Global Journal of Management and Business Research: B

Economics and Commerce

Case Study of Nyarugenge District
Management Control Instruments

Rapid Impact on Savings Banks
Selling Price Across Supply Chain

Discovering Thoughts, Inventing Future

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<td>MBA/BBA (University of Saarbrücken)</td>
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<td>Web: lancs.ac.uk/staff/bartras1/</td>
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<td>Lecturer, Department of Marketing, University of Calabar</td>
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<td>Tourism Consultant, Cross River State Tourism Development Department</td>
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<td>Co-ordinator, Sustainable Tourism Initiative, Calabar, Nigeria</td>
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<td>Director, Summer Abroad Program, Medieval Europe Travel Course</td>
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<td>Professor Department of Sport and Movement Studies</td>
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<td>University of Johannesburg, South Africa</td>
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Digitalization and its Rapid Impact on Savings Banks in Germany

By Carsten Giebe & Kevin Schulz
Szent István University

Abstract- The German banking industry is facing major challenges due to digitalization. The digital transformation is significantly influenced by technological progress, tighter regulation and low-interest phases. The market entry of fintechs and changing customer behaviour is also a reality. To meet the challenge of the digitalization and to reduce costs, savings banks are increasingly turning to mergers, staff cuts and branch closures. The purpose of this research is to investigate the impact of digitalization on German savings banks. Through an explorative literature review, scientific sources and real KPIs of savings banks in Germany were used. The impact of digitalization on savings banks in the period 1999 – 2018 was investigated using the study situation and the analysis of key business figures. The aim is to answer whether the cost-cutting actions of savings banks are justified from an economic point of view based on the KPIs operating result, cost-income ratio and return on equity. In recent years, it has become clear that German banks lack a clear strategy. The results may be of interest to researchers dealing with the digital transformation of savings banks in Germany.

Keywords: savings banks | digital transformation | digitalization | german banking system.

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Abstract: The German banking industry is facing major challenges due to digitalization. The digital transformation is significantly influenced by technological progress, tighter regulation and low-interest phases. The market entry of fintechs and changing customer behaviour is also a reality. To meet the challenge of the digitalization and to reduce costs, savings banks are increasingly turning to mergers, staff cuts and branch closures. The purpose of this research is to investigate the impact of digitalization on German savings banks. Through an explorative literature review, scientific sources and real KPIs of savings banks in Germany were used. The impact of digitalization on savings banks in the period 1999 – 2018 was investigated using the study situation and the analysis of key business figures. The aim is to answer whether the cost-cutting actions of savings banks are justified from an economic point of view based on the KPIs operating result, cost-income ratio and return on equity. In recent years, it has become clear that German banks lack a clear strategy. The results may be of interest to researchers dealing with the digital transformation of savings banks in Germany.

Keywords: savings banks | digital transformation | digitalization | german banking system.

I. Introduction

Due to the current spread of the Coronavirus, economic activity around the world is significantly affected. According to Michel et al. (2020), it seems almost inevitable that the German economy will plunge into recession. However, the possible course and severity of the effects are unclear. The fact is that the uncertainty is reflected not least in the financial markets. Since the beginning of the pandemic, strong price losses and simultaneous implicit volatility have been recorded. The latter is often interpreted in the research literature to measure economic uncertainty (Michelsen et al., 2020).

Some banks that were already on shaky ground before the crisis may not survive the pandemic. The cost-income ratio, an important indicator of the efficiency of institutions, has deteriorated almost continuously over the past 15 years. This is not only due to declining earnings, but also to rising operating costs. In addition, digitalization is putting the business models of traditional banks to the test. According to Röseler, the Executive Director of Banking Supervision, German banks must cut their costs much more rigorously if they want to be competitive in the long run. The pandemic acts as an accelerator here (press release Federal Financial Supervisory Authority, 2021).

The German banking system traditionally consists of three pillars, private sector banks, savings banks and cooperative banks (see Figure 1). This structure makes the German banking system unique, only the Austrian banking system has a similar structure in Europe (Behr & Schmidt, 2015; Frank et al., 2014; Komorowski, 2020). The focus of this research paper is on the German savings banks (Pillar 02).

Figure 1: Own representation of the “German Banking System"
Changing customer expectations, new competitors and a strong big technological change are influencing the banking market in Germany. We live in a working and living environment characterized by automation and digitalization. As a technical revolution, this also encompasses many areas of the savings banks. Digitalization is a priority in order to be able to ensure that we can catch up in terms of "digital skills" and not miss the boat. To realize their ambitions, savings banks are therefore well advised to create the necessary internal conditions for digital transformation. Today's banking services must be benevolently examined for feasibility, then embedded in processes and suitable technical architectures. A higher level of automation can reduce costs and open up further data sources (Damaschke & Giebe, 2020).

II. Literature Review

An exploratory literature search was conducted to find sources on the impact of digitalization on savings banks in Germany. The studies on savings banks in the age of digitalization are rudimentary. The results of the literature search can be divided into four headings. The first heading contains the necessary data needed to study savings banks. These are data sets such as the number of savings banks, the number of branches, the number of employees as well as business management KPI's. The second section deals with the German banking market and the savings banks in Germany. Examples include the authors Behr & Schmidt (2015), Conrad et al. (2017), Damaschke & Giebe (2020) and Fischer & Arz (2016). In essence, a drastically changed situation for the savings banks, a low-interest rate level, changed competition and massive cost-cutting measures could be researched. The third category of literature deals with the digitalization of banks and savings banks. The authors Drummer et al. (2016), Giebe (2019), Henke et al. (2016), Komorowski (2020) and Sebastian et al. (2017) should be mentioned as examples. In the articles of the authors listed, it was possible to research that the digital transformation has also arrived in banks and savings banks. On the other hand, the urgent need for a strategy could be deduced. The fourth and last section of the literature research deals with other topics such as omnichannel management, brand or VR devices. Menrad (2020), Hammerström et al. (2019) and Zwerenz (2019) should be mentioned here as representatives to enable a discussion within the framework of this research.

III. Research Gap and Research Question

In their 2007 paper “The Impact of Bank Mergers on Efficiency: Empirical Evidence from the German Banking Industry”, Georgiev & Burghof examine the impact of mergers on business efficiency (Georgiev & Burghof, 2007). This does imply the use of similar metrics as in this research. However, it can be noted that the research question is different from the focus on mergers. Furthermore, it can be noted that the working paper uses the time series 1991 - 2004, which allows for a research gap in terms of timeliness.

Based on the described research gap, the authors formulate the following research question:

Are the cost-cutting activities such as branch closures and staff reductions due to the rapid impact of digitalization of savings banks in Germany economically justified about the present operating result, cost-income ratio and return on equity?

IV. Hypotheses and Methodology

To answer the research question quantitatively, the following data on Statista (https://de.statista.com/) was used for our research and was narrowed down to the common period 1999-2018. In addition to the number of individual savings banks, branches and employees, real KPIs were used in this research. Specifically, we looked at operating profit, cost-income ratio and return on equity. The operating result usually describes the result from ordinary business activities. The cost-income ratio describes the cost-income ratio in the operational business of the savings banks and provides information on efficiency. The lower the cost-income ratio, the more efficiently the savings banks operate. The return on equity describes the result (net income after taxes) about the equity capital employed.

- Number of savings banks in Germany
- Number of branches of savings banks in Germany
- Number of employees of savings banks in Germany
- Operating income of savings banks in Germany
- Return on equity after taxes of the savings banks in Germany
- Development of the cost-income ratio of savings banks in Germany

The software R was used to evaluate the data. The visualisations were generated in Python.

The following hypotheses were made:

1st hypothesis:

\[ H_1: \text{The operating profit of savings banks in Germany has changed statistically significantly in the years 1999-2018 due to digitalization.} \]

2nd hypothesis:

\[ H_2: \text{The cost-income ratio of savings banks in Germany has changed statistically significantly in the years 1999 - 2018 due to digitalization.} \]

3rd hypothesis:

\[ H_3: \text{The return on equity of the savings banks in Germany has changed statistically significantly in the years 1999 - 2018 due to digitalization.} \]
Descriptive analyses

The number of institutes has decreased by about 34% over the entire period under consideration, from 587 in 1999 to 386 in 2018 (see Figure 2). The monotonic decrease is significant with a rank correlation coefficient of -1 and unbroken up to and including 2018. This reflects a long-lasting phase of consolidation.

![Number of savings banks over time](image1)

**Figure 2:** Own representation of the "Number of savings banks"

The consolidation of the savings banks is accompanied by a consolidation of the bank branches (see Figure 3).

Over the entire period under review, the branches were reduced to a similar extent as the institutions. With shrinkage of approx. 46%, this development is even more pronounced and affects the institutions that were still active on the market until 2018.

![Number of branches over time](image2)

**Figure 3:** Own representation of the "Number of branches"
The number of employees has developed quite analogously (see Figure 4). Here, too, there is a very clear monotonous decline, which continued at an accelerated pace from 2015 onwards.

![Figure 4: Own representation of the "Number of employees"

The similar trends in the number of institutions, branches and employees in the period under review from 1999 to 2018 are reflected in a high correlation between them.

