest.

4.6.5 Management support

Management support has been considered in CSS literature as a prerequisite behaviour factor for success or failure of the implementation of such an expensive system (Al-Omiri and Drury, 2007; Chenhall, 2004; Shields, 1995; Krumwiede, 1998;). Cohen et al. (2005) argued that the problem emerges in the implementation process of CSS in the case of a lack of financial or human resources – lack of top management support. Similarly, Chenhall (2004) states that management support is the most important variable impacting the success or failure of more sophisticated costing systems. In an empirical study analysing the impact of behavioural and organisational factors, Shields (1995) concluded that management support, in interconnection with other variables, is positively correlated to CSS in the pursuit of organisational effectiveness. The question one may ask is at which stage the top management support is needed for the organisation's effectiveness. This study attempts to suggest that management support, alongside other behavioural and organisational factors, attracts the necessary resources prior to the adoption of CSS and its implementation (Wessels and Shotter, 2000; Himme, 2012; Guenther and Gaebler, 2014; Brown *et al.*, 2004). Therefore, the following hypothesis is tested:

H3b. There is a direct or indirect positive association between management support and CSS through the perceived adequacy of resources.

4.7 Summary

This chapter reviews the literature of CSS and focuses on the influence of behavioural factors, contextual factors, and organisational factors on the adoption of CSS. Contextual factors refer to those business environmental factors which are usually out of an organisation's control but exercise an influence on the organisation. Two factors were considered: uncertainty avoidance and the organisational factor size. Uncertainty avoidance is asserted as a cultural factor which might have an impact on the adoption of an accounting innovation. Size is included as an external factor which can be considered in the perspective of globalization as a strategic factor for integration and cost reduction. Behavioural factors are factors which refer to the interaction of human resources in influencing an organisation's activities. Among behavioural factors, this current study includes management knowledge and management support. Finally, the chapter provides a literature review of the construct adequacy of resources, which is considered as an organisational factor. Within the perspective of adopting an innovative accounting costing system, this current study posits that the perceived adequacy of resources emerges as a pattern from the interplay between behavioural factors, organisational factors, and contextual factors. These factors are the prerequisite inputs prior to the adoption of CSS. This current investigation fills the gap in the literature on the extent to which factors influence the adoption of CSS. In most of the literature, the factors mentioned above were investigated within the scope of implementation of CSS, rather than as prior prerequisites for adopting or designing a more sophisticated costing system. Moreover, the current research attempts to

uncover the generative mechanism explaining the observed relationship in an empirical domain. By doing this, it answers the question of the extent to which, and how, factors influence the design and the adoption of CSS. In this perspective, a theoretical model linking hypothesized relationships between factors and CSS was proposed. The following chapter will cover the interactive aspect of contingency theory by looking at the impact of CSS on non-financial performance.

Chapter five: Cost system sophistication and non-financial performance

5.1 Introduction

The aim of this chapter is to present an overall review of the literature relative to the effect of cost system sophistication on organisational performance. The chapter starts by discussing the relationship between CSS and performance as seen by many researchers in the field. This is followed by the measurements used in literature for assessing organisational performance. Some empirical evidence from past studies on the relationship between CSS and organisational performance are presented. Additionally, the chapter establishes from the past studies the existence of a relationship between CSS and non-financial performance. The chapter ends by proposing a theoretical model for conceptualization of hypothesized relationships between constructs. Moreover, the chapter emphasizes throughout what differs this current study from the previous studies.

5.2 CSS and organisational performance

As one of the management accounting systems, CSS can be considered to be a systematic use of an accounting system to achieve an organisation's goals, which include higher organisational performance (Chenhall, 2003). However, there are criticisms attached to the CSS as a methodology for more organisational effectiveness (Innes *et al.*, 2000). From the perspective of attempting to establish the relationship between CSS and performance, more studies were conducted (Kennedy and Affleck-Graves, 2001; Cagwin and Bouwman, 2002; Innes and Mitchell, 1990; Gordon and Silvester, 1999; Banker *et al.*, (2008).

Innes and Mitchell (1990) argue that there is no evidence to establish the existence of an association between CSS and performance outcomes. Similarly, Gordon and Silvester (1999) investigate the stock market impact from the announcement of adoption of ABC among United States firms. The findings indicate that there is not a positive or a negative reaction by the stock market. Contrarily, Kennedy and Affleck-Graves (2001) suggest that the performance improvement is possible only when the adoption of such a system is combined with other driver factors. However, the authors did not specifically state which those value driver factors are. Kennedy and Affleck-Graves (2001) use holding period returns and cumulative abnormal returns as measurements for organisational effectiveness. The results indicate that organisations which have been adopters of ABC outperform the non-adopters. In addition, results also suggest that the adoption of ABC adds more value to the firm.

Cagwin and Bouwman (2002), in investigating the improvement in financial performance with ABC, concluded that there is a positive relationship when ABC is used alongside with other strategic initiatives. Similarly, Ittner *et al.* (2002) conducted research into the relationship between ABC and financial performance – return on net plant assets – which show that the use of ABC is related to a greater improvement in quality and cycle time. Furthermore, they found an indirect association between the use of more sophisticated systems with cost effectiveness. Shields (1995) suggest that the effectiveness in an implementation of ABC varies between firms, and this depends more on the effects of behavioural and organisational factors. In an equivalent way, Banker *et al.* (2008) argue that ABC has no significant direct effect on the manufacturing performance – measured by financial measurements. However, there is a positive effect when the relationship between ABC and performance is mediated by world class manufacturing practices. Cagwin and Bouwman (2002) argue that the

positive relationship between ABC and organisational performance – return on investment - is possible only when ABC is used concurrently with other strategic initiatives. More recently, Vetchagool *et al.*(2021) found that organisations which use ISO 9000 and ABC concurrently outperform those which do not combine ISO 9000 with ABC.

Although, as suggested by some researchers, the ultimate goal of CSS is to achieve organisational effectiveness (Cooper and Kaplan, 1992; Bescos and Charaf, 2013), the question on the economic benefit remains unsolved. There are researchers who suggest, for a better understanding, adopting of a long-term perspective in investigating the impact of the adoption of CSS on the performance through the use of non-financial performance measurements (Moriarity and Hendricks, 1991; Hussain, 2004; Kaplan and Norton, 1996; Van der Stede *et al.*,2006).

As referred to in the literature above, the examination of the interactive contingency between ABC and performance outcome was investigated in complete isolation to the management control perspective of the organisation. Those studies did not integrate the impact the fit between factors and CSS might have on the performance outcomes concomitantly. In this regard, the lack of investigating the association between CSS and performance as part of the control package might be one of the causes of inconsistencies of findings in the literature. In addition, the above studies were conducted from the perspective of developed countries and focused more on the objectives and financial measurements. Thus, there is a gap in literature on whether the adoption of CSS is related to organisational performance. Therefore, this current study seeks to remedy the above gap by suggesting, for the first time, a holistic perspective including the effect of fitness between factors and the adoption of CSS on the organisational performance in the context of a developing country, the Democratic Republic of Congo. The current study also suggests that the adoption or design of CSS is

nothing more than a tool of success emerging from the interplay of numerous factors, in which effectiveness on adoption of such a system is measured by the users' satisfaction and the use of CSS in decision making and in cost management.

5.3 Organisational performance measurements

Yeung *et al.* (2006) posit that organisational performance is a measurement of organisational effectiveness. Therefore, organisational performance is integrated in an organisation's strategic planning (Buhovac and Slapnicar, 2007). Saying this, the choice of measurement tools to use in that process is crucial. Powell (2004) argues that management needs to choose which organisational performance accurately measures the organisation's effectiveness. Furthermore, the measurement selected must be relevant to the organisation's overall strategic goals (Paranjape *et al.*, 2006). Organisational performance can alter when the measurements used are not relevant to the strategic objectives (Ittner and Larcker, 1997; Paranjape *et al.*, 2006).

Previous studies argued that organisation's strategy is paramount as it leads practices in management accounting in order to achieve the planned performance (Otley, 1980; Krumwiede and Charles, 2006; Simon, 2007). However, regarding the question of what measurement to use, past studies presented conflicting evidence between financial and non-financial measurements to measure performance. According to Kaplan and Norton (1996), financial measurements offer a lagging indicator of performance. They continue by arguing that non-financial measurements offer a leading indicator for performance. Some of the financial measurements are profitability indicators, liquidity indicators, production output indicators, revenues indicators, and sales

indicators (White, 2008). On the other hand, non-financial measurement for performances uses subjective variables, which can be quantified.

According to Van der Stede *et al.* (2006) non-financial measurements for performance are associated with innovation strategy. Ittner and Larcker (1997) found that there is a positive relationship between non-financial measurements and organisational performance. Similarly, Davis and Albright (2004) provided empirical evidence establishing a positive association between non-financial measurements and organisational performance. Previous studies used customer satisfaction, employee's satisfaction, quality innovation, market share, and employee's turnover as proxies of non-financial measurements (White, 2008).

The effectiveness of accounting information system was examined in literature based on the model proposed by DeLone and Mclean (1992, 2003). Success of the use of accounting information system (AIS) is evaluated using the following construct: user satisfaction, use of information system, system quality, service quality, individual and organisational impact. In their study DeLone and Mclean (1992, 2003) reviewed a total of 180 theoretical and empirical articles on the success of information systems. They argued that user satisfaction generates net benefit, known as individual and organisational impact. In this regard, user satisfaction is a measure of information system success (Ranganathan and Kannabiran, 2004). Within the context of developing countries, especially the context of the Democratic Republic of Congo, CSS is considered to be an innovation or a new method of management accounting control system (Ngokana *et al.*, 2021 and Lufuma *et al.*, 2020). From this perspective, as with any other type of innovative management accounting system, it is necessary to portray a high-quality characteristic in providing accurate information for the use of such a system to the satisfaction of the users (Diavastis *et al.*, 2016).

Diavastis *et al.*'s (2016) study on the interactive effect of user satisfaction and management accounting information system indicates that ABC use, when concurrently interacted with users' satisfaction, leads to a higher financial performance. So, they consider user satisfaction as an enabler of success of ABC use among Greek hostels. In another words, according to Diavastis *et al.* (2016), users' satisfaction is a measurement of the accounting information system. Alongside the users' satisfaction, Diavastis *et al.* (2016) added the role of top management to determine the ultimate effectiveness of an information system. Therefore, it is the users of the innovative accounting system who determine the degree of success of the use of ABC. Subsequently, the satisfaction of the users of CSS is hypothesized to lead to a higher non-financial performance by creating more value or financial performance by generating more profitability.

This assertion of a direct relationship between users' satisfaction with an information system and organisational performance was confirmed by various empirical studies (Baraka *et al.*, 2013; Ben-Zvi, 2012). Based on DeLone and Mclean's (1992, 2003) model, dimensions on the success of organisational effectiveness, Baraka *et al.*'s (2013) study found that the two more weighted dimensions, user satisfaction and net benefit, explained better the success of information system effectiveness. Similarly, Ben-Zvi (2012) argues that users who perceived the information system as effective correlates with performance. However, the study did not reveal a significant association of human resources' availability in designing a decision-making information system and performance. Therefore, in regard to decision making, user satisfaction with the of use of accounting information system - cost system sophistication - is an indicator of measurement leading to AIS effectiveness. Moreover, the

improvement of performance is attained when the use of CSS interacts with users' satisfaction with the accounting information system (Diavastis *et al.*, 2016).

This current study moves the boundary further on the effectiveness of information systems by integrating within the same analysis the impact which behavioural factors, in conjunction with organisational and contextual factors, will have on designing or adopting an accounting information system, and its consequences on performance outcomes. In congruence with the accounting information system effectiveness literature, this study posits that the adoption or design of a more sophisticated costing system is nothing other than the practical success tool of the strategic planning. Furthermore, the study posits that the process starts from the cognitive reasoning process of the top management through cost-benefit analysis relative to the economic benefit of adopting an innovative costing system. Adding to the argument of DeLone and Mclean (1992, 2003) relative to the role of top management in determining the ultimate effectiveness of an information system, this current study stipulates that the top management's role starts at the beginning of the process. It starts at the input stage prior to the adoption of an innovative accounting costing system through management awareness and knowledge. Later, this role is reinforced through knowledge values shared to other social actors within the company – management support. The effectiveness of the adoption of such accounting information systems is measured by the users – top management - satisfaction with the system and the use of the AIS in the decision making.

Another measurement used in this current study is the use of the costing system sophistication itself for decision making and in cost management. The proponents of ABC argue that the use of ABC helps to capture the economic benefits of the production processes (Banker *et al.*, 2008). It also helps to generate accurate information

needed by the managers for decision making. The users of an accounting information system will need to gather the information needed to create more value in each process of production or transformation. At the same time, the synergy created with the managers' level of satisfaction leads to more accurate information on costs and effective decision making (Diavastis *et al.*, 2016). Diavastis *et al.*'s (2016) study on the interplay between AIS users' satisfaction and the use of CSS concluded with a positive influence towards organisational performance. Therefore, the use of CSS by itself constitutes a subjective measurement which indicates, indirectly, a creation of value of processes within the organisation, and by this regard determines the effectiveness of the information system. The following section presents some empirical evidence on the association between CSS and organisational performance.

5.4 CSS and organisational performance empirical evidence

The control perspective of management in organisation places organisational effectiveness as a fundamental pillar of contingency theory. In this regard, management accounting information systems must be investigated as part of large organisations' control packages (Otley, 2016). Indeed, CSS was developed in the 1980's as an information system to overcome cost distortion caused by traditional costing systems, and also to help strategic decision making (Gupta and Galloway, 2003). Thus, as suggested by theories of diffusion of innovations, the adoption of CSS directly and indirectly influences organisational performance (Bescos and Charaf, 2013). According to Cooper and Kaplan (1999), the adoption of a more sophisticated costing system helps the organisation's decision making to achieve organisational performance. Various empirical evidence in management accounting research indicates a positive association between CSS and performance outcomes (Miryazdi and Jusoh, 2015;

Bescos and Charaf, 2013; Kennedy and Afflect-Graves, 2001; Ittner *et al.*, 2002; Cagwin and Bouwman, 2002; Vetchagool *et al.*, 2021).

Miryazdi and Jusoh (2015) argued that organisations at a higher level of diffusion cost system sophistication have better organisational financial performance when compared to those at a lower stage of diffusion of CSS. The study examines the performance consequences among Iranian manufacturers from stock exchange firms based on the four stages of the diffusion of CSS. In the same way, Bescos and Charaf (2013) posit that the adoption of CSS is motivated by the search of organisation effectiveness to face pressures from the business environment, such as globalization. They carry on by stating that CSS provides a better allocation of costs and a better link between the adoption of CSS and an organisation's performance. The findings reveal that there is a direct effect between CSS and performance at the Central Bank of Morocco.

Kennedy and Afflect-Graves (2001) concluded that companies that adopted a more sophisticated costing system outperform – when measured by Holding Period Returns, Cumulative Abnormal Returns - by 27% in comparison to non-adopters of CSS. Furthermore, the findings reveal that CSS increases an organisation's value through effective utilisation of resources and cost control. Ittner *et al.* (2002) found a positive association between CSS and manufacturing performance. Specifically, they found that it is related to improvement of quality and time cycle. In addition, CSS reduces manufacturing cost. Recently, Vetchagool *et al.* (2021) used structural equation modelling to assess the impact of the adoption of CSS and ISO 9000 on organisational performance. The result indicates a significant relationship between the use of CSS and ISO 9000 and organisational performance. In congruence, Cagwin and Bouwman

(2002) conclude that the improvement of performance – return on investment - occurred when CSS is used in concurrence with other initiatives.

In contrast to other findings, Banker *et al.* (2008) asserted that the association between CSS and performance is indirect. It is mediated by the world class manufacturing practices. Based on the sample collected from US manufacturing plants, the result indicates that the association between CSS and performance has no significant direct impact on the plant's performance. Thus, to have a full understanding of the impact of CSS, you must integrate the missing link – world class manufacturing practices. In the same way, using hierarchical regression analysis, Ionannis *et al.* (2016) found that only when the adoption of CSS interacts with accounting information system that users' satisfaction does lead to the improvement of financial performance. The study develops a new framework linking information system user satisfaction theory and contemporary management accounting techniques. The next section presents the hypothesized relationship between the adoption of CSS and the non-financial measurements.

5.5 The adoption of CSS and Non-financial performance.

Adopting an innovative costing system such as CSS is part of a strategic management accounting control system. In this perspective the focus is on control system for performance improvement (Nguyen *et al.*, 2020). Thus, the effectiveness of the organisational performance depends on the fitness with management accounting control (Buhovac and Slapnicar, 2007). The organisational effectiveness can be achieved by controlling non-financial performance (Hashem and Alqatamin, 2021). Non-financial indicators are important as the same level of financial indicators in evaluating the performance of an organisation (Borodin *et al.*, 2019) and can be measured using the

construct such as user satisfaction, time delivery or quality. Therefore, accounting information system - CSS - influences the organisation's non-financial performance by evaluating its contribution in the decision-making process. Hence, the use of CSS in decision making, which is a subjective construct, can be considered as an indicator for performance improvement.

Van der Stede *et al.* (2006) investigated the association between quality-based manufacturing strategy and the usage of objectives and subjective performance measures. The study indicated that the use of diverse measures benefits organisational effectiveness. Moreover, the findings reveal that the alignment between quality-based manufacturing strategy and non-financial measures influences organisational performance positively. Also, Van der Stede *et al.*'s (2006) findings show that manufacturers who put more emphasis on quality use more objective as well as subjective measurements of non-financial measures. For Van der Stede *et al.* (2006), and many more academics and practitioners (Itnner and Larcker, 1998; Hoque, 2004), the traditional financial measurements used for performance are no longer adequate with the new realities of business environment characterized by higher competitiveness, customization, and advances in manufacturing practices. In this regard, non-financial measures reflect more on modern business environment realities and the needs for higher performance.

Similarly, Kaplan and Norton (1996) asserted that non-financial measures provide a leading indicator for performance when compared to financial measures which provide only a lagging indicator. For Kaplan and Norton (1996, p.2) organisations are operating in a complex competitive environment to the point that the complete understanding of the goals and the processes of obtaining those goals are important. Therefore, from the perspective of long-term objectives, Kaplan and Norton (1996) proposed

a framework that provides strategic measurement and management system known as a balanced score card (BSC). The framework measures organisational performance based on financial measurements, as well as non-financial measurements such as customer satisfaction, internal business processes, learning and growth (Kaplan and Norton, 1996 p.8). While the financial measurement tells the story of the past achievement in which long-term business capabilities and customer satisfaction are not critical, the non-financial measures are the drivers of future performance. Moreover, non-financial measures can vehiculate the energies and specific knowledge held by human resources within a firm towards the achievement of long-term strategic goals (Kaplan and Norton, 1996).

Using a contingency model between strategy and performance measurement, Hoque (2004) concluded that there is a positive relationship between management strategic choice and performance mediating through the use of non-financial measurements of performance. According to Govindarajan and Gupta (1985) organisations which follow strategies such as new product development, market share, innovation and customer satisfaction put more weight on non-financial measures to evaluate performance. Similarly, for innovation– oriented strategy, Ittner *et al.* (1997) found that these organisations place more consideration on using non-financial measures for performance – market share, efficiency, quality product, customer satisfaction and employee satisfaction. Ittner *et al.* (1997) investigate the determinant influencing the use of financial and non-financial measures for performance in top management bonus contracts. Those organisations which have innovative and quality-oriented strategies tend to put more weight on non-financial measurements. Moreover, the findings also highlight the fit which must exist between the management practices and strategic goals. Although Ittner *et al.*'s (1997) evidence was based on the scope limited to the

accounting field of compensation, it gives indication on the appropriateness of the use of non-financial measures of performance in another field of accounting research.

In this current research, the adoption of new methods of management costing system – CSS – is investigated in the context of the Democratic Republic of Congo's business environment as a strategic choice of a long-term perspective. Therefore, as suggested by Ittner *et al.* (1997) non-financial measures are relevant measurements of performance consistent with the long-term innovate strategy: users' satisfaction, the use of costing system in costing management and decision making (Diavastis *et al.*, 2016). The assumption in this current study is that CSS is an innovative costing system which can be used for an effective cost system and decision making in the pursuit of organisational effectiveness. As argued throughout this literature, African firms, particularly Congolese firms, need an effective cost management system to face the growing changes in the business environment. However, organisational performance measurements chosen must fit the organisation's strategic purpose. Hence, the measurements are likely to influence the evaluation of the organisational effectiveness. Buhovac and Slapnicar (2007) suggest the chosen measurements for performance evaluation must fit also with the management control systems. Therefore, the preponderant determinant of the organisation's performance is the contingent fit between organisational structure, strategy, and contingencies (Jeremias and Gani, 2004). Previous research found that optimal fit can be realized when organisations adopting CSS align with its contingencies (Krumwiede and Charles, 2006).

Empirical evidence, as previously discussed, suggests that ABC can lead to higher organisational performance. This is possible with the support provided by the organisation, such as management support, adequate resources to invest in innovation, perceived usefulness of the accounting innovation, the clarity of organisational

objectives, fitness with strategy, structure, and contingencies (Chenhall, 2004; Innes *et al.*, 2000). Given the above, a hypothesized model of relationships between factors, CSS and organisational performance is presented in this chapter 5. This current study asserts that the alignment between those constructs is likely to lead to a higher organisational performance measured by non-financial measures. The following section proposes a theoretical model conceptualizing the hypothesized association between CSS and non-financial performance.

5.6 Theoretical model

In addition to the examining of the contextual factors influencing the adoption of cost system sophistication, contingency theory advocates that investigation should seek, at the same time, their impact on organisational performance (Fisher, 1995; Chenhall, 2003; Drury and Tayles, 2005). CSS is positively associated with organisational performance (Cagwin and Bouwman, 2002; Bescos and Charaf, 2013). It has been found that CSS adopters outperform non-adopters (Kennedy and Affleck-Graves, 2001; Miryazdi and Jusoh, 2015). Moreover, the adoption of such sophisticated systems contributes to the organisation's decision making for more effectiveness (Cooper and Kaplan, 1999). Furthermore, the positive relationship between CSS and performance is also ascertained as an indirect relation. Indeed, Banker *et al.* (2008) found that the positive relationship is mediated through manufacturing good practices. Thus, the positive relationship exists only when the adoption of CSS interacts with users' satisfaction. From this perspective, effectiveness is achieved through users' satisfaction. Therefore, users' satisfaction with the use of the management accounting system in the process of decision-making constitutes one of the indicators of an accounting information system (Ben-Zvi, 2012).

Based on DeLone and Mclean's (1992, 2003) model of the effectiveness of the accounting information system, this current study proposed to assess the effectiveness of CSS through the use of information systems and users' satisfaction. Prior empirical research indicated that optimal fit can be achieved when CSS adopters align effectively with its contingency's factors (Krumwiede and Charles, 2006). Moreover, only certain design models can enable higher performance and any fit departure from this type of design generates less performance (Drazin and Van de Ven, 1985). In this regard, a theoretical model was developed, as shown in Figure 5.1 below, to assess the impact of the adoption of CSS on the organisation performance. Thus, the model includes the interactive aspect of contingency theory (Drazin and Van de Ven, 1985) which consists of investigating whether the correlation between contextual, behavioural, and non-behavioural factors with CSS impacts organisational performance. The following sections give a brief explanation on the latent construct organisation performance, followed by the development of the hypotheses.

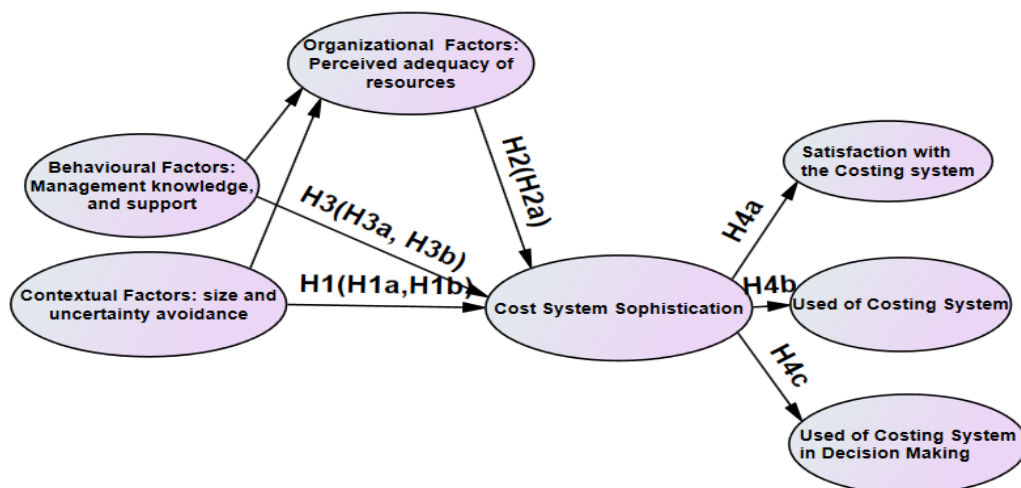


Figure 5. 1 Hypothesized CSS and Non-Financial Performance Indicators.

5.7 Hypothesis development

Product cost system sophistication was developed not only to overcome cost distortion from traditional costing systems but also for strategic decision making (Bescos and Charaf, 2013). From that perspective, according to the diffusion theory, the adoption of an innovative costing system has a goal to influence organisational performance (Bescos and Charaf, 2013). The interactive contingency approach supports the view that the alignment between context and organisational system, such as CSS, would lead to higher organisational performance (Drazin and Van de Ven, 1985). The organisational performance can be evaluated using financial or non-financial measurements. According to Van der Stede *et al.* (2006), non-financial measures are more used by organisations that focus more on innovation strategy. Indeed, by investigating the use of CSS in the context of a developing country, this study places itself in the perspective of innovative Congolese organisations that are looking to improve their decision making by investing in a more innovative costing system. Empirical evidence from Ittner and Larcker (1997) confirmed that there is a positive relationship between non-financial performance and innovation and quality strategy. Similarly, Abdel-Maksoud *et al.* (2005) found that there was a positive association between the use of an advanced management accounting practice – such as CSS – and the use of the non-financial performance measurements. Hence, the expectation is that the adoption of CSS would have a positive impact on organisational effectiveness. The study develops this hypothesis:

H4. The adoption of an innovative costing system – cost system sophistication – has direct and positive impact with organisation non-financial performance measurements: (a) users' satisfaction with the costing system; (b) use of costing system for cost management; (c) use of costing system for decision making.

5.8 Summary

This chapter provides an overview of this current study by covering the influence of the adoption of CSS on the organisations' non-financial performance. Contrarily to most of the studies in literature, this current study adopts a holistic view of management accounting control systems to investigate the impact of adoption of a management accounting information system – CSS - on organisational performance as part of an overall control package. By adopting this approach, this study seeks to provide a remedy for the discrepancies of findings on the question relative to the economic benefit of the adoption of CSS. Therefore, the association between CSS and non-financial performance emerges from the interplay of factors equating to observed pattern perceived adequacy of resources, CSS, and non-financial performance. This chapter establishes that there is a relationship between CSS adoption and performance. Within the context of the Democratic Republic of Congo, in which CSS can be considered as an innovative accounting information system, non-financial measurements are the most appropriate measurements to measure organisational effectiveness.

In addition, the chapter presents the empirical evidence from the literature linking CSS to organisational performance. Thus, the literature indicates that there is a positive relationship between the adoption of CSS and performance. From the perspective of the Congolese context, CSS adoption is considered as an innovative costing system. Therefore, non-financial measures such as user satisfaction, and use of the system for decision making, are found appropriate to indicate the performance improvement. Saying this, the organisational performance depends on the fit between factors, and CSS. This current study posits that it starts from the cognitive perception of top management of the adequacy of resources, passing through shared values of

knowledge to the entire system, and it ends by the top management's appreciation of the effectiveness of CSS as measured by non-financial measurements of performance – users' satisfaction and the use of the CSS in decision making and in cost management. A theoretical model of the hypothesized association between constructs was proposed. The next chapter will present this study's methodology.

Chapter Six: Methodology

6.1 Introduction

This chapter aims to critically discuss this current research's methodology, methods, strategies, data collection, empirical model, and econometric procedure. The chapter starts by providing a rationale of choosing various philosophical assumptions which will be used to guide the reader of this piece of research. Each paradigm was evaluated based on its appropriateness in regard to this research's aim and objectives. This will be followed by the methodological implication of the adopted paradigm- empirical realism. Subsequently, comes the research strategy of a mixed method from the perspective of critical realism. The chapter ends with data collection techniques, empirical model, and econometric procedure.

6.2 Research Philosophy – ontology, epistemology, and axiology

The choice of research methodology and methods are underpinned by the researcher's assumptions on reality and beliefs about knowledge (Crotty, 1998). So, researchers are required to specify the research's philosophical stances. This facilitates the readers, or the observers of the study, to understand the rationale beyond the findings (Crotty, 1998; Heron, 1996; Saunders *et al.*, 2016; Bryman, 2016). Thus, it is imperative to answer some questions relative to the research's epistemology, ontology, methodology and methods. Moreover, the researcher must justify the appropriateness of the chosen philosophical stance, of the methodological stance, and of the methods based on this research's quest or objectives (Creswell, 2014). In literature, research philosophy is described as the underpinning assumptions and beliefs beneath the reasoning process for knowledge development - ontology, epistemology,

and axiology (Bryman, 2016; Saunders *et al.*, 2016). These are assumptions made relative to human knowledge and realities, and social actors' values (Saunders *et al.* 2016).

Ontology refers to the nature of social reality. It indicates the way a social actor considers and investigates the research's objective. It determines how one apprehends the world, therefore affecting the social actor's choice on the type of research (Bryman, 2016; Saunders *et al.*, 2016). According to Crotty (1998), ontology is a study of being of the nature of existence. In this regard, the ontological assumption places the foundation of the research itself, and any modification of the assumption results in a new direction and new research design. Most of the research into management accounting costing systems examining the relationship between context factors and costing systems were based on functionalist assumption that each aspect of society is independent and works towards a societal equilibrium and functioning as a whole. This current study considers that parts of society are in continuous interaction, inter-connection and dependence which lead towards an emergence of patterns and self-organisation. This opposite assumption of reality raises a theoretical problem in understanding and managing contingency relationships. The alternative approach, which is near to reality, shows that the perceived patterns in the system emanate from an interaction of a set of factors from a complex environment. The alternate ontological assumptions of contingent relationships means that the fitness between context-structure and organisational effectiveness does not necessary lead to an equilibrium. This implies that, because of complexity, it is imperative to investigate if the adoption of a more sophisticated cost system will lead to an organisation performance.

There are two extreme ontological positions: the objectivist, and the constructivist (Bryman, 2016,p.29). The objectivist ontology posits that reality confronts the social

actor. Reality is an external fact beyond the social actor's reach and influence (Bryman, 2016). In contrast, the constructivist viewpoint is that reality is socially constructed by the social actor (Bryman, 2016, p.29).

Another type of research assumption that underpins research focus is known as epistemology. This latter refers to the assumption on how you can know what you know(Saunders *et al.*, 2016, Bryman, 2016). It also refers to what is acceptable knowledge, valid knowledge, and legitimate knowledge (Saunders *et al.*, 2016, Bryman, 2016), and how knowledge can be disseminated and transferred (Saunders *et al.*, 2016, Bryman, 2016). Philosophical epistemological stances can be grouped between positivism and interpretivism (Bryman, 2016). Positivism assumptions cascade from natural sciences. It considers that social reality is real and universal. Reality is external to the social actor. It is absolute, granular and in order (Saunders *et al.*, 2016). In contrast, the interpretivism assumptions are extracted from humanities' sciences. Reality is multiple and chaotic (Saunders *et al.*, 2016).

The axiology assumption refers to the value and valuation of things. Biddle and Schafft (2015) describes axiology as “ a nature of ethics and of what we value”. Each social actor will value reality based on his or her own beliefs and backgrounds. This determines why a researcher will choose to investigate on what particular subject and not on the others, or some research questions over others (Biddle and Schafft, 2015). As Ehrenfels (1896) posits, we give value to things based on our own desire. For Ehrenfels (1896) this desire can be towards real things or towards ideal things. The assumption of Ehrenfels (1896) in trying to develop a general theory of value is that there is some absolute value in which are embedded the values considerations. Referring to Ehrenfels(1896), Biddle and Schafft (2015) describe the absolute value as the long-standing prejudices which allude to values just as though they were premises of real

things that make them desirable. In other words, we desire things not because they have got values, rather than we just desire things, therefore it causes us to attribute value to things. Biddle and Schafft (2015) acknowledge that, although each research community has their own particular research norms, researchers in social sciences are showing more engagement with the axiological stances in the designing of academic research. This engagement with the axiology stance is practiced by researchers with critical theory through the practice of a continuous reflexivity and critical subjectivities of the research (Biddle and Schafft, 2015).

In a similar way, the choice of this research subject, or the way we selected research objectives, are consequences of long-standing values characterizing who we are, what valuables we desire, and what is ethical in our perspectives and beliefs. The object of interest in this current research consists of providing an academic contribution for a bright future of African nations through an effective management of Congolese businesses. The findings of this research will provide a framework of complex relationships between factors, CSS, and organisational performance. Practitioners can use the model for more efficient decision making and cost effectiveness. Hence, the choice to conduct this particular research results from our absolute value, Christian values. We consider, as part of our calling – disciples of **Jesus Christ** - to be the light of the world and the salt of the earth. Be the light also means uncovering the unknown through the reasoning process, and through that knowledge making life easier for each living reality; this also includes management of resources and values such as businesses. Based on this absolute value of going deeper in lighting the world, we give more values by going beyond the simple correlation investigation of most of management accounting costing studies in the search for a real truth, which is in this case, the generative mechanism explaining what we can observe in an actual domain and

the empirical domain of reality. By doing this we also give value and respond to the calling as it was ordained by the Lord of Lords to Peter to walk on the water. Yes, as Peter did, we are also attempting to go deeper in the research of truth and walk on the water of knowledge. Therefore, this is our leitmotiv: going deeper and fulfil the calling. In fact, what we are looking for, the object of the quest, without knowing, is Him. This is my, our axiology, our ethics, our valuation of things, what causes us as researchers to keep going or to select the appropriateness of some things and acts over others.

6.3 Research paradigms and epistemic communities

Paradigm is another way of grouping assumptions to differentiate philosophical positions relative to each ideological and political orientation on the reality (Saunders *et al.*, 2016). They are grouped in two poles' extremes –regulation and radical change. While the former refers to the ideological and political stances advocating the status quo, integration, and cohesion, the latter refers to the assumptions calling for revolutionary types of changes by advocating subjects such as conflicts, domination, and emancipation (Saunders *et al.*, 2016). In Table 6.1, Saunders *et al.* (2016) describe four main groups - functionalist, interpretive, radical humanist, and radical structuralist.

Table 6. 1 Four paradigms for organisational analysis

Radical change			
Subjectivist	Radical Humanist	Radical Structuralist	Objectivist
	Interpretive	Functionalist	
Regulation			
Source: Saunders <i>et al.</i> , 2016, p.133.			

The functionalist paradigm involves rational explanation and proposes recommendations relative to the actual structure. The majority of business management research is conducted in the functionalist paradigm (Saunders *et al.*, 2016; Bryman, 2016). The interpretive paradigm refers to an understanding of how humans attempt to make sense of the social reality (Saunders *et al.*, 2016; Bryman, 2016). The radical structuralist paradigm focuses on how to make change based on the analysis of the social reality (Saunders *et al.*, 2016, p.135; Bryman, 2016). The radical humanist paradigm covers assumptions relative to the critical perspective of social reality. It puts emphasis on the political nature and its consequences on the social life surrounding us (Saunders *et al.*, 2016. P.135, Bryman, 2016).

Similarly, Currie (2019) categorizes philosophical assumption as conservative or creative. The conservative orientation is similar to regulation as explained above. Creativity corresponds to the radical change (see Table 6.1). This classification of two poles of philosophical stances can be traced back to Thomas Kuhn and Karl Popper. According to Kuhn (1970), scientists are, in most cases, making a jigsaw by using the pre-existing stools, approaches, and principles. Comparatively, nowadays, most researchers in business management adopt a functionalist perspective in conducting research, and by this means they are filling the literature gap in a particular domain of knowledge without searching to be more creative or more maverick. This is the conservatist, positivist and functionalist perspective. In contrast, Popper (1970) adopted a more creative perspective on how to acquire and transfer knowledge. Popper (1970) posited that a good researcher takes a bold hypothesis to be resiliently tested.