<table>
<thead>
<tr>
<th>Number of institutes</th>
<th>Number of branches</th>
<th>Number of employees</th>
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<tr>
<td>1.0000000</td>
<td>0.9623245</td>
<td>0.9312817</td>
</tr>
<tr>
<td>0.9623245</td>
<td>1.0000000</td>
<td>0.9842132</td>
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They express cost reduction measures in the savings banks finance group and are henceforth combined into one factor "cost reduction measures".

For this purpose, three factors are formed by linear combinations with the help of a Principal Component Analysis (PCA).

The first factor PC1 already explains more than 95% of the variance and combines the statistics "number of institutions", "number of branches" and "number of employees". Consequently, we interpret this factor as a global measure of the cost reduction measures.

**Inductive analyses**

**Methodology**

A linear regression model is used to examine the operating ratio, cost-income ratio and return on equity to see whether they changed significantly during the period under review. If this is the case, a second linear regression is used to determine the influence of the cost-cutting measures on these KPIs to determine if a significant influence can be said to exist. The significance level is set to alpha = 0.05.

To take the time series character of the data into account, the tests are carried out with a HAC estimator (heteroskedasticity and autocorrelation consistent). The analysis of the residual plots justifies this methodological approach, since heteroskedasticity and autocorrelation of the residuals are present.

**Statistical tests**

The operating result of the savings banks fluctuated strongly between 1999 and 2018. For example in 2008 – during the global economic crisis –
the operating income fall back to the level of the year 2000. However, the operating result grew with a clear upward trend until 2018 (see Figure 5).

To distort the results of this analysis by an outlier, the operating result from 2011 was excluded from the analysis of the significance of this trend.

![Operating income over time](image)

**Figure 5:** Own representation of the “Operating income”

On average, the operating result of the entire savings banks finance group grew by approximately 370 million euros per year between 1999 and 2018. The significance of the increase can be seen in the p-value $0.003341 < 0.05$ of the explanatory variable Year.

| Coefficient     | Estimate | Std. Error | t value | Pr(>|t|) |
|-----------------|----------|------------|---------|---------|
| (Intercept)     | -736760.089 | 166327.055 | -4.4296 | 0.0003671 |
| Year            | 370.127   | 82.755     | 4.4736  | 0.0003341 |

The influence of the cost reduction measures on this increase is later analyzed.

When looking at the residual plot, the autocorrelation of the residuals in the form of a periodic curve is striking (see Figure 6). The HAC estimator takes this anomaly into account.
The return on equity also fluctuated strongly during the period under review. It reached a temporary minimum in 2008, then recovered again until 2010 and oscillated until 2018 (see Figure 7).

Again, the year 2011 is treated as an outlier and thus removed from the analysis.

The return on equity did not change significantly during the period under review, as shown by the p-value 0.07677 > 0.05. Consequently, this KPI is excluded from further analysis.
The residual plot shows an autocorrelation of the residuals and also a weak form of heteroskedasticity (see Figure 8). The heteroskedasticity shows up as an increasing dispersion of the residuals, which leads to a funnel-shaped residual distribution. This anomaly is also taken into account by the HAC estimator.

![Residual plot](image)

**Figure 8:** Own representation of the "Return on equity" (Residual plot)

The cost-income ratio also fluctuated strongly throughout the entire period under review (see Figure 9). A clear trend, whether positive or negative, is not discernible. Here, the year 2008 is not considered an outlier in this time series, since it appears inconspicuous. Instead, a sharp drop in the cost-income ratio occurred with a time lag of two years in 2010, where it fell to the lowest level in the period under review.

![Cost-Income Ratio over time](image)

**Figure 9:** Own representation of the "Cost-income ratio"
The cost-income ratio did not change significantly during the period under review.

The $p$-value 0.5085 is greater than alpha = 0.05. Consequently, no further analysis is carried out for this KPI either.

\[
\begin{array}{cccc}
\text{Estimate} & \text{Std. Error} & \text{t value} & \text{Pr(>|t|)} \\
\text{(Intercept)} & 185.699774 & 174.862382 & 1.0620 & 0.3023 \\
\text{Year} & -0.058872 & 0.087269 & -0.6746 & 0.5085
\end{array}
\]

The residual plot reveals the autocorrelation of the residuals and again confirms the use of the HAC estimator (see Figure 10).

Only the operating result has changed significantly from 1999 to 2018. It is analyzed whether the cost reduction activities are significantly related to the increase in operating profit. The factor cost reduction measures (PC1) from the Principal Component Analysis is used as the explanatory variable. The cost reduction measures had a significant impact on the operating profit. The $p$-value of 0.006756 is less than 0.05.

\[
\begin{array}{cccc}
\text{Estimate} & \text{Std. Error} & \text{t value} & \text{Pr(>|t|)} \\
\text{(Intercept)} & 6596.68 & 640.73 & 10.2862 & 1.023e-08 *** \\
\text{PC1} & 1147.95 & 572.44 & 2.0225 & 0.046756 ** \\
\text{---} & & & & \\
\text{Signif. codes: } 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
\end{array}
\]

V. DISCUSSION OF THE RESULTS

To survive, savings banks are increasingly turning to mergers, staff cuts and branch closures to reduce costs. The President of the Federal Association of German Banks, Hans-Walter Peters, expects that up to a quarter of the branches of all banks and savings banks in Germany will be closed in the next few years (Peters, 2018).

As has been pointed out, savings banks have significantly reduced the number of institutions, branches and employees. There are various reasons for this, e.g. a historically unprecedented environment of lowest and negative interest rates in the euro area and Germany (Wolgast, 2016). Based on the available key figures, the reduction of savings banks, branches and employees can be described as a rapid impact due to digitalization.

It was found during the research that only the operating profit changed significantly in the years 1999-2018. For this KPI, a relationship can be established with the cost reduction measures that have taken place due to increasing digitalization. The KPIs cost-income ratio and return on equity, on the other hand, did not change significantly during the period under review. The following research question had to be answered: Are the...
Managerial and operational decisions due to the rapid impact of digitalization at savings banks in Germany economically justified about the present operating result, the cost-income ratio and return on equity? Since two (cost-income ratio and return on equity) of the three ratios to be examined do not show any significant change, it can be stated that the cost-cutting measures are not economically justified.

The role of the branches is under discussion from an omnichannel perspective. Branch closures are without alternatives due to the ever-increasing cost pressure (Waschbusch et al., 2016). Banks and savings banks are also lagging behind other sectors in this context. Omni-channel management in German bank distribution will change significantly and is without alternative (Menrad, 2020).

In recent years, it has become clear that banks in Germany lack a concrete strategy. It would be desirable to find strategies that do not exclusively focus on cost reductions, e.g. through branch closures (Henke et al., 2016). However, the digital strategy of a savings bank only has added value if it promotes investments and bundles resources at the same time. The top management of many companies is hesitant to define a digital strategy. The best digital strategies guide both strategic and operational decisions (Sebastian et al., 2017).

VI. Conclusions

Many banks and savings banks in Germany could miss the boat in the age of digital transformation. On the one hand, external influences such as customer behaviour, customer expectations, technological change, willingness to pay and product life cycles are gaining importance. On the other hand, the internal expectations of employees, e.g. the acceptance of new technological solutions and processes, are rather sluggish. According to a study by the consulting firm McKinsey, traditional banks and savings banks could lose a third of their turnover through competition with FinTech companies (Drummer et al., 2016).

For other reasons, too, there is a need for action. The banking industry is facing an environment in which rapid environmental changes are linked to strict IT governance requirements. Banks have to face even stricter regulatory and more complex requirements to be able to limit business risks. To achieve this, robust governance and complex IT infrastructures must also be ensured (Gregory et al., 2018).

Unfortunately, German banks are increasingly neglecting proactive action and serving customer interests. The danger is that banks may no longer be optimally positioned for the future. The more entrenched a banks structures and organization are, the more passive it is. The focus will increasingly be on improving profitability alone (Fischer & Arz, 2016).

The banking sector would benefit from the development of different competencies. Commercial banks need to develop their own competencies for each activity in the value chain. This is the only way to make the most of the various technological innovations (Mavlutova & Volkova, 2019).

Examples of opportunities and competencies in the age of digitalization for German savings banks are Big Data & Analytics for forecasting closing probabilities or Virtual Reality Devices for innovative customer advice (Giebe et al., 2019; Hammerström et al., 2019).

In summary, it can be stated that digital transformation is a highly complex matter that affects the entire company. The formulation of a digital transformation strategy remains a crucial success factor (Hess et al., 2016). Digitalization is a process that will accompany banks from now on. Digitalization will continue to be a natural part of daily work and organization. From the cleaning lady to the CEO, every employee must develop and demonstrate digital skills (Giebe, 2019).

VII. Limitations and Directions for Further Research

One of the limitations of this research is the set of key performance indicators (KPIs). Only a selection of KPIs could be used. This could be the starting point for further research that examines other KPIs. Another methodological criticism is the selection of the time series. The time window investigated will be outdated and allows for an analogous investigation in the future. The results of this research may be useful as a benchmark paper in this regard.

The COVID-19 pandemic hit Europe at the beginning of 2020, whereas the time series studied ends in 2018. Research regarding the impact of the COVID-19 pandemic can be a value-added endeavour.

A study by Conrad et al. showed that inhabitants of sparsely populated rural regions in particular have comparatively poor digital access. It must be questioned to what extent the savings banks succeed in digitally mapping basic financial services promptly and across the board (Conrad et al., 2017). This means that a part of bank customers cannot be reached digitally by savings banks. The authors suggest taking the clientele of savings banks in Germany into account in further studies. Due to the different regional orientation of German savings banks, the age, gender and place of residence of bank customers, for example, lend themselves as study factors. Another aspect for further research could be the influence of the savings bank brand on possible KPIs. If the enthusiasm of employees for the savings banks (aka Sparkassen) brand grows, employee identification and performance will increase. This performance can in turn positively influence KPIs (Zwerenz, 2019).
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Digitalization and its Rapid Impact on Savings Banks in Germany


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Understanding Tax Compliance in the Informal Sector in a Developing or Emergent Economy: A Case Study of Nyarugenge District Rwanda

By Dr. Sazir Nsubuga Mayanja, Akumuntu Joseph & Shakira Namutebi Mayanja
University of Kigali

Introduction - Background of the study: Existence of governments and the social and political contracts between the governed and those who govern them is a central feature of modern society. The governed entrust those who govern them with the responsibility to provide security as well as physical and social infrastructure, among others, to live and enjoy quality life. They owe the mutual responsibility, to pay taxes or other levy to the governers. (Edame & Okoi, 2014).

The first known system of taxation was in Ancient Egypt around 3000–2800 BC in the first dynasty of the Old Kingdom. The earliest and most widespread form of taxation were the corvée and tithe. In an organised society, tax is the price paid for civilisation. Such society needs a well-financed administrative structure. Therefore, taxation in its different forms has existed as long as society had the minimum elements of government (Taxation Handbook, 2015).

Keywords: Informal sector, tax compliance, developing countries, principles.

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Understanding Tax Compliance in the Informal Sector in a Developing or Emergent Economy: Case Study of Nyarugenge District Rwanda

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\section{Introduction}

\textbf{a) Background of the study}

The first known system of taxation was in Ancient Egypt around 3000–2800 BC in the first dynasty of the Old Kingdom. The earliest and most widespread form of taxation were the corvée and tithe. In an organised society, tax is the price paid for civilisation. Such society needs a well-financed administrative structure. Therefore, taxation in its different forms has existed as long as society had the minimum elements of government (Taxation Handbook, 2015).

\textbf{b) Benefits of taxation}

Taxes are often resisted. However without taxes or some other form of levy, society would ground to a halt. It provides the means of expenditure by those in authority to provide quality of life commensurate with the value the governed extend. Secondly, it is a means to distribute wealth. The rich would exploit the resources without those with similar access benefitting. It would be exploitative and most likely there would be social and political uprising. Finally, it provide a means of social and economic recognition, with those paying higher taxes earning bigger recognition.

\section{Objectives of the Study}

The research was carried out with the following objectives:

1. To identify the challenges faced by tax collectors in Nyarugenge District, Rwanda
2. To show the challenges which prevent informal traders form paying taxes in Nyarugenge District, Rwanda
3. To analyze the relationship between informal trade and tax compliance in Nyarugenge District, Rwanda

\section{Justification and Significance of the Study}

Tax compliance is a matter of great concern to governments and tax payers, in both developed and developing countries. By answering the question of the study, we believe findings of this research would assist the government of Rwanda and other countries to formulate appropriate policies that motivate tax payers to comply In addition, other researchers will benefit from the findings and pursue more research in this and other related areas.

\section{Literature Review}

Tax compliance refers to fulfilling all tax obligations as specified by the law, freely and completely, and it includes submitting a tax return within the stipulated period, correctly stating income and deductions and paying assessed taxes by due date (Atawodi & Ojeka, 2012). Tax compliance has also been defined as the ability of taxpayers to meet their statutory obligations under the tax laws that require them to file tax returns and pay taxes promptly (Abdul-Jabbar & Pope, 2008).

Factors which contribute to compliance and non-compliance

Various factors contribute to either tax compliance or its antithesis, non-compliance. Governmental policy effectiveness, transparency of the tax system as well as voice and accountability are perceived to be key grounds for tax compliance or non-compliance. As aspects of tax administration, they significantly influence variances in tax compliance (Nkundabanyanga et al, 2017).

Justice, actual or perceived, inherent in a tax administration system affects the level of compliance by the taxpayers. There are three types of justice in taxation systems, namely, distributive justice (viewed as the...
exchange of resources, that is, benefit and cost); procedural justice (viewed as the process of resource distribution) and retributive justice (viewed as the appropriateness of sanctions when norm-breaking occurs). Tax compliance behavior of the taxpayer will be in response to whether the procedure is just or not. Retributive justice is a theory of punishment that when an offender breaks the law, justice requires that they suffer in return, and that the response is proportional to the offence (Sellywati et al, 2017). Modern tax systems rely heavily on voluntary compliance for revenue collection. Very clear understanding of why taxpayers meet their obligations or fail to do so or of how much tax liability is uncollected is critical for measuring administrative performance and for targeting compliance strategies (John & Liu, 2007).

Tax compliance continues to be a critical problem in developing and emergent countries. Governments have to ever widen the tax net through concerted combination of more enforcement and moral suasion, as well as technology-based improvements (Anirudh, 2019). Deterrence models generally predict compliance patterns based solely on the subjective probability and utility of outcomes associated with alternative actions. Yet recent work in behavioral decision theory suggests that compliance decisions may also be affected by how the risks of noncompliance are described and how the decision-maker’s preferences are expressed. Cognitive heuristics evoked by these descriptive and procedural variables affect tax compliance. It was found in a study that taxpayer preferences are significantly influenced by descriptive and procedural variables that traditional expected utility models ignore. Using tax decision problems involving alternative actions, it is possible for tax administration to increase tax compliance and tax collection to a degree with conventional tools and practices. Beyond legal obligations, it is necessary to analyze the ethical-cultural norms of the individuals and the society and the behavior of taxpayers and to produce the requisite policy accordingly, so as to increase the voluntary tax compliance and motivate the taxpayer (Serdar, 2019).

The potential for behavioral research to contribute to better tax collection and administration has been quite limited. Effective tackling of the task requires a better understanding of attitudes and behavioral motivations of taxpayers against taxation so as to improve both voluntary compliance and tax administration efficiency. Some of the important factors influencing fiscal behavior are discouragement; personal and social norms; fairness and trust in the tax administration; complexity of the tax system; the role of government and the broader economic environment. A contemporary healthy tax system does not mean exclusively a series of norms and the increase or decrease of the amount of taxes, duties and contributions. Rather it also entails a long history in which it was created and stratified, mindful of a certain cultural tax system which it was created and stratified, mindful of a certain cultural behavior of taxpayers which has been shaped in a manner that facilitates the proper operation and compliance with the norms and the consolidation of good practices in the field (Mitu, 2016).

Behavioral economics and economic psychology are other disciplines that have been leveraged to explain tax compliance and noncompliance. They cover areas such as rational and irrational decision-making; social representations about taxes, as well as the interaction between tax authorities and taxpayers. From behavioral finance in particular rational choice and tax payments have been addressed from the point of view of prospect theory, mental accounting and framing effects to explain social representations and provide knowledge and understanding of taxation, attitudes and beliefs, personal and social norms, as well as distributional and procedural justice (Olsen & Kirchler, 2018).
The theory of planned behavior (TPB) has also been used to investigate the issue of tax compliance. It is based on the notion that there are three components to behavior: attitude, subjective norms, and perceived behavioral control. Seven determinants have been developed to study tax compliance intention, namely, tax morale, tax fairness, trust in government, perceived power of authority, tax complexity, tax information, and tax awareness. Findings are that tax morale, tax fairness and tax complexity have a statistically significant influence on the tax compliance intention of the citizens. It has been further proven that the power of authority, trust in government, tax information, and tax awareness do not show a statistically significant relation to tax compliance intention (Heang & Yongjin, 2020).

A study was carried out on factors that determine tax compliance attitude and perception in Kenya, Tanzania, Uganda and South Africa. Findings were that in Kenya and South Africa, citizens who perceive that it is difficult to avoid taxes are more likely to have a tax compliant attitude than citizens who think avoidance is relatively easier. Evidence was also found that individuals who are more satisfied with public service provision are more likely to have a tax compliant attitude in all the four countries. On the other hand, frequent payment to non-state actors, for instance criminal gangs, in exchange for protection, reduces likelihood to have tax compliant attitude. In addition, in Tanzania and South Africa it was established that individuals who perceive that their ethnic group is treated unfairly by the government are less likely to have a tax compliant attitude. The degree to which respondents perceive that it is difficult to know what taxes to pay is also negatively correlated with tax compliant attitude in these two countries. Tax compliance attitude in Uganda is low, mainly because of the low perception about the quality of public services provided among tax payers (Ali, 2013). A study by the World Bank of a cross-section of Ugandan firms shows that an adverse business environment characterised by inadequate Government provision of public capital, bureaucratic bribery and an inefficient legal and regulatory environment could potentially induce a firm’s behaviour towards tax evasion (World Bank Group, 2017).

V. The Informal Sector

The definition of what the informal sector is has most times been characterised by negative connotations such as activities that are unrecognized, unrecorded, unprotected or unregulated by public authorities, although it is not confined to marginal activities but also included profitable enterprises. The sector has also been referred to as the shadow, hidden, black, underground, gray, clandestine, illegal, unreported, non-cash and parallel economy (Thomas, 2002).