Contemporary, social epistemology goes beyond the testing of hypotheses to integrate the communication aspect of findings (Currie, 2019). This refers to how to bring together scientific communities, infrastructure, and networking in the process of

generating knowledge. This emerging approach is represented in the form of formal modelling of different communities. Formal modelling refers to the views of various scientific communities. Among those formal models there are, agent-based models, landscape, and evolutionary models (from biology), two arm bandit models, rational decision models, and abstract argument models. In this current study, we extracted from the landscape and evolutionary model the Kauffman (NK) model to explain the contextual landscape of Congolese businesses. The landscape and evolutionary model proposed by Chae (2012) was also adapted in order to propose the functioning of various agents or constructs within the model. The landscape of contextual uncertainty helps to understand the extent and the ways in which the constructs hypothesized in this study influence the adoption of CSS and NFPM. The following sections discuss some of the existing paradigms.

6.3.1 Research philosophical paradigms and appropriateness

As the table 6.2 illustrates there are two extremes of philosophical paradigms: the positivism versus the interpretivism.

Table 6. 2 Research philosophical paradigms

	Positivism	Interpretivism
Ontology	Realist- reality is objective and pre-existing the social actor (Lukes,1982; by Emilie Durkheim (1858-1917)	Relativist- reality is subjective and socially constructed, reconstructed (Burrell and Morgan, 1979)
Epistemology	Science is objective and value free.	Science is subjective and value driven.
Methodology	Used of deduction process. Theories consist of testing hypotheses. uses instruments for data collection such as surveys, statistics, and quantitative data in the pursuit of objective and rigorous knowledge (Neuman, 2011). Experimental and manipulative	Use of induction process. Through observation of facts that emerges theories. Hermeneutic, dialectic, individually constructed.
Appropriateness toward this research objectives	Appropriate in establishing relationships between variables. But not appropriate in illustrating the explanatory mechanism.	Appropriate at some extent. But the interpretivist paradigm standalone might fail to meet some of the methodological requirements.

Most of the research in management accounting costing system, particular that relative to contingency theory on the impact of contextual factors on the adoption of CSS, were conducted on the basis of positivist survey questionnaires' perspective (Al-Omiri and Drury, 2007; Brierley, 2008; Drury and Tayles, 2005; Otley, 1980; Bjørnenak, 1997; Malmi, 1999; Booth and Giacobbe, 1998; Hoque, 2000a,b; Clarke *et al.*, 1999; Krumwiede, 1998; Gosselin, 1997). However, those research's findings resulted in inconsistencies and discrepancies. To mitigate those setbacks, this current research opted to choose a different epistemological stance which will be most in tune with the basic principle of contingency in its naturalistic ways. Furthermore, critics arose against the dominance of positivism. They were concerned about the anomalies and inconsistencies in positivism-based research findings (Morgan, 2007). The failing predictions of positivist findings led to a reviewing of the philosophical assumptions underpinning the positivist paradigm. This allowed a shift of paradigm by putting more attention on the qualitative side of research.

Contrary to positivism, interpretivism asserts the use of strategy which takes into consideration differences between peoples, opinions, or the object of the research. To answer to this research question on the why organisations adopt a CSS or to the way in which factors influence the adoption of CSS, the quest of research goes beyond the explanation of the eventual association between context-structure. The researcher in this regard attempts to provide a meaning to the pattern emerging from the interplay of various reality. Therefore, epistemologically, the interpretivist argues that knowledge is acquired through the apprehension of human and social interaction by which a subjective meaning of social reality is created, rather than through the hypothetical deductive reasoning process (Walsham, 1995; Chen and Hirschleim, 2004). In this perspective, the interpretive paradigm may provide an appropriate

philosophical stance through which to investigate the complexity of interaction between various behaviour factors from which emerge pattern equating to factors→CSS→OP.

According to Walsham (1995), the aim and scope of an information system goes beyond the simple aspect of capturing and processing information for decision making. It also includes the understanding of the context surrounding the management of the information system itself. In this regard, the researcher can gain the insider's point of views about the information system by investigating how the process influences the context as well as how the context influences the system. Therefore, the semi-structured interview is the most appropriate means in order to capture information from the insider's perspective for any investigation seeking for more understanding of the context of adopting a more sophisticated system, and how this influences the organisational effectiveness. However, due to this current research quest of searching also to establish the explanatory mechanism beneath the relationship between factors, CSS and organisational performance, the interpretivist paradigm standalone might fail to meet some of the methodological requirements. The following sections discuss on pragmatism and critical realism which are in line with this research objectives.

6.3.2 Pragmatism

The pragmatism paradigm considers that the relevance of concepts resides in the fact that they can support actions (Saunders *et al.*, 2016; Bryman, 2016; Morgan, 2017). The pragmatist social actor attempts to provide a solution to a problem in order to inform future practices based on the research's findings. Thus, a pragmatist is more concerned with practical solutions rather than abstract findings (Morgan, 2007). Therefore, for the pragmatic paradigm, the use of multiple methodological approaches is

justifiable – quantitative and qualitative- in the process of finding a practical solution. The pragmatic approach suggests the use of abductive reasoning. Pragmatist research moves back and forth between inductive reasoning and deductive reasoning (Saunders *et al.*, 2016; Bryman, 2016; Morgan, 2007).

It is imperative to note that there are diverse types of pragmatism: functional pragmatism, referential pragmatism, and methodological pragmatism (Goldkuhl, 2012). Functional pragmatism's knowledge is considered as a basis for action. Referential pragmatism considers action as a primary focus for any empirical and theoretical investigation. However, methodological pragmatism is more concerned with how knowledge is created. A researcher, in that process of creating knowledge, does not take a dogmatic position. They adopt a pluralist attitude by using methods or a combination of methods that work the best on the basis of the purpose of the study and also of the current empirical position (Goldkuhl, 2012).

This current study searches to find out to which extent factors influence the design or choice of a costing system. Designing a costing system is one of examples of constructive knowledge (Goldkuhl, 2012). This calls to a pragmatic thinking as it includes, in the process, the prospective, prescriptive, and normative aspects of knowledge. In this aspect, the current study can adopt a methodological pragmatic thinking as philosophical stance within a pluralist perspective. However, to answer the research question brings researchers to the purpose of the research or to the question the research is endeavouring to answer (Crotty, 1998). The purpose of the research is the first step to undertake in order to shape the philosophical thinking of a research project. While philosophical assumption stances are pivotal, the research statement of the problem, or the research questions (or research objectives), are fundamental (Creswell, 2014). As this research seeks to find out the extent to which, and in which

ways, the contextual factors influence the adoption of CSS and organisational performance, this quest is of an abstract realm rather than a quest of action. It appears correct to adopt a more pluralist process of thinking, a non-dogmatic thinking, in regard to philosophical stances in which are embedded in this empirical study. While pragmatism sounds appropriate for a methodology for a non-purist philosophical stance, it is not appropriate in regard to this research's objectives. Pragmatism is mostly used in order to find a solution to a quest rather than uncovering the why and the what of associations. Therefore, methodological pragmatism would not be the best option to answer this research questions as expressed in the form of objectives (see Chapter 1).

6.3.3 Critical realism and this current research's ontology and epistemology

Realism considers that natural science and social science can use the same types of approach for data collection and explanation (Saunders *et al.*, 2016, Modell, 2020a; Bhaskar, 1975). Similar to positivism, realism asserts that reality pre-exists the social actor, it is external (Bhaskar, 1975). Empirical realism considers the fact that reality can be apprehended using appropriate methods. Critical realism considers that reality is pre-existent, and it is of a natural order. However, events and discourses are from social order. In this regard, the researcher can understand and modify the social order or events only when he/she uncovers the social structures that generate them. In other words, critical realism aims to uncover the causal mechanism beneath a phenomenon and its intended effects (Miller and Tsang, 2010). This current study leans more towards a critical realism as it can help to elucidate the anomalies or discrepancies discovered in the various positivist studies in management accounting costing system literature. The study seeks to uncover the causal mechanism beneath the

emerging phenomenon and the effect that phenomenon has on CSS and organisational performance.

Indeed, the critical realism ontology posits the existence of the reality independent of the social actor's knowledge or perception of it (Bhaskar, 1975; Zachariadis *et al.*, 2013). At the same time, critical epistemology posits a fallibilist stance which stipulates that the social actor's knowledge of reality is socially constructed (Miller and Tsang, 2010, p.144). The existence of external reality outside the knowledge of researchers infers that knowledge's claim, in realist philosophical stances, can be logically and empirically challenged (Miller and Tsang, 2010). Bhaskar (1975, p.43) argues that to be fallibilist about knowledge you have to be a realist about things, whereas to be dogmatic about knowledge is to be a sceptic about things. Thus, critical realism ontology combines a little bit of realism and constructivism (Elder-Vass, 2012). In this regard, according to Modell (2009), critical realism does not adhere to the existence of "naïve realism", a singular objective reality which is made knowable without being filtered through theories applied by the social actors.

Critical realism as part of critical accounting research paradigm (opposite to positivism accounting research) evolves on the critics of such singularity, and at the same time acknowledges the view of reality as partly mind independent. The critical perspective on accounting provides possibility for researchers and practitioners to face the challenges of the environmental changes that global business environment is bringing in and from which conventional theories and practices are no more fit for purposes (Baker, 2011). Indeed, the critical perspective acknowledges that the accounting practices are inexplicably connected with a various set of societal, behavioural, distributive, political, and more issues of the modern era of globalisation (Baker, 2011). It has also an editorial perspective toward social change (Baker, 2011).

In his book "A realist theory of science" Bhaskar (1975) proposed critical realism as an alternative philosophical stance to the positivist stance based on the theory of causal laws. He argued that the constant conjunction of events is not a sufficient or necessary condition for establishing scientific law. He continues by arguing that it is only if we established the scientific law that we can provide the appropriate rationale for the conjunction of events. In other words, it shows that the structures exist independently of the actual manifestation of events; it is the pattern of events that we can experiment with and from the structure of things we can comprehend the sense of our performance of the events (Bhaskar, 1975, pp. 13-15).

Therefore, according to Bhaskar (1975) there are mechanisms that provide explanations. Reality is distinguished by three domains: the domain of the real, the domain of the actual and the domain of the empirical (Bhaskar, 1975; Modell, 2009). The domain of the real refers to the factual basis of the causal laws, the ways of acting of things. From these mechanisms, which endure or act independently of men through a process of enabling or preventing change (Miller and Tsang, 2010, p.144; Modell, 2009), emerge events or patterns in the actual domain, some of which can be experienced whereas others cannot. Those which can be experienced through direct or indirect observation are part of the empirical domain. For Miller and Tsang (2010, p.145) the implication of mechanisms has to be actualized or empirically evidenced. Therefore, argued Carter and New (2004), empirical realism seeks to test explanations that go beyond the correlations between various conjunctions of events and consequences. As such, in this study, rather than focusing solely on the empirical outcomes of the contingent relationship between contextual factors, CSS and organisational performance, the critical realist seeks an explanation of mechanisms from which emerge those precedents and consequent events. Notwithstanding, the causal powers of the

appearance of the event is permanently indeterminate, therefore the full effects are not definitely known by the social actors (Modell, 2017).

The methodological implications of the critical realist philosophical stances are: (a) distinguishing reality in the real domain, the actual domain, and the empirical domain, (b) to theorize supposes to propose mechanisms that explain events (Bhaskar, 1975). Therefore, posit Miller and Tsang (2010), to identify a mechanism researchers have to synchronize together the two traditional reasoning processes of deduction and induction to form what they call “retroduction”. According to Bhaskar (1975, p.105-117), it is an inferential reasoning process that reconstructs that which lies behind the condition of occurrence of a pattern of events. Thus, retroduction seeks to identify the generative critical mechanism from which emerge the generalized instance and the occurrence of the patterns.

Miller and Tsang (2010, pp. 147- 150) propose four steps of testing mechanisms by critical realist methods:

Step 1: Identifying the mechanisms believed to explain the hypothesized relationships within the study’s scope. In this study, this step requires investigation based on the interpretative stance the interface of the theory, and the context of the study, The Democratic Republic of Congo. For Miller and Tsang (2010), researchers will have contextualized the explanatory structure of the study underpinning hypothesized causal relationships. What are the mechanisms (could be more than one) which account for the causal relationship of contextual factors and the adoption of CSS in the context of the uncertain environment of The Democratic Republic of Congo? An unobserved adequacy of resources to invest in costing systems can be seen through a variety of manifest effects such as size, management knowledge or management supports. Thus, multiple indicators can be used as latent constructs in structural equation

modelling to indicate the construct of interest which is the occurrence of the perceived adequacy of resources to invest.

Step 2: Testing of the presence of the mechanisms in an empirical setting: If the causal mechanism exists, the following step consists of testing the existence of the hypothesized relationships. If it exists, then the theory is valid. On the contrary, if it does not exist, the theory is not valid. This stage is important and crucial, rather than jumping straight away to testing the relationships between the constructs and the dependent variables.

Step 3: Test isolated relations: In the case of existing evidence affirming the presence of the theorized mechanisms, step 3 seeks to test their causal effects. Step 3 illustrates the relationships between variables.

Step 4: Test the theoretical system: In case the empirical data confirms the theoretical mechanism and their effects, this step seeks to evaluate the implication of this mechanism jointly. This stage moves the analysis from the isolated test of the theorized mechanism to measuring the entire complex system. Step 4 switches from the mechanisms of step 1, of partial correlations, and seeks the use of multivariate methods. Therefore, correlational analysis has to be complemented by other analysis directly testing the mechanisms for the study to include the entire theoretical system of the interest. Structural Equation Modelling appears to be the most appropriate econometric tool to compute such complex analysis. Researchers also need to acknowledge potential relevant outside contingencies such as the uncertainty landscape of this study or various control variables.

Finally, the research design in critical realism is particularly pluralist (Miller and Tsang, 2010; Modell, 2009, 2017, 2020). This is appropriate as various methods apprehend various aspects of the reality. The triangulation of mixed methods will yield a

better understanding of the emerging of the phenomenon between factors and CSS adoption within an extensive or intensive set of testing. In the extensive research tests, this study seeks to find the generalities across the relationships between variables. The quantitative methods seem the most appropriate. Whereas, in an intensive setting the researcher tries to find the explanatory mechanisms relevant in the emerging of the patterns. For this, the qualitative approach seems the most appropriate. Critical realism encourages mixed methods (Mingers, 2006).

Baker and Modell (2017) conducted a field study in one of the Australian packaging companies on the performative's effects of Corporate Social Responsibility from the perspective of critical realism. The study adds to the structuralist understanding of the performativity by highlighting systematically the causal powers underpinning the performative patterns. They continue by explaining, through a retroductive and retroductive process, how performative patterns are activated through pre-existent social structures conceptualized in the form of multiple and interrelated norm circles – customer demands, normative management knowledge, and labour rights. Furthermore, the findings empirically demonstrated how one of the concepts of the Corporate Social Responsibility on the shared values, in intersection with the interplay of causal powers beneath the norm circles, activates or supresses the emergence of tendencies - performativity of CSR. The study was novel in the literature of performativity in the accounting literature from the perspective of critical realism.

Similarly, Scott *et al.*(2017) examined the effects of SWIFT adoption on banks' performance in a longitudinal study in 29 countries. The study was conducted from the perspective of critical realism. The purpose was to identify the mechanisms - the causal powers in the domain of the real - underpinning the observed events in the empirical domain. The findings indicate that the adoption of SWIFT has a significant

impact on the long-term for the organisation's profitability. Furthermore, when comparison is made between small and large companies, the effects are greater on small organisations. Moreover, a domino effect was pointed out as a generative mechanism activating the benefit of adoption. The retrodiction depth analysis also shows the value that access to a cooperative of practices has on small and medium enterprises and the role that SWIFT plays as a non-state social actor in conjunction with legislators in writing international regulations between businesses.

6.4 This research's strategy

This research adopts a quantitative research method to analyse data collected with a questionnaire survey. A quantitative approach has been considered as the more objective and scientific strategy (Bryman, 2016). It relates to quantifiable data and numerical data. The approach emphasizes the testing of hypotheses and theories through a deduction reasoning process (Bryman, 2016). According to Bryman (2016) and Saunders *et al.* (2016), there are some setbacks with a quantitative approach. Firstly, it fails to distinguish between the natural order and the social world. Secondly, the measurement process integrates a sense of precision and accuracy. Thirdly, the extreme reliance on instruments and procedures can be detrimental to the reality of social life. Finally, the analysis of relationships creates a static and mechanic view of reality which is considered as being independent to the social actors.

Additionally, this research adopts, at the same time, a qualitative research method for data analysis. Qualitative research emphasizes words rather than quantification of data and analysis. It seeks for a deep understanding of the where, what, why and how of the phenomenon. The approach is inductivist, constructivist and

interpretivist. There are various techniques to collect qualitative data, among it the use of a semi-structured interview. Therefore, this research adopts a combination of the two approaches: quantitative and qualitative approach. Both approaches in management accounting research are summarized in the following section.

6.4.1 Quantitative approach in this research

The first objective of this research consists of examining the relationships between contextual, behavioural, managerial, and organisational factors in costing system sophistication (CSS). A quantitative approach within a critical realism is often considered as descriptive because of the fact that quantifiable description and correlation does not provide the causal explanation of the phenomenon of the study observed in the empirical domain (Zachariadis *et al.*, 2013). On that basis, from the perspective of critical realism, the quantitative method has to be associated with the qualitative method in order to uncover the mechanisms generating the patterns observed in the actual domain. In addition, to avoid criticism of fallacy from the statistical methods used in quantitative approach (regression analysis), this current study uses Structural Equation Modelling, which aligns more with the critical realism ontology (Zachariadis *et al.*, 2013). As such, the study adopts a perspective of a demi-regularity, which is considered to be a partial event regularity showing the occasional pattern or tendency of the phenomenon within a specific context and under specific conditions in time and space. As such, this current study is conducted within the Congolese business context within the space-time condition described as the contextual uncertainty of Congolese Business environment in 2022. In this regard, demi-regularities help to:

- (1) focus on the research design and hypothesis development on the generative causal mechanisms.

(2) help to assess and interpret findings (Zachariadis *et al.*, 2013).

The focus is on the patterns which will emerge from the hypothesized confirmatory factor analysis between the construct “Perceived Adequacy of Resources” and a concerted set of factors. Further enquiry by means of a qualitative literature review will be conducted. The following section discusses the qualitative approach and its contribution from the perspective of critical realism.

6.4.2 Qualitative approach in this research

The qualitative approach helps to find out the how and why, or the mechanism, beneath the existing relationship uncovered between factors and the adoption of CSS. In addition, it provides a depth of understanding of the impact of adopting a more sophisticated costing system on organisational performance. The non-financial constructs used to measure organisational performance are subjective. The qualitative approach helps form the discourse of participants to grasp the depth of meaning, understanding and interpretation of the why of this eventual relationship. It uses an inductive reasoning process to generate theories. It starts by observation of facts from which theories will be generated. Data collection used for this second stage of this research is by means of semi-structured interviews and information analysis.

A qualitative approach was used in management accounting-based research for the study of the how and why occurrence of a phenomenon. What it is or is not or is in the process of becoming. Therefore, it focuses on how and why phenomena emerge, settle, or become (Burns, 2014). In this regard, it adopts a process-oriented perspective, which acknowledges that organisational system is complex, evolutive, uncertain, unpredictable, flowing, emancipating, or changing (Burns, 2014). Various theories were used in order to interpret results from cross-sectional or longitudinal qualitative accounting management research. Among them, there is a contingency

theory (Drury and Tayles, 2005). Sometime combination of theories is used as an attempt to draw out more insights and rich interpretation of empirical findings (Busco and Scapens, 2011). So, a pluralism stance is sometime encouraged in qualitative management accounting research (Burns, 2014). As such, this current research proposes a combination of contingency theory and complexity theory to draw out a rich understanding on the question relative to the extent to which, and in what ways, a set of factors influences the adoption of CSS and further organisational effectiveness. This is a complex and dynamic set of relationships in an evolutive organisational system. Therefore, a qualitative approach is appropriate to uncover the way the phenomenon of the adoption of CSS is unfolding through time.

Especially, in critical realism, the qualitative approach plays a preponderant role. Interviews will help to understand the mechanisms generating the emergence of events, but also identify structures and the mechanisms in interplay within a complex system (Zachariadis *et al.*, 2013). Because social structure is concept related, there is a need to interpret and understand findings from qualitative analysis based on the contextual uncertainty of the Congolese landscape. According to Mingers (2004) social structures are geographically and historically dependent on the social context systems in which they are embedded. They are inherently interactive and open (Mingers, 2004). In these circumstances, a qualitative approach plays the role of providing the conditions (the external contingent – time and space) under which the appearance of the phenomenon occurs. Similarly, according to Zachariadis *et al.*, (2013) a qualitative approach distinguishes the external contingent to the internal context - the necessary aspect of the objects of the study and its social structures. Therefore, through the lens of the Congolese contextual uncertainty landscape (the external circumstances which are space and time dependent), this research's findings (the necessary internal aspect

of objects and structure) will be interpreted. The following section presents a summary of this current research's mixed methods.

6.4.3 Mixed method as methodology

Mixed method combines the integration of quantitative and qualitative strategy to provide complementary insights in the same empirical phenomenon in the objective of improving the validity of representations (Bryman, 2016; Modell, 2009). This is far away from other types of combination between various research methods from different stances. Thus, It does not include cases where research strategies are used to provide a background to results emerging from the used of other research strategies methods without any combination between those strategies for the purpose of validation.

There are various types of mixed methods design based on the decision priority – the weight of the data collection type - and the sequence decision – the order of precedence in the use of each research strategy (Bryman, 2016).

Table 6. 3 Mixed methods design matrix

Paradigm emphasis decision	Equal status Dominant status	Time order decision	
		Concurrent	Sequential
		QUAL + QUAN	QUAL → QUAN QUAN → QUAL
		QUAL + quan QUAN + qual	QUAL → quan Qual → QUAN QUAN → qual Quan → QUAL
		Qual: qualitative research strategy Quan: quantitative research strategy Source: Johnson and Onwuegbuzie(2004)	

- 1) The convergent parallel mixed methods design type uses simultaneously both the quantitative and the qualitative research strategies with the same weight of decision priority. Results from analysis are compared and merged in order to form an integrated findings for the entire research.

- 2) The explanatory sequential mixed methods type gives priority to the results from the qualitative findings to form hypotheses which will be later tested through using quantitative research strategy for aim to develop questionnaire or to infer generalisation of the qualitative results.
- 3) Or the explanatory sequential starts with the quantitative research strategy for data collection which will be followed by qualitative strategy in order to provide more in depth understanding of the quantitative findings or depth explanation which can come only through a qualitative method.
- 4) In the embedded mixed method design each research strategy can have priority but at the same time getting insights from the other methods findings as well as from the context of the study. In this type, data can be collected simultaneously or sequentially.

As previously argued both methods – Quantitative and qualitative- are used for the purpose of validation of the integrated findings. However, the choice of which type of mixed methods design to choose depends on the role the mixed methods will play in the pursuit of the research objectives (Bryman, 2016). Consequently, in critical realism as the weight is more on the findings of the mechanisms in the real domain of reality, qualitative method will have more priority but at the same time within the retrodiction and retrodiction reasoning process extracting insights from each method findings and from the context of the study. Therefore, this current study opts for the embedded mixed method design. The following section will give more details on the mixed methods use in the perspective of critical realism.

6.5 Mixed methods in Critical Realism

Critical realism has been considered among the prominent theoretical frameworks capable of offering practical guidance for mixed methods research design

(Zachariadis *et al.*, 2013; Mingers, 2004). Based on critiques of the two popular paradigms of positivism (realism) and constructivism. Mingers (2004) argued that critical realism is a way of providing a consistent and pertinent philosophy in information system research. Positivism, on the one hand, has been considered as resulting in a weak empiricist view leading to a deprivation of the strength of the realist ontology and causality, while on the other hand, constructivism and post modernism undermines even the tenets of science and rationality. In this regard, critical realism adopts various methodological approaches. This makes it attractive for information system research, as well as for management accounting information-based research, a practice-oriented research-based method culminating from the tenets of both natural science and social science (Mingers, 2004). Modell (2020b) posits that critical realism is a bridge transcending the gap between the current division between the realist and the constructivist positions of reality. He argues that critical realism integrates both the emic and etic approach to form a complex causal association for the purpose of uncovering patterns which are occurring in the actual domain within a specific context. As such, it is a basis for establishing management accounting research that integrates both the economic and sociological aspects of reality (Modell, 2020b). In this regard, critical realism is pluralist. It is a rapprochement to the positivist conception of reality as well as a rapprochement to the constructivist conception of reality. This rapprochement has methodological implication on the validity and reliability of inferences.

Indeed, in mixed methods literature, validity often refers to the quality and rigour of a study (Zachariadis *et al.*, 2013). It signifies the extent to which research results reflect the object of the study (Collis and Hussey, 2009). Three types of validity have been highlighted in mixed methods literature: internal validity, measurement validity and inferential validity (Venkatesh *et al.*, 2013). Depending on which research

approach design is adopted, each validity refers to a particular meaning. In the quantitative approach, design validity indicates the internal validity and external validity. The internal validity signifies that the correlation observed is the causality of a constant conjunction of events, while the external validity refers to the generalization or extrapolation of the findings. The measurement validity refers to the analytical reliability, the consistency of the data, in the absence of measurement error. In addition, it refers also to the construct validity, which is an indication of the degree to which the constructs used captured the information they are intended to capture. Finally, the inferential validity refers to the statistical validity by showing the degree to which the statistical findings are significant to make inferences. In a qualitative approach, validity is paramount as it determines how well the research was designed and conducted. Design validity, first of all, indicates how well the qualitative research was designed and executed. Secondly, how well data collected were analysed resulting in consistent, dependable, and plausible findings (measurement validity). Finally, inferential validity in a qualitative approach provides the overall quality of the interpretation and inferences of the study.

Similarly, reliability portrays the quality of the research conducted at the same time as research validity. It signifies the absence of differences in the findings in case of a repetition of the same study (Collis and Hussey, 2009). In other words, if the same research is repeated within the same conditions it will result in the same outcome. Therefore, it refers to the consistency of the measurements (Bryman, 2016). In a quantitative approach, it signifies that those numerical findings generated by a particular indicator or construct will remain the same although process and instrument are different (Bryman, 2016; Neuman, 2011). In a qualitative approach, reliability has the same meaning of consistency relative to the making of observations over time using

various techniques of data collection such as interviews or document analysis (Neuman, 2011; Bryman, 2016). Various inclusive criteria were used with Structural Equation Modelling to determine the validity and reliability of this research. Cronbach's Alpha's value was also used to measure the reliability of the data collected through a survey questionnaire. An alpha value between 0.90 to 1.0 is considered excellent; between 0.80 to 0.89 is considered as good; 0.70 to 0.79 acceptable, 0.60 to 0.69 questionable; 0.50 to 0.59 poor and below 0.50 unacceptable. An SPSS Cronbach Alpha analysis has revealed a value of 0.79 for 42 items of the survey questionnaire. The value of 0.79 is an acceptable inclusion criterion. Thus, it is statistically reliable.

In critical realism, the focus is on finding the generative mechanisms beneath the occurrence of events. In a conventional quantitative approach for design validity, the observation of correlation between factors in a causal effect determines the internal design. In critical realism the attention is focused on validating that the occurrence of events is a manifestation resulting from a particular generative mechanism within a particular context of the field. Therefore, the external validity consists of asserting that the existence of one or more generative mechanisms explaining the occurrence of events in a particular context has the same likelihood to generate a similar event in a different context. Similar to conventional measurement validity, in critical realism the reliability refers to the non-measurement error of the measurement used in the method. In addition, construct validity in critical realism refers to the fact whether data that are empirically available provide valid knowledge on the emerging pattern caused by the generative mechanism. The inferential validity refers to whether results from statistical analysis provide information on the constant conjunction of events observed in the empirical domain.

Additionally, in a qualitative approach, descriptive and credibility validity are concerned with the explanation of the mechanism beneath the emerging pattern and the condition with which they are in interplay, as well as the appreciation of the field by highlighting and scoping the context of the study. The transferability concerns the idea that similar events occurring in different scenarios are caused by the same generative mechanism causing the current event's manifestation. For the analytical validity, in a qualitative approach, theoretical validity in critical realism refers to the use of theory to hypothesize about the mechanism and provide an explanation about the event's appearance. Dependability in critical realism refers to the contingent factors surrounding the object. In regard to the consistency, in critical realism this is about challenging and informing the process of continuous enquiry in a retroductive reasoning. Furthermore, plausibility in critical realism indicates that data are empirically available. They provide a valid knowledge of the manifestation of the observed pattern in an actual domain resulting from the hypothesized generative mechanism from the real domain. Finally, for the inferential validity, results from the qualitative approach can portray information on the intransitive structure, the generative mechanisms that cause the constant conjunction of events at the empirical domain.

In summary, in the conventional mixed methods construct validity, the correlation between the theoretical constructs and the observed variables from the empirical domain suffice to establish validity. Whereas, in critical realism, construct validity refers to the link between the generative mechanism from the real domain that causes the events from the actual domain which are experienced in the empirical domain. The external validity represents an attempt to generalize in an empirical domain by asserting that the generative mechanism causing the appearance of events between measurements can be applied in a different context, and with alternative measures. The

following section discuss on this current study mixed methods from the perspective of critical realism.

6.6 Current study's mixed methods

This current research aims to uncover the mechanism beneath the relationship observed between factors with the adoption of CSS, and subsequently its impact on the organisation's effectiveness. Moreover, it proposes a best fit model linking factors, CSS, and organisational performance. To achieve these research objectives, a cross-sectional study was conducted under the retrodution and retrodiction reasoning processes.

6.6.1 A cross-sectional study

Cross-sectional field study is recognised in management accounting literature as a research method helping to address specific knowledge gaps and bridge the gaps between field research and empirical research (Lillis and Mundy, 2005). By doing so, it responds to the call for more approaches to face the issue of lack of generalizability of case studies or lack of connection between findings in the theoretical basis of management accounting. It has been used in management accounting research to deepen insights into constructs or constant conjunctions of events which have been empirically explored. Cross-sectional study broadens understanding on the cross-case patterns in a specific context and detects variation in interpretation of practice such as ABC or BSC (Lilly and Mundy, 2005). Among the previous studies, we can enumerate research conducted in respect of non-linearities between variables, multidirectional relationships (covariance relationships) and causal intervals (Merchant, 1985; Abernethy and Lillis, 1995).

Merchant (1985) used a field study, a cross-sectional study, to explore how discretionary program decisions are controlled among decentralized organisations. The findings indicate that decisions are influenced by many devices called controls. Furthermore, the effects of the controls vary according to the characteristics of profits centres. Similarly, Abernethy and Lillis (1995) used a cross-sectional approach in conducting research on the impact of manufacturing flexibility on the efficiency-based performance measurement and the use of integrative liaison devices. Data were collected through semi-structured interviews.

Both empirical examples are similar to this current study, which aims to uncover the impact of multiple factors on the emerging patterns in the actual domain. As such, a cross-sectional approach is adequate and appropriate. This is also appropriate when there is an established theory - contingency theory- relating to the phenomena under study (Lillis and Mundy, 2005). Thus, this study designs a mixed methods reproductive methodology in order to identify the generative mechanisms in the domain of real explaining the constant conjunction of events - perceived adequacy of resources, CSS adoption and higher organisational performance - observed in the empirical domain.

6.6.2 Retrodution and retrodiction

The reasoning process of theorizing abstract research and the context-sensitive empirical research from the perspective of critical realism research is made through retrodution and retrodiction (Modell, 2017). Retrodution represents a process of building, theoretically, an informed conjecture on the basis of the patterns observed in the empirical domain relative to the individual causal powers explaining them (Modell, 2017). Because those causal powers are not always observable, researchers draw off abstraction from the events or patterns emerging in a specific and empirical context (Baker and Modell, 2017). Retrodiction is the process of assessing how the

concerted set of causal powers are activated and interplaying between them to enable or restrain the emerging of tendencies in a specific context. As the following sections elucidate, the theoretical development of this current study starts with the retrodiction from which the perceived adequacy of resources is abstracted as a tendency leading to the adoption of a more sophisticated costing system. The second part – retrodiction - attempts to explain that the perceived adequacy of resources is a four structures construct, composed of Size, Uncertainty Avoidance, Management Knowledge, and Management Support. It is the interplay of various social structures that activate the causal powers explaining the adoption of a more sophisticated management accounting costing system. Consequently, the adoption is likely to lead to a higher organisational performance. Furthermore, the retrodiction process provides more insights into the activation of the causal powers – enabler and restrainer mechanisms. The following sub-sections present the steps to follow through in the retroductive and retrodictive reasoning process of this current study.

6.6.2.1 Description step

This research is part of a third stream of literature of CSS which consists of analysing the influence of factors on the design or adoption of such a system in the pursuit of organisational objectives. There is a gap in the literature within the context of the Congolese business's environment regarding the adoption of CSS. In addition, previous studies conducted from the perspective of a positivism survey questionnaire resulted in inconsistency and a lack of a cumulative body of knowledge. Hence, this appreciation stage helps to identify the debate in the field of management accounting costing systems. This exploratory literature review guides the next stage, which emphasizes the econometric modelling.

The key findings from the literature review reveal that CSS design or adoption is positively associated with contextual factors. The literature also helps to identify inconsistencies in the previous findings regarding the association between contextual factors and CSS. At this stage the retroductive process places emphasis on the appreciation and analysis. The inconsistent findings from the preliminary analysis of the literature led to discovering the gap, and consequently shaped the design of this current research, which seeks to discover the generative mechanism explaining the occurrence of the association between factors, CSS, and organisational performance. This stage also clarifies a wide range of research and data collection approaches – the quantitative approach and the qualitative approach.

This research adopts a quantitative data set as a way of analysing the influence of determinants to the adoption of CSS and organisational performance. Structural Equation Modelling as an extensive research method will produce information about the relationship between a combination of contextual, behavioural, and organisational factors on CSS and OP. This will be followed by a qualitative analysis.

6.6.2.2 Retroduction and retrodiction analysis step

This stage consists of abstracting and analysing the constructs in regard to their structure of things and causal powers. The study identifies the determinants influencing CSS adoption or design. The literature review reveals that the contextual factor size was persistently found significant with the adoption of CSS (Aiken and Hage, 1971; Blau and McKinley, 1979; Kimberly and Evanisko, 1981; Ettlie *et al.*, 1984; Joshi, 2001; Chenhall, 2003; Bjørnenak, 1997; Krumwiede, 1998; Drury and Tayles, 2005; Al-Omiri and Drury, 2007; Cinquini *et al.*, 2015; Boukr, 2018). The explanation provided in literature is that this is because large firms do have adequate resources to invest in such innovation (Al-Omiri, 2003). In addition, it has been argued that the

adequacy of resources is positively associated with any other factors influencing the success or failure of CSS (Cohen *et al.*, 2005). Looking to build on this stream, this current study digs deeper to search to uncover the social structure beneath the adequacy of resources which are likely to lead to the adoption of CSS. With the findings from a qualitative interview, the study identifies the generative mechanisms characterizing the structure between factors and CSS. To investigate the question of how the mechanisms are released, retrodiction will be used. The concerted interplay between norms circles creates, in the conception of top managers, a perception of having adequate resources to adopt or design a more sophisticated system. However, the non-linear interaction between norms circles may enable or restrain the causal power which might lead to the appearance or disappearance of the event – PAR, CSS, and OP.

The combined use of the quantitative and qualitative methods and a literature review helps to gather evidence on the factors and norms circles in interplay. It elucidates also how the interplay enacts with (positive loophole) the causal powers or restrains the causal powers by creating continuous liabilities between norms circles. Further, both retrodution and retrodiction help to extract patterns or some regularities from the data collected allowing the researcher a proficient level of confidence for generalization. Hence, the generative mechanism found in this current study can be applied in the different context under some contextual conditions. The external validity does not only provide evidence that the finding of a generative mechanism can also be applied in another similar context, but also infers the statement of causal effect of the perceived adequacy of resources to the adoption of CSS, identified through the enabling of the generative mechanism identified. The next section covers the assessment stage.