Researchers have defined the informal sector or economy variously according to what best fits with the object of their own analysis. For example, one school of thought discriminates between registered or unregistered economic activity (Joshi et al., 2013).

The term “informal sector” was first used in a study of informal income opportunities in urban Ghana, involving the Frafras, one Northern Ghanaian group, as migrants to the urban areas of Southern Ghana. In this study the economic activities of the low-income section of the labour force in Accra, the urban sub-proletariat into which the unskilled and illiterate majority of Frafra migrants are drawn were described. As a result of Price inflation, inadequate wages, and an increasing surplus to the requirements of the urban labour market, there was a high degree of informality in the income-generating activities of the sub-proletariat. Given the uncertainty related to the economic activities of the members of the communities studied, income and expenditure patterns were more complex than is normally allowed for in the economic analysis of poor countries. This made evaluation of economic activities difficult as was determination of tax payable (Harth, 1973).

The phrases informal sector and informal economy have been interchangeably used in much of economics literature. It constitutes an important component of most economies. It contributes between 25 and 65 percent of GDP and between 30 and 90 percent of total non-agricultural employment in most economies. The trend is likely to continue with the informal economy in sub-Saharan Africa likely to remain large for many years to come. This should not be cause for worries, because the informal sector presents both opportunities and challenges for policymakers. During the five years period between 2010-14, Sub-Saharan Africa unweighted average share of informality reached almost 38 percent of GDP. It was only surpassed by Latin America and the Caribbean, which registered a higher rate at 40 percent of GDP. The comparative figures for South Asia and Europe are 34 percent and 23 percent of GDP in South Asia and Europe respectively.

For the Organisation for Economic Co-operation and Development (OECD) member countries, the informal sector is estimated to account for 17 percent of GDP. With limited opportunities in the formal sector, informal activity avails an essential social and economic safety net by providing employment and income to a large number of otherwise vulnerable people. It also offers means to poverty reduction. Between 30 to 90 percent of employment in the non-agricultural sector occurs in the informal sector in some sub-Saharan African countries (IMF, 2017).

Other studies have also confirmed the findings above. The importance of the informal sector is equally important in other parts of the world. Estimated average size of informal economy on tax revenue as a
percentage of GDP was 37.4 % in Peru, in Latin America it was 34 % while in OECD countries it was 19.89 % (Guillermo & Deyv, 2019).

In cities worldwide the informal sector offers a high proportion of employment ranging between 80% on average in Abidjan, Bamako, Cotonou, Dakar, Lomé, Niamey and Ouagadougou, 59% in Lima, Peru, 53% in Ho Chi Minh City, Vietnam and 45% in Buenos Aires, Argentina (Herrera et al 2012).

VI. Taxation of the Informal Sector

The issue of taxation of the ‘informal economy’ in developing and emergent economies has received increasing attention in recent years as has been that of whether indeed taxation of the informal economy is justified. Questions have been raised regarding the issue with critics arguing that the potential revenue yields are low, administrative costs are high, tax incidence is likely to be regressive, and tax enforcement risks exposing vulnerable tax payers to harassment (Keen, 2012).

Failure to pay taxes is not an issue of formality or informality. Thus, reducing informality cannot form the basis of tax policy, because the reasons for not paying taxes vary across both informal and formal sectors. For example, believing that tax rates are unjustifiably high or that there is no evidence of benefits arising from taxes paid are reasons pertinent to firms in both formal and informal sectors. Accordingly, in designing tax policy, the reasons for not paying taxes matter as much as or more than the fact that a firm pays no taxes. (Kanbur & Keen 2015).

Taxes from the informal sector have a significant effect on capital development. In a study carried out in the Lagos Metropolis, among the conclusions made was for government not only to create an enabling environment for the informal sector but also give all necessary support for its survival because the sector has contributed immensely to the capital development of the state. It was recommended that the government should continue with its capital development programs by constructing more roads, building hospitals, schools and markets in order to gain the trust of the citizenry (Andy et al 2019).

In a study on informal sector tax compliance issues and the casualties between taxation and economic growth in Ghana, empirical evidence findings revealed that attitudes, subjective norms, and perceived behavioural control were the main determinants of the informal sector compliance factor, and it was recommended that efforts should be geared towards improving tax systems to augment the GDP of the country (Ameyaw et al, 2016). In neighbouring Nigeria, a study carried out in River State findings were that taxing the informal sector boosted revenue generation and positively affected the economic development of developing states in Nigeria (Obara & Nangih, 2017).

Tax non-compliance is more pronounced in developing and emerging countries. There is no single theory that can explain the phenomenon of tax noncompliance behaviour, however perception and attitude of taxpayers are among the factors contributing towards compliance behaviour. Empirical evidence indicates that taxpayers act according to their belief and attitudes. A framework focusing on tax service and public governance indicates that quality as well as tax system structure are factors relevant to developing and least developing countries, in as far as promoting tax compliance is concerned (Lutfi et al, 2015). There should be greater reliance on locally grounded binding constraints analysis. This must be coupled with careful attention to understanding politics and the drivers of trust in particular contexts, to guide analysis of how best different investments may be combined, prioritized, or sequenced (Wilson et al, 2019).

Recent interest in the matter of taxing the informal sector has been catalyzed by growing attention to the potential benefits of informal sector taxation in terms of revenue, growth, and governance. With respect to revenue, the informal sector forms a large and, in many countries, growing share of GDP, and thus represents a potentially significant source of tax revenue for cash-strapped governments (Schneider & Montenegro, 2010).

a) The informal Sector in Rwanda

In Rwanda, the informal sector refers to establishments that are not registered with the revenue authority body (RRA) to pay local or national taxes and do not maintain regular operational accounts (NISR, 2014). Over time Rwanda has recorded significant growth in the formal sector, and the percentage level of the formal private sector and the government of Rwanda’s Vision 2020 explicitly promotes private sector development and recognizes the informal sector as a key part of the economy. Nevertheless, there is need for concerted effort to expand the formal sector because it enables business enterprises to effectively plan for their future investments and expand their business activities. The expansion would increase domestic revenues (Rukundo, 2015).

In Rwanda the informal sector is an enterprise that employs one to nine people. It covers a wide sector and it includes manufacturing, trading, and services. The sector includes market traders, artisans (mechanics, technicians), cottage industrialists, petty hawkers, transport workers, small shops, and micro businesses. Built on experience, a progressive tax system is capable of reducing the chances of evading taxes because it eliminates the onus of self-assessment from the informal sector, such that the duty of evaluating taxable income rests on the tax authority (Adesoji &
There is growing evidence that taxing the informal sector encourages them to be more organised and practice better management by way of keeping proper financial and accounting records (Oduwole & Sanni, 2014). When considering the merits of committing scarce resources to taxing small informal sector firms, debate has frequently focused on limited revenue potential, high costs of collection and potentially perverse impacts on small firms. By contrast, recent arguments have increasingly emphasised more indirect benefits of informal sector taxation in relation to economic growth, tax compliance and governance. These potentially broader benefits are increasingly finding support in recent research, but they are contingent on government support and consequently demand further attention. Encouraging tax compliance demands not only lowering costs but also strengthening the potential benefits of formalisation, from increased security to new economic opportunities. Successful reform needs political support from political leaders, tax administrators and taxpayers alike. It also requires institutional reform (Anuradha et al, 2013).

The issue of paying tax is a primary nexus between the individual (taxpayer) and the state. Tax laws are examples of purposive administrative law. Compliance is as problematic as non-compliance and tax payers, be they individuals or bodies corporate, have different opportunities for both compliance and non-compliance, and paying tax does not necessarily involve deliberate decisions. Four clusters of factors affecting the content of compliance decisions are material consequences, normative expectations, sociolegal attitudes and beliefs as well as expressive factors (Kent & Kinsey, 1987).

VII. Resistance to Registration for Tax Purposes

In previous studies efforts have been made to find out reasons for not registering for taxes, and self-reported expected tax obligations. One such study was carried out by the World Bank involving small enterprises in Katwe area of Kampala, Uganda in 2011.

Despite the numerous benefits of taxation to the economies of various countries there are various reasons as to why potential tax payers do not register for purposes of taxation, as table 1 below indicates (Dekoya et al, 2020).

<table>
<thead>
<tr>
<th>Reason for not registering for taxes</th>
<th>Share (%)</th>
<th>Expectation of annual tax obligations</th>
<th>Actual annual tax obligations</th>
<th>Monthly turnover</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Share (%)</td>
<td>Expectation of annual tax obligations</td>
<td>Actual annual tax obligations</td>
<td>Monthly turnover</td>
</tr>
<tr>
<td>High registration cost</td>
<td>1.5</td>
<td>86,000</td>
<td>224,125</td>
<td>100,000</td>
</tr>
<tr>
<td>Too small to pay taxes</td>
<td>53.0</td>
<td>50,000</td>
<td>111,645</td>
<td>100,000</td>
</tr>
<tr>
<td>Taxes are too high</td>
<td>12.0</td>
<td>95,000</td>
<td>254,943</td>
<td>100,000</td>
</tr>
<tr>
<td>No action will be taken</td>
<td>1.0</td>
<td>40,000</td>
<td>60,167</td>
<td>200,000</td>
</tr>
<tr>
<td>Too complicated process</td>
<td>0.7</td>
<td>235,000</td>
<td>380,000</td>
<td>100,000</td>
</tr>
<tr>
<td>No time to register</td>
<td>3.2</td>
<td>50,000</td>
<td>195,263</td>
<td>216,000</td>
</tr>
<tr>
<td>Do not know what the TIN is</td>
<td>11.5</td>
<td>50,000</td>
<td>941,045</td>
<td>100,000</td>
</tr>
<tr>
<td>Business is just not registered</td>
<td>9.3</td>
<td>60,000</td>
<td>138,058</td>
<td>100,000</td>
</tr>
<tr>
<td>Do not know where to register</td>
<td>3.4</td>
<td>100,000</td>
<td>276,158</td>
<td>100,000</td>
</tr>
<tr>
<td>Other Specify</td>
<td>4.4</td>
<td>50,000</td>
<td>70,625</td>
<td>100,000</td>
</tr>
</tbody>
</table>


In table 1 above, tax obligation refers to what enterprise owners would have been expected to pay if they had been registered for tax purposes. As is noted from the table over half of the interviewees (53%) believed their businesses were too small to be taxed. This was distantly followed by the argument that taxes were too high at 12%, closely followed by the potential taxpayer’s lack of knowledge of the Taxation Identification Number (TIN) at 11.5%. With the overwhelming belief that one’s business is too small to
be taxed, even if the rates were lowered there has to be a very big reduction for one to even remotely think about paying the tax. Indeed, with the two leading arguments for not registering, it would be surprising if a potential taxpayer bothered to know the TIN.

Apart from the reasons given above for not registering, arguments are raised against taxing the informal sector. Low levels of revenues relative to costs incurred in collecting taxes from the informal sector is one of the major arguments. Taxable incomes are usually low or non-existent. Secondly given that majority of informal sector workers are the underprivileged or marginalized, the rural women and youths or those from the ghettos, there is a high possibility that taxation of the informal sector risks being highly income and gender regressive (Pimhidazai & Fox, 2012).

VIII. Theoretical Framework

Taxes impact on society in various ways because they are socio-political-economic tools which, through the ways the proceeds are utilized, can greatly change the quality of life people in a community live. A lot of theories have therefore evolved to explain many aspects of taxes and taxation. Some of these are the subject matter of discussion below.

a) Canons of taxation

A Scottish economist argued for a systematic approach to matters of taxation and believed that a tax must be levied on the basis of rules he called canons of taxation. These were equity or ability, certainty, economy and convenience (Adam, 1776).

Table 2: Adam Smith’s Cannons of Taxation

<table>
<thead>
<tr>
<th>Canon</th>
<th>Adam Smith’s observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity or ability</td>
<td>The subject of every state ought to contribute towards the support of the government as nearly as possible in proportion to their respective abilities, that is, in proportion to the revenue which they respectively enjoy under the protection of the state</td>
</tr>
<tr>
<td>Certainty</td>
<td>The tax which each individual is bound to pay ought to be certain and not arbitrary. The time of payment, the quantity to be paid, ought to be very clear and plain to the contributor and to every other person.</td>
</tr>
<tr>
<td>Economy</td>
<td>Every tax ought to be so contrived as both to take out and keep out of the pockets of the people as little as possible over and above what it brings in to the public treasury of the state.</td>
</tr>
<tr>
<td>Convenience</td>
<td>Every tax ought to be levied at the time and in a manner in which it is most likely to be convenient for the contributors to pay it.</td>
</tr>
</tbody>
</table>

Source: Adapted from the An Inquiry into the Nature and Causes of the Wealth of Nations

Adam Smith’s canons of taxation outlined above are as valid and sound today as they were in 1776. That his book An Inquiry into the Nature and Causes of the Wealth of Nations came out in five editions during Adam Smith’s lifetime, in 1776, 1778, 1786 and 1789 is not surprising. All theories and principles of taxation that were postulated later, directly or indirectly derive from these four pillars propounded by the greatly endowed Adam Smith. Indeed, non-compliance arises because of breach of one or several of the canons. A tax that is not equitable, certain, economic or convenient as indicated above provides room for non-compliance. Breach of the canons of taxation as propounded by Adam Smith will most likely result into non-compliance. Thus, for example a complex tax which the taxpayer does not understand or one which requires the taxpayer to go through a costly process and involving travel to regional tax offices and therefore uneconomic from the taxpayer’s point of view is likely candidate for involuntarily evasion. Compliance costs of taxation include three major components, namely money costs, time costs and psychological costs to the taxpayers. Expenditure on professionals such as tax consultants and accountants, investment advisors, tax agents and legal practitioners as well as expenses relating to taxation guides, books and other incidental costs such communication, stationery and travel is referred to as compliance costs. When these compliance costs are high, they can lead to tax evasion, avoidance or both (Sandford & Hardwick, 1989).

b) The Sacrifice or Ability to Pay theory

The sacrifice (or ability to pay) theory derives form Adam Smith’s canon of equity as outlined above. He believed that tax payers should make contributions to the public coffers in proportion to the revenue which they enjoy under the protection of the state’ (benefits) and also in proportion to ‘respective abilities ‘(ability to pay) which are reflected by the revenues they derive from the economy. It was generally agreed that this not only just but it was also equitable. This principle seeks to ensure that tax subjects the taxpayers to an equal sacrifice (Clifton et al, 2001). This is through introduction
of the principle of progression in the tax system. By paying the taxes the individual sacrifices in the form of foregone alternative uses of money paid in terms of taxes. Because equity is concerned with the fair distribution of the tax burden, the ability to pay principle should also consider the incidence of a tax, as the formal incidence, and this is because the person on whom the tax is levied, is not necessarily the same person who actually bears the burden of the tax (Peter & Helen, 2009).

c) The Benefit Theory

The Benefit theory, also known as the insurance theory or the Quid Pro quo theory of taxation, relates the sacrifice of the taxpayer in paying the taxes with the benefits they enjoy from governmental expenditure. The benefit theory states that the taxation should be in accordance with the benefit enjoyed by a taxpayer from the facilities or services provided by the Government (Jon, 2000). The theory has been criticized on various aspects. The poor or underprivileged receive greater benefits from the government in the form of free social services like education and health yet they are the least able to bear the burden of taxation. It is also difficult to record every single taxpayer’s benefit. Furthermore, the intensity of desire by a particular taxpayer for service from government is difficult to quantify, and therefore it is equally difficult to determine how much the beneficiary is prepared to pay for it.

d) The Principle of Maximum Social Advantage

Economic welfare of the community is the goal of state’s economic policy. The Principle of Maximum Social Advantage extends the ability-to-pay principle to include the benefits of public expenditure in that it seeks to balance the social advantage of public expenditure and the social sacrifice involved in the payment of taxation. It is alternately called the Principle of Maximum Aggregate Welfare or the Principle of Maximum Social Advantage. It is criticized from the point of view that it is difficult to determine the measures which will lead to maximum social advantage (Ngerebo, 2010).

e) Principle of Productivity

To justify its imposition a tax should produce for its government sufficient revenue. Taxes should be productive. The principal tallies with the economy canon propounded by Adam Smith. To justify its imposition. The principle demands of government selection of a few taxes yielding sufficiently large revenues as opposed to a multiplicity of taxes, to avoid high cost of collection, relative the amount collected. This should be so in the medium and long term. The cost-benefit analysis point of view of the principle is attractive because it is logical (Tuan, 2016).

f) Principle of Elasticity or Flexibility

The economic or financial systems in which taxes are charged and collected is dynamic. This in turn requires that the tax system should have the capacity to adjust itself in the ever changing globalised environment. The tax system should be fairly elastic so as to enable government, if it deems it necessary for example to raise more funds, to do so without incurring exorbitant costs in this endeavour (Saez & Giertz, 2012).

g) Principle of Simplicity

Tax systems should be simple, tax laws should be clear and easily understandable to the common man. Simplicity reduces the cost of collection of taxes and inconvenience to the taxpayers. A Complex tax system breeds corruption in tax administration and may lead to temptations for non-compliance. The taxes should be simple to calculate and encourage self-assessment also to some extent. The basis of arriving at tax liability should be easy to comprehend, tax bands where applied should be logical, the rates should be moderate, the manner and timing of payment should be convenient (Philippe, 2017).

h) The lifeblood theory

The theory posits that the system of taxation works like a blood circulatory system. Taxes flow into the government coffers and through government expenditures the taxes flow back into the economy to fund infrastructure and services, among others. Providers of the labour and material inputs are taxed on the profits they generate from their businesses or earnings received as salaries, and the cycle continues (Ajay, 2018).

i) Principle of Diversity

Just like businesses manage risk partly through portfolio diversification, governments should adopt similar strategy in evolving fiscal policy (Federico, 2018). Sectors enjoy success or suffer losses differently because the nature of their activities differ. Agriculture depends very much on the vagaries of nature especially in least developed economies. Issues of climatic change are heavily impacting on the sector. The manufacturing and services sector are impacted upon by basically different factors. Government should therefore be cognizant of the risk posed by a narrow tax base which would expose it to shocks when the few sectors suffer negative revenue trends and consequently losses and falling taxable income. Indeed, diversification also satisfies the canon of equity, by covering as many taxpayers and sectors as possible, instead of burdening a few Chowdhury (2015).

j) Conceptual framework

A conceptual framework is a structure which the researcher believes can best explain the natural progression of the phenomenon to be studied (Camp, 2001). It is arranged in a logical structure to provide a picture or visual display of how ideas in a study relate to one another and it assists the researcher in identifying and constructing his/her worldview on the phenomenon.
to be investigated (Grant & Osanloo, 2014). We had dependent and independent variables which are informal trade as the independent and tax compliance as the dependent variable.