6.6.2.3 Retroductive and retrodictive assessment step

After the description and analysis phases comes the assessment phase. At this stage, the researcher will gauge the findings from the retroductive and retrodictive analysis for further analysis of the explanations of the observation of an empirical constant conjunction of the events. The ideal in the SEM is to have a situation of overidentified model. The overidentified model enables the researcher to find the model which fits the best with the data collected. The measurement model that meets the inclusion criteria is retained for the test of the complete theoretical system through SEM. This stage moves from the isolated test of theorized mechanism to measure the entire complex system – from partial correlations to seeking the use of multivariate methods, SEM. Thus, the analysis not only ensures the abstract research (searching to discover the mechanisms from the structure of things) but also the concrete research in the empirically observed variables.

6.6.3 Theory development and econometrics procedure

To test theory, the current research adopts the four steps of theorization from the perspective of critical realism proposed by Miller and Tsang (2010). Following their recommendation, SEM is the most appropriate econometrics process for uncovering the mechanism beyond the correlation phenomenon between factors, CSS, and non-financial performance measurements. As Table 6.4 below shows, the theory development starts with the first two steps: identifying the mechanism and the test of the theory. This is followed by testing the causal effects and the test of the entire hypothesized model. Confirmatory Factor Analysis is used as the econometric procedure for the first two steps, followed by the Structural Equation Modelling for the last two steps.

Table 6. 4 Theory development and econometrics procedure

	Meaning	Theory testing	Theory testing	Econometric procedure
Step 1: Identifying the mechanisms supposed to explain the hypothesised relationship.	A) Interpretive work from literature review to draw out theories and the empirical context of interest. B) contextualised specification of the explanatory conditions underneath the hypothesised causal association. C) choose at least one mechanism	A) The unobserved Perceived Adequacy of Resources can be seen through a variety of manifest effects from an interplay of behavioural, contextual, and organisational factors.	B) The perceived adequacy of resources is a 4 factors structure.	Measurement equation: Confirmatory factor analysis (CFA).
Step 2: Testing the theory	A) Check if the proposed mechanism exists in the empirical domain. B) If the mechanism is validated, we confirm the hypothesis (otherwise, reject the theory). C) This stage is important and crucial, rather than jumping straight away to testing the relationships between the constructs and the dependent variables.	Summary of the confirmatory factor hypothesis: (a) The perceived adequacy of resources (responses) can be explained by five factors: SIZE, MK, MS, AND UA (b) Each item pair measure has a non-zero loading on the PAR factor that is what is designed to measure (target loading) and a zero loading on all other factors (nontarget loadings)	(c) The four AR factors, consistent with the theory (size – adequacy of resources (Drury and Tayles, 2005); adequacy of resources – other factors (Shields, 2005) (That adequacy of resources is associated with any other variables). (d) Error terms associated with each indicator are uncorrelated.	A) Use of multiple indicators for latent construct – PAR (the causal mechanism): Confirmatory Factor analysis (CFA). B) Interviews content analysis on the managers' perception and intentions on the adequacy of resources.
Step 3: Test the causal effects	In case of existing evidence affirming the presence of the theorized mechanisms, this step seeks to test their causal effects. Step 3 illustrates the relationships between variables.	A) prior to attempt to verify or falsify the entire theoretical system in an open context, we test binary or complex subset relationships under control conditions.		Parameters partial correlation analysis between exogenous factors with the endogenous factor - PAR. CFA and SEM.
Step 4: Test the entire theoretical system	If the collected empirical data matches the theoretical mechanisms and their effects, the step 4 is to evaluate the entire system. This moves the analysis from the isolated test of the theorized mechanism to measure the entire complex system. It seeks the use of multivariate methods.	The adoption of an innovative costing system – cost system sophistication has direct and positive impact with organisation non-financial performance: (a) user satisfaction with the costing system;	(b) use of costing system for cost management. (c) use of costing system for decision making.	Full SEM. (Full correlations with multivariate methods. Acknowledging outside contingencies (literature review + qualitative content analysis). Multiple group analysis (with control variable – industry sector).

Source: adapted from Miller and Tsang (2010)

6.7 Research sample and population

This section presents the population of the study and the technique used to select the sample.

6.7.1 Sampling technique and design

The population of the study for this current research is the field of Congolese businesses, from which a sample will be extracted. While a sample is the segment of the population which will be selected from the population, the sample frame refers to the list of all businesses from which the sample is selected (Bryman, 2016, p.174). There are various sampling strategies to use in order to select a sample – probability sampling and non-probability sampling. The probability sample is selected using random selection which gives the same chance to each unit of the population of being selected (Bryman, 2016). The aim of this technique consists of extracting a more representative sample from which the researcher can infer findings to the entire population as the technique keeps the sampling error at a minimum. The non-probability sample is a technique in which a sample is selected without using a random selection method (Bryman, 2016). Among the probability sampling techniques, there are simple random sampling, systematic sampling, stratified random sampling and multi-stage cluster sampling. This current study opts to use systematic sampling. The systematic sampling method selects each unit from the sample frame. Each firm from the list is allocated a unique number. Using a systematic random sampling technique, 1000 businesses were selected using random numbers (Bryman, 2016; Saunders *et al.*, 2016). The random sampling technique was used in some management control system studies for its simplicity in selecting a sample (Al-Omiri and Drury, 2007; Drury and Tayles, 2005).

6.7.2 Target population

According to the global report of general census of enterprises in the DRC (RGE, 2020), there are approximately 681,211 enterprises in the DRC (Rencensement General des Entreprises, 2020). The report, therefore, contains only private and state enterprises which are officially incorporated from the government agency. 185,022 enterprises out of the 681,211 are located in the capital province of Kinshasa. This represents 29.6% of the overall total. However, the list of enterprises as referred to above excludes small commercial activities, self-employed businesses, state schools, state health organisations, and state public agencies. It excludes millions of businesses operating within an informal sector of activities. Furthermore, there is a lack of official statistics and private databases on the number of enterprises operating in The Democratic Republic of Congo. In the face of these difficulties, using a sample frame seems to be the most effective and practical way to extract the sample for this current study. A sampling frame of 2500 companies from the “ Federation des enterprise du Congo” was composed. This list includes several types of enterprises operating in the province capital of Kinshasa affiliated to the Federation of Congolese Enterprises. The Federation of Congolese Enterprises is an agency incorporated under Congolese law number 004/2001 of 20th of July 2001 relative to the general disposition of association of non-profit organisations for public utility.

6.7.3 Sample size

In the perspective of SEM, determining sample size is one of the difficulties that faces researchers. There is not in literature a generalised guideline regarding sample size. Past studies used what is known as the rules of thumbs in asserting the sample size prerequisite: Boomsma (1982, 1985) proposed a minimum of 100 or 200 for

sample size; while Bentler and Chou (1987) suggested a size of five to 10 observations per parameter; or according to Nunnally (1967) an estimation of 10 cases per variable. These rules are not model specific; therefore, they are likely to mislead on the size of the sample. An appropriate sample size must achieve an adequate statistical power to make sure of an existence of true relationship in the data observed. Statistical power is the probability of rejecting a null hypothesis when it is false. It depends on (1) the chosen alpha level (often $\alpha = 0.05$); (2) the magnitude of the effect of interest; (3) the sample size.

This study is conducted among registered Congolese firms. The sample is limited to the capital province of Kinshasa. This is because of feasibility and financial constraints. The DRC is the second largest country in Africa with 2,350,000 square kilometres of land sharing a common border with nine other countries. It is a vast country composed of 26 provinces benefiting from a high degree of political and administrative autonomy. Therefore, it is likely to have disparities of accounting norms and practices, as the institutional context of each province differ to another. For generalization of the findings, it seems necessary to create a semi-regularity of the scope of study by limiting the findings to one region. Furthermore, this study was conducted during the Covid-19 travel restrictions. Therefore, it was not possible to travel to various parts of the country to collect data.

Data were collected through a survey questionnaire and semi-structured interviews between 2021-2022. The report contains questions relative to the practices of cost system sophistication, contextual factors - size, uncertainty avoidance -, behavioural factors - management knowledge and management support -, and organisational factors - adequacy of resources. Firms were extracted from a list of 2500 companies using a systematic random sampling technique. Managers with expertise in

accounting costing systems were identified and approached for the survey. One thousand questionnaires were sent. 250 (201 useful) questionnaires were collected, an overall response rate of 25% (21% of useful answers). The response rate is not far from 19,6% of Al-Omiri and Drury (2007) response rate or 30,1% of Drury and Tayles (2005). Both studies were published among a higher-ranking academic journal. Therefore, the rate is acceptable. Of the participants 25.4% were from manufacturers, 39.3% from services, 12.4% were from the financial and commercial sector and 22.9% from retailers. Of the participants, 74.6% adopt a simplistic cost system sophistication, 17.9% adopt a middle complexity system, and 7.5% adopted a more sophisticated system with many cost pools and many cost drivers.

6.8 Data collection

Two techniques were used for data collection: the survey questionnaire and the semi-structured interviews.

6.8.1 Survey Questionnaire

A questionnaire is the commonly used technique of quantitative primary data collection in case of explanatory or descriptive research (Saunders *et al.*, 2016; Bryman, 2016). The majority of questions use the Likert scale. The Likert scale facilitates pre-coding: “please circle the one answer that best corresponds to your views”. The easy answering technique diminishes the risk of missing data from participants. Close-ended questions are also used. Close-ended questions offer an easy answering process. However, this type of close ended questions reduces the spontaneity on the account of the participants. There is also a difficulty in creating ready-made answers which are mutually exclusive.

The questionnaire (see appendix 1) contains diverse types of questions:

(a) broad questions relating to the CSS of the business unit (see questions A1 to A9).

(b) questions related to those implementing a CSS (B1 to B10).

(c) questions for business units not adopting a CSS (C1).

(d) questions relative to the context-environment in which the business unit operates (D1 to D21).

Questions were adapted from literature for more content validity and for comparison with prior studies (Drury and Tayles, 2005; Al-Omiri and Drury, 2007; Foster and Swenson, 1997; Shields, 1995; Lukka and Granlund, 1994; Innes and Mitchell, 1995; Krumwiede, 1997; Gosselin, 1997; Al-Omiri, 2003). Questions were written in English and later translated to French to facilitate comprehension for our participants, who are French speakers. We kept the same format between both questionnaires to enable easy coding. As Table 6.5 indicates, each latent construct is measured by a composite of observed variables.

Table 6. 5 Latent and observed variables measurements

Table 6. 5 Latent and Observed variables measurements			
Latent variable	Observed variable	Measurements	Literature (adapted from)
1. Cost System Sophistication CSS1	Assigning indirect costs to products or services.	A1	Drury and Tayles, 2005; Al-Omiri and Drury, 2007; Al-Omiri, 2003
CSS2	How many cost centres assign indirect costs to products or services (1 st stage)	A2	Drury and Tayles, 2005; Al-Omiri and Drury, 2007; Al-Omiri, 2003
CSS3	How many diverse types of indirect cost allocation recovery methods in the 2 nd stage	A3	Drury and Tayles, 2005; Al-Omiri and Drury, 2007; Al-Omiri, 2003
2. Adequacy of resources AR1	Upper management provided adequate resources for implementation and use of ABC	B8n	Drury and Tayles, 2005; Al-Omiri and Drury, 2007; Al-Omiri, 2003;
AR2	Adequate training provided for using ABC	B8u	Drury and Tayles, 2005; Al-Omiri and Drury, 2007; Al-Omiri, 2003;
AR4	Adequacy of resources to invest in management accounting innovation	D8c	Drury and Tayles, 2005; Al-Omiri and Drury, 2007; Al-Omiri, 2003;
3. Management knowledge MK1	Knowledge and awareness data from ABC model provided accurate assessment of costs	B8e	Bjørnenak (1997) ; Chongruksut (2002); Drury and Tayles, 2005; Al-Omiri and Drury, 2007;
MK2	Knowledge and awareness of ABC information is widely used within our firm for special cost studies	B8i	Bjørnenak (1997) ; Drury and Tayles, 2005; Al-Omiri and Drury, 2007;
MK3	Managers are knowledgeable about ABC information	B8l	Bjørnenak (1997) ; Drury and Tayles, 2005; Al-Omiri and Drury, 2007;
MK4	Management knowledge and awareness of management accounting innovation	D8b	Bjørnenak (1997) ; Drury and Tayles, 2005; Al-Omiri and Drury, 2007;
4. Management support MS1	ABC receives dedicated support from managers	B8j	Drury and Tayles, 2005; Al-Omiri and Drury, 2007; Wessels and Shotter, 2000; Morrow and Connolly, 1994; Shields (1995), Innes and Mitchell (1995)
MS2	Support for ABC in this company is wide-spread	B8K	Drury and Tayles, 2005; Al-Omiri and Drury, 2007; Wessels and Shotter, 2000; Morrow and Connolly, 1994; Shields (1995), Innes and Mitchell (1995)

MS3	Support from departments outside accounting for ABC success	B8p	Drury and Tayles, 2005; Al-Omiri and Drury, 2007; Wessels and Shotter, 2000; Morrow and Connolly, 1994; Shields (1995), Innes and Mitchell (1995)
MS4	Management support for management accounting innovation system	D8a	Drury and Tayles, 2005; Al-Omiri and Drury, 2007; Wessels and Shotter, 2000; Morrow and Connolly, 1994; Shields (1995), Innes and Mitchell (1995)
5. Uncertainty avoidance UA1	Level of avoidance of uncertainty with the outcomes of innovation	D8f	Hofstede (1991, 1984), Noravesh <i>et al.</i> (2007), Nagirikandalage and Binsardi (2017) ; Drury and Tayles, 2005
6. Size SIZE 1	Annual Sales revenue	D2a	Drury and Tayles, 2005; Al-Omiri and Drury, 2007; Bjørnenak, 1997; Askarany <i>et al.</i> , 2010
SIZE2	Number of employees	D2c	Drury and Tayles, 2005; Al-Omiri and Drury, 2007; Bjørnenak, 1997; Askarany <i>et al.</i> , 2010
7.Organisation performance UCS1	Use of cost system in cost management (to assign cost for decision making)	B4a	Foster and Swenson, 1997; Shields, 1995; Lukka and Granlund,1994; Innes andMitchell,1995; Krumwiede,1997; Gosselin,1997; Drury and Tayles, 2005; Al-Omiri and Drury, 2007;
UCS2	Use of cost system in cost management (use for cost management)	B4b	Foster and Swenson, 1997; Shields, 1995; Lukka and Granlund,1994; Innes andMitchell,1995; Krumwiede,1997; Gosselin,1997; Drury and Tayles, 2005; Al-Omiri and Drury, 2007
UCS3	Use of cost system in cost management (determining the cost of products for use in cost plus pricing)	B6e	Foster and Swenson, 1997; Shields, 1995; Lukka and Granlund,1994; Innes andMitchell,1995; Krumwiede,1997; Gosselin,1997; Drury and Tayles, 2005; Al-Omiri and Drury, 2007
UCS4	Use of cost system in cost management (in cost management)	B6i	Foster and Swenson, 1997; Shields, 1995; Lukka and Granlund,1994; Innes andMitchell,1995; Krumwiede,1997; Gosselin,1997; Drury and Tayles, 2005; Al-Omiri and Drury, 2007
SCS1	Satisfaction with costing system (improving decision making)	B5	Foster and Swenson, 1997; Shields, 1995; Lukka and Granlund,1994; Innes andMitchell,1995; Krumwiede,1997; Gosselin,1997; Drury and Tayles, 2005; Al-Omiri and Drury, 2007
SCS2	Satisfaction with costing system (right tool)	B8a	Foster and Swenson, 1997; Shields, 1995; Lukka and Granlund,1994; Innes andMitchell,1995; Krumwiede,1997;

			Gosselin,1997; Drury and Tayles, 2005; Al-Omiri and Drury, 2007
SCS3	Satisfaction with costing system (overall benefit)	B8b	Foster and Swenson, 1997; Shields, 1995; Lukka and Granlund,1994; Innes andMitchell,1995; Krumwiede,1997; Gosselin,1997; Drury and Tayles, 2005; Al-Omiri and Drury, 2007
SCS4	Satisfaction with costing system (good thing for our company)	B8c	Foster and Swenson, 1997; Shields, 1995; Lukka and Granlund,1994; Innes andMitchell,1995; Krumwiede,1997; Gosselin,1997; Drury and Tayles, 2005; Al-Omiri and Drury, 2007
SCS5	Satisfaction with costing system (ABC information has had a noticeable impact on our company)	B8g	Foster and Swenson, 1997; Shields, 1995; Lukka and Granlund,1994; Innes andMitchell,1995; Krumwiede,1997; Gosselin,1997; Drury and Tayles, 2005; Al-Omiri and Drury, 2007
UCSDM1	Usage of costing system in decision making (stock valuation)	B6a	Foster and Swenson, 1997; Shields, 1995; Lukka and Granlund,1994; Innes andMitchell,1995; Krumwiede,1997; Gosselin,1997; Drury and Tayles, 2005; Al-Omiri and Drury, 2007
UCSDM2	Usage of costing system in decision making (product or service discontinuation decision)	B6b	Foster and Swenson, 1997; Shields, 1995; Lukka and Granlund,1994; Innes andMitchell,1995; Krumwiede,1997; Gosselin,1997; Drury and Tayles, 2005; Al-Omiri and Drury, 2007
UCSDM3	Usage of costing system in decision making (product mix decisions)	B6c	Foster and Swenson, 1997; Shields, 1995; Lukka and Granlund,1994; Innes andMitchell,1995; Krumwiede,1997; Gosselin,1997; Drury and Tayles, 2005; Al-Omiri and Drury, 2007
UCSDM4	Usage of costing system in decision making (outsourcing decisions)	B6d	Foster and Swenson, 1997; Shields, 1995; Lukka and Granlund,1994; Innes andMitchell,1995; Krumwiede,1997; Gosselin,1997; Drury and Tayles, 2005; Al-Omiri and Drury, 2007
UCSDM5	Usage of costing system in decision making (new product or services overview decisions)	B6f	Foster and Swenson, 1997; Shields, 1995; Lukka and Granlund,1994; Innes andMitchell,1995; Krumwiede,1997; Gosselin,1997; Drury and Tayles, 2005; Al-Omiri and Drury, 2007
UCSDM6	Usage of costing system in decision making (profitability analysis)	B6h	Foster and Swenson, 1997; Shields, 1995; Lukka and Granlund,1994; Innes andMitchell,1995; Krumwiede,1997; Gosselin,1997; Drury and Tayles, 2005; Al-Omiri and Drury, 2007

UCSDM7	Usage of costing system in decision making (budgeting)	B6j	Foster and Swenson, 1997; Shields, 1995; Lukka and Granlund,1994; Innes andMitchell,1995; Krumwiede,1997; Gosselin,1997; Drury and Tayles, 2005; Al-Omiri and Drury, 2007
UCSDM11	Usage of costing system in decision making (activity performance measurement and improvement)	B6k	Foster and Swenson, 1997; Shields, 1995; Lukka and Granlund,1994; Innes andMitchell,1995; Krumwiede,1997; Gosselin,1997; Drury and Tayles, 2005; Al-Omiri and Drury, 2007

6.8.2 Semi-structured interviews

There are two main types of qualitative interviews - unstructured interviews and semi-structured interviews (Bryman, 2016; Collis and Hussey, 2009). While the unstructured interviews are non-standardized and casual, in the semi-structured interviews, questions are grouped by topics or enquiries (Saunders *et al.*, 2016; Bryman, 2016). This current study collected the qualitative data based on the analysis of the data collected in a quantitative survey. A sample of cost system sophistication adopters was chosen. The interviewees were contacted for an explanatory interview to obtain in depth understanding of the phenomenon of the adoption of CSS. Interviewees, in a semi-structured interview, were asked to talk about their thoughts on the following topics:

- (1) what makes them adopt a new method of management accounting costing system.
- (2) what are their thoughts on having adequate resources to invest in an innovative costing system such as CSS.
- (3) do you use CSS for decision-making, or for cost management.
- (4) are you satisfied with the benefit your company is gaining from the use of CSS?

6.9 Empirical model and Econometric procedure

To test the hypotheses, Structural Equation Modelling analyses are conducted to corroborate and refute the assertion of existence of relationship between independent factors with dependent factors. The two equations from the SEM which would be used are:

a) Measurement equations: $X = \lambda_x \xi + \sigma$; $Y = \lambda_y \eta + \varepsilon$

b)Structural equation: $\eta = \Gamma \xi + \beta \eta + \zeta$.

SEM is a statistical methodology that uses a confirmatory approach (hypothesis testing) for the analysis of the structural theory of the phenomena of the study (Byrne, 2016). According to Joop and Bechger (1999), SEM is commonly used in behavioural sciences and, recently, in analysing firms' efficiency (Berraies and Hamoud, 2018). SEM is also increasingly used in management accounting research (Henri, 2007; Smith and Wright, 2004; Bryant *et al.*, 2004; Poon *et al.*, 2001; Cagwin and Bouwman, 2002; Hadid and Hamdan, 2021). It displays a causal process that generates observations on multiple factors. It contains: (a) the causal processes under observation represented with multiple structural equations or multiple regression equations; (b) the equations can be illustrated in models to facilitate conceptualization of the theory under observation (Byrne, 2016). This is followed by testing the hypothesized model in a simultaneous analysis of the entire system of variables. The objective in this regard consists of determining the extent to which the hypothesis model is consistent with the data. If good fitness is found, the model accepts the hypothesized relationships, otherwise such relationships are rejected. In this regard, less emphasis on the significance testing about individual effects to a more emphasis on the evaluation or good fitness of the entire theoretical models (Kline, 2016; Rodgers, 2010). SEM is considered as a quiet methodological revolution shifting from the emphasis from the statistical significance of individuals effects to the significance of the entire framework. So, the significance testing role is smaller in SEM compared to other statistical econometrics such as multiple regression or ANOVA(Kline, 2016). However, for comparison reason with the past studies in management accounting contingency-based research, the significance testing between individual effects were conducted. Based on that, we could accept or reject individual relationships hypotheses. The decision on the whole

theoretical model was evaluated in the basis of the goodness for fit requirements. Therefore, the evaluation of the whole theoretical model paramount over the individual effects within the model (Kline, 2016). Thus, SEM econometric has two components: (1) the model of measurements – relationship between measured variables and observed variables - (factor analysis), and (2) the structural model (path analysis). For Weston and Gore (2006), the pathways between constructs in the model illustrate the simultaneous emergence of interrelationships between variables and the environment. When compared to the normal multiple regression analysis, SEM further adopts a confirmatory approach to the exploratory approach of traditional regression analysis. It adopts an inferential standpoint when demanding that the pattern emerging from the interrelationship of factors be specified in regard to the context and to the circumstance of occurrence. Furthermore, SEM integrates the unobserved latent variables in the analysis contrarily to the normal regression analysis. It benefits by incorporating random measurement error and controlling non-random error (Henri, 2007).

6.10 Summary

The question of to which extent contextual factors influence the adoption of cost sophistication and performance guided the choice of this current study's philosophy, methodology and methods. The study places itself in a critical realism paradigm as a philosophical stance. The aim is not only to establish a relationship between constructs but also to provide explication on the causal effects germinating from interaction of numerous factors with CSS and performance outcomes. Hence, an interpretivist epistemology was adopted to explain the mechanism beneath the emergence of patterns in the relationship context - CSS and OP. This was in addition to a realism ontology in regard to the social structure beneath the observed phenomenon. Mixed methods

were adopted from the perspective of critical realism. A survey questionnaire and a semi-structured interview were used to collect data. The validity and reliability of the findings are reinforced as measurements used to capture data were adapted from prior well-known surveys. The study was narrowed to the scope of the study regarding some of the factors: organisational size, adequacy of resources, management support, management knowledge, and uncertainty avoidance.

Because of the complex relationships for this study's analysis, SEM would be used as an econometric model. Based on the retroductive and retrodictive reasoning processes, the current study seeks to uncover the generative mechanisms beneath the observed pattern emerging from the interaction of behavioural, organisational, and contextual factors. In addition, an insight into the steps to follow for theorization was given. In brief, the process of creation of knowledge starts with the old knowledge. Based on that, hypotheses between factors CSS and NFPM will be generated. Then, this will be followed by the use of mixed methods for data collection. A context will be established based on literature relative to the macro-micro context of the business environment of the Democratic Republic of Congo. Data collected will be computed using SEM software SPSS Amos 28. This will be followed by a discussion and analysis through a retroduction and retrodiction reasoning process. Findings that will emerge will be interpreted based on the Congolese Contextual Landscape. An interpretative conclusion will be proposed from which will be elicited new knowledge.

Furthermore, an explanation will be given regarding how the causal effect is enacted or restrained from the interplay of various norms circles leading to the regularity of the association between factors, CSS, and non-financial performance. The chapter also presents the sample size and data collection techniques adopted for data collection.

Chapter seven. Factors influencing the adoption of Cost System Sophistication: Results and Discussion

7.1 Introduction

This chapter presents the empirical analysis of the influence of factors on the adoption of Cost System Sophistication (CSS). It comprises a first and second section on the measurement factors used for data analysis and hypotheses testing. The third section presents the statistical methods. The fourth section presents the results of the study on the confirmatory factor analysis and structural equation modelling which comprises a good fit analysis of the hypothesized CSS path model. The chapter ends with a summary.

7.2 Measurement factors used in this research data analysis.

For data analysis, constructs are grouped into three factors : contextual factors, organisational factors, and behavioural factors. Fisher (1995) describes these factors as factors relative to the external environment where the business operates. As previously argued, Size is increasingly considered to be a strategic external factor for a better cost management. It can be considered at the same time as organisational factors as it depends on business activities. We also include in the contextual factors category the national culture. The degree of uncertainty avoidance within the national culture influences societal values, and in return, accounting values as well at the organisational level. Behavioural factors refer to those factors related to the comportment or behaviour of the employees. We include in this category management knowledge and management support.

Latent constructs are measured using observed variables (see Section 6.8.1; Table 6.3). The observed variables are questions within our survey questionnaire (see Appendix 1). The factor Size is measured by objective values of the number of employees or annual revenue (D2a, D2c). Perceived Adequacy of Resources is measured by B8n, B8s, B8u, and D8c. Management support is measured by B8j, B8k, B8p, and D8a. Factor management knowledge is measured by B8e, B8i, B8l, and D8b. Uncertainty avoidance is measured by D8f. The dependent and independent variables are categorised accordingly and are consistent with contingency theory (Drazin and Van de Ven, 1985). The adoption of CSS is considered in the first instance as a dependent variable depending on the factors. Later, CSS is considered within a complex model as an independent variable influencing the dependent variable organisation non-financial performance measurements.

7.2.1 Contextual factor: Size measurement

In consistency with the literature, Size is measured by objective measurements, the sales revenue (Drury and Tayles, 2005) and the number of employees (Bjørnenak, 1997; Askarany *et al.*, 2010).

7.2.2 Contextual factor: Uncertainty avoidance measurement

Uncertainty avoidance is one of the dimensions of national culture (Hofstede, 1991, 1994). It is described a collective mental set of values relative to humanity and differentiating one country from another (Nagirikandalage and Binsardi, 2017). According to Hofstede (1991) this programming mental collective influences individual behaviour and perceptions. Furthermore, those perceptions shape the meaning of social life – attitudes towards accounting practices or systems (Hofstede, 1984, 1991). The DRC, as with most African countries can be categorized as belonging to the

vertical collectivism as opposite to individualism countries, based on Hofstede's cultural classification (Hofstede, 1991).

According to the institutional isomorphism theory of heterogeneity, the adoption of a management accounting system can be influenced by coercive and normative pressures, enabled or constraint by cultural values (Nagirikandalage and Binsardi, 2017). Therefore businesses, when facing the same environmental constraints, would adopt the same common methods or practices to counteract to the same struggles. Thus, national culture can influence the adoption or non-adoption of an accounting costing system based on the mimic isomorphism theory enacted by the national cultural dimension. Liu and Pan (2007) argue that, apart from top management support, the success of cost accounting diffusion depends also on the organisation's cultural factor. They found that the top-down corporate culture triggers the success of management accounting diffusion. Similarly, by investigating the effect of culture on accounting Noravesh *et al.*(2007) conclude the existence of an association between national cultural values in Hofstede's framework and accounting values from Gray (1988). To measure the cultural values and accounting values, Noravesh *et al.*(2007) use proxies such as the unstable economy, government intervention, and inappropriate use of methods.

Similarly, this current study refers to the four dimensions of accounting practice as proposed by Gray (1988), such as secrecy versus transparency, flexibility versus uniformity, professionalism versus statutory, conservatism versus optimism. For the accounting values, the current study refers to Hofstede's four dimensions of individualism versus collectivism, avoidance to uncertainty vs non-avoidance to uncertainty, low power distance versus high power distance. Therefore, to measure the uncertainty avoidance at a business unit level, a seven-point Likert-type scale of questions was

used (see D8f). The survey participants were asked to indicate, on the scale of 1 for very unimportant to 7 for especially important, the importance of each motive leading to the adoption of CSS: the employee or the business unit level of avoidance to the uncertainty from the results of innovation.

7.2.3 Organisational factor: Perceived Adequacy of Resources measurement

There is not, in management accounting costing system literature, a clear definition of the concept of adequacy of resources. This variable was referred to in literature as a logical reason explaining the empirical relationship found in numerous studies relative to the factor of organisation size and the adoption of a costing system. As Al-Omiri (2003) suggested, large firms, as measured by sales revenues, possess enough resources to design an innovative system. This implies that large firms have adequate financial resources to influence CSS. However, this also means availability of a network of communication or of infrastructure for introduction of a more sophisticated system (Al-Omiri, 2003). Moreover, it could also mean availability of human resources through management knowledge, training in specialized skills or availability of management support for the adoption of newness.

This current study apprehends adequacy of resources as a construct emerging from the interactions of numerous factors. Indeed, the concerted set of financial resources, human resources, behavioural and managerial factors, create a pattern- an evolutive stage within a complex and dynamic interaction- known as a perceived adequacy of resources. To measure this variable, the study adapted four indicators from Drury and Tayles (2005) – adequate resources for use of CSS; adequate training, and adequate resources to invest in an innovative accounting system. Therefore, the perceived adequacy of resources to invest is measured by a seven-point Likert-type scale

(see B8n, B8s, B8u, D8c). Participants were asked to indicate the degree of importance in the following statements: (c) adequacy of resources to invest in an innovative accounting system; (n) top managers provided adequate resources for the operation of CSS; (s) adequate trainings were made available for designing a CSS or (u) adequate trainings were provided for the use of the CSS.

7.2.4 Behavioural factor: Management support measurement

Based on the previous studies, top management support was found highly associated with the success of ABC (Wessels and Shotter, 2000; Shields, 1995). In a comparable way, Morrow and Connolly (1994), Innes and Mitchell (1995) attribute the failure of ABC to the lack of active management support. Shields (1995) measured top management support using a seven-point Likert-type scale to rate the degree to which top management support is present in the ABC initiative (from extremely low to extremely high). Identically to Shields (1995), applicants were asked to circle the rate of degree which they consider important in top management support in accounting innovation systems. This current study uses a seven-point Likert-type scale to measure management support through the observed variables – B8j, B8k, B8p, and D8a. Participants were asked to indicate the extent to which they agree or disagree on the statements: B8(j) CSS receives a strong support from the top managers; B8(k) a widespread support of the ABC in the business unit; B8(p) other non-accounting departments have shown support to the design or adoption of CSS; D8(a) management support for management accounting innovation.

7.2.5 Behavioural factor: Management Knowledge measurement

To measure management knowledge, Bjørnenak (1997) asked participants whether or not they had a priori awareness and knowledge of Activity Based Costing.

He added a further question on the sources of such knowledge - courses, training, magazines, internal sources, and others. Identically, this current study measured management knowledge by asking participants if they had a priori knowledge of CSS. Another question was added relative to the sources of such knowledge and awareness of the innovative accounting system: B8(e) knowledge that data from CSS provide an accurate assessment of the costs; B8(i) information from CSS is widely used for special cost studies; B8(l) managers are acknowledgeable of information coming from CSS, D8(b) management prior knowledge and awareness of the existence of an innovative management accounting system ABC.

7.3 Statistical methods

Because of a departure from multivariate normality of this current study's data, non-parametric methods are used for data analysis. In case there is no alternative available for non-parametric methods, parametric methods are used such as in case of regression and multiple regression in structural equation modelling. Among the reasons for supporting the use of non-parametric methods is the fact that the non-parametric makes few assumptions on the population distribution (Wu, 2003), contrary to the parametric such as the estimation of maximum likelihood in structural equation modelling (Kline, 2016). This current study uses SEM methods for data analysis.

7.3.1 Instruments

Measures used in this study are cost system sophistication (CSS), users satisfaction with costing system (SCS), the use of costing system in cost management (UCS), the use of costing system in decision making (UCSDM), organisation performance (OP), size (SIZE), management knowledge (MK), management support (MS),

perceived adequacy of resources (PAR) and uncertainty avoidance (UA). The exogenous constructs include:

- (1) PAR is measured by a seven-point Likert-type scale (D8c, D17, B8n, B8s, B8u, C1k, it is also considered as an endogenous variable).
- (2) MK is measured by asking questions on prior knowledge of CSS (D8b, B8e, B8f, B8g, B8h, B8i, B8l, C1a).
- (3) MS is measured by a seven-point Likert scale question (D8a; C1c, B8j, B8k, B8k, B8p, C1e, C1l).
- (4) uncertainty avoidance is measured by a seven-point Likert scale question (question D8f).
- (5) size is measured by objective measurement variables and a seven-point Likert scale (question D2a, D2c, D17, D19, C1f).

The exogenous variables were designed by following the recommendations proposed in literature (Shields, 1995, Al-Omiri and Drury, 2007). Endogenous variables are CSS and NFPM. To collect various costing system practices in the context of the DRC, we adopt a broader perspective by considering an interval of practices from a simplistic system to a more complex system (Drury and Tayles, 2005). Therefore, the endogenous construct CSS is measured by the number of cost pools and drivers used at the distinct stages of the two-stage procedure of costs allocation (A1, A2, A3, A4). Other endogenous constructs are SCS, UCS and UCSDM. The following section discusses the validity and reliability of the collected data.

7.3.2 Validity and reliability of the sample

Validity and reliability determine the quality of a survey questionnaire. Firstly, the content validity can be assessed by examining the literature of the domain of the study. The seven constructs were designed using a validated questionnaire from past

studies in management accounting costing systems (Drury and Tayles, 2004; Al-Omiri and Drury, 2007; Cagwin and Bouwman, 2002; Gunther and Gabler, 2014; Chongruksut, 2002; Foster and Swenson, 1997). Therefore, this research design is robust in terms of establishing relationships from statistical findings, internal credibility, construct operationalisation and external credibility. Secondly, the construct validity of the measurement instrument can be assessed statistically through factor analysis. These are the criteria of inclusion as developed by Rahman (2000), and Paul and Maiti (2008):

- (1) a loading factor ≥ 0.3 are considered as significant, whereas factors with loading < 0.3 are erased.
- (2) for the remaining variables, a correlation coefficient of ≥ 0.3 are retained, whereas factors with correlation < 0.3 are deleted.
- (3) the reliability is measured by assessing the consistency of the questions that are supposed to measure the same concept within the questionnaire.

Using Cronbach's alpha, the alpha value of ≥ 0.7 is acceptable (Nunnally, 1978).

Perceived Adequacy of Resources construct is measured through three items. A factor analysis reveals that all measurements indicated a factor loading of > 0.3 and are kept (AR1, AR2, AR4). Therefore, the three indicators are considered as statistically significant indicators of PAR. Management Knowledge construct is measured by four items. The factor analysis revealed that four measurements have a loading of more than 0.3 and are kept (MK1, MK2, MK3, M4). Management Support latent variable was measured by four items in which all four items had a loading factor of ≥ 0.3 . Cronbach's Alpha is 0.6. UA was measured by one item (UA1). Size was measured by objective measurements. CSS was measured by two indicators (CSS2, CS3). CSS1 was dropped as it did not meet the inclusion criteria of a loading factor > 0.3 .

Finally, after validity and reliability tests, the five constructs (PAR, MK, MS, Size and UA) are definitively measured, respectively, by 3,4,4,2,1 observed variables. An SPSS Cronbach alpha analysis revealed a value of 0.85 for 42 items. Thus, it is statistically reliable.

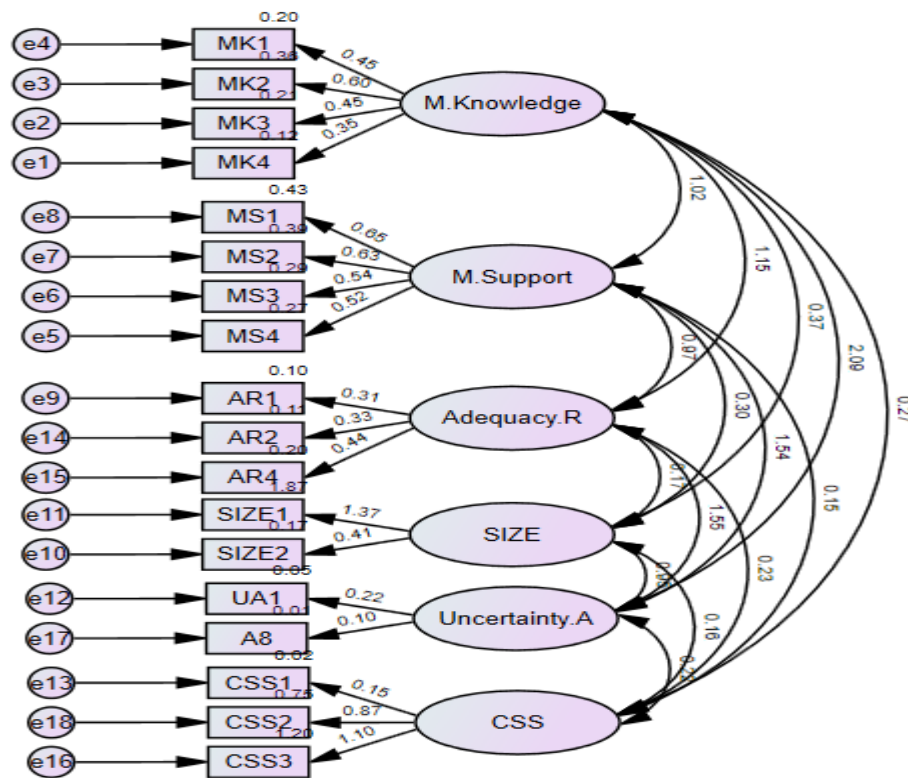


Figure 7. 1 Confirmatory Factor Analysis

7.3.3 Empirical analysis

The model as shown in Figure 7.1 was tested using SPSS AMOS 28 by employing the two stages approach – measurement model and the structural equation model (Byrne, 2016). The measurement model via confirmatory factor analysis consists of discovering and describing latent variables based on the sample covariance among a set of indicators (Mulaik, 1987; Sumer, 2003). In addition, it establishes the correlation between latent variables. The structural model, the other half of SEM, has a role in testing the general model of relationship between latent variables. Here, the

hypothesized model is tested by a series of regression equations. Two models are used:

- a) Measurement equations: $X = \lambda_x \xi + \sigma$; $Y = \lambda_y \eta + \varepsilon$.
- b) Structural equation: $\eta = \Gamma \xi + \beta \eta + \zeta$; where, the relation between endogenous and exogenous variables are represented by the symbol Γ ; between endogenous variables by β . The symbol ζ represents the residual variance.

7.4 Result

Results are presented in three main sections: results based on the survey questionnaire, results based on the semi-structured interviews and the overall interpretation based on the Congolese business landscape.

7.4.1 Descriptive analysis of the questionnaire

This section provides a descriptive analysis of the survey questionnaire to answer the question relative to the first objective of this study: Which, and to what extent do, factors influence the adoption of cost system sophistications among Congolese firms?

7.4.1.1 Sample screening

The questionnaire forms were collected manually and later given a serial number for reference in case of verification and review. A serial number from 1 to 201 was given to the usable forms. In this process of screening, 49 forms were excluded or were considered as unusable due to missing data or wrongly answered forms. Thus, 250 questionnaires were collected out of 1000, which represents a 25% response rate

and a 20.1 % usable response rate. Data were processed in SPSS 27 software for descriptive, and SPSS Amos 28 for inferential, statistics.

As the default estimation method in Structural Equation Modelling, maximum likelihood assumes multi-normality for continuous dependent variables (Kline, 2016). Data relative to the adoption of CSS in Congo, and the determinants influencing such adoption, were tested for normality. With the sample of 201, Kolmogorov-Smirnov and Shapiro-Wilk tests were used to measure the normality in SPSS. The assumptions which have a p-value of more than 0.05 violate the null hypothesis. The test reveals that the Shapiro-Wilk's test ($p < .05$) (Razali and Wah, 2011), Kolmogorov-Smirnov's test ($p\text{-value} < .05$) (Razali and Wah, 2011), and visual inspection of their histograms are not normally distributed for dependent variables (the adoption of CSS and NFPM). The skewness and kurtosis values are far from zero. Therefore, non-parametric tests appear to be the most appropriate as they make no assumptions about the distributions

Table 7. 1 Test of normality

	Kolmogorov-Smirnov			Shapiro-Wilk Statistic		
	Statistic	df	Sig.	Statistic	df	Sig.
How many cost centres assign indirect costs	.438	201	.000	.601	201	.000
Number of rates in usage for indirect costs	.449	201	.000	.579	201	.000
Use of cost system in cost management-use in cost plus pricing	.161	201	.000	.923	201	.000
Use of cost system-cost management	.158	201	.000	.906	201	.000
Satisfaction with costing system-improving decision making	.207	201	.000	.906	201	.000
Satisfaction with CS- as right tool	.170	201	.000	.906	201	.000
Satisfaction with CS-overall benefit	.154	201	.000	.907	201	.000

Satisfaction with CS- good thing for our firms	.147	201	.000	.914	201	.000
Satisfaction with CS-noticeable impact	.172	201	.000	.929	201	.000
Usage of CS in decision making-stock value	.144	201	.000	.904	201	.000
Usage of CSDM-product discontinuation	.163	201	.000	.922	201	.000
Usage of CSDM in product mix	.120	201	.000	.932	201	.000
Usage of CSDM-outsourcing	.130	201	.000	.924	201	.000
Usage of CSDM-new product	.262	201	.000	.818	201	.000
Usage of CSDM-profitability analysis	.171	201	.000	.892	201	.000
Usage of CSDM-budgeting	.188	201	.000	.910	201	.000
Usage of CSDM-activity performance and improvement	.215	201	.000	.865	201	.000
CSDM: costing system in decision making CS: costing system						

7.6.1.2 Sector of activities and organisation size

Sector of Activities:

As Table 7.2 illustrates, there are four types of sectors of activities among the sample: manufacturers, services, financials and commercials, and retailers. The services' sector represents the highest rate of data collected at 39.3 %, with only 12.4% for the financial and commercial sector. The manufacturing sector represents 25.4% of all participants, while 22.9% is for retailers.

Table 7. 2 Business sector of activities

	Frequency	Percent	Valid percent	Cumulative percent
Manufacturing	51	25.4	25.4	25.4
Services	79	39.3	39.3	64.7
Financial and commercial	25	12.4	12.4	77.1
Retailer	46	22.9	22.9	100.0
Total	201	100.0	100.0	

Organisation size:

As Table 7.3 shows, 75.1% of the companies have an annual revenue less than US \$50,000,000, 16.4 % have revenues between 50 to 1 billion US dollars, and only 4% are above the range of 1 billion US dollars. However, when size is measured by the number of employees, 55.7% have a number of employees below 10. This is large when compared to the 27.4% of companies within the interval between 10 and 49 employees. Only 13.9 % of participants have a number of employees between 50 to 249. 3% of the data represents companies with more than 249 employees.

Based on Congolese law number 06/004 of 27th of February 2006 relative to the fiscality regime applicable to the small and medium enterprises -(SME is all organisations which have an annual revenue less than US \$400,000 or which have less than 200 employees) - Ngokana *et al.* (2021) opted to consider as SMEs all organisations with a number of employees between 10 and 100. They wanted to exclude micro-enterprises from their sample. This current study chooses to consider as SMEs all organisations with less than 250 employees. The choice of 250 is for reason of comparison with seminal studies conducted in most developed countries such as the UK. SME is defined in the UK as small and medium sized businesses with fewer than 250 employees. Hence, it follows that that 97% of the data are considered as SMEs in comparison with the small number of 3% of larger companies.

Table 7. 3 Annual sales revenues

	Frequency	Percent	Cumulative percent
Below \$50.000.000	151	75.1	75.1
\$50.000.000-\$1.000.000.000	33	16.4	91.5
Above \$1.000.000.000	17	8.5	100.0
Total	201	100.0	

Table 7. 4 Number of employees

	Frequency	Percent	Cumulative Percent
Below 10	112	55.7	55.7
10-49	55	27.4	83.1
50-249	28	13.9	97.0
Above 249	6	3.0	100.0
Total	201	100.0	

7.6.1.3. Costing system sophistication among Congolese enterprises

The first section of the questionnaire is about the cost system in practice among Congolese enterprises. This includes two questions relative to the complexity of the costing system used. Once the applicant ticks the case affirming that they allocate overheads to their products or services, they are asked to indicate the number of cost pools or centres in use in their business unit and the number of diverse types of cost drivers. Table 7.5 below shows a cross tabulation between the number of cost pools with the number of rates for calculation of indirect costs. The number of cost pools matched the description of level of complexity of the costing system, which are low complexity for 1 cost centre, middle complexity for more than 1 cost centre and high complexity for more than 3 cost centres. Similarly, the same description relative to the number of cost centres matches the corresponding description of the number of rates in usage for calculation of indirect costs (number of cost drivers in the second stage). Because both traditional and sophisticated costing systems are absorption costing systems, this current study keeps it simple by considering as less (or low) complexity the use of 1 cost centre, while the use of more than 1 cost pool is the increase of the level of complexity in the costing system. So, similar to Drury and Tayles (2005), a single cost centre with a single volume-based rate cost driver is considered as low complexity, whereas many cost centres with many cost drivers is considered as high

complexity. However, to keep the classification simple, rather than adopting the composite measure of scores for each point for the two questions, as proposed by Drury and Tayles (2005), we divided the level complexity into three groups: the low complexity, the middle complexity, and the high complexity. This is because of a potentially low range of responses in regard to the variety on costing system practices among Congolese enterprises. The composite measure with ranking works the best in the case of an enormous range of responses which can be grouped, and scores allocated for each rank, which is not the case with this current study's data sample.

The result of the cross tabulation indicates that 74.6% of the participant organisations had a low complexity costing system. It means they use less than 2 cost centres and cost drivers for calculating their overheads. Only 36 out of 201 participants (17.9%) had a middle complexity costing system. In other words, those organisations have more than 1 cost centre and at least 1 cost driver. Furthermore, the result shows only 7% practice what is considered to be a high complexity of costing system, they have 3 cost centres with many rates of cost calculation. Only 0.5% of organisations have more than four first stage cost centres and many rates for overhead allocations.

Table 7. 5 Number of rates in usage of overhead cross tabulation

How many costs drivers?						
How many costs centres	Rates in usage for calculation of indirect costs					Total
	Low complexity CSS, =1	Middle complexity CSS, >1	High complexity of CSS, >2	High complexity of CSS, >4		
Low complexity CSS, =1	99.3%	0.7%				100%
Middle complexity CSS, >1	10.3%	89.7%				100%
High complexity CSS, >2	6.7%		93.3%			100%
CSS >4				100%		100%
Total	74.6%	17.9%	7.0 %	0.5%		100%

To achieve objective 1 of this research into the extent of use of CSS within the Congolese environment, participants were asked to tick yes or no if they allocate overheads to the cost objects. As shown in the table below, 98% of responding organisations assign overheads to the cost objects, 197 out of 201. This indicates that a large majority of companies do consider the allocation of indirect costs to the cost centres, which is a form of complexity of system. However, this complexity is still at the lower level, which can be considered as simplistic complexity with one cost pool versus 1 cost driver. This description corroborates with the previous findings from Ngokana *et al.* (2021) and Lufuma *et al.* (2020). Both studies concluded that the majority of SME companies in The Democratic Republic of Congo practice a traditional costing system which can be compared with a lower level of complexity of the absorption costing system of two stages. Identically to what was found in other developing countries such as Egypt, Al and McLellan (2011) concluded there was a lower level of adoption of modern management information systems compared to the traditional management information practices except for the product or service profitability analysis. Similar findings were suggested by Ahmad and Leftesi (2014) among Libyan companies. Notwithstanding, the distinguishing feature of this study findings is that it portrays the existence of a range of practices which can be considered as a lower complexity of practices among Congolese companies to a higher complexity of practices of costing system. Once an organisation agrees to the practice of allocating overheads to the cost centre, they use, in principle, the cause effect linking costs to the activities causing them. Nevertheless, having just one cost pool and one cost driver keeps the system quite close to the cost volume methodology of traditional cost allocation practices (known as traditional costing system).

Table 7. 6 Assigning indirect cost to products

	Frequency	Percent	Cumulative Percent
No	3	1.5	1.5
Yes	197	98.0	99.5
2(missing)	1	.5	100.0
Total	201	100.0	

7.6.1.4 Factors influencing the adoption of Costing system sophistication

To achieve this research objective on the factors influencing the adoption of CSS, data were collected through a survey questionnaire in the first instance. Secondly, a qualitative analysis was conducted to find the generative mechanisms explaining the observed events equating to factors, adoption of CSS and non-financial performance. The analysis of data was conducted based on the theoretical framework built under the premises of contingency and complexity theory. While the contingency theory is used as the underpinning theoretical basis explaining association between contingent factors and the adoption of CSS, complexity theory helps to understand the generative mechanism beyond the emerging pattern observed in the empirical domain. The contingent factors are apprehended in three groups: behavioural factors, organisational factors, and contextual factors.

Behavioural factors:

These are factors relative to human behaviour in interaction with the surrounding environment, such as providing support for application of management information systems, sharing knowledge with employees, providing training, etc. This current study analyses the impacts which management support (Chenhall, 2004) and management knowledge (Shields, 1995; Krumwiede, 1998) have on the adoption of CSS. The two constructs are quantified using observed variables - (see the observed variables as

described in Table 6.3). The four observed variables used for the latent management knowledge (MK1, MK2, MK3, MK4) have a mean values range between 4.40 to 5.28 with a standard deviation between 1.653 to 1.942. A confirmatory factor analysis will be discussed in the inferential analysis section. Those factors which will meet the inclusion criteria will be maintained as impacting the CSS in the hypothesized model – factors, CSS, OP.

Table 7. 7 Statistics of management knowledge construct

	Knowledge awareness that ABC-accurate costs	Knowledge and awareness that ABC-special costs studies	Managers are knowledgeable of ABC information	Management knowledge and awareness- CSS innovation
N (valid)	201	201	201	201
Mean	4.50	4.40	4.54	5.28
Median	5.00	4.00	5.00	6.00
Std. Deviation	1.874	1.772	1.924	1.653
Variance	3.511	3.141	3.770	2.732
Skewness	-.294	-.189	-.239	-.862
Std. Error of skewness	.172	.172	.172	.172
Kurtosis	-1.064	-1.018	-1.229	-.095
Std. Error of Kurtosis	.341	.341	.341	.341

Managerial (organisational) factors:

This refers to the factors relative to the act of managing or organising a business, such as having resources or assets. Extracted from the literature in management accounting contingency-based research, perceived adequacy of resource is a construct indicating the existence of adequate resources – financial or human, communication networks, trainings, etc. – in the adoption of a management accounting information system (Cohen *et al.*, 2005). This research proposes that the perceived adequacy of resource is a construct preceding the adoption of CSS. It is a four structures construct composed of MK, MS, Size, and UA. In the following section on the data analysis, the hypothesis will be computed using a Confirmatory Factor Analysis.

Meantime, PAR (Perceived Adequacy of Resources) is measured using proxies such as upper management provided adequate resources for implementation of costing system, adequate training provided for ABC and adequate resources to invest in an innovative costing system. The result shows, as described in Table 7.8 below, a mean between 4.71 to 5.02 with an SD deviating in the range of 1.6 to 1.8. In addition, the distribution shows a small skewness approaching the value of 0.5 (-0.4; -0,5 and -0,7). It is a negative skewness. The Kurtosis does not deviate a lot from a normally distributed set of data, respectively -0.9, -0,6 and -0.2.

Table 7. 8 Statistics of perceived adequacy of resources

	Upper management provided adequate re-sources for implementation and use of ABC	Adequate training provided for using ABC	Adequacy of resources to invest in management accounting innovation
N	201	201	201
Mean	4.71	4.79	5.02
Median	5.00	5.00	5.00
Std. Deviation	1.808	1.766	1.654
Variance	3.268	3.119	2.734
Skewness	-.446	-.534	-.710
Std. Error of Skewness	.172	.172	.172
Kurtosis	-.901	-.669	-.261
Std. Error of Kurtosis	.341	.341	.341

Contextual factors:

These factors refer to the contextual elements influencing the organisation, such as culture. Size is considered as an external factor from the perspective of the global market. As organisations grow, they enter into relationships with more customers and suppliers to the extent that the internal factor Size becomes highly important to the point of being considered as a strategic external factor. This is because it comes along with possibilities such as high access to resources or capabilities to control the level of uncertainty. Size is measured using objective measurements such the annual revenue or the number of employees. Uncertainty

avoidance is measured using the seven-point Likert-type scale relative to the question of the level of avoidance of uncertainty in the case of innovation at a business unit level. The analysis shows a skewness of -0.422 and a Kurtosis test of -1.080. 25.4% of corresponding organisations found it to be very important as an indicator of the level of uncertainty in the organisation towards the adoption of innovation. Putting this together, approximately 60% considered uncertainty avoidance as an important factor for the adoption of an innovation, with 18.4% replying somewhat important, 15.4% important, and 25.4% very important.

Table 7. 9 Level of avoidance of uncertainty with the outcomes of innovation

Uncertainty avoidance with the outcomes of innovation			
	Frequency	Percent	Cumulative Percent
Very unimportant	16	8.0	8.0
Unimportant	23	11.5	19.5
Somewhat unimportant	21	10.5	30.0
Neutral	21	10.5	40.5
Somewhat- important	37	18.5	59.0
Important	31	15.5	74.5
Especially important	51	25.5	100.0
Total1	200	100.0	
Missing	1		
Total 2	201	100.0	

Results regarding the factors influencing the adoption of CSS will be generated from the SEM analysis in the next section. Partial correlation analysis will be conducted between observed variables and latent variables. This will be followed by a full multiple regression analysis between various constructs within the model. Further

analysis on the indirect full effects of each parameter will be conducted. SEM is the most appropriate as it helps to conduct a complex analysis between constructs. Prior to determining which factors impact the choice or the design of CSS, the following section discusses the evaluation of the overall fit of the model.

7.4.2 Evaluation of the overall fit of the Factors and CSS model

There is an ongoing discussion in the field of statistics in regard to the best ways to evaluate the extent to which a proposed model fits the data (Kline, 2016). Thus, there is not a black and white statistical framework which can attest correct and incorrect hypotheses of the SEM (Kline, 2016; Sumer, 2003). In the SEM literature, different fit statistics are reported. Nevertheless, there is a minimum set of fit statistics that any result of the overall fit should include (Kline, 2016):

- (a) the model chi-square with degree of freedom and p-value.
- (b) Steiger-Lind Root Mean Square Error of Approximation (RMSEA) and 90% confidence interval.
- (c) Bentler Comparative Fit Index (CFI).
- (d) Standardized Root Mean Square Residual (SRMR).

Among the studies published in SEM literature, the above set of fit indices was used – the chi-square (χ^2); the goodness fit index (GFI) and the root mean square - RMR - (Joreskog and Sorbon, 1998). The value of the chi-square for a just identified model generally equals zero. If $\chi^2_M = 0$, the model perfectly fits the data. In other words, the covariance of the observed measurements equals the predicted latent variables. The chi-square χ^2 estimates the badness of fit statistics (Kline, 2016; Sumer, 2003). So, the optimal fit is illustrated with χ^2_M equals to zero, and any increases of χ^2_M means a worsening of the model (Paul and Maiti, 2008; Sumer, 2003; Klyne,

2016). In the situation of large samples and multivariate normality, the fit is tested by χ^2_M for overidentified model (Kline, 2016). The model is judged fit if χ^2_M equals that of its degree of freedom (df_M) regardless of the sample size. Marsh and Hocevar (1988) suggested that an acceptable fit has a suggested ratio of 2:1 to 5:1 ($\chi^2_M: df_M$). The good fit index (GFI) is proposed to situate between 0.90 and 1.00. For the root mean square residual (RMR), Hansen (1989) argued that it has to be small in regard to the size of the diagonal correlation matrix. It has to be less than 0.05 (Hansen, 1989). For the root mean square of an estimate approximation, (RMSEA) it must have a value between 0.05 and 0.08 (Hansen, 1989). For Bollen (1989) an equal or greater 0.90 value indicates a good model fit for comparative fit index (CFI) and for incremental fit index (IFI).

7.4.3 The measurement model

The measurement model, as indicated in Figure 7.1, is composed of six latent variables (PAR, MK, MS, SIZE, UA, CSS). Four of those are exogenous variables - MK, MS, SIZE and UA -, while two are endogenous variables - PAR, and CSS. After elimination based on the CFA criteria, we decided to keep five latent variables. UA could be removed as the loading factors were less than 0.3. However, in order to test the hypothesis relative to this construct, and as long as the model shows a good fit, we decided to keep it as part of the model.

The measurement model has provided (preliminarily) a good fit to the data (χ^2_M ($n=201$)=153.833, $df_M=120$, $p<0.05(0.020)$; $RMR=0.141$; $GFI=0.922$; $NFI=0.852$; $CFI=0.962$; $IFI=0.963$). The chi-square is not too large in relation to the degree of freedom, with a ratio of 1.282. Therefore, the model is of good fit. In addition, a comparative fit index (CFI), the incremental fit index (IFI), the good fit index (GFI) and the normed fit index (NFI) have values near the inclusion criteria of fitness of 0.90. Thus,

this preliminary measurement model is a good fit to the collected data. Therefore, latent variables are reliably measured by the observed variables.

Table 7. 10 Goodness for fit of measurement model

Parameter	Values
Chi-square with 120 degrees of freedom	153.833
Root means square residual(RMR)	0.141
Goodness of fit index (GFI)	0.922
Normed fit index (NFI)	0.852
Comparative fit index (CFI)	0.962
Incremental fit index (IFI)	0.963

Table 7. 11 Covariances among the variables for the measurement path model

			Esti- mate	S.E.	C.R.	P	Label
M.Knowledge	<-->	M.Support	.430	.122	3.519	***	par_9
M.Knowledge	<-->	Adequacy.R	.372	.119	3.117	.002	par_10
M.Knowledge	<-->	SIZE	.065	.036	1.798	.072	par_11
M.Support	<-->	Adequacy.R	.451	.131	3.447	***	par_12
M.Support	<-->	SIZE	.081	.044	1.858	.063	par_13
Adequacy.R	<-->	SIZE	.034	.026	1.306	.191	par_14
M.Knowledge	<-->	Uncertainty.A	.147	.073	2.004	.045	par_19
M.Knowledge	<-->	CSS	.079	.034	2.322	.020	par_20
M.Support	<-->	Uncertainty.A	.156	.077	2.019	.044	par_21
M.Support	<-->	CSS	.051	.034	1.473	.141	par_22
Adequacy.R	<-->	Uncertainty.A	.143	.077	1.846	.065	par_23
Adequacy.R	<-->	CSS	.080	.043	1.859	.063	par_24
SIZE	<-->	Uncertainty.A	.045	.030	1.510	.131	par_25
SIZE	<-->	CSS	.029	.017	1.691	.091	par_26
Uncertainty.A	<-->	CSS	.017	.021	.836	.403	par_27

The indicators, as illustrated in section 7.4.4, are loaded with a loading factor of more than 0.3. Most of the observed variables are the good indicators of their latent constructs. The loading indices were statistically significant, except for the construct Uncertainty Avoidance. Therefore, some modification relative to the original specification of the model was needed to be done. Furthermore, as indicated in Table 7.11, the exogenous constructs (MK, MS, SIZE and UA) are significantly covariate with each

other. Exceptionally, there are significant covariances between management support (MS) with perceived adequacy of resources (PAR); management knowledge (MK) and perceived adequacy of resources (PAR). In an equivalent way, there are strong covariances between management knowledge and management support, and between management knowledge and CSS. Moreover, there is a nearly significant ($p=0.063$) covariance between the perceived adequacy of resources (PAR) and CSS.

7.4.4 The structural model

The confirmatory factor analysis indicates that latent constructs proposed for testing the path model are adequately estimated by the indicators. Various models were tested previously to testing the two models selected, as will be illustrated in the sections below. Those tests indicated good fitness within the path model. This was followed by the hypothesized structural equation model by fixing the path as illustrated in Figure 7.2. The structural model 1 yields a fit model at this stage of data analysis [X^2_M ($n=201$)=153.833, $df_M=120$, $p<0.020$, $RMR=0.141$, $GFI=0.922$, $NFI=0.852$, $CFI=0.962$, $IFI=0.963$] and the significant path relationship between observed indicators and latent variables was achieved.

Figure 7.2 illustrates the CSS path model analysed through Structural Equation Modelling. The good fitness indices are presented in Table 7.10. This current study argues that Chi-square is an appropriate measure to illustrate a good fit when the sample size is more than 200 (this current study's sample is 201). The ratio $\chi^2:Df$ of 1.282 is acceptable. It is not far from the good fitness interval of [2:1; 5:1]. In addition, other testing tools are more useful as they confirmed a good fitness. Therefore, the GFI, NFI, CFI and IFI, respectively, indicated indices which equal the inclusion values of good fit (interval of 0.90 to 1.00). Saying that, the indices indicate that the structural

model of this study (CSS structural model1) approximately provides a better fit to the data, although the RMR is outside the inclusion criteria.

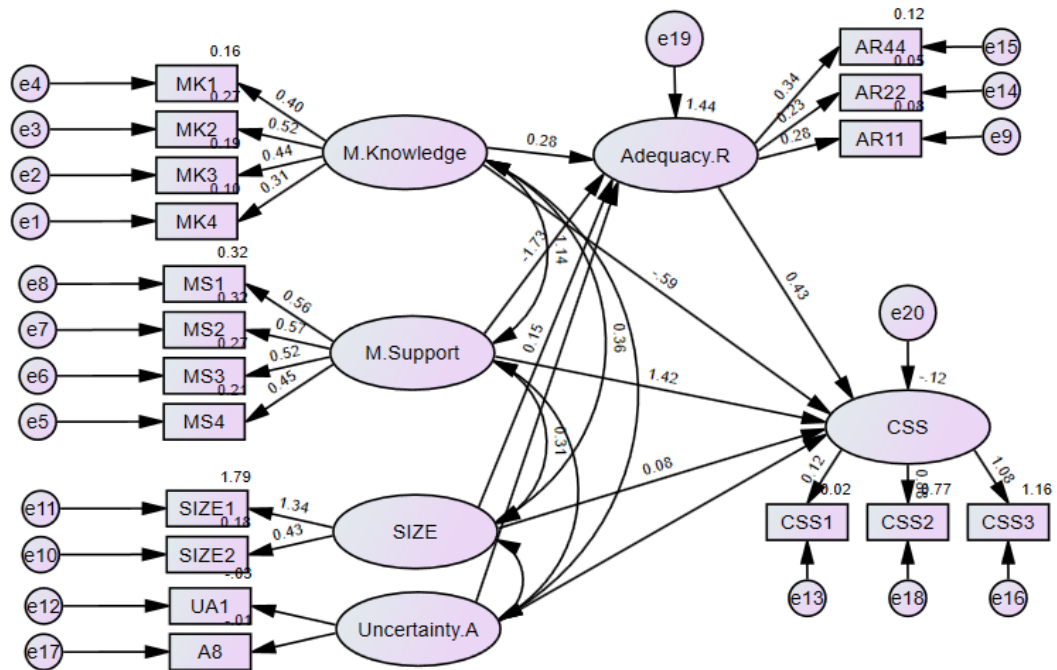


Figure 7. 2 CSS path model 1.

Parameters with their standard error, critical ratio and p-value are presented in Table 7.12 below. As the table shows, none of the relationships between exogenous variables with endogenous variables is statistically significant. All the Critical ratios of the path between PAR to MS, PAR to MK, PAR to UA, PAR to SIZE, CSS to MK, CSS to MS, CSS to SIZE, CSS to UA and CSS to PAR are less than 1.96. In another words, they have a non-significant association. However, all the indicators are in a significant association with the exogenous constructs (p=value less than 0.05; *** means a p-value of 0.0001). Also, a squared multiple correlation of the default model indicates that more than 100 times ($R^2=1.444$) of the adequacy of resource is explained by the exogenous variables, while 11.5 % of the CSS is explained by the model. However, the negative sign of the R-square (-0.115) means the model does not follow the trend

of the data. Based on that, this structural model 1 is abandoned for a structural model 2.

Table 7. 12 Non-standard regression weights for SEM 1

			Estimate	S.E.	C.R.	P	Label
Adequacy.R	<---	M.Support	1.203	1.020	1.179	.239	par_19
Adequacy.R	<---	M.Knowledge	-.275	1.031	-.266	.790	par_20
Adequacy.R	<---	Uncertainty.A	-.400	1.127	-.355	.723	par_21
Adequacy.R	<---	SIZE	-.218	.327	-.666	.505	par_22
CSS	<---	M.Knowledge	-.648	1.209	-.536	.592	par_23
CSS	<---	M.Support	1.088	2.010	.541	.588	par_24
CSS	<---	SIZE	.120	.245	.490	.624	par_25
CSS	<---	Uncertainty.A	-.360	1.302	-.277	.782	par_26
CSS	<---	Adequacy.R	-.468	1.036	-.452	.651	par_27
MK4	<---	M.Knowledge	1.000				
MK3	<---	M.Knowledge	1.662	.435	3.824	***	par_1
MK2	<---	M.Knowledge	1.782	.441	4.043	***	par_2
MK1	<---	M.Knowledge	1.448	.395	3.669	***	par_3
MS4	<---	M.Support	1.000				
MS3	<---	M.Support	1.392	.286	4.873	***	par_4
MS2	<---	M.Support	1.499	.295	5.078	***	par_5
MS1	<---	M.Support	1.497	.297	5.049	***	par_6
AR1	<---	Adequacy.R	1.000				
SIZE2	<---	SIZE	1.000				
SIZE1	<---	SIZE	2.426	1.027	2.363	.018	par_7
AR2	<---	Adequacy.R	.804	.276	2.910	.004	par_8
AR4	<---	Adequacy.R	1.105	.309	3.581	***	par_12
A8	<---	Uncertainty.A	1.000				
UA1	<---	Uncertainty.A	3.201	1.521	2.104	.035	par_13
CSS2	<---	CSS	1.000				
CSS1	<---	CSS	.031	.015	2.032	.042	par_14
CSS3	<---	CSS	1.202	.119	10.063	***	par_15

Model 2 presents a better fit (see Figure 7.3). We remove the construct uncertainty avoidance as it offers a loading factor of less than 0.3. Consequently, the CSS model proposed improved significantly: [X^2_M (n=201)=119.939, $df_M=80$, $p=0.003$, $RMR=0.155$, $GFI=0.924$, $NFI=0.875$, $CFI=0.953$, $IFI=0.955$, $RMSEA=0.050$]. The

correlation analysis between exogenous constructs indicates that management knowledge is positively correlated to management support with a coefficient of 1.143. Similarly, management knowledge is positively correlated with SIZE with a coefficient of correlation of 0.443. Management support (MS) and SIZE are positively correlated with a coefficient of 0.385 with a p-value less than 0.05. Also, they are positively covariate with a variance estimate of 0.424 between MK and MS, of 0.92 between MK and SIZE, and of 0.117 between MS and SIZE (p-value <0.05) (see Tables 7.15 and 7.16).

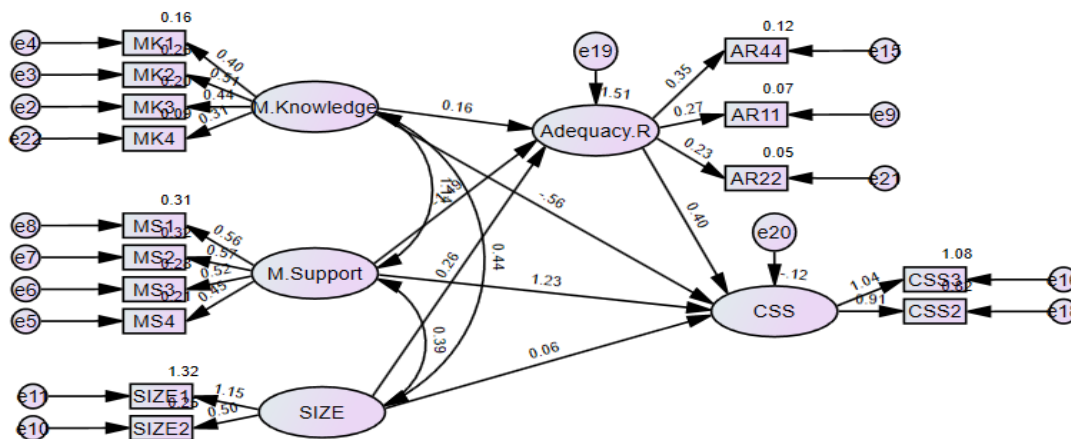


Figure 7. 3 CSS path model 2

Table 7. 13 Goodness for fit of the final structural model 2

Parameter		Values
Chi-square with 80 degrees of freedom		119.939
Root means square residual		0.155
Goodness of fit index (GFI)		0.924
Normed fit index (NFI)		0.875
Comparative fit index (CFI)		0.953
Incremental fit index (IFI)		0.955

Table 7. 14 Regression weights for model 2

			Estimate	S.E.	C.R.	P	Label
Adequacy.R	<---	M.Knowledge	.155	.703	.221	.825	par_13
Adequacy.R	<---	M.Support	-.990	.535	-1.850	.064	par_14
Adequacy.R	<---	SIZE	.301	.192	1.567	.117	par_15
CSS	<---	M.Knowledge	-.646	.848	-.763	.446	par_16
CSS	<---	M.Support	.969	1.188	.816	.415	par_17
CSS	<---	SIZE	.083	.256	.326	.744	par_18
CSS	<---	Adequacy.R	.475	.817	.581	.561	par_19
MK3	<---	M.Knowledge	1.704	.455	3.742	***	par_1
MK2	<---	M.Knowledge	1.789	.456	3.922	***	par_2
MK1	<---	M.Knowledge	1.485	.413	3.595	***	par_3
MS4	<---	M.Support	1.000				
MS3	<---	M.Support	1.392	.285	4.881	***	par_4
MS2	<---	M.Support	1.500	.295	5.089	***	par_5
MS1	<---	M.Support	1.490	.295	5.047	***	par_6
AR11	<---	Adequacy.R	1.000				
SIZE2	<---	SIZE	1.000				
SIZE1	<---	SIZE	1.782	.565	3.153	.002	par_7
AR44	<---	Adequacy.R	1.181	.340	3.477	***	par_11
CSS2	<---	CSS	1.000				
CSS3	<---	CSS	1.122	.108	10.422	***	par_12
AR22	<---	Adequacy.R	.840	.297	2.826	.005	par_20
MK4	<---	M.Knowledge	1.000				

Table 7. 15 Covariances model 2

			Estimate	S.E.	C.R.	P	Label
M.Knowledge	<-->	M.Support	.424	.123	3.461	***	par_8
M.Knowledge	<-->	SIZE	.092	.042	2.192	.028	par_9
M.Support	<-->	SIZE	.117	.050	2.323	.020	par_10

Table 7. 16 Correlations (Group number-Default model)

			Estimate
M.Knowledge	<-->	M.Support	1.143
M.Knowledge	<-->	SIZE	.443

			Estimate
M.Support	<-->	SIZE	.385

Parameters estimation with their standard errors, critical ratios and p-values are shown in Table 7.14. As indicated from the investigation of structural equation model 2 (Figure 7.3) only one relationship between exogenous constructs and endogenous constructs is mostly significant. It is the relationship between perceived adequacy of resources and management support with a p-value of 0.06 with critical ratio approximately 1.96 (CR-1.850). Perceived adequacy of resources and management knowledge has a regression weight of 0.155 ($p=0.825$). This means that 15.5% of change of PAR is explained by management knowledge construct. PAR and size have a regression weight of 0.301 with a p-value more than 0.05. Thus, 30% of change in the perception of adequacy of resources from the managers can be explained by the organisation's size. However, the construct PAR is in an opposite direction with the management support construct (regression weight of -0.990). Moreover, the perceived adequacy of resources is in a positive relationship with the adoption or design of a more sophisticated costing system. 47.5% of change in the adoption of costing system sophistication can be explained by the perceived adequacy of resources.