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Dependent Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informal trade</td>
<td>Tax compliance</td>
</tr>
<tr>
<td>1. Tax avoidance</td>
<td>1. Achievement of taxes and fees</td>
</tr>
<tr>
<td>2. Rate of tax charges</td>
<td>2. Costs associated with non-compliance</td>
</tr>
<tr>
<td>3. Tax Illiteracy</td>
<td>3. Tax education</td>
</tr>
</tbody>
</table>

**Figure 1:** Source: Researcher conceptualization (2006)

**IX. RESEARCH METHODS AND TOOLS**

In any research the appropriateness of the methods and tools used contributes a lot on how the findings of the particular study are reliable and valid.

a) **Research design**

A research design is the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. It is the conceptual structure in which research is conducted. It constitutes the blueprint for the collection, measurement and analysis of data. It includes an outline of what the researcher did from writing the hypothesis or research question and its operational implications to the final analysis of data (Kothari, 2004). Both primary and secondary sources were used. The study used a combination of cross sectional and descriptive designs in which both qualitative and quantitative approaches were adopted. Questionnaires were administered to respondents who answered both open-ended and close-ended questions. Quantitative data was analysed by means of frequencies, percentages and means correlations to arrive at conclusions. A sample of 14 employees and 96 informal traders were involved.

b) **Procedures and techniques used for gathering data**

We wrote a letter requesting for permission to collect data to the Major of Nyarugenge district who in turn gave an authorization letter to the Executive Secretaries of sectors. These helped in identifying the informal traders and the tax collectors. While collecting data, we obtained relevant information by repeating and putting clear questions to the respondents.

c) **Study population**

Population refers to an aggregate or totality of all the objects, subjects or members that conform to a set of specifications (Polit and Hungler, 1999). We collected and analyzed the views of Nyarugenge district’s informal traders and tax collectors. The targeted population was 4,800 operators in the informal sector and 14 tax collectors of Nyarugenge district. The distinction between informal traders and tax collectors in administering questionnaires was based on the fact that informal traders may live their own experiences in not paying taxes which may be different from those lived by tax collectors in collecting taxes. This is presented in table 3 below.

<table>
<thead>
<tr>
<th>Population category</th>
<th>Population under study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informal traders</td>
<td>4,800</td>
</tr>
<tr>
<td>Tax collectors</td>
<td>14</td>
</tr>
<tr>
<td>Total</td>
<td>4,814</td>
</tr>
</tbody>
</table>

Source: Nyarugenge District Department of Finance

d) **Interview technique**

An interview can be defined as a conversation between an interviewer and the respondent contacted for the purpose of obtaining information. Two types of interviews were used in this study, that is, the formal or structured interview and the informal or unstructured interview. The structured is based on questions predetermined and specific before the onset of the interviews. The unstructured arise out of the responses to the formal interview. The unstructured interview was conducted to obtain complementary tax collection information.

e) **Questionnaire**

The questionnaire was one of the tools used during the study to collect data. It was in Kinyarwanda, the mother tongue of respondents. This questionnaire comprised both closed and open-ended questions which enabled a mix of qualitative and quantitative information to be gathered. The questionnaire was presented in form of nominal and 5-Likert scale as described in table 4 below.
In selecting the respondents, the researchers used convenience and purposive sampling strategies. Convenience sampling is non-probability sampling where the information is collected from the members of the population who are conveniently or readily available to provide it (Sekaran, 2003). Purposive sampling is a type of sampling whereby the researcher uses own judgment or common sense regarding the participants from whom information will be collected (Amin, 2005). Given that the population of informal traders and tax collectors is fairly homogeneous on the information required, we used this technique in selecting the taxpayers, tax collectors and other employees such as Director of Finance, Revenue accountant and Revenue inspectors who were available during the distribution of questionnaires. See table five below.

**Table 5: Sample size**

<table>
<thead>
<tr>
<th>Strata (Sector)</th>
<th>Number of personnel</th>
<th>Sample size</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxation department</td>
<td>8</td>
<td>8</td>
<td>Convenient</td>
</tr>
<tr>
<td>Top management</td>
<td>4</td>
<td>4</td>
<td>Convenient</td>
</tr>
<tr>
<td>Taxpayers</td>
<td>84</td>
<td>84</td>
<td>Convenient</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td>96</td>
<td>Convenient</td>
</tr>
</tbody>
</table>

Source: Author (2018)

To ensure validity in research, examination of trustworthiness is crucial. For us to establish the validity of the research instrument in this study, we were helped by research advisors and other experts. We were advised on retaining items based on their relevance, representation and clarity of wording. Thereafter, based on the feedback, we eliminated items that were unclear, irrelevant or redundant.

**j) Reliability**

Reliability refers to the level of dependability of the questions in the research instrument or the degree to which a measurement instrument gives the same results each time that it is used, assuming that the underlying item being measured does not change. Before administering the questionnaires, a pre-test was conducted in Nyarugenge and Muhima sectors, on the instrument whose validity was ensured. The aim was to pre-test the questionnaire with the view to ensure that respondents understood the questions so as to provide appropriate responses. In addition, it helped to check whether administration of the survey procedure as a whole went smoothly (Finn, 2015).

To certify that the instrument is reliable a Cronbach’s Alpha coefficient of 0.6 and above must be achieved (Amin, 2005). Using SPSS, the calculated value of the instrument reliability was 0.862 Cronbach’s Alpha. See table 6 below.

**Table 6: Results of reliability test**

<table>
<thead>
<tr>
<th>Valid items</th>
<th>Sample size</th>
<th>Cronbach’s Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td>96</td>
<td>0.862</td>
</tr>
</tbody>
</table>

Source: researchers’ data

**g) Validity and Reliability of the Instrument**

According to (Ochieng et al, 2007), for a study to be of real meaning it ought to apply valid and reliable instrument. We ensured that the research instruments checked for validity and predetermined its reliability.

**h) Validity**

The level of dependable of the questions in the research instrument or the degree to which a measurement instrument gives the same results each time that it is used, assuming that the underlying item being measured does not change is referred to as validity (Shutte worth, 2015).

Validity determines whether the research truly measures what it is intended to measure or how truthful the research results are (Hamed, 2016). There are various types of validity but most commonly used are content validity and face validity. Content validity looks at whether the instrument adequately covers all the content that it should with respect to the variable. Face validity, is where experts are asked their opinion about whether an instrument measures the concept intended.
Table 7: Evaluation and scoring of the questionnaire: Analysis of perception

<table>
<thead>
<tr>
<th>Scale Point</th>
<th>Responses</th>
<th>Verbal description</th>
<th>Weighted mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Strongly Agree (SA)</td>
<td>Very high perception</td>
<td>4.21 – 5.00</td>
</tr>
<tr>
<td>4</td>
<td>Agree (A)</td>
<td>High perception</td>
<td>3.51 – 4.50</td>
</tr>
<tr>
<td>3</td>
<td>Neither Agree nor Disagree (ND)</td>
<td>Fair perception</td>
<td>2.51 – 3.50</td>
</tr>
<tr>
<td>2</td>
<td>Disagree (DA)</td>
<td>Low perception</td>
<td>1.51 – 2.50</td>
</tr>
<tr>
<td>1</td>
<td>Strongly Disagree (SD)</td>
<td>Very low perception</td>
<td>1.0 – 1.50</td>
</tr>
</tbody>
</table>

A Likert scale with five points was used for the survey. This is because it allowed the respondents to measure how much they agreed or disagreed with a particular statement (McLeod et al., 2015).

There was need to establish or explain to what extent a change in one or several independent variable(s) could explain a change in the dependent variables. Table 8 below indicates the strength of the relationship was rated.

Table 8: Rating of Correlations

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly high</td>
<td>0.9 – 1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>0.7 – 0.9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>0.5 – 0.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weak</td>
<td>0.3 – 0.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very weak</td>
<td>0 – 0.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1) Limitations

First, eliciting information from respondents required patience and high degree of tact due to their evasiveness and fear wondering that the researcher may be among the authorities in charge of the District, who after gathering the information, would use it to exact taxes on them. A lot of time was required. Secondly, the informal sector is characterised by lack of or poor records.

X. Findings

This research intended to achieve the following objectives: identify the challenges faced by tax collectors in Nyarugenge District, show the challenges which prevent informal traders not to pay taxes and to analyze the relationship between informal trade and tax compliance.

a) Socio-Demographic characteristics of the respondents

The study findings of socio-demographic characteristics (Gender, Age, Education and Experience) are summarized in the following tables.