PAR is largely explained by the exogenous factors (Management knowledge, management support, and size) as the R-square is largely above the value of 1 ($R^2=1.51$). This means that more than 151% of the construct is explained by the model. However, as previously argued, only the regression weight between PAR and management support is mostly statistically significant.

CSS has a negative regression weight with management knowledge (coefficient = -0.646). However, it is positively explained to the rate of 96.9% by the predictor construct management support (coefficient = 0.969). In addition, any change of 1 unit

of the predictor SIZE will affect the rate of 8.3% for the adoption of CSS (regression weight = 0.083). This is similar for adequacy of resources, which has a positive regression weight as predictor of CSS (0.475; $p=0.561$, $CR=0.581$). Moreover, CSS has an R-square of 0.120. This means that 12% of CSS is explained by the model (PAR, MK, MS, and SIZE). However, none of the relationships were found to be statistically significant.

SIZE has a positive direct effect on CSS (path coefficient = 0.301), an indirect effect on CSS (path coefficient = 0.141), and a total effect with a coefficient path of 0.226. Management support has a direct effect with a coefficient of 0.969, an indirect effect of 0.074, and a total effect of 0.499. Management knowledge has a negative direct effect with a path coefficient equal to -0.643, an indirect effect coefficient of 0.074, and total effect equivalent to -0.573. Adequacy of resource has a direct effect with a positive path coefficient of 0.475, has no indirect effect on CSS, and total effect with a coefficient of 0.475. To analyse the effect of uncertainty avoidance construct, we are to refer to the structural equation model 1. The findings indicate that uncertainty avoidance has a regression weight negative to CSS (coefficient = -0.360) and to adequacy of resources (-0.400). It is significantly covariate with management knowledge (coefficient = 0.147, p -value = 0.045) and management support (coefficient = 0.156, p -value = 0.044). It has a negative total effect of -0.173 on the adoption of CSS.

Table 7. 17 Total effects (model 2)

	SIZE	M.Support	M.Knowledge	Adequacy.R	CSS
Adequacy.R	.301	-.990	.155	.000	.000
CSS	.226	.499	-.573	.475	.000
MK4	.000	.000	1.000	.000	.000
AR22	.253	-.831	.130	.840	.000
CSS3	.254	.560	-.642	.532	1.122
CSS2	.226	.499	-.573	.475	1.000
AR44	.356	-1.168	.183	1.181	.000

	SIZE	M.Support	M.Knowledge	Adequacy.R	CSS
SIZE1	1.782	.000	.000	.000	.000
SIZE2	1.000	.000	.000	.000	.000
AR11	.301	-.990	.155	1.000	.000
MS1	.000	1.490	.000	.000	.000
MS2	.000	1.500	.000	.000	.000
MS3	.000	1.392	.000	.000	.000
MS4	.000	1.000	.000	.000	.000
MK1	.000	.000	1.485	.000	.000
MK2	.000	.000	1.789	.000	.000
MK3	.000	.000	1.704	.000	.000

Table 7. 18 Direct effects (model 2)

	SIZE	M.Support	M.Knowledge	Adequacy.R	CSS
Adequacy.R	.301	-.990	.155	.000	.000
CSS	.083	.969	-.646	.475	.000
MK4	.000	.000	1.000	.000	.000
AR22	.000	.000	.000	.840	.000
CSS3	.000	.000	.000	.000	1.122
CSS2	.000	.000	.000	.000	1.000
AR44	.000	.000	.000	1.181	.000
SIZE1	1.782	.000	.000	.000	.000
SIZE2	1.000	.000	.000	.000	.000
AR11	.000	.000	.000	1.000	.000
MS1	.000	1.490	.000	.000	.000
MS2	.000	1.500	.000	.000	.000
MS3	.000	1.392	.000	.000	.000
MS4	.000	1.000	.000	.000	.000
MK1	.000	.000	1.485	.000	.000
MK2	.000	.000	1.789	.000	.000
MK3	.000	.000	1.704	.000	.000

Table 7. 19 Indirect effects (model 2)

	SIZE	M.Support	M.Knowledge	Adequacy.R	CSS
Adequacy.R	.000	.000	.000	.000	.000
CSS	.143	-.470	.074	.000	.000
MK4	.000	.000	.000	.000	.000

	SIZE	M.Support	M.Knowledge	Adequacy.R	CSS
AR22	.253	-.831	.130	.000	.000
CSS3	.254	.560	-.642	.532	.000
CSS2	.226	.499	-.573	.475	.000
AR44	.356	-1.168	.183	.000	.000
SIZE1	.000	.000	.000	.000	.000
SIZE2	.000	.000	.000	.000	.000
AR11	.301	-.990	.155	.000	.000
MS1	.000	.000	.000	.000	.000
MS2	.000	.000	.000	.000	.000
MS3	.000	.000	.000	.000	.000
MS4	.000	.000	.000	.000	.000
MK1	.000	.000	.000	.000	.000
MK2	.000	.000	.000	.000	.000
MK3	.000	.000	.000	.000	.000

With regard to the factors influencing the adoption of CSS among Congolese organisations, the findings indicate that the positive relation between size and CSS is not statistically significant. This contradicts our hypothesis (H1a) which predicts that size has a direct and an indirect positive association with CSS through adequacy of resources to invest. This finding leans toward the assertion of the absence of a relationship between organisational size and the adoption of CSS, as supported by some of the scholars (Gosselin, 1997; Libby and Waterhouse, 1996; Cohen *et al.*, 2005). Similarly, the hypothesis H1b:(Strong uncertainty avoidance is positively associated with simplistic cost system sophistication) is also rejected. Despite a significant covariance with management knowledge and management support, uncertainty avoidance did not indicate a good loading factor (less than the inclusion criteria of 0.3), but also the negative regression weight to the CSS or to perceived adequacy of resources was not significant.

In relation to the construct perceived adequacy of resources (PAR), although results indicate that more than 100% of the construct can be explained by the model ($R^2 = 1.51$), the relationship was not statistically significant except for one exogenous construct. Indeed, management support is mostly significantly related to the PAR. Notwithstanding, results indicate a positive and a non-significant relationship with the adoption of CSS. This contradicts our hypothesis (H2a) which predicts that the perceived adequacy of resources to invest is positively related to CSS. Similarly, it also contradicts hypothesis (H3a) which predicts that management knowledge has an indirect positive and direct relationship with CSS through perceived adequacy of resources to invest. As shown in Table 7.17, there is a negative regression for the path MK to CSS, and a positive regression weight for the path MK to PAR. Both paths have a p-value of more than 0.05, therefore they are non-significant. Contrarily, management support construct indicates a mostly significant relationship with perceived adequacy of resources with a regression coefficient of 0.990 (see Table 7.17), but the results indicate a non-significant positive relationship with CSS. What is certain is that management support influences tremendously the relation between PAR and CSS. In addition, although a clear negative direct effect of management knowledge toward CSS (coefficient = -0.636), of management support toward CSS (coefficient = 0.969), or of clear indirect effect of MK to CSS (coefficient = 0.074) or of MS to CSS (coefficient = -0.470), those relationships have a p-value more than the inclusion criteria of 0.05. So, at this stage of analysis, we cannot confirm the hypothesis H3a. (Management knowledge has an indirect positive and direct relationship with CSS through adequacy of resources to invest), or H3b. (There is a direct or indirect positive association between management support and CSS through the perceived adequacy of resources). Thus, H3a and H3b are rejected.

Table 7. 20 Hypotheses test summary

Hypothesized Relationships	Standardized Estimates	C.R	p-value	
H1a. SIZE->CSS	0.083	0.326	0.744	
H1b. UA->CSS	-0.360	-0.277	0.782	
H2a. PAR->CSS	0.475	0.581	0.561	
H3a. MK->CSS	-0.646	-0.763	0.446	
H3b. MS->CSS	0.969	0.816	0.415	
R-square				
PAR	1.51			
CSS	-0.120			
Model Fit				
CMIN/Df=1.382, p=0.008, GFI=0.924, CFI=0.958, NFI=0.867, IFI=0.959, RMR=0.146, RMSEA=0.044				

7.4.5 Significance of the SEM findings relative to factors influencing the adoption of CSS

The SEM findings indicate that the perceived adequacy of resources to invest in an innovative costing system (such as CSS) emerges from the combination a of set of behavioural and contextual factors. It has an R-square of 1.509. It indicates that a proportion of more than 150% of the variance of PAR can be explained by the model. The construct PAR is positively related to the adoption of CSS with a regression weight of 47.5%. The mostly meaningful relationship between management support and perceived adequacy of resources can be a starting point in understanding what causes Congolese companies to adopt a costing system. Indeed, the adoption of CSS is a practical application of management information system. As the qualitative analysis of the interviews reveals in the following sections, the generative mechanism starts from the interactions between knowledge management norms circles, cultural values norms circles and business strategic norms circles.

SEM shows non-significant relationships between behavioural, organisational, and contextual factors and the adoption or the design of CSS. This could mean that there is heavy construct which has a tremendous impact in constraining the

generative mechanism leading to the adoption of an innovative costing system to exert its causal effects. The following section provides more insights in this regard.

7.4.6 The analysis of the interviews

This section presents the analysis of the qualitative approach which has an objective to provide in-depth information on the generative mechanisms and causal powers underpinning the tendencies or patterns observed in the actual domain. Therefore, it supplements results obtained from the quantitative analysis. Companies which use more than one cost pool, and more than one cost driver are qualified as a non-simplistic cost system sophistication adopter. A sample of the interviewees is extracted from the survey questionnaire responses among the companies' adopters of the CSS. The interview was conducted over the phone. It was transcribed, and later translated from French to English. The thematic analysis of the interviews was conducted at the end of the process through a retroductive-retroductive process of analysis from the perspective of critical realism in order to provide more meaning and understanding of the constant conjunction of phenomenon factors, CSS, and organisational performance.

7.4.6.1 Interviewees' expertise and experience

The interviews were conducted with accountants, financial directors, and CEOs. They were all with people who have the expertise enabling them to answer the guided questions of the semi-structured interviews. We had two accountants, one financial director and one CEO. All the interviewees had a work experience exceeding 10 years. They witnessed changes in their companies and were able to relate to them in their answers. The following sections present the description of the interviews and is followed by the interviews' analysis.

7.4.6.2 Factors influencing CSS adoption

The interviewees were asked to provide information on what causes them to adopt a new method of management accounting costing system in their business unit.

Manager 1 started by presenting the need of improving the employees' social life, therefore the need for more effectiveness of business management in order to generate profit. In regard to the question above, Manager 1 states:

“ I think what makes our company to adopt new methods of management accounting is a conjunction of several factors that can be considered as prerequisites of newness such as a clear support from the top managers, adequate resources – ICT, knowledge of the new costing system, training on the usage of such systems”.

Similarly, another participant, Manager 2, argues that there is not one reason that can be pinpointed, rather, there is a concerted combination of multiple factors which all play the role of an enabler in the adoption of an innovative costing system.

In his own words, the second manager said:

“ There are nebulous of causes that led our company to adopt such system. First of all, I believe the most important is the role and the function that management accounting plays in our company. From 2018 there was a desire from our top managers to place management accounting as strategic function in the pursuit of the organisation objectives. A clear change that has placed accountants at the centre of decision making. This strategic shift has led to a complete review of our accounting practices. However, this change could not be possible without top managers making available financial resources, communication resources, human resources such as - accountant with expertise in the use of costing system. Above, I will say the catalyser was the company social norms

changes. It needed to change people culture from being the passive actors to the active employees.”

To the list of factors enumerated above by the interviewees, there are other factors influencing the adoption of CSS, such as the degree of internationalization of the businesses and their capacity for gathering technical provisions needed for adoption of an innovative accounting system. According to Manager 3, being part of a multinational company creates the environment leading to the adoption of new methods of management accounting systems.

He states:

“ The most important driver of adopting a more sophisticated product costing system is the degree of internationalisation of our company. The headquarter provides the technical provision needed for such management accounting practices. Among those provisions, there are adequate educational skills, adequate access to finance, the importance of competition, the importance of innovation, a large network of communication and a higher integration of ICT. All these factors work together in influencing our top managers to adopt a system which is recognised in the world among the most effective for cost management. If I have to choose one , I will say, being part of an international company. As such there are some norms or benchmarks, we should adhere too for more credibility and effectiveness”.

Another, Manager 4 said - accounting as part of strategical planning, value creation, norm circles; market demands, company demands - :

“ I think the adoption of a more sophisticated system for our cost management germinated from the desire to be more competitive in the market. The market is becoming more competitive, our customers are becoming more demanding.

They are requiring quality for our products. Therefore, our accompany wanted to innovate to improve product quality and employees working experience. So, new objectives were adopted – (1) increasing sales through higher quality of our products, (2) increasing sales through improving employees working experience. With the new vision, the management accounting was considered as driver for value creation through cost reduction, which will consequently increase company profit and wealth which in return were redistributed to increase salaries and the quality of our products.”

Among the internal factors influencing the adoption of CSS, Manager 4 pointed out the role of the organisation’s culture.

“ I think the driving force beneath the adoption of new methods of management accounting costing systems in our company is the culture of excellence in everything we are doing. From the need of customer, passing through the waste reduction, to the delivery of our services. In this perspective, we started taking risks to the point of going against some of rooted norms such as the conservatism and adopting a more modern practices even in management accounting control practices. However, changing the culture was not enough. There was a high degree of support from the top management and availability of financial and human resources”.

7.4.6.3 Perception of the concept of adequacy of resources

All the interviewees were asked about their expectation of the concept of having adequate resources to invest in an innovative costing system. Manager 1 explained by stating:

“ To have adequate resources preceding the adoption of new methods of management accounting costing systems is important. This cascades from a

conjunction of several factors, which can be characterised as prerequisites for adoption of such system. This means a concerted set of financial resources, technical resources (software, high integration of ICT), human resources and innovative strategy. Only the combination of those factors creates the higher perception of having enough resources to adopt and implement a new system of costing management”.

In the same way, Manager 2 claimed:

“The perception of having enough resources in order to invest in innovative accounting system resides on the apprehension of top managers. It is the top managers who assesses and considers if the company has available resources to adopt and implement such system. In my view the decision of adopting the new methods of cost management was supported by various inputs such as employees training on the use of new practices, high integration of ICT, financial resources, pioneers for change, support from other functions within the organisation, and knowledge about costing management.”

For Manager 3,

“ The adoption of such system requires enough financial resources. With financial resources other resources could be created such as providing training on how to use the system; providing technical support in the use of such system; providing human support in term of time and expertise; creating a mindset for newness in the pursuit of higher performance; a network of communication channels, social concerns, and organisation culture. Being part of a multinational , our branch benefits from the concerted set of the factors above, from which derive the adequacy of resources to invest in an innovative information system for more effectiveness”.

Manager 4 claimed that the concept of having adequate resources is subjective as it solely depends on the top management's decision.

“ I think adequacy of resources cannot be quantifiable. It is subjective to the choice already decided by the top management. For this manager, the interplay of a range of factors – administrative and technical – can be considered as enough to decide to adopt a more sophisticated system, whereas for another manager there is not enough resources to move to such system. So, the degree of adequacy of resources resides on the perception of the top management, which cascades from the strategic planning of the organisation”.

For Manager 4, the requirement for adopting a more sophisticated costing system depends on the societal environment.

“ In my understanding our societal norms characterised by a higher degree of uncertainty avoidance or high degree of power distance stop us to move towards a new framework of management control systems and practices. Indeed, cost management is not among the priorities of our norms. The priority is in other things. Therefore, I think the concept of adequacy of resources should also include the social change enabler of the adoption of innovative management accounting practices. Thus, adequate resources mean financial resources, management support and societal changes toward more risk-taking attitudes for more effectiveness.”

7.4.6.4 Use of CSS for decision-making and for cost management.

Interviewees were asked if they used the CSS for decision-making and cost management. Manager 1 indicated that new methods of management costing system were adopted for organisational performance.

Manager 1 : "The main reason of adopting a CSS in our company is relative to increasing organisation performance. This passes necessary through making effective strategic decision. It is used for decision making in regard to price' s fixation, the cost of the new product or service introduction, budgeting, and cost reduction."

Similarly, other interviewees support the view that the adoption of a more sophisticated costing system is related to the pursuit of profitability.

Manager 2: " I think we adopted a more modern management information system to improve strategic decision making. Our organisation's goal was to increase the profit and reduce costs. The top management believed that this can be achieved by reducing waste and accurately allocate resources."

For Manager 3,

" Using more cost pools and distinct types of overhead recovery methods facilitate to trace back resources to the related activities. Yes, we use the new method of costs calculation for business strategic decision making".

For Manager 4,

" Yes, we use cost system sophistication for strategic decision making in regard to price fixation, outsourcing decision, cost reduction and profitability."

7.4.6.5 Satisfaction with the use of CSS

All the interviewees claimed that managers – accountants - are satisfied with the use of CSS.

For Manager 1: " the adoption of a more sophisticated costing system has produced reliable results as we were able to calculate accurately activities costs. We are all satisfied with it".

For Manager 2: “ Yes, we are satisfied with the use of ABC. It reduces the nightmare of not knowing how to allocate costs relative to some of the activities such as cleaning services which cannot assign to a particular function within the business unit.”

For Manager 3: “ I think our satisfaction is higher with the new method of management costing system we are using right now, compared to the traditional practices. We are able to take more effective decision in regard to outsourcing for example. We are able to introduce a more competitive product in the market in the term of quality and price. Furthermore, our company has increased its profits since the adoption of such system”.

For Manager 4; “ Yes, we are satisfied with cost system sophistication as it helps to allocate indirect costs to cost objects with accuracy. In addition, we become more competitive compared to our competitors as we can now take more effective strategic decision.” We are also satisfied as the new practices created a new mindset in regard to waste reduction and a more accountability. Each team is aware of the costs to undergo for their activities rather than relying on the average costs used with traditional costing systems.”

7.4.6.6 The interviews' findings

The adoption of a management accounting innovative system is intrinsically related to the conceptualization of the organisation's effectiveness. As would be suggested by the theories of diffusion of innovations, the adoption of CSS can be seen as one of the sub-systems within a management control package directly or indirectly related to the pursuit of organisational performance (Bescos and Charaf, 2013). From this perspective, such adoption derives from a conglomerate, an interplay of various social structures. The interaction between those social structures leads to the adoption

of a CSS. So, the analysis of the adoption of such a system is crucial as it constitutes a pivotal point for an effective cost management and provides explanation of how various structures which preceded its manifestation and its effects on performance are associated with such structures.

The analysis is conducted among Congolese firms. Data collection took place between the period of 2021 to 2022 during the Covid-19 pandemic. Among the adopters of a more sophisticated costing system (from the survey questionnaire), a sample was extracted, and interviews were conducted relative to the adoption of new methods of cost management in their business unit. The interviewees were managers – accountants, financial directors, and CEOs - with at least ten years of work experience. Based on their experience, participants were able to trace back practices within their business unit and provide accurate descriptions of what they think were the causal powers leading to the adoption of a more effective cost management system. There were four questions guided from the tendencies uncovered empirically from the survey questionnaire: (1) what causes them to adopt a CSS, (2) what they think of a PAR to invest in regard to the adoption of management accounting costing innovation, (3) Do they use CSS for cost management and what are their levels of satisfaction with the new management costing system? In total, four interviews were conducted between 2021 and 2022. The interviews were transcribed and translated from French to English. In order to come to an informed analysis, the interviews were complemented by a further literature review.

As previously stated, this qualitative analysis aims to provide more insights into the generative mechanisms beneath the emerging tendencies observed in the empirical domain relative to the effect of factors on the adoption of CSS and organisational effectiveness. In other words, the research tries to find a broader range of social actors

or practices within an organisation which can be considered as norms circles exerting a positive loophole (enabler) or a negative loophole (restrainer) on the manifestation of the observed or unobserved patterns.

In critical realist literature, a social actor does not operate in a structural vacuum (Bhaskar, 1975). It acknowledges the existence of social structures which precede the occurrence of an event. According to Baker and Modell (2017) these structures are imbued of causal powers that are likely to generate mechanisms leading to a constant conjunction of events. Similarly, Elder-Vass (2010) states that social structures have emergent causal powers. They are conceived of being multiple, an interaction of various norms-cycles. They also represent a particular group of social actors regrouped by these social norms around practices or actions. Those social actors are collectively intentioned to push such agenda (Baker and Modell, 2017; Wahlberg, 2014; Elder-Vass, 2010).

The retroductive analysis of the survey questionnaire, which forms the basis of the semi-structured interviews, indicates that CSS adoption is associated with the PAR despite the non-statistical significance. In addition, this adoption is intimately related to the strategic vision of the company for more organisational effectiveness. The retroductive analysis will be followed by the retrodictive analysis which consists of ascertaining the social structures, the norm circles explaining the patterns or tendencies observed in the empirical domain. The retrodictive analysis provides the insights on how the patterns come to occur.

7.4.6.7 Business adoption of an innovative costing system is multiple

The adoption of any management information system such as CSS must be investigated as part of the overall package of management accounting control systems (Otley, 2016). As such, a strong emphasis on the adoption of an innovative costing

system is intertwined with a strategic organisational goal of improving organisational effectiveness through more accurate strategic decision. In this perspective, the social actor - top manager - plays a key role in aligning numerous factors - controlled and uncontrolled factors - with the organisation's strategic vision. So, the strategic vision is translated into form of actions, practices, systems, and initiatives. The adoption of new methods of management control systems such as CSS is one of those sets of actions or systems expressing the approach of the top management in regard to cost management. Therefore, it is a conjecture of various actions, practices, and systems, which are in continuous interplay from each other, leading directly or indirectly to the emergence of the adoption of an innovative costing system.

Referring to the reason for adopting a new innovative system, all the interviewees highlighted that there is a conjecture of several factors which work together to create a favourable environment leading to the adoption of an innovation:

“ The adoption a new methods of management accounting results from a conjunction of prerequisites such as top manager support, ICT integration, prior knowledge on the management accounting innovation and training on the use of such system.” (Manager 1; interviews)

“ There are nebulous of factors such as communication resources, appropriate organisation culture for innovative adoption.” (Manager 2, interviews)

“ It is a concerted set of factors such as technical provision, level of internationalization, education skills and financial resources.” (Manager 3, interviews).

Retroductive analysis of pattern “perceived adequacy of resources associated with CSS”:

CSS was developed and presented as a solution for its accurate information costs, for enhancing organisational performance through supporting strategic actions,

for identifying and eliminating waste and improving efficiency (Brimson,1991; Drury, 2015). From this perspective, it provides appropriate information for operational and strategic decision-making. Furthermore, it offsets the organisational and individual tendencies towards disorder and chaos (Kaplan, 2006). Thus, it is up to the top management teams to put in place adequate resources as actions to achieve the strategic goal.

Adequate resources are considered by the majority of our participants as eclectic concept or multiple, which regroups several factors or resources. These can be grouped into two types of factors – technical resources and administrative resources. Among technical resources, there are ICT integration, financial resources, degree of internalization, level of competitiveness in the market, etc.(semi-structured interviews). Similarly, participants enumerated a list of administrative resources as drivers of creating the perception of having adequate resources, such as top managers support, knowledge of such systems, employees' training on the use of such innovation systems, social norms changes within the organisation, being strategically innovative, culture of excellence, human resources, etc. (semi-structured interviews).

As previously argued, it is a nebulous mix of those social structures in a continuous interplay that generate what seems to be an observable constant conjunction of events, especially the tendencies seen in the empirical domain from the survey questionnaire analysis relative to the contingency between the PAR and the adoption of CSS. This is consistent in part with the views of Shields and Young (1989) that the adoption or implementation of CSS (ABC) must be considered as an administrative innovation. Therefore, it has to incorporate behavioural and organisational factors which are the underpinning forces determining what is or is not important from the employee's perspective, and consequently their preparedness or not for adopting

innovative practices or systems (Shields, 1995). However, Shields (1995) fails to consider that the adoption of whatever types of innovation - administrative or technical - has to be preceded by some social structures. These can be considered as a reality of things within the process of adopting new ways of processing or practicing costs allocation. Technical factors also play a contingent role in the adoption process, as our interviews revealed.

Moreover, all the interviewees place the emphasis on the top managers as the driving forces of the occurrence of the tendencies to have adequate resources to invest. Thus, the adoption of a more sophisticated system resides in the appreciation of the top managers. The appreciation of how well the adequacy of resources is perceived matches the preferences, the goals, the agendas, the knowledge, and the resources of the dominant or powerful coalitions of employees, particularly the top managers. One of the interviewees explained:

“ It is up to the culture of excellence adopted as goal that led to the adoption of new methods of management control costing system. Nevertheless, this could not be possible unless there was an appropriate support from the top management.” (Interviews). Similarly, another manager carried on asserting that the perception of having enough resources depends solely on the apprehension of top managers. (Interviews, March 2022).

One may say it is the perception value of the top managers that conceptualises the construct adequacy of resources to invest in an innovative costing system. This current study hypothesized that the “perceived adequacy of resources” is multiple, it is a four structures construct composed of SIZE, Management Knowledge, Management Support, and Uncertainty Avoidance. Therefore, what appear to be the tendencies from the survey analysis are apprehended by our interviewees as perceived value

in the mind of the top managers. It is a perceived value of the top managers. The concept is unidimensional (depending on the top manager's cost and benefit cognitive reasoning process) as well as multi-dimensional (a conjecture of technical and administrative factors). This perceived value is a result of individual judgement on the contribution of the new methods of cost management (CSS) will bring in increasing the organisation performance.

Hence, based on the survey analysis and interviews, the adoption of CSS is associated with the tendencies, as observed in the empirical domain, relative to the perceived adequacy of resources to invest, resultant from the cognitive reasoning process of the top manager in the pursuit of organisational performance. This current study's retroductive analysis identified some eventual norm-cycles or social structures which are imbued with generative mechanisms or causal powers enabling or restraining the occurrence of the tendency to associate perceived adequacy with CSS and OP.

Management Knowledge norms: From the perspective of a demand for an innovative cost management system, the PAR value is considered to be a unidimensional concept linking the subject – the top manager - and the object – CSS and OP. We argue that the value given to the construct is comparative. It compares the cost and benefit that might be incurred in the use of traditional costing systems (TCS) to the cost and benefit which would be incurred in the adoption and implementation of a new method of costing management (CSS). We also argue that the construct is, by virtue, personal as it entirely depends on the top management's cognitive thinking about the benefit the new system would add to the organisation's strategic goals. We argue also that the construct is multi-dimensional and situational as it depends on the interplay of various structures – technical and administrative structures. On that basis,

the question this analysis attempts to uncover is relative to the social structures that might be responsible for the emerging patterns to associate PAR, CSS, and organisational performance. This normative is the management knowledge and awareness, particularly the prior knowledge and awareness of the top manager in regard to the cost-benefit the new methodology will bring in pursuit of the organisation's effectiveness.

As Manager 2 stated:

“The perception of having enough resides on the apprehension of top management. It is the top managers who assess and consider if the company has available resources to adopt and implement such system. He added other determinants such as employees training and knowledge of CSS”.

Generally, in the resources-based views of modern organisation, knowledge management is not limited to the top managers alone but also to the other employees. It is up to the entire work force – employees - to innovate and create solutions for more effectiveness (Mughraj, 2015). So, the normative of management knowledge includes the entire working forces of the organisation. Therefore, the adoption of a management information system such as CSS is mainly a consequential part of the success of the innovativeness strategy. Knowledge management is considered to be an asset for competitive advantage that must be possessed, used, and nurtured. It is considered to be the causal power for success (Abualoush *et al.*, 2017). Knowledge is here apprehended from the perspective of the realist view, as a result of a cognitive processing triggered by stimuli. It is a capability (Schubert *et al.*, 1998). Consequently, this implies the exposure of the employees to the usefulness of the management's knowledge, and the facilitation and assimilation of such knowledge. Therefore, knowledge must be shared to influence action, to build core competencies and understanding of the

strategy and support the development of employees and of the organisation's core of competencies (Bouraghda and Dris, 2015).

It is the conceptualization of knowledge sharing, which involves an exchange among the top managers and employees within the business unit, wherein resides the basis of a social structure with potential causal power or imbued with a generative mechanism to enable or to restrain the tendency observed between PAR, CSS, and organisational performance. Baker and Modell (2017) used the same concept of "share value" as a basis of forming norms circles explaining the observed tendency of the performativity of Corporate Social Responsibility. The following section analyses another norms circle which is in continuous interplay with knowledge share value. Furthermore, it can explain the mechanisms beneath the association of PAR, CSS, and OP.

Cultural norms values: The adoption of innovative practices or systems does not happen accidentally; it happens in conjunction with the requirements of the organisation's environmental setting, enabling the application of knowledge and the benefit return of such application. As such, cultural values, which are embedded in the national culture, drive the institutional forms and practices (Hofstede, 1984). Gray (1988) extended Hofstede's hypothesis in which societal values have institutional consequences by arguing that the accounting sub-systems draw from the societal values. These accounting values, in return, will influence the accounting systems and practices. For Gray (1988) the conservatist accounting values consists of being cautious of measurement as a way of coping with unpredictability (uncertainty avoidance) of the future, contrary to the optimistic approach, which is a risk taker, a more innovative approach. Consequently, an organisation with a culture of high uncertainty avoidance will maintain and protect institutional practices and systems for conformity. This

includes, for example, the culture of using traditional costing systems and avoiding any change, deviant ideas, or practices. Contrarily, the weak uncertainty avoidance will easily adopt innovative systems or practices. As one the managers illustrated:

“ The strong risk-taking avoidance and the high degree of power distance stop companies to move towards new framework of management control systems and practices. Thus, to have adequate resources mean to create an atmosphere, a societal change toward more risk takers for more effectiveness.”

In the context of adoption of a new method of costing system, the propensity to maintain traditional norms codes of beliefs and behaviours restrains any shared value of innovation towards the adoption of a more sophisticated costing system. This can reinforce the point of view of keeping traditional costing systems and counteract the adoption of a deviant idea. Ngokana *et al.* (2021) found that among Congolese SMEs 65.6% implement Traditional Costing Systems (TCS) on the basis of the preservation of rigid codes or preservation of the status quo. Similarly, Diop (2018) posited that factors that restrain the adoption of new methods of costing systems among Senegalese firms are: (a) the management's satisfaction with the traditional cost system (60%); and (b) traditional costing systems are considered as effective (58%).

Generally, cultural norms underpinning accounting values are subconsciously driving employees' cognitive thinking, mindsets, capabilities, and actions. In the case of the strong uncertainty avoidance atmosphere, this norm circle stops, and inhibits any deviance or new practices or systems that might come from the knowledge management norms circle. Often, cultural norms – uncertainty avoidance - are transmitted through family social networks, institutionalized in the education systems, and later constitute the rigid codes within an organisation. In order to adopt a new method, as illustrated by the interviewees, cultural change has to be considered as the

prerequisite adequate resource to create an atmosphere of adopting a more sophisticated costing system among Congolese firms. The next section presents another norm circle which has a tremendous causal power on the knowledge share values and cultural norms.

Business strategic norms: Business strategy is the core compass directing every system, subsystem, structure, and action of an organisation. It cascades from the organisation vision and mission. It can be considered as a core social structure around which all other systems are built, activated, and evolved. It sets plans and goals indicating how the organisation will compete – which market, product, or services. Thus, the adoption of a management accounting information system such as CSS is nothing other than an instrument of success in the pursuit of the goals set by the organisation's strategy. Management information system, which is part of the information system, is a set of interrelated subsystems that collect and analyse information – costs information - and provides a mechanism to achieve organisational objectives underlined in the organisation's strategy. From this perspective, CSS is considered to be a subsystem in interaction with other subsystems to achieve strategical objectives. Therefore, one may argue that top management particularly, alongside other employees, are social actors who are held together around the norm circle “business strategy” by reinforcing this norm in regard to what constitutes appropriate actions, systems, and budgets. Moreover, they hold together, especially the top management, the intention to enforce such norms (Elder-Vass, 2010) in each action and practice – including accounting costing systems and practices. Therefore, a business strategic norm is imbued of the causal powers directing and shaping even the cognitive reasoning process of the individual - top manager or employee - to adopt a specific course of actions such as the adoption of a more sophisticated cost system (Elder-

Vass, 2010). Baker and Modell (2017) pursue an argument that when this comes to be, the causal powers are activated, causing particular patterns to emerge or events to occur – this current study observed a pattern of “perceived adequacy of resources” to equate with CSS and non-financial performance. As the interviewees revealed, business strategical norms play a vital role in the choice of an innovative costing system. They stated:

“ There is a nebulous of causes that led our company to adopt CSS. I believe the most important is the role and the function that management accounting plays in our company. A clear change that has placed accountant at the centre of decision making. This strategic shift has led to a complete review of our accounting practices.” (Manager 2, interviews)

“ I think the adoption of a more sophisticated system for our cost management germinated from the desire to be more competitive in the market. Therefore, our accompany wanted to innovate to improve product quality and employees working experience. With the new vision, the management accounting was considered as driver for value creation through cost reduction.”(Manage 4, interviews.

Furthermore, business strategy includes some keys factors such as a clear leadership vision, an organisational culture, plenty of resources, and efficient and effective systems. CSS is a system in which efficiency and effectiveness are measured by its capabilities to provide circumstances for decision-making and providing accurate information. According to Al-Tai (2009), the efficiency of the system is measured also by the usage of the system - use of costing management - and the users' satisfaction – managers' satisfaction with CSS. Abualoush *et al.*(2017) argue that user's satisfaction is the most used indicator as it is related to the organisation's performance, the

employee's performance and to the value of information provided. Therefore, a business strategy norms circle in interaction with other norms circles, can enable the causal powers driving the tendency observed in the adoption of CSS, and non-financial performance measured by the usage of such a system, managers' satisfaction with the CSS, and the use of the costing system in decision-making.

All the interviewees acknowledge that:

“The use of costing system in decision making, the managers satisfaction with CSS or the usage of costing management“ (Managers, interview March 2022).

Retrodictive analysis on the emergence of the pattern to equate “PAR, CSS, OP”:

From the retrodictive analysis, we were able to find out that there are three social structures – knowledge management norms, cultural norms values and business strategic norms - behind the appearance of the tendency observed in the empirical domain. Now, the retrodictive analysis attempts to provide an explanation of how the generative mechanisms activate or restrain the causal powers between those norms' circles.

This revolves around the top manager who, in the first instance, becomes involved with the shared values of knowledge management, which, in turn, is in a continuous interaction with other norms circles leading to an enactment of causal powers, and consequently to the emergence of the observed tendency. Based on the data collected from interviewees, the top manager plays a key role in terms of support and knowledge as a driving force determining the existence or not of adequacy of resources, leading to the adoption of management accounting innovation. As one manager stated:

“The perception of having enough resources in order to invest in innovative accounting system resides on the apprehension of top management in this

regard. It is the top managers who assess and consider if the company has available resources to adopt and implement such system”.

One of the interesting findings from the interviewees is that the construct of having adequate resources to invest in innovative costing systems is accentuated by the appreciation of the top manager. It is also accentuated by the top manager’s cognitive disposition, whether or not it matches with the organisation’s goals. It is the prior knowledge of the cost and benefit the new system will yield or not in the mind of the top manager that determines if the organisation has achieved enough adequate resources. This is manifested in the form of what strategic choice top managers will make in regard of what constitutes an appropriate costing system to adopt or not. In addition, the top manager’s incentive in pursuing organisational goals – such as organisational performance improvement - is underpinned by the shared values of the management knowledge. The top manager is committed to the achievement of higher performance. He shares the values of his knowledge to influence action and build a core of competencies for his organisation. This leads to the adoption of a management accounting information system – CSS - as an instrument for the success of the organisational strategy. Thus, the top manager orientates his cognitive effort toward the shared values of the new methodology of cost calculation and creates a coalition around the norm circle “business strategy”. Together with the employee’s, the top manager creates the cultural environment of adopting innovation in costing management. As the evidence points out:

“ It is the top managers who assess and consider if the company has available to adopt and implement such system” (interviews).

“ I think adequacy of resources cannot be quantifiable. It is subjective to the choice already decided of the top management” (interviews).

As the evidence from the interviews suggested, it is the subjective perception of the value of the top manager in respect of an innovative costing system that leads to enabling the norm of knowledge management shared values as a foundation for organisational effectiveness. Subsequently, this norm enables the causal power of the management knowledge norms circle to build a coalition around new practices, actions, and systems. However, these causal powers can be reinforced or restrained by the organisation's cultural norm circle. So, the patterns can emerge when there is a positive loophole enacted by the interrelation between shared values and an appropriate culture enhancer of adoption of new methods. As posited by the managers:

“ I think the driving force beneath the adoption of new methods of management accounting costing systems in our company is the culture of excellence in everything we are doing. From the need of customer, passing through the waste reduction, to the delivery of our services. In this perspective, we started taking risks to the point of going against some of rooted norms in adopting a more modern practices in management accounting control systems”.

Cultural norms values can also work as a restrainer – or a liability, or negative loophole - to the mechanism. In the case of a strong uncertainty avoidance culture, the cultural norms can work as an inhibitor to causal powers generated by the knowledge management norms circles. Conversely, a weak uncertainty avoidance or a risk taker culture, when interacting with the knowledge norms circles, enacts the generative mechanism leading to the emergence of PAR.

Furthermore, the interplay between knowledge management norms circles and cultural norms circles is not enough to explain how this enacts the non-financial performance of the organisation. Embedded in business strategic norms, the generative mechanism starts with the knowledge capability of the top manager to communicate

and transfer to other employees the importance of adopting a new method of control management accounting (CSS) for cost reduction. The knowledge management, which has to be transferred into actions or practices, is reinforced, and activated when meeting with cultural norm values, such as weak avoidance uncertainty. At this stage, the non-linear interaction between these norm circles generates the perceived adequacy of resources in the mind of the top manager, which in turn leads to the decision to adopt a new system of cost management. So, the adoption of CSS is an instrument for the success of management accounting information systems. However, the generative mechanism reaches its climax when it aligns with the business strategy norms. It is the business strategy norm that regroups an organisation's mindsets, actions, and practices. It puts in place a set of resources, including an appropriate internal environment, in the pursuit of strategic goals. It is the business strategic norms that set up what is effective or efficient. It is the compass linking all other social structures toward organisational effectiveness.

The efficient system is the one which enhances user satisfactions with the adopted practices and with the use of such a system for decision-making. The effective system is achieved when the adopted system is used for cost management. As pointed out by managers, they stated:

" The main reason of adopting a CSS in our company is relative to increasing organisation performance. This passes necessary through making effective strategic decision. It is used for decision making in regard to price's fixation, the cost of the new product or service introduction, budgeting, and cost reduction."

Hence, the generative mechanism starts from the perceived value in the mindset of the top manager cognitive reasoning process relative to the use of new methods of cost management. At this stage the mechanism has a weak causal power. It grows

in intensity when knowledge management is share to the employees. The tendency is reinforced by cultural norm circle which supports and encourage practices of cultural change to remove resistance for change. Now, the generative mechanism is activated when it enters into an interplay with risk taker business environment. Which has to be created by the top managers and the employees. Therefore, it transforms the organisation context which was averse to new methods of costing management to a more fertile environment to an innovative costing system. One of the interviewees said that:

“ I think the concept of adequacy of resources should include the social change enabler of the adoption of innovative management accounting practices in costing management”.

Finally, the causal power achieved its highest strength when the norms circles fit with business strategic norms. At this stage the interaction between the knowledge management norm, cultural norm and business strategic norm enacts the generative mechanisms behind the emerging of the pattern “ perceived adequacy of resources associated to the adoption of a more sophisticated costing system and higher organisation performance”.

The findings above illustrate how the cognitive knowledge of the top manager is spread to other employees through share values process and amplified by the innovative cultural norm toward organisation effectiveness. The adoption or a design of CSS is other than the instrument of success of share knowledge value in action. Furthermore, the generative mechanism (we name” the psychocultural effect”) achieves its maximal power when interacting and aligning with business strategic norm circle. Business strategy reinforces the mechanism and explains the regularity of the tendency observable in the empirical domain. Business strategic norm is the compass linking the knot between various norm circles and helping in this regard to perpetuate

the occurrence of such association between PAR, CSS, and OP. In the next section, in the perspective of middle range thinking, we provide a definitive interpretation of the results according to the contextual uncertainty of Congolese business landscape.

7.4.7 Interpretation based on Uncertainty landscape of DRC

Although the quantitative analysis shows that the relation between perceived adequacy of resources and CSS was statistically non-significant, more than 151% ($R\text{-square} = 1.51$) of the variance of perceived adequacy of resources can be explained by the model. Thus, the perceived adequacy of resources is a construct composed of 3 structures – management knowledge, management support, and SIZE. This is further explained by the generative mechanism uncovered through interviews analysis which reveals that cultural norms within an organisation can restrain the effect of the causal powers emanating from the knowledge share value norm circle. It is the lack of predisposition of cultural change to adopt a new way of doing things, a negative loop-hole, or a liability, which affecting negatively the generative causal powers leading to a statistically significant relation between the emergence of “perceived adequacy of resources” and the adoption of costing system.

In addition, as we argued previously, the environmental complexity of nowadays, particularly from a Congolese business environment in which rugged contextual uncertainty is embedded (see arguments in Chapter 2 and 3), traditional linear contingency cannot explain fully all the interplays of the association between business environmental factors and the adoption of CSS. The standard algorithms used in SPSS (multiple regression analysis) do not incorporate what this current study is proposing at this explorative stage of knowledge of the uncertainty landscape. Extracted from Kauffman's (NK) model, the Congolese business landscape is highly uncertain (unpredictable) due to higher number of various micro and macro factors in continuous

interactions. As K increased, the non-linear interplays between MK, MS, PAR, SIZE, and UA also increased to the point of making the system more complex. In this regard, while the traditional linear contingency cannot capture the degree of uncertainty of the landscape, complexity theory can explain and help to understand the mechanisms involved between the subsystems from which the PAR emerged. The absolute value of the R-square of 0.12 for the construct CSS indicates that only 12% of the adoption of CSS is explained by the model. Therefore, we may argue that 88% is explained by other factors. We continue by suggesting that it is explained also by the contextual uncertainty of the Congolese landscape. We assert that the complexity is co-evolutionary as it incorporates a chain of events caused by the appearance or disappearance of behaviour changes from the subsystems. Thus, Congolese organisations are in continuous adaptation within the less smooth landscape. However, when the interplays between behavioural factors - MK and MS -, and contextual factors- SIZE and UA - reached the peak (where the level of interdependence is higher, $K=N-1$), every factor is influenced by everything else. As the tables (7.13, 7.14 and 7.15) above indicate from the fit SEM model, management knowledge is covariate with management support (estimate=0.424; $p=0.000$), with SIZE (estimate=0.092; $p=0.028$). Similarly, management support has a covariance to SIZE of 0.117 with a p -value=0.020. It means that management knowledge tends to increase or decrease at the same time with management support and size. In an analogous way, there is a tandem mutual increase or decrease between management support and SIZE. Furthermore, the positive and significant correlation between management knowledge and management support (coefficient= 1.143, $p<0.05$), management knowledge and SIZE (coefficient =0.443, $p<0.05$), and management support and size (coefficient=0.385, $p<0.05$) provide further information that not only do they increase or decrease at the same time,

but they are also related. Therefore, in an overly complex situation such as the Congolese business environment, the causal powers enabler of the emergence of the PAR leading to the adoption of new methods of management control is in continuous liabilities with other norms circles, restraining the continuous constant conjunction of events or regularity of the findings. As such, it is understandable why the hypothesized relationships between MK and CSS, MS and CSS, SIZE and CSS, UA and CSS were found not to be statistically significant.

Furthermore, the algorithms of the standard structural equation modelling with latent variables considers that the common factors and the unique factors are independent. This is not the case in a high degree of complexity, such as in the Congolese business landscape. From this perspective, this explorative equation, $U_n = \Lambda_{Un} \eta + \varepsilon$ and $\eta = \Gamma \xi + \zeta$, represents better the mathematical model. Uncertainty is equal to all other factors predicting its degree of unpredictability. Within this current study, contextual uncertainty landscape = costing system sophistication + factors + non-financial performance. The system is non-linear as the predicting constructs of the system are in interplay with each other. They are in a continuous evolution, creating patterns which can emerge or not, depending on the appearance or disappearance of the causal effects. Therefore, the knowledge shared value mechanism interacts with other norms circles for self-organisation with the aim of reducing the degree of uncertainty of the landscape. As such, a sharing of knowledge with the other culture structure, namely the employees, will end up in actions or practices such as the adoption of management accounting information system-CSS-. This latter is nothing other than the instrument of success of the knowledge shared, which started from the cognitive perception of the top management. This mechanism, when it aligns with an innovative culture within the company, enables a causal power leading the appearing of the

pattern adequacy of resources preceding the adoption of CSS. As stated previously, the mechanism will achieve its climax when the business strategic norms provide resources and infrastructures for more effectiveness and efficiency. Such effectiveness will be measured by the degree of use of the new system of cost sophistication or a degree of satisfaction with the system. This all aims at reducing the uncertainty to its minimal point (when the probability tends toward zero). When the uncertainty is higher, this leads to the situation where the social norms circles, such as higher uncertainty avoidance culture, restrains the regularity of constant conjunctions of events, therefore there is a lack of statistical significance between CSS→SIZE, CSS→MK, CSS→MS, and CSS→PAR.

7.5 Summary

This empirical chapter on the factors influencing the adoption of CSS presents in detail the measurement variables, used in the data analysis and hypotheses test. SPSS and SPSS AMOS software were used to handle a complex multivariate relationship of behavioural, contextual, and organisational factors with the adoption of CSS. A measurement model was used to identify significant indicators measuring latent factors, whereas a structural model was used to indicate the emerging pattern and strength of simultaneous relationships between constructs. The descriptive analysis of the survey questionnaire indicates that 39.3% of participants were from the service sector, 12.4% from the financial and commercial sector, 25.4% were manufacturers, and 22.9% were retailers. The large majority of participants, approximately 97%, were SMEs, whereas 3% were from large companies. A cross-tabulation indicates that approximately 74.6% of companies apply a less complex costing system, which can be considered as traditional costing systems, while 17.9% apply a middle

complexity system versus 7% who apply a higher complexity system. Furthermore, the analysis also answers the research question on the extent of use of a more sophisticated costing system (objective 1). Results also show that more than 98% of the companies allocate overheads to cost objects and various practices of the level of complexity of system, ranging from the traditional costing systems to those with a higher degree of complexity. Similarly, findings indicate quite an influence of behavioural, contextual, and organisational factors on the adoption or design of a cost system sophistication. The structural model results of the most fit model (CMIN/Df=1.499, $p=0.003$, GFI=0.924, CFI=0.953, NFI=0.875, IFI=0.955, RMR=0.155, RMSEA=0.050) shows that there is a positive relationship between SIZE and CSS (Estimate of 0.083), MS and CSS (estimate of 0.969), a negative regression weight between MK and CSS (estimate of -0.646), and PAR and CSS (estimate of 0.475). The R-square indicates that variance of the perceived adequacy of resources' construct can be explained by the predictors MK, MS, and SIZE at the rate of 151%. Also, the model can explain at the rate of 12% (negative direction) the adoption of CSS.

However, all those relationships were found to be non-significant, therefore hypotheses H1a, H1b, H2a, H3a, and H3b are rejected. From the perspective of the critical realism, further analysis of four interviewees reveals that there are three social structures or norms circles beneath the emerging pattern of PAR observed in the empirical domain of reality: management knowledge norms, cultural norms, and business strategy norms. Moreover, the retroductive and the retrodictive analysis provide insights into the generative mechanisms the patterns equate to in relation between PAR, adoption of CSS and organisational effectiveness. The findings indicate that the mechanism starts with the cognitive thinking based on the benefit and cost an innovative costing system will bring to the organisation's strategic goals. First of all, the top

manager determines the intensity of adequacy of resources. Through a knowledge share values norms circle, the mechanism is adopted and reinforced by other employees. This leads to the adoption of CSS as an instrument of success of strategic goals of the organisation. Cultural norms value-enhancing innovation will enable the mechanism, while a higher uncertainty avoidance culture will restrain the mechanism. Finally, it depends on the business strategic norms, in which all social structures are embedded, for the generative mechanism to be activated and maintained for a period of time. Furthermore, the non-significant relationships found in the analysis can be explained by the cultural norms' circles, which can play a role of restrainer for change, and also by the rugged contextual uncertainty landscape of the Congolese business environment.

Chapter eight: Cost System Sophistication and Non-financial Performance: Results and Discussion.

8.1 Introduction

This chapter presents the empirical analysis on the impact of cost system sophistication on the non-financial performance. It contains sections on the measurement factors used in data analysis. These are followed by the statistical methods. Final results were presented in form of descriptive statistics and inferential statistics with structural equation modelling. The chapter ends with interviews analysis and the overall interpretation of results based on Congolese contextual uncertainty landscape. Last section provides a summary.

8.2 Measurement factors used in this research data analysis

In this second research model, cost system sophistication is considered as a predictor construct of the organisational performance outcomes. While the former is measured by the ordinal scale relative to the number of the cost pools or of cost drivers used in allocation of costs, the latter used non-financial measurements of the organisation's effectiveness, such as the users' satisfactions or the use of the CSS in decision-making or in cost management.

8.2.1 Cost system sophistications measurement factors

Abernethy *et al.* (2001) used a survey questionnaire to measure product costing sophistication. In an analogous way, Drury and Tayles (2005) capture data in regard to the level of sophistication by asking closed ended questions and seven-point scale questions. They asked participants to indicate the number of cost pools and diverse types of cost drivers they were using within their business unit. Therefore, identically

to Drury and Tayles (2005), this current study quantifies CSS through proxies relative to:

- (a) whether the participant's business unit assigns overheads to products or services (question A1)
- (b) For the first stage of the two stages procedure, how many cost pools are approximately used to assign indirect costs to products or services (question A2)
- (c) At the second stage of the two-stage procedure, how many types of cost recovery methods are used in assigning costs to the cost objects - machine hours, labour hours, etc.(question A3).

8.2.2 Organisational performance measurement factors

According to Vetchagool *et al.* (2021) an organisation's performances are defined as the outcomes of organisational actions. The use of non-financial performance indicators, and of advanced management practices, have been acknowledged as tools for management accounting systems (Mia and Winata, 2008). They have the objective of attaining the organisation's goals (Mia and Winata, 2008). As such, the use of CSS can be linked to the non-financial performance indicators to illustrate the effectiveness of an organisation. From this perspective, this current research uses three indicators:

- (a) the users' satisfaction with the costing system,
- (b) the use of the costing system in cost management, and
- (c) the use of costing system in decision making.

Users are, specifically, accounting managers, financial directors, or CEOs. Respondents were given a glossary on each measurement to indicate their agreement or disagreement.

For the users' satisfaction with a costing system, participants were asked to indicate their level of satisfaction with the costing system in improving decision-making (question B5); or as a right tool for improving decision-making (B8a); or as it procures an overall benefit (B8b); or as a good thing for the company (B8c); or as it provides an accurate assessment of the company costs (B8e); or as it has a noticeable impact on the business unit (B8g). For the use of a costing system in cost management, participants are asked to indicate if they use a costing system to assign costs for decision-making (B4a); or if they use a costing system for cost management (B4b); or if they use a costing system in determining the costs of products (B6e); or if they use a costing system for cost reduction (B6i). For the use of a costing system in decision making, participants are asked about the use of a costing system for stock valuation (B6a); or if it helps for products' or services' discontinuation (B6b); or if it helps for product mix decisions (B6c); or if it helps in making decisions for product outsourcing (B6d); or if it helps making decisions in product pricing (B6e); or as it helps in making decision on new products or services (B6f); or if it helps in the design stage of new products (B6g); or if it helps in making decisions on the profitability analysis of the product (B6h); if it helps in budgeting (B6j); if it helps in activity performance measurement and improvement (B6k); and whether it helps in other business decision-making (B6l).

8.3 Statistical methods

Structural equation modelling is used to analyse data collected through a survey questionnaire. Non-parametric methods are used, as data collected are not normally distributed. The semi-interviews were analysed using a thematic analysis. The

following sections present the sample used, the instruments used, the validity and reliability of the collected data, and the empirical analysis.

8.3.1 Instruments

Organisational performance (OP) was measured by non-financial performance measures:

- (a) satisfaction with cost system sophistication (questions B5, B8a, B8b, B8c, B8e, B8g, D14a)
- (b) usage of a costing system in decision-making (questions B6a, B6b, B6c, B6d, B6e, B6f, B6g, B6h, B6l, B6j, B6k)
- (c) usage of a costing system within a cost management (questions B4a, B4b, B6e, B6i)

To measure each construct, participants were asked questions on a seven-point Likert Scale ranging from (1) strongly disagree to (7) strongly agree. The following section assesses the validity and reliability of the data collected.

8.3.2 Validity and reliability of the sample

As illustrated in Figure 8.2, users' satisfaction with the costing system sophistication was measured through five indicators. After conducting a confirmatory factor analysis with SPSS AMOS 28, the analysis indicated that two indicators showed a factor loading of <0.3 . In this regard, they were deleted. However, just one of the coefficients of correlation of the remaining indicators is above the criterion of ≥ 0.3 , therefore it was included as a significant indicator of users' satisfaction (SCS2).

The same construct validity test was conducted for the usage of costing systems in decision-making. Eight items were used to measure the above latent variable. The confirmatory analysis revealed that two of indicators had a loading of $\Rightarrow 0.3$,

therefore they were retained. In addition, among the remaining items, they had a correlation above the inclusion requirement of ≥ 0.3 . Therefore, they are considered as the most representative observed measurements for the latent variable (UCSDM2, UCSDM3).

Finally, the use of a costing system in cost management was measured by four indicators. Two had a factor loading below 0.3. Therefore, they were removed. The remaining had a correlation above ≥ 0.30 . The two with less than 0.3 loading factors were not included, as they did not meet the inclusion criterion. Only one of the indicators has a correlation of 0.76 which is above the 0.3 criterion. In this regard, it was retained as a good representative of the latent variable use of a cost system in cost management (UCS3). Moreover, the Cronbach's Alpha was 0.79. Therefore, the remaining items are considered as valid and reliable indicators of the construct use of a costing system in cost management.

8.3.3 Analysis

Structural equation modelling through SPSS AMOS 28 was used to investigate this current study's hypothesis model. This is consistent with some recommendations in literature (e.g., Drury and Tayles, 2005; Chenhall, 2003). Firstly, a confirmatory factor analysis is conducted for a measurement model. Secondly, a structural equation modelling was applied to measure the relationship between exogenous and endogenous constructs. The two-step analysis is consistent with prior studies in literature (e.g., Abdel-Masoud *et al.*, 2016). Furthermore, we used thematic analysis to analyse interviews.

8.4 Results

Results are presented in the following ways: firstly, we present the descriptive analysis of the survey questionnaire. Secondly, we present results on the measurements and structural models. Finally, a brief presentation of the testing hypotheses is followed by analysis of the interviews and the overall interpretation of results through the lens of the Congolese contextual uncertainty landscape.

8.4.1 Descriptive analysis of the questionnaire for non-financial performance

To measure organisational performance, 17 non-financial measurements were used. As the tables below show, 92.5 % of responding organisations used a cost system for decision making. This represents 186 firms out of 201. Only 7.5% of them do not use cost management for decision making. Similarly, the same percentage of companies, in this case 92%, agree with the use of a cost system in cost management.

Table 8. 1 Use of cost system in cost management(to assign cost for decision making)

Use of CS in cost management- assign cost for decision making			
	Frequency	Percent	Cumulative Percent
No	15	7.5	7.5
Yes	186	92.5	100.0
Total	201	100.0	

Table 8. 2 Use of cost system in cost management (use for cost management)

Use of CS in cost management – use for cost management			
	Frequency	Percent	Cumulative Percent
No	15	7.5	7.5
Yes	185	92.0	99.5
Missing	1	5	100.0
Total	201	100.0	

Table 8.1 indicates that most of the Congolese firms use a costing system in decision-making for an overview decision on a new product as a non-financial performance measurement compared to other measurements. It is found that 35.8%

consider it a particularly important measurement for organisational effectiveness; 30.3% as very important for activity performance measurement and improvement; and 23.4% for profitability analysis and cost management. Results also indicate that 19.4% considered that it was a particularly important measurement in decisions relative to budgeting. Additionally, outsourcing, product mix, product discontinuation and stock valuation were respectively found to be very important at the rate of 16.4%, 12.4%, 16.4% and 15.9%. Moreover, managers are satisfied with costing systems and replied at the rate of 13.9% that it is very successful for improving decisions. Participant strongly agreed, at the rate of 14.9%, that a costing system is the right tool for effectiveness. In an equivalent way, 18.9% strongly agreed on the overall benefit the costing system brought to their organisation, or 15.9% are satisfied with the costing system as a good thing for their organisations. Finally, the lowest response in terms of especially important measurement for non-financial performance was the use of cost in determining the cost of products for use in cost plus pricing, at the rate of 9.5%. This descriptive statistic is inconsistent with the previous studies by Ngokana *et al.* (2021), who argued that most Congolese companies use “the checking with the budget” as the main tool and most crucial tool for a management accounting information control system.

Table 8. 3 Use of costing systems in cost management

Use of CS in cost management			
	Frequency	Percent	Cumulative Percent
Very unimportant	14	7.0	7.0
Unimportant	22	10.9	17.9
Somewhat unimportant	24	11.9	29.9
Neutral	29	14.4	44.3
Somewhat important	32	15.9	60.2
Important	33	16.4	76.6
Very important	47	23.4	100.0
Total	201	100.0	

Table 8. 4 Satisfaction with costing system (improving decision making)

Satisfaction with costing system – improving decision making			
	Frequency	Percent	Cumulative Percent
Very unsuccessful	11	5.5	5.5
Unsuccessful	7	3.5	9.0
Somewhat unsuccessful	25	12.4	21.4
Neutral	35	17.4	38.8
Somewhat successful	33	16.4	55.2
Successful	62	30.8	86.1
Very successful	28	13.9	100.0
Total	201	100.0	

Table 8. 5 Satisfaction with costing system (Overall benefit)

Satisfaction with costing system – Overall benefit			
	Frequency	Percent	Cumulative Percent
Strongly disagree	14	7.0	7.0
Disagree	24	11.9	18.9
Somewhat disagree	23	11.4	30.3
Neutral	27	13.4	43.8
Somewhat agree	37	18.4	62.2
Agree	38	18.9	81.1
Strongly agree	38	18.9	100.0
Total	201	100	

Table 8. 6 Satisfaction with costing system (good thing for our company)

Satisfaction with costing system – good thing for our company			
	Frequency	Percent	Cumulative Percent
Strongly disagree	13	6.5	6.5
Disagree	22	10.9	17.4
Somewhat disagree	30	14.9	32.3
Neutral	35	17.4	49.8
Somewhat agree	32	15.9	65.7
Agree	37	18.4	84.1
Strongly agree	32	15.9	100.0
Total	201	100.0	

Table 8. 7 Use of costing system in decision making (product discontinuation)

Use of costing system in decision making- product discontinuation			
	Frequency	Percent	Cumulative Percent
Very unimportant	17	8.5	8.5
Unimportant	17	8.5	17
Somewhat unimportant	29	14.4	31.4

Neutral	37	18.4	49.8
Somewhat important	27	13.4	63.2
Important	41	20.4	83.6
Very important	33	16.4	100.0
Total	201	100.0	

Table 8. 8 Use of costing system in decision making (product mix decision)

Use of costing system in decision making- product mix decision			
	Frequency	Percent	Cumulative Percent
Vert unimportant	25	12.4	12.4
Unimportant	21	10.4	22.9
Somewhat unimportant	33	16.4	39.3
Neutral	38	18.9	58.2
Somewhat important	29	14.4	72.6
Important	30	14.9	87.6
Very important	25	12.4	100.0
Total	201	100.0	

Table 8. 9 Use of costing system in decision making (outsourcing)

Use of costing system in decision making - outsourcing			
	Frequency	Percent	Cumulative Percent
Very unimportant	22	10.9	10.9
Unimportant	23	11.4	22.4
Somewhat unimportant	36	17.9	40.3
Neutral	31	15.4	55.7
Somewhat important	28	13.9	69.7
Important	28	13.9	83.6
Very important	33	16.4	100.0
Total	201	100.0	

Table 8. 10 Use of costing system in decision making (new product overview decision)

Use of costing system in decision making- new product overview decision			
	Frequency	Percent	Cumulative Percent
Very unimportant	6	3.0	3.0
Unimportant	9	4.5	7.5
Somewhat unimportant	11	5.5	12.9
Neutral	20	10.0	22.9
Somewhat important	24	11.9	34.8
Important	59	29.4	64.2
Very important	72	35.8	100.0
Total	201	100.0	

Table 8. 11 Use of costing system in decision making (profitability analysis)

Use of costing system in decision making – profitability analysis			
	Frequency	Percent	Cumulative Percent
Very unimportant	23	11.4	11.4
Unimportant	22	10.9	22.4
Somewhat unimportant	19	9.5	31.8
Neutral	28	13.9	45.8
Somewhat important	27	13.4	59.2
Important	35	17.4	76.6
Very important	47	23.4	100.0
Total	201	100.0	

Table 8. 12 Use of costing system in decision making (performance measurement and improvement)

Use of costing system in decision making- performance measurement and improvement			
	Frequency	Percent	Cumulative Percent
Very unimportant	14	7.0	7.0
Unimportant	18	9.0	15.9
Somewhat unimportant	21	10.4	26.4
Neutral	22	10.9	37.3
Somewhat important	23	11.4	48.8
Important	42	20.9	69.7
Very important	61	30.3	100.0
Total	201	100.0	

Table 8. 13 Use of costing system in cost management (cost of product for use in cost pricing)

Use of costing system in cost management – cost of product for use in cost pricing			
	Frequency	Percent	Cumulative Percent
Very unimportant	16	8.0	8.0
Unimportant	30	14.9	22.9
Somewhat unimportant	37	18.4	41.3
Neutral	25	12.4	53.7
Somewhat important	29	14.4	68.2
Important	45	22.4	90.5
Very important	19	9.5	100.0
Total	201	100.0	

8.4.2 The measurement model of CSS and non-financial performance

The measurement model, as presented in the figure below, contains four latent constructs. Three of them are considered to be dependent variables representing the

non-financial performance- satisfaction with costing system (SCS), use of costing system (UCS) and use of costing system in decision making (UCSDM). Cost system sophistication (CSS) is considered in this model as an independent variable. The observed indicators with a loading coefficient less than 0.30 were removed.

The confirmatory factor analysis provides a bad fit to the data with chi-square (201)= 379.838; df=164; p=0.000; RMR=0.310; GFI=.837; NFI=0.726; IFI=0.823, CFI=0.820; RMSEA=0.081. Therefore, the model was improved by removing indicators with a loading factor of less than 0.30.

8.4.3 The structural model

The measurement model above showed that the observed variables did not correctly indicate the latent constructs for testing the hypothesized relationship of the path model. For goodness comparison of the fits, several nested models were conducted. We modified some path diagrams from the CFA to develop the hypothesized CSS, OP path diagram model. The proposed SEM showed a good fit to the data collected [χ^2_M (n=201)= 88.163, df=24, p<0.000, RMR=0.462, GFI=0.911, NFI=0.878, CFI=0.906, IFI= 0.908, RMSEA=0.116] and significant path relationships between constructs were achieved. The CSS – OP path diagram, as examined through SEM, is presented in Figure 8.1. The goodness fit model for the CSS-OP is presented in Table 8.15.

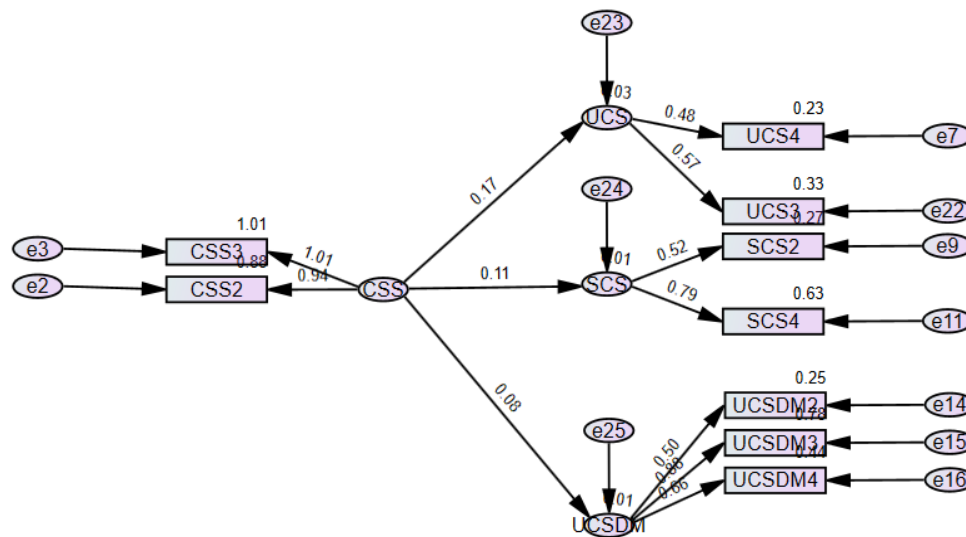


Figure 8. 1 Final CSS-OP model path diagram

The squared multiple correlation of users' satisfaction (SCS) with the costing system (CSS) is 0.011. In a similar way, results show a squared multiple correlation of 0.007 of the use of a costing system in decision making (UCSDM), and of 0.030 for use of a cost system sophistication (UCS). This shows that 1.1% of variance in users' satisfaction can be explained by the adoption of a costing system sophistication; 0.7% of variance in UCSDM can be explained by the adoption of costing system sophistication; 3% of variance of UCS can be explained by the adoption of costing system sophistication. However, the regression weights of the default model indicates that the associations between CSS with SCS, UCS, and UCSDM are not statistically significant. As the table below illustrates, the association between CSS with (SCS, UCS, UCSDM) has an estimate of 0.267, 0.180, and 0.125 with p-value more than 0.05, and critical ratio less than the inclusion value of 1.96, respectively.

Table 8. 14 Regression weights (final model)

			Estimate	S.E.	C.R.	P	Label
UCS	<---	CSS	.267	.224	1.191	.234	par_6
SCS	<---	CSS	.180	.227	.795	.426	par_7
UCSDM	<---	CSS	.125	.120	1.042	.298	par_8
CSS2	<---	CSS	1.000				

			Estimate	S.E.	C.R.	P	Label
CSS3	<---	CSS	1.047	.160	6.551	***	par_1
UCS4	<---	UCS	1.000				
SCS2	<---	SCS	1.000				
SCS4	<---	SCS	1.416	1.679	.843	.399	par_2
UCSDM2	<---	UCSDM	1.000				
UCSDM3	<---	UCSDM	1.807	.353	5.124	***	par_3
UCSDM4	<---	UCSDM	1.390	.233	5.972	***	par_4
UCS3	<---	UCS	1.134	1.063	1.066	.286	par_5

Hence, to answer to the research question regarding the impact of the adoption of CSS on organisational performance among Congolese companies, this structural model's findings show a positive relationship between CSS and the non-financial performance. However, these positive relationships, as illustrated in the path between CSS and the three non-financial constructs, are not statistically significant. This contradicts the hypothesis (H4) which predicts that the adoption of an innovative costing system – cost system sophistication - has a direct and positive impact on an organisation's non-financial performance: (a) user satisfaction with the costing system; (b) use of costing system for cost management; (c) use of a costing system for decision-making. Thus, hypothesis (H4) is rejected.

Table 8. 15 Hypotheses test summary

Hypothesized Relationships	Standardized Estimates	C.R	p-value	
H4a. CSS → UCS	0.267	1.191	0.234	
H4b. CSS → SCS	0.180	0.795	0.426	
H4c. CSS → UCSDM	0.125	1.042	0.298	
R-square				
UCSDM	0.007			
SCS	0.011			
UCS	0.030			
Model Fit				
CMIN/Df=3.673, p=0.000, GFI=0.911, CFI=0.906, NFI=0.878, IFI=0.908, RMR=0.462, RMSEA=0.116				

8.4.4 The analysis of interviews (see also Section 7.4.6)

The findings from the retroductive and retrodictive analysis indicate that, under the impulsion of a top manager, - through shared values mechanism - , knowledge of innovative costing systems is spread to other employees. This is later amplified when a management knowledge norms circle aligns with the innovative cultural norms' values. In this circumstance, the adoption of CSS is other than the instrument of success of shared knowledge value in action. In the final stage, the generative mechanism achieves its maximal causal powers when interacting and aligning with business strategic norms circles. It is the business strategic norms circles that reinforce the mechanism and explain that the regularity found in the empirical domain equates to the constant conjunction between PAR, CSS, and non-financial measurements. It is the business strategic norms which determine the efficiency and the effectiveness of the adopted management information system. Such effectiveness is measured by the level of the users' satisfaction with the new system, or the use of such a system in cost management and decision-making.

Thus, business strategic norms are the compass linking the knots between multiple norms circles and helping, in this regard, to create the generative mechanisms, and at the same time to perpetuate the occurrence of such associations between PAR, CSS, and OP. When the business strategic norms circle orientates toward innovative strategies, all organisations' resources work in congruence with other driving forces to enact practices, actions, and systems aligning with the strategic goals. Furthermore, the effectiveness of the practices or of the costing system adopted is measured by the

degree of satisfaction of the users of the system or the use of the new systems in the decision-making process.

However, the retroductive and retrodictive analysis reveals also that cultural norms values can play a role of restrainer or negative loophole restraining the occurrence of the emergence of causal powers. This can explain the lack of statistical significance on the path relationships between MK, MS, SIZE , PAR and CSS-OP . In the case of higher uncertainty avoidance, an organisation will prefer to stick with a traditional costing system rather than adopting new methods. Indeed, in this circumstance, cultural norms values take the ascendance by blocking any initiative towards change. This can explain why the majority of Congolese companies (approximately 97%) are still using traditional costing systems. Furthermore, when the innovative strategies are not part of the business strategic norms, the causal effects of the generative mechanisms are restrained. Therefore, the occurrence process of the emerging patterns and its regularity is restrained.

8.4.5 Interpretation based on the uncertainty landscape of the DRC

Results show that CSS is positively associated with managers' satisfaction, CSS is associated with the use of costing systems in cost management, and CSS is associated with the use of costing systems in decision-making. However, these relationships were not statistically significant. In addition, the retrodictive analysis illustrates that the causal effect from the generative mechanism is restrained by the cultural norms' values. Business strategic norms in which are embedded practices and activities within an organisation, when they do not fit with innovative strategies, obviously reinforce the use of traditional costing practices.

Furthermore, the highly contextual uncertainty of obviously Congolese business environment reinforces the complexity of the system. In the same way it

reinforces the liabilities the cultural norms values (higher uncertainty avoidance) would exert on the generative mechanism toward the adoption of an innovative system. As the enabler driving forces of the mechanism is reduced, subsequently the significance of the relationship between CSS and organisational effectiveness is also reduced. This finding corroborates with Chae's (2012) arguments positing that in the case of a peak (a situation highly unpredictable) a jump strategy with a radical innovation might yield a higher performance. Therefore, the lack of innovative innovation among Congolese firms leads to statistically non-significant relationships between CSS and organisational effectiveness (as measured by SCS, UCS, and UCSDM).