Table 9: Respondents Gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>Frequency</th>
<th>Percentage</th>
<th>Cumulative percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>32</td>
<td>33.3</td>
<td>33.3</td>
</tr>
<tr>
<td>Female</td>
<td>64</td>
<td>66.7</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>96</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Primary Data

The revelation in table 10 is that the majority, that is 49 out of 96, thus 51% of the total respondents, were uneducated. Those who had attained primary level schooling were 47 out 96 thus 49%. This is a key guide to policymakers. Read together with the table on gender above, the implication is that the majority women are of very limited education, and the male are not any much better. This shows that the low level of education was the main factor contributing to the informality of conducting informal trade. Related to this is the evident failure to keep both financial and non-financial records, which is incompatible with taxation compliance. If participation in the informal sector is closely related to low levels of education, then policy in the education sector must be aligned to address this. Programs for tax education have to be rolled out cognizant of the challenge.

b) Challenges faced by tax collectors

In order to have accurate information, we prepared questions about the challenges faced by tax collectors from Nyarugenge District on informal trade and the table 11 below provides the field findings.
Table 11: Challenges faced by tax collectors

<table>
<thead>
<tr>
<th>Statements</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of enough skills of tax collectors in the domain of finance</td>
<td>5.0</td>
<td>35.7</td>
<td>35.7</td>
</tr>
<tr>
<td>Poor perceptions on the relevance of tax payment</td>
<td>2.0</td>
<td>14.3</td>
<td>50.0</td>
</tr>
<tr>
<td>Taxpayers’ culture to evade taxes</td>
<td>1.0</td>
<td>7.1</td>
<td>57.1</td>
</tr>
<tr>
<td>Social condemnation among taxpayers against tax offences</td>
<td>3.0</td>
<td>21.4</td>
<td>78.5</td>
</tr>
<tr>
<td>Business activity without trading license</td>
<td>1.0</td>
<td>7.1</td>
<td>85.6</td>
</tr>
<tr>
<td>Means of transport to facilitate taxpayers to reach the area of tax collection</td>
<td>2.0</td>
<td>14.4</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: Primary Data 2015

Table 11 shows that 5 out of 14 (35.7%) of the tax collectors said that the challenge they face is lack of enough skills in the domain of finance. Those faced with the stigma of social condemnation among taxpayers who are against tax offences were 3 out of 14, that is, (21.4%) tax collectors. In third place, 2 out of the 14 tax collectors (14.4%) said that the challenge faced by tax collectors is means of transport to facilitate taxpayers to reach the area of tax collection. A similar percentage is challenged by poor perceptions on the relevance of tax payment. Finally, 1 out of 14 tax collectors (7.1%) out of 14 tax collectors said that the challenge they faced was taxpayers’ culture to evade and avoid taxes and carrying on business activity without trading license. The findings reveal that some of the barriers to tax collection and compliance are institutional and can be administratively addressed by the Rwanda Revenue Authority (RRA). Rejection by society is a psycho-socio problem which must be addressed as such before symptoms reveal themselves by way of stress.

c) Challenges faced by informal traders on tax payment

We asked questions about the challenges faced by informal traders in an effort to pay tax in Nyarugenge District.

Table 12: Challenges faced by informal traders on tax payment

<table>
<thead>
<tr>
<th>Statement</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of education on tax payment and procedures</td>
<td>3.0</td>
<td>5.0</td>
<td>4.171</td>
<td>0.69577</td>
</tr>
<tr>
<td>Failure to understand the relevance of paying tax</td>
<td>3.0</td>
<td>5.0</td>
<td>4.171</td>
<td>0.69577</td>
</tr>
<tr>
<td>Higher tax rate imposed compared with business capacity</td>
<td>4.0</td>
<td>5.0</td>
<td>4.6667</td>
<td>0.47388</td>
</tr>
<tr>
<td>Low capital of investment</td>
<td>4.0</td>
<td>5.0</td>
<td>4.8438</td>
<td>0.36500</td>
</tr>
</tbody>
</table>

Source: Primary data 2015

Table 12 indicates a telling and quite significant average mean score of about 4.2000 with regard to challenges faced by informal traders on tax payment. This implies that the challenges are really potent. At the top are the challenges of low capital investment, with a mean score of 4.8438 and lowest standard deviation of 0.36500. This is closely followed by higher tax rate imposed compared with business capacity (most likely reflected by the low capitalisation) whose mean is 4.6667 and standard deviation is 0.47388. This means that respondents differ least on the challenge of low capital, and almost similarly on high tax rates. Scoring lower but also significant figures are challenges of failure to understand the relevance of paying tax and lack of education on tax payment and procedures with a mean of 4.1771 and standard deviation of 0.69577. First of all, this is not surprising given that the level of education of the participants in the informal sector is barely basic, where it exists. This was revealed in section 10.1 on Socio-Demographic characteristics of the respondents.
The coincidence of standard deviations with the mean scores, that is, lack of education on tax payment and procedures and failure to understand the relevance of paying tax depicts a high degree of consistency in the findings and therefore reliability and validity of the findings. This is further confirmed by standard deviation of 0.47388 and 0.36500 for 4.6667 and 4.8438 scored for higher tax rate imposed compared with business capacity and low capital of investment respectively. It indicates a high level of research rigour as defined in section 9.10 on rigour, validity and reliability above.

d) Informal traders’ opinion on tax payment

After appreciating the challenges faced by tax collectors, as well as those faced by informal traders on tax payment, we found it pertinent that we obtain information on the informal traders’ opinions on tax payment. The findings are as in table 13 below.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Minim</th>
<th>Maximum</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduction of rates imposed on taxpayers’ business</td>
<td>4.00</td>
<td>5.00</td>
<td>4.6667</td>
<td>.47388</td>
</tr>
<tr>
<td>Increasing the purchasing power of the population through poverty reduction program</td>
<td>4.0</td>
<td>5.00</td>
<td>4.8438</td>
<td>.36500</td>
</tr>
<tr>
<td>Facilitate informal trade to access the business capital</td>
<td>3.0</td>
<td>5.00</td>
<td>4.6667</td>
<td>.49275</td>
</tr>
<tr>
<td>Monitoring and placement of informal trade to the modern market</td>
<td>2.0</td>
<td>5.00</td>
<td>4.3438</td>
<td>.47745</td>
</tr>
<tr>
<td>Sensitizing the informal traders for behavior change</td>
<td>4.0</td>
<td>5.00</td>
<td>4.8333</td>
<td>.37463</td>
</tr>
<tr>
<td>Training of informal trade regarding tax payment</td>
<td>4.0</td>
<td>5.00</td>
<td>4.3438</td>
<td>.47745</td>
</tr>
</tbody>
</table>

Source: Primary data 2016

The results from the table 13 logically flow with the findings in table 12 which provides findings on challenges faced by informal traders on tax payment. It is therefore not surprising that top on the list is the demand for increase of the purchasing power of the population through poverty reduction programs. It has a mean score of 4.8438 out of 5.0 and a standard deviation of .3650, the highest and lowest in the table respectively. Coincidentally, at the top of the list in the table of challenges was low capital investment, with a mean score of 4.8438 and lowest standard deviation of 0.36500. Poverty reduction is impliedly most crucial as it enhances income, which in turn would increase savings and therefore the capital in the potential and actual taxpayer’s enterprises. In table 13 increase in poverty reduction is followed by sensitising the informal traders for behaviour change which scored a mean of 4.8333 a standard deviation of .37463. In table 11 on challenges by tax collectors social condemnation among taxpayers against tax offences and poor perceptions on the relevance of tax payment ranked higher than most others, expect lack of enough skills of tax collectors in the domain of finance. In table 12 above lack of education on tax payment and procedures as well as failure to understand the relevance of paying tax scored a high average of 4.1771. It is therefore not surprising that sensitising the informal traders for behaviour is the next most important issue on informal traders’ opinion on tax payment. Training of informal traders regarding tax payment and monitoring and placement of informal trade to the modern market follow with a score of 4.3438. Sensitising and training are about creating awareness and therefore closely related. It is also important that when one objectively trains or sensitizes for a purpose or deliverables, the trainees are monitored to assess whether the training was effective and benefited the trainees. It is about impact assessment.

A population whose poverty is reduced and who have been sensitised and trained are expected to graduate to a higher level. The enhanced skills and management competences in turn imply business capacity that will require that in addition from internal sources, enterprises can leverage external sources to increase their funding. It is therefore logical that next to poverty alleviation programs, sensitisation and training, facilitation of informal trade to access the business capital, scoring a mean of 4.6667 is next. At the same level of score is reduction of rates imposed on taxpayers’ business. This is so because with a wider tax base and well sensitized and better capitalized businesses, more revenue can be raised by a responsive community, with more taxable profits.

e) Relationship between informal trade and tax compliance

Correlation is a measure or degree of relationship between variables. Statistical correlation can be positive, negative or zero. In the table below we interrogate the relationship between informal trade and
tax compliance in Nyarugenge District. The Spearman’s correlation coefficient, $r$, can take values from +1 to -1. The higher the magnitude of the $r$, the higher the revealed relationship, whether negative or positive.

Table 14: Correlations Analysis

<table>
<thead>
<tr>
<th></th>
<th>Informal trade</th>
<th>Tax compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Spearmen's rho</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Informal trade</td>
<td>Correlation Coefficient</td>
<td>1.000</td>
</tr>
<tr>
<td></td>
<td>Sig. (1-tailed)</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>96</td>
</tr>
<tr>
<td>Tax compliance</td>
<td>Correlation Coefficient</td>
<td>.660*</td>
</tr>
<tr>
<td></td>
<td>Sig. (1-tailed)</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>96</td>
</tr>
</tbody>
</table>

The findings presented in table 14 show that there is a slight positive relationship between tax compliance with informal trade at 0.666, sig .000. This implies that more has to be done to raise the relationship. On the good side, on their part the informal sector taxpayers are not totally oblivious of their statutory role of paying taxes. The government of Rwanda can do a close study elsewhere, especially in Africa to improve on tax compliance.