8.5 Summary

This chapter presents a discussion and empirical analysis on the relationship between CSS and non-financial performance. The hypothesized theoretical model was tested based on the inclusion criteria extracted from literature relative to chi-square and good fit indices. Results of the measurements and structural analysis through SPSS Amos 28 reveal a fit model composed of positive relationships between CSS and the use of costing systems (estimate = 0.267, $p > 0.05$), between CSS and the use of costing systems in decision-making (0.125; $p > 0.05$), and the CSS and the users' satisfaction with the costing system (0.180; $p > 0.05$). The model was fit with a statistically significant chi-square (CMIN/Df=3.673; GFI=0.911; CFI=0.906; NFI=0.878; IFI=0.908; RMR=0.462, RMSEA=0.116). 1,1% of the variance in the organisational effectiveness relative to SCS can be explained by the adoption of CSS (R-square= 0.011). 3% of organisational effectiveness relative to UCS can be explained by the predictor CSS (R-square=0.030). 0.7% of organisational effectiveness relative to UCSDM can be explained by the predictor CSS (R-square=0.007).

However, these relationships were found statistically non-significant. Therefore, the proposed hypotheses were rejected. Further to that, a qualitative analysis indicates that there are three social structures or norms circle underpinning the emerging of the construct adequacy of resources leading to an adoption of an innovative costing system and organisational effectiveness. From the interplay between management knowledge norms, cultural norms values and business strategic norms, the generative mechanisms can be apprehended. While knowledge shared values can enable the causal effect of the generative mechanism, it is up to business strategic norms to bring their fullness towards a higher performance. The lack of an innovative strategy restrains the causal effect. This can explain the non-significant relationship found in the structural equation modelling. Furthermore, this is also true as the Congolese contextual uncertainty landscape is higher. The lack of an innovative mindset, such as lower uncertainty avoidance, restrains higher performance.

In conclusion, this chapter answers the research question relative to the impact of the adoption of CSS on non-financial performance by providing the path relationships between CSS and SCS, UCS, and UCSDM. However, the positive relationships were found to be non-significant. The explanation is provided from the interplay between norms circles and the high degree of uncertainty of the Congolese business environment. Notwithstanding, the CSS-OP path diagram presented above seems to be the best fit model and can be proposed as a developed framework of relationships between contextual, behavioural, and organisational factors, and cost system sophistication, and with non-financial performance measurements (Figures 8.1 and 9.2).

Chapter Nine: Conclusion

9.1 Introduction

This chapter presents the summary of the thesis and its key findings. It initially starts by revisiting the research objectives, the themes from which the research theoretical framework was developed, the methodology and the findings. This is followed by a summary of how the findings and the conclusion are related to the theoretical framework. It also includes a summary of this research's contribution to the literature relative to the product cost system sophistication. Finally, it ends with some limitations of the study and suggestions for future research.

9.2 Overview

The recent renewal of interest in cost efficiency in the pursuit of organisational effectiveness among African companies (Diop, 2018) has led this study to aim to examine the factors influencing the adoption or the design of cost system sophistication in the pursuit of organisational effectiveness. Indeed, previous studies conducted in this stream of literature on the factors influencing the adoption of cost system sophistication resulted in inconsistent findings. While some of them concluded a significant relationship between factors and the adoption or the design of CSS (Malmi, 1999; Booth and Giacobbe, 1998; Krumwiede, 1998; Drury and Tayles, 2005; Al-Omiri and Drury, 2007; Cinquini *et al.*, 2015; Boukr, 2018), others concluded there was a non-significant relationship (Bjørnenak, 1997; Clarke *et al.*, 1999; Booth and Giacobbe, 1998; Gosselin, 1997; Libby and Waterhouse, 1996; Baird, 2007; Cohen *et al.*, 2005). These seminal studies, conducted in the context of developed countries (Al-Omiri and Drury, 2007; Cinquini *et al.*, 2015; Boukr, 2018) omitted to integrate, among other

reasons, within the research framework the level of complexity and uncertainty characterizing the business environment. Consequently, these contingency based studies produced few significant results (Otley, 2008, 2016; Atkinson *et al.*, 1997) as their findings are alleged to not set to exist in a complex, dynamic and changing environment of organisation control (Chenhall, 2003; Otley, 2016). In this regard, extraordinarily little was found regarding the question of why such systems were adopted or the extent to which factors within the business environment influence its adoption (Drury and Tayles, 2005), leaving a fertile research field for further study.

To fill to this gap, this current research attempts to provide more insights on the questions relative to: (1) the extent in which business environment factors influence the adoption of a more sophisticated costing system; (2) subsequently the impact of such adoption or design in non-financial performance. Contrary to most of the seminal studies, this current study provides evidence from a developing country, The Democratic Republic of Congo, by incorporating the impact the level of the complexity, uncertainty and dynamism of Congolese contexts would have on the established or non-established hypothesized relationships between factors, CSS, and non-financial performance. (3) Furthermore, this research attempts to develop a model of complex relationships upon a concerted set of factors – behavioural factors, organisational factors, and contextual factors - with CSS and non-financial performance, as recommended for further studies in literature (Shields,1995; Malmi,1999; Drury and Tayles,2005; Al-Omiri and Drury, 2007). (4) Moreover, the current research goes further by attempting to unfold the generative mechanism explaining the observed association uncovered in the empirical domain between the mentioned factors, CSS, and non-financial performance.

Drawing from the review of the relevant literature, a framework was built based on the triangulation of contingency theory and complexity theory to help to achieve the research's three objectives. As recommended in the literature, the middle range thinking perspective was found as the most appropriate in case of uncertainty by looking at the environment in which the systems are embedded (Otley, 2016). Therefore, the interpretation of the contingency theory is revived based on the complexity of the Congolese business environment. We posit the fit between context-structure and organisational effectiveness depends on the level of uncertainty within a particular contextual landscape of Congolese firms.

Within the perspective of critical realism, mixed methods research was adopted as a way of collecting data. This was followed by the retroductive and retrodictive reasoning process as a way of interpreting data. Data were collected through a survey questionnaire and semi-structured interviews. 201 usable questionnaires were collected out of 1000 distributed to the participants - accountants, financial managers, and CEOs. Results obtained from the survey questionnaire guided questions asked during the semi-structured interviews. While Chapter 7 presents the findings and discussion of the empirical Chapter 4, Chapter 8 presents the findings and discussion of the empirical Chapter 5. To analyse data, structural equation modelling was used to compute analysis through SPSS AMOS 28. The following section presents the main findings.

9.3 Main findings of the study

This section presents the main findings based on the research objectives:

- (1) To examine the extent to which factors influence the adoption of CSS among Congolese firms.

(2) To investigate the impact of CSS on Congolese firms' non-financial performance.

(3) To develop a framework of relationship between contextual, behavioural, and managerial factors and CSS.

9.3.1 Main findings relative to the extent to which factors influence the adoption of CSS

The descriptive analysis of the questionnaire shows that a large majority of participants, 97%, are SMEs and only 3% can be considered to be large companies. Within that configuration, 74.6% of companies adopt or apply a less complex costing system or traditional costing system. 17.9% of Congolese companies adopt what can be qualified as middle complexity costing systems. Only 7% of companies adopt a more complex costing system. Although the structural model results indicate a good fit model within the inclusive criteria (CMIN/Df=1.499, $p=0.003$, GFI=0.924, CFI=0.953, NFI=0.875, IFI=0.955, RMR=0.155, RMSEA=0.050), the relationships found between contextual factors – SIZE and CSS; Uncertainty Avoidance and CSS – were not statistically significant. Therefore, hypothesis 1, positing that there is a direct or indirect relationship between contextual factors and the adoption of CSS, is rejected. With regard to the contextual factor SIZE, this finding corroborates with the previous studies that argued that there is no significant relationship between the factor organisation size and the adoption of a more sophisticated system (Gosselin, 1997; Libby and Waterhouse, 1996; Baird, 2007; Cohen *et al.*, 2005).

Contrary to Gray's (1988) argument that 80% of the country profile in terms of accounting values are explained by the factor uncertainty avoidance, this current study found that there was not a significant association. The uncertainty had a

regression coefficient weight outside the inclusion criteria, therefore, for good fitness of the model, it was removed.

Similarly, the association between the organisational factor PAR and CSS was not statistically significant. Although the variation of the PAR can be explained completely by the model (R-square = 151%), the relationship was not significant (value ≥ 0.05). Therefore, hypothesis 2, suggesting a positive relation between organisational factors - through PAR - and the adoption of CSS, is rejected. There is not, to our knowledge, an empirical finding testing the influence of adequacy of resources factor on the adoption of CSS. This result leans more towards the argument posited by Innes and Mitchell (1995), Wessels and Shotter (2000), and Quinn *et al.*, 2017 stating that adequacy of resources was not the main reason explaining the success of CSS implementation. Furthermore, regarding the positive association between management support and CSS (estimate regression coefficient = 0.969), the negative association between management knowledge and CSS (estimate = -0.646) cannot be sustained as they were statistically insignificant. Therefore, hypothesis 3 proposing, the existence of a direct or indirect relationship between behavioural factors through the PAR, is rejected.

Moreover, from the perspective of critical realism, further analysis of the semi-structured interviews reveals that there are three social structures or norms circles explaining the observed patterns in the empirical domain. As illustrated in Figure 9.1, there are management knowledge norms, cultural norms, and business strategic norms.

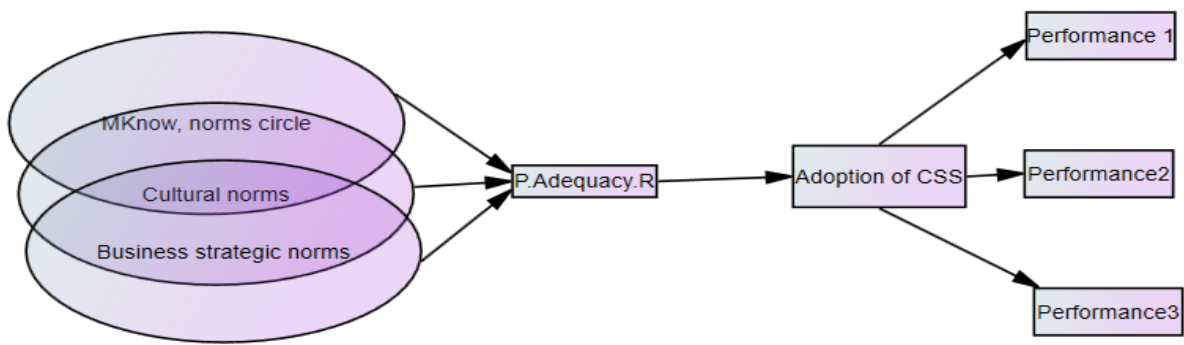


Figure 9. 1 A critical realism perception of the adoption of CSS

Results indicate that the mechanism process starts with the cognitive thinking of the top manager regarding the benefit that an innovative costing system will add to the organisation's strategic goals. Through knowledge share values, the prior knowledge and awareness of the top manager is spread through shared values norms to the entire organisation including other social actors within the organisation – other employees. Consequently, this leads to the adoption of a management information system as an instrument of success of strategic goals. Finally, it is from the business strategic norms circles, as a compass, that the interplay between various social structures enacts or restrains the generative mechanism. In this regard, the statistically non-significant relationships uncovered in the analysis can be explained by the overriding of the cultural norms' circles, creating liabilities which restrains, in return, any effort for change. Furthermore, the rugged contextual uncertainty of the Congolese business environment can provide more insights into the non-significant relationships uncovered in the analysis. As Hofstede (1991) argued, societies characterized with strong uncertainty avoidance have conservative behaviour and beliefs and are intolerant of deviant ideas or innovation. In contrast, weak uncertainty societies are more relaxed with new practices and more tolerant with deviation. At the peak of the rugged

landscape, as previously explained in Chapter 3, there is an increase of interaction of several factors. Therefore, in these circumstances, Congolese businesses can adopt a more conservative attitude, and through cultural norms circles, restrain any effort toward the adoption of a new system of costing system management.

9.3.2 Main findings relative to impact of cost system sophistication on Congolese firms' non-financial performance

Results from the SEM indicate a positive relationship between CSS and the use of a costing system with a regression coefficient weight estimate of 0.267 ($p > 0.05$). Identically, a positive relationship exists between CSS with the used of the costing system in decision-making, with an estimate of 0.125 ($P > 0.05$), and also a positive relationship between CSS and the users' satisfaction with the costing system (estimate=0.180, $p > 0.05$). Although the good fitness of the model with a statistically significant chi-square and with a good inclusion criterion (CMIN/Df=3.673; GFI=0.911; CFI=0.906; NFI=0.878; IFI=0.908; RMR=0.462, RMSEA=0.116), the relationship between CSS and non-financial performance measurements were not statistically significant. Therefore, hypothesis 4, proposing a direct and positive relationship between the adoption of CSS and organisational non-financial performance, is rejected. This finding follows the line of Van der Stede *et al.*'s (2006) argument positing that the use of non-financial measurement for performance evaluation goes together with an innovative strategy. This is not the case with Congolese businesses strategies. As argued throughout this current discussion (Chapters 7 and 8), the lack of innovative mindset hinders any effort for adopting an innovation. Subsequently, this negatively affects the relationship between CSS and non-financial performance.

Moreover, the retrodution and retrodictive analysis show that the pattern equates to factors, adoption of CSS and non-financial performance, observed in an empirical domain, is underpinned by the interplay of three social structures (see Figure 9.1) – management knowledge norms circles, cultural norms circles and business strategic norms circles. The generative mechanism is enacted by the apprehension of the top manager and spread to the other forces through knowledge share values. In return, the adoption of an innovative costing system appears to be a continuation of the effectiveness of business strategic norms for higher performance. This explains, partially, the positive association between CSS and SCS, and UCSDM and USC. However, as previously argued, cultural norms circles alongside the lack of an innovative strategic mindset hinder the generative mechanism and restrain any causal powers towards more effectiveness. This restraining aspect is further reinforced by the rugged uncertainty contextual landscape of the Congolese business environment.

9.3.3 Main findings relative to a framework of relationships between contextual, behavioural, and organisational factors

The analysis of both empirical chapters (7 and 8) shows that a good fit model was developed. It integrates a complex relationship between behavioural, organisational, and contextual factors, CSS, and non-financial performance (Figures 8.1 and 9.2). This is illustrated in the overall framework model in Figure 9.2, below. The model can be improved for more fitness. This model shows a chi-square of 434.021 with a degree of freedom of 196 and p-value of 0.000. As argued by Marsh and Hocevar (1988) a CMIN/DF (2.214) ratio between 2:1 to 5:1 is an acceptable fit, which is the case with the proposed framework. Both authors suggested this ratio is suitable for samples between 100 and 200. In addition, a good fit index is approximately near the interval of 0.90 to 1.00 (GFI = 0.831). Based on these criteria, we can conclude that

the model is overidentified and approximately fits the data. Therefore, it can be proposed as a framework model of a combination of set of behavioural, organisational, and contextual factors with CSS and non-financial performance (see Figure 9.2).

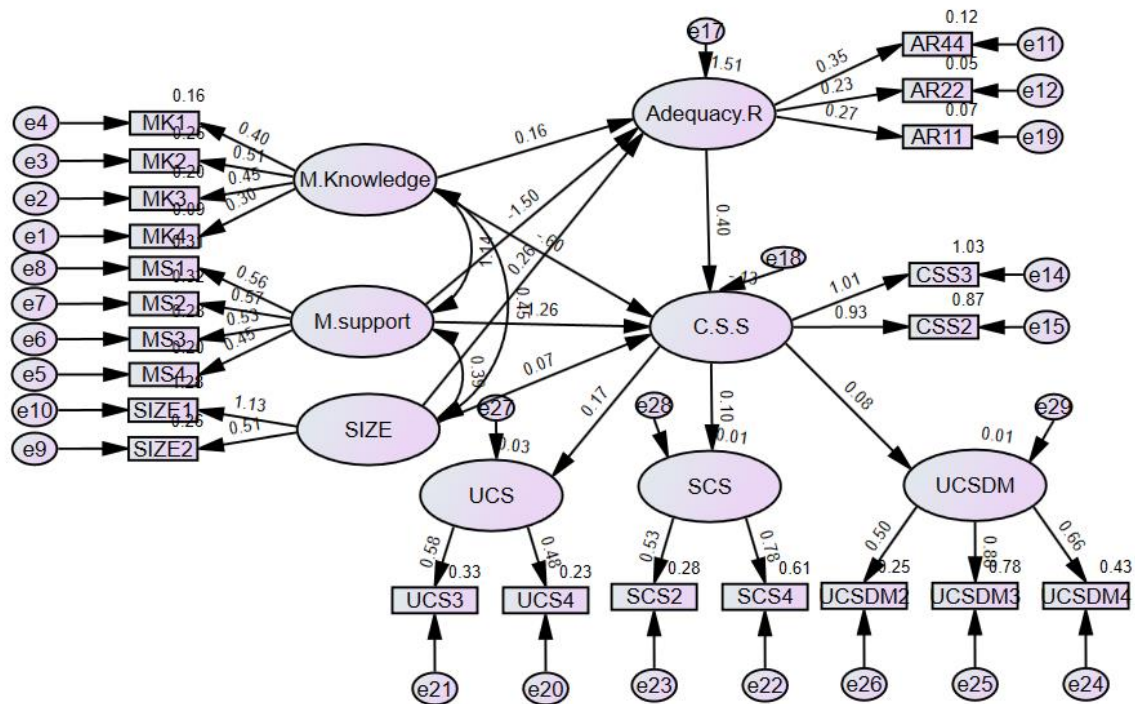


Figure 9. 2 Overall SEM -Factors, CSS and NFPM

Table 9. 1 The goodness for fit of Factors, CSS and NFPM

Parameter	Values
Chi-square with 196 degrees of freedom	434.021
Root means square residual	0.424
Goodness of fit index (GFI)	0.831
Normed fit index (NFI)	0.703
Comparative fit index (CFI)	0.806
Incremental fit index (IFI)	0.812

While most of the relationships were found to be not statistically significant, except the significant relationship between management support and PAR, contingency theory in triangulation with complexity theory justifies those findings. Contingency theory can explain how the investigated factors are associated or not with the adoption of a costing system (Gosselin, 1997; Krumwiede, 1998; Clarke *et al.*, 1999). In this current study relationships were found although they were non-significant.

Contingency theory can justify the lack of significance by the lack of alignment or departure to the fit design model. This departure causes the model to show lower performance or less effectiveness (Drazin and Van de Ven, 1985). Particularly, as the retroductive and retrodictive analysis indicate, the lack of alignment between contingencies with innovative strategy (Chandler, 1962) is a departure from the fitness and this is likely to weaken the association between the adoption and non-financial performance measurements. Furthermore, as argued, within an uncertain and dynamic environment, contingency theory is limited and fails to provide a full understanding of the occurrence of a constant conjunction of events (Otley, 2016). In this regard, the impact of the contingencies on the structure of the organisation or on the system adopted would be various, depending on the level of uncertainty of the business landscape.

In this regard, complexity theory is used as a theoretical lens to understand this substantive issue. Thus, from the perspective of critical realism, the emerging pattern equates to $PAR \rightarrow CSS \rightarrow OP$, which, in the actual domain, can be explained by the interaction of various sub-systems or social structures uncovered in Chapters 7 and 8 - management knowledge norms circle, cultural norms circle and business strategic norms circles. Complexity theory posits that what is observed in the empirical domain emanates from various patterns deriving from the multiple interactions of those norms' circles, which have to be controlled for more effectiveness (Anderson, 1999; Houchin and MacLean, 2005). When the adoption of CSS, which is considered as a success instrument of the application of knowledge shared values, does not fit with an organisational cultural norms circle, this departure will explain the lower organisational performance. This can explain the lack of significance between CSS-UCS, CSS-SCS, and CSS -UCSDM. Furthermore, from the perspective of a dynamic environment, the traditional linear concept of contingency theory does not work. Between the real

domain and the actual domain, an organisation evolves from one state to another, it is in a complex adaptation from a situation of chaos to a new transient equilibrium. Therefore, the interplay between the three norms circles elucidated is in a non-linear mode. From the interaction the generative mechanism is enacted or constrained. When enabled, the perception of having adequate resources in the mind of the top manager is spread through knowledge shared values, and finally results in the adoption of an innovative costing system. When this fits with the cultural norms circle and the business norms circle, the emerging pattern – $PAR \rightarrow CSS \rightarrow OP$ - becomes a constant conjunction of events and shows some occurrence regularity. In contrast, when restrained, the emerging pattern – $PAR \rightarrow CSS \rightarrow OP$ - is not maintained. It quickly disappears as it was a punctuated equilibrium. This adaptive evolutive model explains the lack of statistical significance of this current research's findings. In addition, as Kauffman's (NK) model argues the higher the interaction between factors, the higher the degree of complexity or uncertainty. The Congolese business context is characterized by a higher level of uncertainty; therefore, the model is interpreted at the peak of the uncertainty landscape ($U_{it} = Z_i + f(X_i, B) + e_i$, see Chapter 3). At the higher level of uncertainty avoidance, there is a tendency to adopt a uniform accounting system, being conservative in the measurement tools with a low level of disclosure (Slater and Niswander, 1995). This explains the lack of the fit between the contingencies with business strategic innovative norms, and, therefore, weak relationships between the adoption of CSS and non-financial performance.

Hence, the findings of the study, as summarized above, are related to the theoretical framework. The triangulation of contingency and complexity theory helps to conceptualize the object of this current study's investigation, therefore, to develop a

framework of relationships as proposed above. The CB-SEM estimate the unknown coefficient in a set of linear structural equation .

9.4 Robustness of the econometric method findings

The findings for the quantitative analysis emerged from the computerisation of the theoretical model based on the CB-SEM (covariance based structural equation modeling) through SPSS AMOS 28 software. The method allows the residuals, disturbances, and variables errors in the process of estimating the residual variance-covariance matrix, the unknown coefficients, as well as the variance measurements errors (Joreskog, 1973). So, the CB-SEM econometric uses the covariance matrix of the collected data to estimate the model parameters simply using the common covariance (Joreskog, 1973). They are various points to consider when you are assessing the appropriateness or robustness of an econometric method- SEM for a study(Hair *et al.*, 2018): sample size, distribution normality, type of data, measurement models, the structural models, context of the study, the objectives of the study, etc.

To establish the representativity of the sample, we use random sampling technique to extract our sample from the sample framework. We gave each unit of the population the same chance to be part of the sample, therefore increased the representativeness of the sample in order to infer our findings to the entire population. Further, the content validity was established as the measurements used came from the validated questionnaire from the literature. In addition, the construct validity was established through the first stage of the SEM procedure – the confirmatory factor analysis. The theoretical framework as proposed in figure 9.2 include only variables which met the inclusion criteria (Rahman, 2000; Paul and Maiti, 2008). All other factors which did not meet the inclusion criteria of having 0.3 loading factor and 0.3 correlation

coefficient (convergence validity) were abandoned. For reliability the Cronbach's alpha indicate a value of 0.7 or 0.79, therefore it was acceptable. The sample of 201 is good enough to establish a goodness for fit when evaluation the model using the Chi-square statistics or based on the thumbs up criteria as proposed in the SEM literature (Boomsma, 1982, 1985; Bentler and Chou, 1987; Nunnally, 1967).

The Kolmogorov-Smirnov and Shapiro-Wilk tests indicated that our data were not normally distributed. In this case the partial least square structural equation modeling (PLS-SEM) could be indicated as alternative for robustness in case of the absence of normality in the data distribution. However, the literature revealed that the maximum likelihood assumption requirement for a CB-SEM offers a most robust findings in case of violation of a normality assumption (Olsson et al., 2000). Therefore, our findings are robust than the alternative findings that could be generated by the use of PLS-SEM method. Notwithstanding, in case of a small sample, findings from CB-SEM can generate abnormality with nonnormal distributed set of data. Only in this situation that the partial least square method can produce a more robustness (Sarstedt *et al.*, 2016). This is not the case of this current research. The sample size is good enough. Therefore, CB-SEM is the most appropriate method to use in regard to robustness of the findings.

This research is based on the primary data to explore the constant conjunction of factors, adoption of costing systems and organisation performance. The use of CB-SEM is more appropriate in this regard as it aims strictly confirmatory analysis of an established contingency theoretical model in the domain of management accounting costing system. Contrarily, to the situation of exploratory research requiring the use of secondary data type for theoretical clarity using or theoretical development- PLS-SEM. The contingency theory is well established theory in management accounting

research. This current study provided through the proposed theoretical framework a revived understanding based on the realities of nowadays business environment. In this context, CB-SEM, as used in this analysis, aims to uncover the goodness for fit of the entire theoretical model rather than putting emphasis on the possible causal relationships of individual effects which would be appropriate in case of less or developing theory (Nitzl, 2016; Hair *et al.*, 2017; Hair *et al.*, 2018). As Kline (2016) will argue, CB-SEM brought a methodological shift (Rodgers, 2010) from the statistical significance of relations between individual effects to the goodness for fit of the entire model.

The econometric method of CB-SEM as used throughout this study illustrated a robust finding. The focus is more on the theory testing and confirmation. First of all, a confirmatory analysis was conducted, and results showed that latent constructs were correctly measured by the observed variables in the basis of the inclusion criteria. Secondly, the proposed SEM illustrated a goodness for fit with a statistically significant Chi-square (see section 7.4.3; 8.4.3; figure 7.2; figure 7.3; table 7.13; figure 8.1; table 8.15). The use of chi-square statistics is appropriate as the CB-SEM is built on the minimisation of the divergence between observed and estimated covariance matrices (Hairs et al., 2018). Therefore, the findings are robust. This is also true for other criteria of evaluation of the goodness for fit such as goodness fit index, normed fit index, incremental fit index, root means square residual, or root means square estimate approximation.

The findings framework of a complex relationships between factors, CSS and NFPM (see figure 9.2 and table 9.1) emerged from assessment of overidentified models. Following the inclusion criteria – rules of thumbs, Chi-square, GFI, IFI, NFI, RMR, RMSEA- , parameters were removed to improve the goodness for fit. The process of improving the fitness was repeated more than once till we reached an improved model

as illustrated in Chapter 9. Therefore, the proposed model is an indicative of a good fitness between the collected data and the theoretical model.

Furthermore, there are other complementary robustness tests proposed in literature particularly for partial least square (PLS-SEM) method such as checking the non-linearity effects, endogeneity, and unobserved heterogeneity (Sarstedt *et al*, 2019). These complementary checks seem appropriate for PLS-SEM. At this stage of knowledge, we cannot assert if they are also appropriate in case of CB-SEM. Based on the context of this research- management accounting critical perspective - the organisation is considered as a complex, adaptive and evolutive interplay of sub-systems in self organisation process from which emerge patterns- observable or non-observable in the empirical domain. Therefore, the assumption is that relationships between factors are non-linear.

In addition, this research opted for an embedded mixed methods design in which qualitative approaches provide deeper insights into causal dynamics. Therefore, the findings from the quantitative approaches are combined with the findings from the qualitative approaches(see appendix 4). Both analyses are integrated for the validation of the representations (Modell, 2009; Bryman, 2016). So, the qualitative approaches which are more weighted than the quantitative approaches get insights not only from the CB-SEM findings but also from the context of the study. Indeed, in critical realism, greater emphasis is placed on the findings relative to the generative mechanism beneath the appearance of the phenomenon of the study. So, the attention is focus on validating that the constant conjunction of events as observed in the empirical domain – factors \rightarrow CSS \rightarrow NFPM- results from a particular mechanism – psychocultural mechanism- as our findings revealed. Thus, the external validity consists of asserting that the psychocultural mechanism is likely to explain the adoption of CSS and

higher organisation non-financial performance in a context different from the scope of this study. Additionally, reliability in critical realism refers to the non-measurement error of the instruments used in the model. As our findings revealed through confirmatory factor analysis, the observed variables were the correct indicative of the latent constructs. Furthermore, for construct validity, we were able to find a goodness for fit of the proposed theoretical model, therefore data available provided a valid knowledge on the adoption of CSS as the emerging patterns from the interplay of multiple factors as caused by the psychocultural mechanism.

As previously argued more weight has to be placed on the qualitative findings. In this perspective, more emphasis was placed on the explanation of the mechanism using a retrodictive and retroductive reasoning strategy. Data from the semi-structured interview were grouped in themes, then later in categories and codes. This rigorous process ended at the saturation stage of analysis from which were drawn three social structures beneath the correlations observed in the empirical domain using CB-SEM. The results clearly indicated that perceived adequacy of resources emerged as a pattern from the interplay of multiple factors and led subsequently to the adoption of CSS and NFPM. For transferability or generalisation of our findings, we were able to circumscribe the context of the study and the circumstances. Therefore, we were able to infer that the regularity on the constant conjunction between factors, CSS and NFPM is caused the psychocultural mechanism generated from the interplays between three norms circles- management knowledge, cultural values norms, and business strategic norms. We concluded it is likely that the same mechanism would cause the emergence of the same phenomenon within the context of SMEs characterised by a rugged contextual uncertainty landscape.

So, our findings are robust as they indicated the contingent factors surrounding the context (SMEs, highly uncertain landscape) – dependability-, they demonstrated the theoretical validity through the use of the triangulation between the contingency theory and complexity theory to explain about the appearance of the phenomenon as well as about the mechanism(see section 3.3.1). They also indicated that the psychocultural mechanism can be observed in a different context with alternative measures within the limited scope of SMEs evolving in a highly uncertain business environment and yields the same emerging patterns equating to $PAR \rightarrow CSS \rightarrow NFPM$.

9.5 Contributions of the study

This research has played its part in the building of a cumulative knowledge of management accounting information systems, particularly in the field of adoption of CSS in a developing country's context. The following sub-section presents the four contributions- empirical, theoretical, methodological, and practical.

9.5.1 Empirical contribution

The findings from this research provide for the first time a holistic view of the cost system sophistication by integrating the degree of uncertainty and dynamism of the business environment. The results indicate that perceived adequacy of resources emerge as patterns from the interplay of a multiple set of factors- behavioural factors(management knowledge and management support), contextual factors (size and uncertainty avoidance), and subsequently lead to the adoption of costing system sophistication and higher organisation performance. Moreover, results found three social structures – management knowledge norms circles, cultural values norms circles and business strategics norm circles – beneath the correlation between factors, the adoptions of costing and non-financial performance measurements. Furthermore, the

generative mechanism (called psycho-socio-cultural effect) enacting or restraining the causal powers from the social structures starts from the top management cognitive process of thinking on the benefit of an adoption of an innovative accounting costing system, through the knowledge shared values and the alignment with a risk taker's organisation culture and innovative business strategy. In this regard, it provides for the first time a full answer to the question relative to the why organisations adopt a more sophisticated costing system and the means by which factors influence such adoption and organisation performance.

9.5.2 Theoretical contribution

This study is novel in the way it pushes the boundary further in the understanding of the functioning of contingency theory within a dynamic and uncertain environment. Previous management accounting contingency-based research was limited to a mechanistic approach which produced a less cumulative body of knowledge (Otley, 1980; 2016). Basing this research design on the middle range thinking perspective, this current research proposes to expand the traditional contingency framework - [organisational performance depends on the alignment between factors and the design of an accounting system, or $Z_i = f(X_i, B) + e_i$; Z_i = organisational performance, $f(x_i)$ = relationship between CSS and contextual factors] – by integrating the contextual uncertainty of the organisation – [$U_{ni} = Z_i + f(X_i, B) + e_i$; where U_{ni} = Contextual Uncertainty landscape]. Nevertheless, this contribution is at the explorative stage. The Congolese contextual uncertainty landscape was qualitatively measured by analysing the macro factors surrounding Congolese businesses, and later integrated within the interpretation of the findings from structural equation modelling and semi-structured interviews analysis.

Moreover, for theory development, this study is novel in encompassing insights from a complexity theory (Chenhall, 2003) to help a further understanding of the generative mechanisms beneath the observed contingent findings of this current study. The new interpretation of contingency framework (see Table 3.1 and Figure 3.4) includes factors which cannot be influenced by the organisation – macro factors- ; factors that can influenced a priori by the organisation, organisational objectives, management control packages – IS, MAIS, CSS - and organisational effectiveness. While contingency theory helps to comprehend how the design of the costing system is related to the contingencies, complexity theory, on the other hand, helps to explain how patterns emerging from the interactions of various social structures or sub-systems are observed in the empirical domain (see Figure 3.4). This theoretical approach meets recommendations proposed in literature:

(1) to incorporate information from the dynamic and uncertain environment in further study in CSS management accounting contingency-based research (Chenhall, 2003; Otley, 2016).

(2) to conceptualize the costing system as part of the overall package of management control system by investigating the selective and interactive contingencies (Drazin and Van de Ven, 1985; Otley, 2016).

(3) to include context information from the data collected by survey (Krumwiede, 1998).

Furthermore, by seeking explanations that go beyond the correlations between contingencies and the design or adoption of CSS and its effects, this is novel. From this perspective, to theorize means to provide the mechanisms explaining the occurrence of events (Bhaskar, 1975). This is what this new understanding of contingency framework has produced in this empirical study. In this regard, it provides for the first

time in CSS literature the generative mechanisms explaining the observed relationships between factors $\rightarrow \text{CSS} \rightarrow \text{OP}$.

9.5.3 Methodological contribution

First of all, this research adds to the few lists of empirical studies conducted from the perspective of critical realism. It is novel in CSS literature because it advances the critical realist approach on how the pre-existing social structures influence the design or adoption of CSS and the organisational effectiveness. It emphasizes the role that the causal power of the generative mechanism has on the occurrence of a constant conjunction of event equating to factors $\rightarrow \text{CSS} \rightarrow \text{OP}$. The methodological implication is the use of an inferential reasoning process known as the retroductive approach – deductive and inductive - in order to uncover the generative mechanisms that cause the emergence of the events. In this regard, it uncovers the emergence of the patterns PAR, CSS and NFPM. Subsequently, a retroductive approach provides further explanation on how the causal powers from the interplay of various norms circles – management knowledge norms, cultural norms, and business strategic norms - are activated and later lead to the tendencies observed in the actual and empirical domains.

This methodological approach of using mixed methods from the perspective of critical realism might advance costing system literature by presenting a methodology that is most in tune with modern business reality and business uncertainty. This methodology is rigorous as it captures the etic and the emic information of the phenomenon of the study. The pre-existing reality of the real domain is of intransitive perspective. Therefore, it can be captured through retroductive and retroductive approaches using the survey questionnaire and semi-structured interviews. At the same

time, the emic information is captured through a retrodictive approach, and provides an explanation of the process of enablers or restrainer of the causal powers.

Structural equation modelling is used to analysis the complex interplay of relationships. It helps through confirmatory analysis and SEM:

(1) to identify the mechanisms that supposes to explain the hypothesized relationship.

(2) testing the theory.

(3) testing the causal effects.

(4) testing the entire theoretical system (see Table 6.2).

Therefore, it provides a complete understanding of the phenomenon. By doing so, this meets the recommendation in the literature on the issue of generalizability of much published research due to the lack of rigorous research methodology and rigorous data analysis methodology (Brown *et al.*, 2004).

9.5.4 Practical implications

This research's findings provide, for the first time in CSS literature, an approximate full picture of the question of why organisations adopt CSS, and the extent to which factors influence the adoption of such systems. The framework of relations between behavioural factors, contextual factors and organisational factors with CSS and NFPM provide to the Congolese SMEs a tool for costing management effectiveness and higher performance. indeed, as the results indicate a fitness between factors, CSS, cultural values of innovation and an innovative business strategy is likely to yield higher performance. Consequently, the cost effectiveness through the implementation of the framework path factor-CSS-NFPM will create a synergy leading to an individual and organisation impact and improve organisation competitiveness. In addition, the adoption of activity-based management -CSS- by SMEs will create more values in

each process or procedure by reducing costs, providing accurate information on cost allocation between activity and resources and therefore, enhance more profitability.

For the SMEs top managers, as the strategies makers (policies makers), the findings on the psychocultural generative mechanism provide a holistic insight on how and what to do in order to control some of the patterns emerging from the interplay of various norms circles in order to enact the regularity of relation between perceived adequacy of resources, the adoption of CSS and organisation performance. Knowing the net benefit, the adoption of modern management control tools (CSS) can generate to the improvement of the organisation competitiveness, top manager can enhance a cultural change and put in place an innovative strategy norms circles around the organisation objectives. To integrate information from the uncertainty and the dynamism of the nowadays business environment for a more effective decision making in cost management, a simulation software can be designed based on the contextual landscape model as proposed in this research findings. It is a system of multiple equations composed of multiple factors that have a likelihood effect on the design of costing system for more organisational effectiveness. Nowadays, quantum computers are able to conduct multiple random analyses of factors within a non-linear relationship and provide solutions in a small lapse of time. Software designers can also be inspired by the weather forecasts software to build non-linear algorithms. Thus, the hardware exists. What remains is to build a non-linear algorithm for a contextual uncertainty landscape.

At the country level, policies makers, can trigger the cognitive capacities of knowledge and awareness of top managers on the adoption of modern management control tools (CSS) by manipulating institutional consequences such as legal system, market structure, corporate ownerships, education, or professional body which in

return would have an impact on the accounting values and practices (Starter and Niswander, 1995). The rigid cultural codes of avoiding uncertainty can be shaped through education and legal framework enhancing more flexibility and more innovative innovation. The innovation itself is a driving force for more SMEs performance, more accumulation of capital, and therefore, it sustains the entire economic growth. So, an effective cost management through CSS can be considered as a national strategic goal for national competitive advantage and better economy. Further, the rugged contextual uncertainty landscape of Congolese business can be reduced through institutionalisation of some of cultural values into a legal framework for more certainty and predictability of accounting practices. This is achievable through reinforcement of the profession of the accountant which is still in its infancy in DRC in regard to the accounting practices such as filing annual accounts and auditing of financial accounts.

For the accounting body, the critical approach in accounting can be considered as a serious alternative to the criticisms of anomalies and inconsistencies of previous survey questionnaire studies. This empirical research findings demonstrate that critical approach of reality can conceptualise accounting systems and practices in its naturalistic ways or as they occur in real world. Not only, the findings illustrate the correlation between factors and structure, it provides the explanatory mechanism beneath what can be observed in the empirical domain. Consequently, this can be a starting point in building a cumulative knowledge in the field of management accounting costing systems. Indeed, critical approach integrates multiple aspects of reality on nowadays business environment- the economic aspect, the sociological aspect and the psychocultural aspect of reality. The psychocultural generative mechanism uncovered in this study implicates an interplay of numerous factors and dimensions of reality and also an understanding of reality as complex, adaptive and co-evolutive. This is a

calling to the accounting professional body for more consideration to the critical approach, a practice oriented based research. In addition, the open system in which are embedded realities within the perspective of a critical realism calls also for more consideration on the complexity theory as a method theory supporting explanation on the substantive issues emerging from the limitation of contingency management accounting-based research.

9.6 Limitations of the study

The main limitation of this study is related to the characteristics of the methodology used, particularly critical realism, which may have had an impact on the interpretation or extrapolation of the findings. The most widespread problem in critical realism has been how to generalize results when operating in an open system. An open system approach considers an organisation to be a living organism that processes inputs from the environments and later returns it as outputs (Hopper and Powell, 1985). It is a complex interdependence between organisations, the sub-systems, and the environment (Hopper and Powell, 1985). The generative mechanism and the causal powers uncovered depend on the patterns emerging from the interactions of various norms circles. Indeed, it is not certain that the interaction between the same norms' circles would produce the same causal powers equating to the observed empirical findings. In this regard, for generalization purposes, the most appropriate option is to adopt a semi-closed system (semi-regularity) which can be achieved through circumscribing the context and the circumstances. These are among the limitations of this study:

(a) firstly, the findings have to be apprehended in the context of The Democratic Republic of Congo which is suggested to be dynamic and with a high degree of

uncertainty. Results are interpreted as such, as companies are evolving at the peak of the contextual uncertainty landscape.

(b) secondly, the findings are geographically circumscribed in the capital province of Kinshasa to reduce disparities of accounting practices within an immense country.

(c) thirdly, as the descriptive statistics reveal, 97% of companies in this research sample are SMEs. Thus, the results are likely to represent a multi-grouped analysis of SMEs. Therefore, the generative mechanisms and the causal powers as explained and interpreted throughout are semi-closed in the context of higher uncertainty among Congolese SMES.

In addition, another limitation relative to the methodological stance of this present study is the limitation of a cross-sectional study. This study is part of a three-year PhD programme. The primary data collection stage starts in the second year of the programme after ethical approval. Thus, we had only one and half years of data collection. In this regard, it appears impossible to conduct a longitudinal primary data study. Therefore, more caution has been taken in inferring causal powers to some of the propositions, as cross-sectional study does not allow such inferences. Furthermore, the data collected represent the opinions of accountants, financial directors, and chief executives. As such, data collected conceptualizes their perspectives on the adoption of a costing system and organisational effectiveness.

9.7 Further research study

This research has provided a framework for the design or adoption of a costing system which can be beneficial to Congolese businesses for effective cost management and for more organisational effectiveness. As argued in the introductory chapter,

to face the increased competitive global market, it is becoming extremely difficult for African companies to ignore the need for adoption of an innovative costing system for better decision-making and higher performance. Particularly for Congolese enterprises, the generative mechanisms which start with the perception of top management's passing through the knowledge shared values, need to find a welcoming innovative cultural norms circle within the life of the organisation to enact the causal powers and yield better cost managements and better performance. These empirical findings provide a guideline on what practitioners can do. Saying this, a novel concept this research proposed is the concept of contextual uncertainty. As argued in literature, the contingency theoretical model in the way it is apprehended nowadays tremendously failed to capture the dynamics and uncertainty of today's dynamic environment. As such, designing a simulation software describing the Congolese businesses' uncertainty landscape will constitute a step forward for an effective cost management decision-making. Knowing the difficulty of the tasks, we suggest putting in place a team of scientists – mathematicians, statisticians, software designers and business managers - to build a topographic uncertainty landscape of Congolese business. This visualization will enhance effective decision-making and organisational effectiveness.

Moreover, based on the limitations enumerated above, further research into CSS can be conducted in the context of Congolese enterprises to mitigate those limitations: (1) within the context of higher uncertainty and SMEs, conduct a further study using a longitudinal data collection. This longitudinal approach will help to extract trend and time components within the data collected, in order to ascertain the existence or not of regularity in the constant conjunction of events and draw conclusions regarding causal relationships. This may take at least 10 years of data collection for a better time series analysis. (2) Within the context of lower uncertainty and of SMEs, this research

can be replicated to gain more insights into how the generative mechanisms are enacted or restrained prior to the emergence of the observed patterns in the empirical domain in the context of developing countries. (3) In addition, further studies could include the views of non-accounting managers for a more holistic overview on the generative mechanism pre-existing the emerging of the phenomena - PAR, CSS and NFPM.

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Appendices

Appendix 1: Survey questionnaire (French and English)

This section presents some of the materials that have been used throughout data collection stage. There is a letter addressed to the participant, a consent form, a survey questionnaire, and an ethical approval from Salford University. We also produce the semi-structure interview questions and the profile of the interviewees.

1.1 Lettre to participants



**University of
Salford
MANCHESTER**

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Salford, M5 4WT,
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0161 295 5000
www.salford.ac.uk

Recipient Name
Address Line 1
Address Line 2
Address Line 3
Postcode

Dear Sirs or Madam,

Firstly, can I offer my appreciation in you taking time to consider this letter.

My name is Dr Marie Griffiths, the Post Graduate Director at Salford Business School in the University of Salford, in Manchester, UK. My student Levy Kiazayila Ndongala who is conducting his PhD and is aiming to assess the relevance of the adoption of an activity-based costing (ABC) system and its implementation by Congolese businesses.

As part of his research, he is seeking the valued opinions from highly regarded business leaders, such as yourself. Please be assured, this study has been approved by the university's ethics committee and your anonymity and the confidentiality of your responses are guaranteed.

My request is your co-operation in completing the attached questionnaire. Any results will be used only in an aggregated form so therefore only the data totally anonymous.

Your participation would be highly appreciated, and we look forward to receiving your completed questionnaire by the end of 31 December 2021. Should you have any queries regarding this project, please feel free to contact me m.griffiths@salford.ac.uk or my PhD student l.ndongala@edu.salford.ac.uk.

At the completion of the questionnaire please reply by using the prepaid envelope supplied on the address. Thank you in anticipation of your co-operation.

Yours faithfully,

Dr Marie Griffiths



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Kinshasa, le 09/02/2021

Concerne : Recherche en vue de l'obtention d'un
diplôme de doctorat en gestion des
entreprises

A Monsieur le Directeur Général de la
...
à Kinshasa/...

Monsieur,

Par la présente, je viens auprès de votre haute
personnalité, solliciter ce dont l'objet est inscrit en concerne.

En effet, je suis un assistant lecturer ad hoc in Business
Economics à l'University of Central Lancashire. Actuellement, je mène un projet de recherche de doctorat sur
l'impact de l'adéquation des ressources à investir dans un système des coûts innovants sur la sophistication du
système des coûts et les résultats de performance non financière à l' université de Salford Manchester.

Cette étude vise à élargir les limites des connaissances
dans ce domaine particulier du système de comptabilité de gestion des coûts dans le contexte de la République
Démocratique du Congo. Cependant, votre apport nous est d'une importance capitale. Raison pour laquelle, nous
vous invitons à participer à ce projet en répondant au questionnaire d'enquête, tout en soulignant que cette étape
de notre recherche, est cruciale pour la collecte de données.

Par ailleurs, soyez rassuré que les données collectées
seront traitées de manière confidentielle et ne seront pas transmis à un tiers. Seuls, les résultats globaux seront
présentés sous forme de thèse.

Du reste, veuillez agréer, Monsieur le Directeur
Général, l'expression de nos sentiments de franche collaboration.

Levy KIAZAYILA NDONGALA

1.2 Consent Form

Consentement éclairé pour une recherche de doctorat sur les systèmes de calculation des coûts (**consent form for a doctorate research in costing system sophistication**)

Moi, le soussigné, confirme que (s'il vous plaît cocher la case le cas échéant) (**I consent by ticking the box below**) :

1.	J'ai lu et compris l'information sur le projet, tel que fourni dans la fiche d'information en date du _____ (I have read and understood the information provided on this research project on the date of)	<input type="checkbox"/>
2.	J'ai eu l'occasion de poser des questions sur le projet et ma participation.(I have had opportunity to ask questions relative to this research project)	<input type="checkbox"/>
3.	J'accepte volontairement de participer au projet. (I voluntarily accept to take part to this research project)	<input type="checkbox"/>
4.	Je comprends que je peux me retirer à tout moment sans donner de raisons et que je ne serai pas pénalisé pour retrait et on ne me demandera pas pourquoi je me suis retiré. (I can withdraw my participation to this research project at any time as it pleases me)	<input type="checkbox"/>
5.	Les procédures de confidentialité m'ont été clairement expliquées (p. ex., utilisation de noms, pseudonymes, anonymisation des données, etc.) (Confidentiality and anonymity principles were explained to me)	<input type="checkbox"/>
6.	Le cas échéant, des conditions distinctes de consentement pour les entrevues, l'audio, la vidéo ou d'autres formes de collecte de données m'ont été expliquées et fournies. (all several types of data collection were explained to me...)	<input type="checkbox"/>
7.	L'utilisation des données dans la recherche, les publications, le partage et l'archivage m'a été expliquée.(How the data collected has been explained to me)	<input type="checkbox"/>
8.	Je comprends que d'autres chercheurs n'auront accès à ces données que s'ils acceptent de préserver la confidentialité des données et s'ils acceptent les termes que j'ai spécifiés sous cette forme. (I understand that other researchers will access to the data collected if they agree to respect confidentiality and anonymity principles).	<input type="checkbox"/>
9.	Sélectionnez un seul des éléments suivants: <ul style="list-style-type: none"> Si je voudrais que mon nom soit utilisé. Alors, je comprendrai dans ce cas que ce que j'ai dit ou écrit dans le cadre de cette étude sera utilisé dans des rapports, des publications et d'autres résultats de recherche afin que tout ce que j'ai contribué à ce projet puisse être reconnu. (If I want your name be cited in this research findings...) Je ne veux pas que mon nom soit utilisé dans ce projet.. (If I don't want my name to be cited in this research findings) 	<input type="checkbox"/>
		<input type="checkbox"/>
10.	Avec le chercheur, j'accepte de signer et de dater ce formulaire de consentement éclairé.(I freely accept to sign and date this consent form)	<input type="checkbox"/>

Participant:

Nom du Participant

Signature

Date

Chercheur:

Levy Kiazayila Ndongala

Name of Researcher

Signature

Date

1.3 Survey Questionnaire

SECTION A – QUESTIONS GENERALES RELATIVES AU SYSTEME DE COUT DE VOTRE UNITE D'AFFAIRES (SYSTEME SOPHESTIQUE DE COUT)

SECTION A- QUESTIONS ON THE COSTING SYSTEM OF YOUR ORGANISATION UNIT

(A1) Est ce que votre unité commerciale attribue-t-elle des coûts indirects (frais généraux) aux produits (ou services)?

Veillez cocher l'une de cases ci-dessous.

Yes [] No []

Si votre unité d'affaires ne dispose pas d'un système d'attribution des coûts aux produits, veuillez passer à la page 8 et répondre uniquement la section D.

Si vous avez répondu «non» à la question A1, veuillez répondre uniquement à la question A5 de la section A.

(A2) La procédure typique d'attribution des coûts indirects (c'est-à-dire des frais généraux) aux produits (ou services) implique un processus en deux étapes. Dans la première étape, les coûts indirects sont alloués aux centres de coûts. Dans la deuxième étape les taux d'allocation des coût indirects / frais généraux sont établis pour chaque centre de coûts à attribuer les frais généraux aux produits / services.

Veillez indiquer ci-dessous pour la première étape approximativement combien de centres de coûts distincts sont utilisés pour affecter des coûts indirects aux Produits. (Par exemple, si votre unité commerciale à 5 centres de coûts, tous utilisent le même type de taux d'attribution des frais généraux, comme les heures de travail direct, veuillez insérer 5 dans l'espace ci-dessous pour indiquer que 5 centres de coûts distincts ont été établi. Lorsque votre unité n'a pas établi séparément de taux d'allocation des frais généraux pour chaque centre de coûts mais utilise un taux unique pour toute unité commerciale dans son ensemble, vous devez insérer 1 dans l'espace ci-dessous).

(A2) Please indicate how many cost pools to assign the overheads to products or services at the first-stage of two stage procedure.

_____ centres de coûts (VEUILLEZ ENREGISTRER LE NOMBRE APPROXIMATIF ICI)

(A3) Veuillez indiquer ci-dessous combien de types différents de répartition des coûts indirects / frais généraux les méthodes de récupération sont utilisées dans la deuxième étape de la procédure en deux étapes décrites à la question A2 pour l'affectation des coûts indirects aux produits / services. (Par exemple, si votre unité commerciale dispose de cinq centres de coûts distincts utilisant tous les heures de travail direct comme méthode de récupération des coûts indirects / frais généraux, veuillez insérer 1 dans l'espace ci-dessous pour qu'une seule méthode est utilisée. Alternativement, si votre unité à 5 centres de coûts et utilise deux méthodes comme bases d'allocation de recouvrement des frais généraux, comme le travail direct heures et heures machine, vous devez cocher 2 dans l'espace ci-dessous).

(A3) Please indicate the number of overheads costs methods applied to allocate cost to cost objects in second stage of two stages procedure.

_____ différents types de méthodes de récupération des frais généraux (VEUILLEZ NOTER NOMBRE APPROXIMATIF ICI)

SECTION B – QUESTIONS APPLICABLES UNIQUEMENT AUX UNITÉS QUI ONT

IMPLÉMENTÉ ABC (ACTIVITY BASED COSTING)

SECTION B- QUESTIONS FOR THOSE WHO ARE IMPLEMENTING A COST SYSTEM SOPHISTICATION (ABC).

(B4) Veuillez cocher un élément pour chacune des lignes ci-dessous pour indiquer la nature de ABC dans votre unité d'affaires.

(B4) Please indicate one item from the list below on the nature of ABC in your business unit.

(a) ABC est utilisé pour l'attribution des coûts aux produits ou services pour la prise de decision Oui []
Non []

(a) ABC is used to calculate cost activities for decision making. Yes, or no?

(b) ABC est utilisé pour évaluer les activités à des fins de contrôle des coûts / de gestion des coûts Oui []
Non []

(b) ABC is used to calculate cost activities for cost management. Yes, or no ?

(B5) Sur une échelle de 1 (pas très réussi) à 7 (totalement réussi), veuillez encercler l'une des les chiffres ci-dessous pour indiquer le degré de réussite de votre système ABC fournissant des informations améliorant la prise de décision et / ou la gestion des coûts.

(B5) on a scale of not very successful (1) to totally successful (7) please indicate how your ABC has been helping in decision making or cost management.

	Pas très Réussi (not very successful)			Modérément réussi(moderate success)			totalement réussi (totally successful)
	1	2	3	4	5	6	7

(B6) Veuillez cocher la colonne «Oui» ou «Non» pour chaque ligne ci-dessous pour indiquer pour quelles fins vous utilisiez ABC. Aussi pour chacune des lignes que vous avez cochées Colonne `` Oui ", veuillez encercler l'un des nombres sur une échelle de 1 (très sans importance) à 7 (d'une importance vitale) pour indiquer le degré d'importance attribuable aux informations ABC pour chacun des objectifs spécifiés.

(B6) Please indicate the level of importance given to ABC information for each of the purposed below (1 for unimportant, 7 for very important).

Objectif	Très sans importance (not very important)			Neutre(Neutral)			D'une importance vitale (very important)
(a) Évaluation des stocks (Stock inventory)	1	2	3	4	5	6	7

(b) Produit ou service décisions d'abandon(discontinuation decisions)	1	2	3	4	5	6	7
(c) Mix produit / service les décisions (product mix)	1	2	3	4	5	6	7
(d) Décisions d'externalisation (outsourcing)	1	2	3	4	5	6	7
(e) Déterminer le coût de produits ou services pour utilisation dans la tarification au coût majoré (cost plus pricing)	1	2	3	4	5	6	7
(f) Nouveau produit ou service décisions d'introduction (new product introduction)	1	2	3	4	5	6	7
(g) Utilisation au stade de la conception pour nouveaux produits / services(designing stage of a new product)	1	2	3	4	5	6	7
(h) Analyse de rentabilité (profitability analysis)	1	2	3	4	5	6	7
(i) Réduction des coûts / coût de gestion (cost reduction or cost management)	1	2	3	4	5	6	7
(j) Budgétisation(Budgeting)	1	2	3	4	5	6	7
(k) Mesure et amélioration du rendement de l'activité (performance measurement and improvement)	1	2	3	4	5	6	7
(l) Autre (Veuillez préciser) (others...)							

(B7) Les motifs potentiels d'adoption de l'ABC (Activity Based Costing) sont énumérés ci-dessous. Sur une échelle de 1 (très peu important) à 7 (d'une importance vitale) s'il vous plaît cercle pour chaque rangée l'un des nombres pour indiquer le degré d'importance attribuable à chaque motif dans la décision d'adopter ABC.

(B7) Please indicate the level of importance of the motive in the decision to adopt the activity- based costing.

	Moins important (less important)			Neutre (Neutral)			Tres Important(very important)
(a) Le système d'évaluation des coûts existant n'était pas fiable (lack of reliability of the current costing system)	1	2	3	4	5	6	7
(b) Le système actuel d'évaluation des coûts n'a pas fourni d'information utile à la direction (the current system did not provide useful information)	1	2	3	4	5	6	7
(c) Il était nécessaire de mettre à jour le système d'information sur les coûts existant(there is a need to update the current system)	1	2	3	4	5	6	7
(d) Nos concurrents utilisaient ABC (ABC is used by our competitors)	1	2	3	4	5	6	7
(e) D'autres unités au sein de la société avaient bénéficié de l'adoption d'ABC (other functions within the business will benefit from the ABC)	1	2	3	4	5	6	7
(f) L'évolution de la structure des coûts a créé la nécessité de remplacer le système existant (the changing of cost structure)	1	2	3	4	5	6	7
(g) L'évolution de l'environnement manufacturier a créé la nécessité de remplacer le système existant (the changing of business environment)	1	2	3	4	5	6	7
(h) Conseils du parent ou de l'administration centrale (recommendation from parent's company)	1	2	3	4	5	6	7
(i) Pressions exercées par le gouvernement ou d'autres autorités réglementaires (pressures from government or other institutions)	1	2	3	4	5	6	7
(j) Nous voulions essayer une nouvelle innovation comptable (an attempt to try a new accounting innovation)	1	2	3	4	5	6	7
(k) Conseils d'auditeurs et/ou de consultants (advice from consultants)	1	2	3	4	5	6	7
(l) L'évolution de l'environnement concurrentiel a créé la nécessité de remplacer le système existant (change of competitive landscape)	1	2	3	4	5	6	7
(m) Être considéré comme ayant un système de coûts sophistiqué et comparable aux meilleures pratiques (to be seen using a best practice relative to costing system)	1	2	3	4	5	6	7

(n) disponibilité des ressources (availability of resources)	1	2	3	4	5	6	7
(m) Autre (S'il vous plaît préciser) (others)	1	2	3	4	5	6	7

(B8) Sur une échelle de 1 (pas du tout d'accord) à 7 (tout à fait d'accord), veuillez encircler pour chaque ligne sous l'un des nombres pour indiquer dans quelle mesure vous êtes d'accord ou pas d'accord avec les déclarations suivantes relatives à la mise en œuvre et à l'utilisation d'ABC au sein de votre unité d'affaires.

(B8) Please indicate in a scale of 1 for strongly disagree to 7 strongly agree of the statements below relative to the implementation and use of ABC in your organisation.

	Ps du tout d'accord (strongly disagree)			Neutre (Neutral)			Tout à fait d'accord (strongly agree)
(a) Malgré les difficultés de mise en œuvre, je suis convaincu qu'ABC est le bon outil comptable dans notre entreprise (ou Business Unit) pour nous aider à gérer nos coûts et améliorer l'exactitude des rapports sur les coûts de produit / service (ABC is a right tool for cost management and cost calculation)	1	2	3	4	5	6	7
(b) Dans l'ensemble, les avantages des données collectées par ABC emportent sur les coûts d'installation d'un nouveau système (ABC benefit overweight the cost of installing the system)	1	2	3	4	5	6	7
(c) En général, ABC est une bonne chose pour notre compagnie (ABC is a good thing for our company)	1	2	3	4	5	6	7
(d) Les coûts rapportés par le système ABC correspondaient à mon intuition sur les coûts relatifs aux produits et services (Costs reported by ABC meet our expectation on costs' reports)	1	2	3	4	5	6	7
(e) Les données du modèle ABC rapportent une exacte évaluation des coûts de notre entreprise (data from ABC provides an accurate information)	1	2	3	4	5	6	7
(f) Les coûts rapportés par le système ABC ne me semblent pas raisonnable sur base de ce que je sais de mon business unit (ou entreprise) (the costs as reported by ABC do seem reasonable based on our business type)	1	2	3	4	5	6	7

(g) Les informations du système ABC ont eu un impact positif et palpable dans notre entreprise (information from ABC has a noticeable impact)	1	2	3	4	5	6	7
(h) Les informations du système ABC ne sont pas largement utilisées au sein de notre entreprise (or business unit) (information from ABC is not widely used in our business unit)	1	2	3	4	5	6	7
(i) Les informations du système ABC sont largement utilisés pour des études de coûts spéciaux (information from ABC is widely used by cost team studies)	1	2	3	4	5	6	7
(j) ABC reçoit un fort soutien de la part de haut cadres (the activity-based costing receives adequate support from the top managers)	1	2	3	4	5	6	7
(k) La prise en charge d'ABC dans cette entreprise est largement répandue (ABC receive appropriate support within our business unit)	1	2	3	4	5	6	7
(l)) Les responsables de cette business unit (ou entreprise) ont une tres bonne connaissance and compréhension sur les informations fournies par le système ABC (Managers are knowledgeable and aware with ABC)	1	2	3	4	5	6	7
(m) La plupart des dirigeants de cette unité d'affaires sont capable d'utiliser les informations rapportées par ABC pour la prise de decision et la minimisation des coûts (Managers are knowledgeable on how to use ABC information for decision making)	1	2	3	4	5	6	7
(n) La haute direction a fourni des ressources adéquates pour la mise en œuvre et l'exploitation d'ABC.(top managers provide adequate resources for the application and the operationalisation of ABC)	1	2	3	4	5	6	7
(o) ABC a été toujours lié aux stratégies compétitives de l' unite d'affaires(ABC is link to the competitive strategy of the business unit)	1	2	3	4	5	6	7
(p) Départements hors de celui de la comptabilité (par ex.production, commercialisation, etc.) ont montré un intérêt à soutenir la réussite du systeme ABC (no-accounting)	1	2	3	4	5	6	7

departments within the business unit have shown interest in supporting ABC)							
(q) L'équipe de mise en œuvre de ABC était multi-départementale. (ABC implementation team was cross-functional)	1	2	3	4	5	6	7
(r) Les données du système ABC ont été utilisées pour l'évaluation de la rentabilité de départements autre que la comptabilité.(information from ABC has been tied to organisation performance and non- accounting personnel evaluation)	1	2	3	4	5	6	7
(s) Une formation adéquate a été dispensée pour la conception du modèle ABC.(adequate training on the ABC implementation was provided)	1	2	3	4	5	6	7
(t) Une formation adéquate a été dispensée pour la mise en œuvre d'ABC. (adequate training on the ABC using was provided)	1	2	3	4	5	6	7
(u) Une formation adéquate a été dispensée pour l'utilisation d'ABC (adequate training on how to use ABC was made available)	1	2	3	4	5	6	7
(v) Lorsque l'initiative ABC a débuté, ses objectifs étaient clairs (ABC initiative has a clear objective at its starting stage)	1	2	3	4	5	6	7

SECTION D -- LE CONTEXTE / ENVIRONNEMENT DANS LEQUEL VOTRE UNITÉ D'AFFAIRES FONCTIONNE

SECTION D—CONTEXT AND ENVIRONMENT OF YOUR BUSINESS UNIT

(D1) Veuillez cocher une case pour indiquer le secteur qui décrit le mieux les activités de votre unité d'affaires.

(D1) Please tick to indicate the sector of activities that describes your business.

Secteur manufacturier (manufacturing []) Secteur de vente au détail(retailer) []

Secteur de service(services) []

Secteur financier et commercial (financial and commercial) [] Conglomérat []

Autres (others) []

(D2) (a) Veuillez insérer le chiffre d'affaires annuel approximatif (en millions de dollars) de votre unité d'affaires au cours du dernier exercice:

(D2) (a) what is your turnover (in \$ million)?

\$_____ millions de dollars (VEUILLEZ NOTER LE MONTANT APPROXIMATIF ICI)

(c) Veuillez insérer le nombre approximatif d'employés de votre unité d'affaires

(c) Please insert the number of employees of your organisation

.....

(D5) Sur une échelle de 1 (pas du tout d'accord) à 7 (tout à fait d'accord), veuillez encrer chaque ligne ci-dessous l'un des nombres pour indiquer dans quelle mesure vous êtes d'accord ou en désaccord avec les déclarations suivantes relatives à la communication and technologie de l'information de vos unités d'affaires.

(D5) Please indicate the extent to which you agree or disagree with the following statements on the IT of your organisation (1 strongly disagree, 7 strongly agree).

	Pas du tout d'accord (strongly disagree)			Neutre(Neutral)			Tout à fait d'accord(strongly agree)
(a) Les informations de l'organisation systèmes (par exemple ventes, achats, fabrication etc.) sont fortement intégrées (c'est-à-dire accessible par) les unes aux autres. (the information system for each function within the business unit are highly integrated to each other)	1	2	3	4	5	6	7
(b) Le système de communication et de technologie de l'information offre une utilisation conviviale pour les requêtes introduites par tous les utilisateurs.(the information system uses a friendly and accessible process for all users)	1	2	3	4	5	6	7
(c) Un large éventail de données sur les coûts et les performances sont disponibles dans le système (various types of costs and performance data are available in the system)	1	2	3	4	5	6	7
(d) Les données de production (ou prestation de services) et d'autres données d'exploitation sont mises à jour dans le système à temps réel 'plutôt que périodiquement. (information in information system are updated in real time for all types of data)	1	2	3	4	5	6	7

(D8) Les intrants potentiels pour l'adoption d'un système de comptabilité de gestion de coûts, le système tel que ABC (coût basé sur l'activité), sont énumérés ci-dessous. Sur une échelle de 1 (très peu important) à 7 (important) veuillez encrer pour chaque ligne l'un des nombres pour indiquer le degré d'importance attribuable à chaque motif dans la décision d'adopter le système ABC.

(D8) Please indicate the level of importance among the motive in taking a decision of adopting ABC, 1 for very unimportant and 7 for very important.

	Très peu importa nt(not Very import ant)			Neutre(neutral)			Très important (Very importan t)
(a) Soutien managérial pour le système d'innovation comptable de gestion de coûts (Management support for management accounting innovation system)	1	2	3	4	5	6	7
(b) Une bonne connaissance et compréhension de l'innovation en comptabilité de gestion de système des coûts (management awareness and knowledge of management accounting innovation system)	1	2	3	4	5	6	7
(c) Adéquation des ressources à investir dans l'innovation en comptabilité de gestion de système des coûts (adequacy of resources to invest in management accounting costing system).	1	2	3	4	5	6	7
(d) La mise en œuvre des stratégies innovatrices (implemenation of an innovative strategies)	1	2	3	4	5	6	7
(e) Niveau d'intégration du système de communication and de technologie d'information dans votre unité d'affaires (level of IT integration)	1	2	3	4	5	6	7
(f) Niveau d'évitement des employés (ou de l'organisation elle meme) à l'incertitude avec les résultats de l'innovation (employee and organisation degree of avoidance of uncertainty with the innovation)	1	2	3	4	5	6	7
(g) Employés (ou organisation elle meme) insatisfaction avec le système actuel de calculation de couts (employee and organisation dissatisfaction with the current costing system)	1	2	3	4	5	6	7
(h) Le niveau de recours aux consultants comme superstructure par les institutions pour faciliter l'adoption des innovations (the level of using management consultants to enhance adoption of innovation)	1	2	3	4	5	6	7
(i)) Pression du gouvernement ou autres autorités pour faciliter l'adoption des innovations (pressure from the government or other institution to enhance the adoption of innovation).	1	2	3	4	5	6	7
(j) Pression venant de l'organisation elle meme pour une strategie d' innovation (pressure from the business unit for a more innovative strategy)	1	2	3	4	5	6	7
(k) Employés (ou l'organisation elle meme) manquent de confiance dans la capacité d'innovation	1	2	3	4	5	6	7

(employee and organisation lack of confidence in the capacity of adopting an innovation)							
l) L'évolution de l'environnement concurrentiel a créé la nécessité de remplacer le système existant (the changing of competitive environment put a pressure of replacing the current system)	1	2	3	4	5	6	7
(m)) L'existence d'un champion du changement reconnu par votre unité d'affaires (the existence of a champion for change in your business)	1	2	3	4	5	6	7
(n) Autre (Veuillez préciser) (Others) :	1	2	3	4	5	6	7

(D18) Lequel des énoncés suivants s'applique au système de calcul des coûts que vous avez décrit tout au long de ce questionnaire:

(D18) which is from the following described the best your organisation costing system?

Si votre unité n'utilise pas de système formel de calcul des coûts pour affecter les coûts aux produits, veuillez insérer cette déclaration en (c) ci-dessous.

(a) Il ne s'applique qu'à l'unité d'affaires où je suis employé []

(a) It does apply only on the business unit we are operating

(b) Il s'applique également à d'autres unités d'affaires au sein de l'organisation []

(b) it is also applied in other units within our organisation.

(c) Autre (Veuillez préciser)

(c) **others.**

(D19) Si votre système de calcul des coûts est applicable à d'autres unités d'affaires, en plus de votre propre unité d'affaires, veuillez insérer le chiffre d'affaires annuel approximatif (en millions de \$) de l'ensemble des unités d'affaires desservies par votre système de calcul des coûts.

(D19) if your costing system is only applied in your unit, can you give the sales revenue for the rest of the business unit.

\$ _____ millions de livres sterling (VEUILLEZ ENREGISTRER UNE APPROXIMATIVE MONTANT ICI)

(D20) Veuillez vérifier l'étiquette au recto de l'enveloppe et vous assurez que le nom est correct, l'intitulé du poste et le nom et l'adresse de l'entreprise sont affichés. Veuillez également nous fournir les informations suivantes qui ne seront utilisées que pour vous contacter directement en cas d'une requête.

(D20) Please add your contact details.

Adresse courriel

Numéro de téléphone

(D21) Serait-il possible qu'une brève réunion soit organisée pour discuter de certaines questions soulevées à travers ce questionnaire?

(D21) Can we organise a meeting for further questions ?

Réunion possible (meeting possible) [] Réunion impossible (meeting not possible) []

MERCI DE PRENDRE VOTRE TEMPS A REpondre A CE QUESTIONNAIRE. PAR CE VOUS AVEZ CONTRIBUE A FAIRE AVANCER LA CONNAISSANCE ACADEMIQUE DANS LE DOMAINE DE COMPTABILITE DE GESTION DE COUTS.

THANK YOU TO TAKE YOUR PRECIOUS TIME TO ANSWER TO THIS SURVEY QUESTIONNAIRE. BY DOING SO, YOU WILL CONTRIBUTE TO THE ADVANCEMENT OF KNOWLEDGE RELATIVE TO MANAGEMENT ACCOUNTING COST MANAGEMENT.

1.4 Ethics Approval

FW: Ethics Application: Panel Decision



Levy Ndongala <L.Ndongala@edu.salford.ac.uk>
To: Levy Ndongala <School of Business and Management>

This message was sent with Low importance.

Reply Reply All Forward

Sun 24/07/2022 15:22

From: ethics <ethics@salford.ac.uk>
Sent: 17 December 2020 20:35
To: Levy Ndongala <L.Ndongala@edu.salford.ac.uk>
Subject: Ethics Application: Panel Decision
Importance: Low

The Ethics Panel has reviewed your application: The impact of organization size on cost sophistication systems and non-financial performance in the context of a developing country: Democratic Republic of Congo.
Application ID: 206

The decision is: Application Approved.

The Chair of the Panel made these comments:

You should be clear on what sort of dissemination activities will be performed and how you are going to publish the results of the project, it is mentioned 'other publications', however there is no clarification what 'other' means.

Please use the Ethics Application Tool to review your application.

Appendix 2 : Semi-structure interview questions

Question 1 what make your business unit to a cost system sophistication?
Question 2 what is your view on the concept of having adequate resources to invest in an innovative costing system sophistication?
Question 3 Do you use CSS for decision making and cost management?
Question 4 Are you satisfied with the use of costing system sophistication?

Appendix 3: Profile of sample interviewees

Code	Organisation type	Position of inter- viewee	Interview type	time
22-1	Manufacturer	Accountant	Over the phone	30 minutes
22-2	Services	CEO	Over the phone	30 minutes
22-3	Conglomerate	Accountant	Over the phone	30 minutes
22-4	Retailers	Financial Director	Over the phone	30 minutes

Appendix 4: Conversation with Sven Modell (2022) on critical realism

Re: Question on the critical realism -cross-sectional study



Sven Modell <Sven.Modell@manchester.ac.uk>

To Levy Ndongala


Reply

Reply All

Forward



Sun 13/03/2022 20:1

 You replied to this message on 13/03/2022 22:06.



JMAR 19 030 paper final version (1).pdf
220 KB

Dear Levy

Thanks for getting in touch and for asking about critical realism. I take it you have read my work on mixed methods and theory triangulation using a critical realist approach. As I argue in these earlier papers of mine, we need to be extremely careful when drawing causal inferences from cross-sectional, quantitative methods unless we can combine such methods with qualitative approaches that provide deeper insights into causal dynamics (see especially Tony Lawson's extensive critique of econometric modelling if you want to dig deeper into this topic from a critical realist perspective).

However, over the past decade, there have been significant advances in positivist accounting research that actually come close to a critical realist position and that discuss the possibilities of causal inferences from quantitative data. See e.g., the special section on causality in AOS 2014 and the papers by Gow et al. (2016) in JAR and Bertomeu et al. (2016) in Trends and Foundations in Accounting Research. For a discussion of such rapprochement between positivism and critical realism, see also my paper in JMAR 2020 (attached).

I hope this is of some help to you.

Best wishes

Sven

From: Levy Ndongala <L.Ndongala@edu.salford.ac.uk>