XI. Conclusions

The factors for tax compliance and non-compliance are two-way. Governments, including that of Rwanda, must promote an equitable legal and regulatory environment for the conduct of business in general, and as revealed in this study, for tax purposes. They must provide enabling tax education programs, set tax rates reasonably, be evidently seen to provide benefits for the taxes paid and have in place adequate and appropriate institutional mechanisms and systems that make appreciation of tax issues and payments convenient for the tax payer. The government has political and social contracts with the people governed, to provide social and other services, as well as the physical infrastructure like roads and utilities like water and power. On their part the governed have the reciprocal and statutory obligation to raise the funds, through among others, paying taxes, to enable government execute its duties and responsibilities under the social and political contracts. They have to pay taxes, which the government will have set, mindful of the canons and principles articulated above.

Respondents were cagey when they were asked about whether there may be inhibitive vices such as frequent payment to non-state actors, for instance criminal gangs or corrupt officials who offer protection to evaders, which reduces individual’s likelihood to have tax compliant attitude. With the findings of study which revealed institutional challenges of, for example, lack of transport, there could be gaps which could allow the vices to creep in.

It is noted from the findings that on their part the informal sector taxpayers in Rwanda are not totally oblivious of their statutory obligations of paying taxes. However, government has to substantially enhance public awareness by way of tax education and accompany this with providing tangible benefits in return for the sacrifices the taxpayer makes.

XII. Recommendations

Tax compliance is only one aspect of the multifaceted and very important matter of the tax discipline. Further studies can for example be done with respect to the national budgetary processes and fiscal policies in Rwanda and other developing or emergent countries. These have an impact on compliance or otherwise, with taxation.

Nations are so closely interrelated in the globalised world that the impact of this phenomena can be a very interesting aspect of tax compliance. Study in this area would be value enhance.

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Moreover


28. INTERNATIONAL MONETARY FUND (2017) SUB-SAHARAN AFRICA RESTARTING THE GROWTH ENGINE WorldEconomic and Financial Surveys Regional Economic Outlook:


Economic Estimation of Profit and Selling Price Across Supply Chain

By Ibrahim Bedane & Mahmud Abdurahmen Mohammed

Madda Walabu University

Abstract- This article aimed at Economic Estimation of Profit and Selling Price across supply chain. Business chain management is crucial for effective operations and Economic Profit and Selling Price Estimation and management across supply chain and meet customer and suppliers needs. Companies should try to establish Mathematical kinds of economic productive relationships with their suppliers that they have with their customers. By developing partnerships, customers and suppliers can build economic relationships that will help them satisfy their shared customers and end users further along the customer-supplier chain.

Keywords: economics; supply chain; profit; price; customer; supplier.

GJMBR-B Classification: JEL Code: A10
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I. INTRODUCTION

The process of business economy management is now presenting a multitude of challenges to governments and all organizations that both provide, directly or indirectly, services to citizens, and undertake large-scale projects with national and international impacts. Global competition for profitability of market actors and citizens demand for fair priced technologically empowered quality product and service worldwide are making these challenges more formidable, and governments can no longer hide behind bureaucratic rules, inadequate resources, and managerial inefficiency while performing their functions.

We are facing inflation daily with out any tangible reason. Price is surging tremendously. Managing trade is weak and trading become uneconomically surging price of products and services across business chain. Individuals usually add price on products they sells and services they offers. Organizations are increasing price of product they produce and service they offers because of unbalanced economic conditions and their own uneconomical profitability desires. Product and service Price is increasing across Business chain and purchasing cost of product is become high and higher which affect economy of end users. End users, customers, are challenged by demands for better quality services, improved performance standards, and more fair and responsiveness commodity price across Business chain. While there is a long way to go, the first steps must be taken and this article offers strategic instrument toward optimal economic goal of improved Economic Estimation of Profit and Selling Price along Business chain mathematically.

Suppliers are those business firm that provide goods and services that help them to satisfy the needs of their own customers. The idea of creating mutually beneficial relationships with both customers and suppliers is a major departure from the traditional approach to customer and supplier relationships. Thus, there must be economic method of managing price of products and services across supply chain. This article present the general concept of business and business chain management. Core concepts of Economic Profit And Selling Price Estimation using mathematical techniques to measure, analyze and implement Economic customer-supplier relationships and productive business chain Profit And Selling Price management across business chain is aim of this article.

II. ANALYSIS AND RESULT

Every Business is part of a long chain (actually many long chains) of customers and suppliers. Each Business is a customer to its suppliers and a supplier to its customers, so it does not make sense to think of a Business as only one or the other. One implication of this concept is that your customer’s customers are, in a sense, your customers as well. Sometimes a Business must focus on both their immediate customers and those next in the chain. Business firm must works hard to satisfy the needs of both the people who use their products and the retail establishments that sell them, labeling the former price and across customer-supplier business chain of consumers and the latter customers.

We are trading and offers services across supply chain from raw material producers, processors, product producers or importers, whole sellers, retailers, distributors to shops. At every stage of supply chain there is needs of profits and profitability. However, end users need and require quality product and services with fair price. Both suppliers and end users or customers need profit and price that must be economical so that they get need and requirement satisfaction. Costs and time (number of days product waits to be solled) are two basic factors to manage profits and price of products and services let alone quantity is one of determining factor of number of days product waits. Initial cost of product is one of basic factor to determine profits and product prices across Business chain with expected mean number of days product waits.
Note: Commodity with low initial cost per unit product should have higher unit product profit in relation to initial unit cost where as Commodity with higher initial unit cost should have lower unit profit in relation to initial unit cost. Moreover, Commodity waiting short mean number of days shall have lower profitability rate where as Commodity waiting longer mean number of days shall have higher profitability rate as per mean number of days Commodity stored and waits to be sold at each Business chain mathematically. Thus, expected profit of unit Commodity at Business chain shall be:

\[ E_{Pr} = IC \times \log IC \]

Where
- \( E_{Pr} \) - expected unit Commodity Business chain profit
- \( IC \) - Initial cost of unit Commodity
- \( Wd \) - unit Commodity waiting days

\[ Wd = \sum_{BC=1}^{BC=n} \frac{mean \_days}{n} = \frac{T \_days}{n} \]

Where \( n \) is number of actors across business chain

Note: Unit cost of unit Commodity at each chain of Business chain is base where as mean unit Commodity waiting days is factor of rate of profit logarithm function of business chain.

The quality of goods and services received from suppliers, the upstream potion of the supply chain, has a significant effect on the quality of goods and services that downstream customers receive. Similarly, The price of goods and services paid to unit Commodity received from suppliers, the upstream potion of the business chain, has a significant effect on the price of goods and services that downstream customers shall pay to receive. Thus, unit Commodity selling price at each chain of supply chain shall be:

\[ C + (IC \times \log IC)^{\frac{M \_days}{T \_days}} \]

Where
- \( C \) - cost of unit Commodity
- \( M \_days \) - mean unit Commodity waiting days of actor
- \( T \_days \) - Total unit Commodity waiting days of chain

Note: Initial cost of unit Commodity at upstream potion of the business chain has a significant effect to set profitability at every stage of business chain and become constant for all actors across business chain. unit Commodity profit of chain actors shall be:

\[ E_{Pr} = \left( \frac{Mean \_BC \_days}{Total \_mean \_days} \right) \]

With the help of GGOOCHAA let us see some examples

Example: trading across five actors of supply chain from product producers or importers, whole sellers, retailers, distributors to shops to reach end user with Initial cost of unit Commodity 9Br and mean Commodity waiting days at business actors across business chain are as shown on figure.

<table>
<thead>
<tr>
<th>Chain</th>
<th>Unit Commodity waiting days</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC 1</td>
<td>16 M. days</td>
</tr>
<tr>
<td>BC 2</td>
<td>19 M. days</td>
</tr>
<tr>
<td>BC 3</td>
<td>20 M. days</td>
</tr>
</tbody>
</table>

Unit Commodity waiting days of Business chain
\[ Wd=\frac{31}{5} = 6.2 \text{ days} \]

Expected profit of unit Commodity of chain is:

\[ IC \times \log IC^{\frac{Wd}{IC}} = 9 \times \log 9^{\frac{6.2}{9}} = 7.473 \text{ Br.} \]

Unit Commodity selling price at end of chain

\[ IC + IC \times \log IC^{\frac{Wd}{IC}} = 9 + 7.473 = 16.473 \text{ Br.} \]

Share of Profit of each actors of chain depends on mean Commodity waiting days of each actor across business chain. They share profit as per their mean Commodity waiting days. unit Commodity profit of BC actors shall be based on expected unit Commodity Business chain profit = 7.473 Br.:

Unit Commodity profit of producers or importers is

\[ 7.473 \times \left( \frac{3}{31} \right) = 0.723 \text{ Br.} \]

Unit Commodity selling price of producers or importers is: 9Br. + 0.723 Br. = 9.723 Br.

Similarly
- Unit profit of whole sellers = 1.205Br.
- Unit selling price of whole sellers = 10.928Br.
- Unit profit of retailers = 1.687Br.
- Unit selling price of retailers = 12.616Br.
- Unit profit of distributors = 1.687Br.
- Unit selling price of distributors = 14.304Br.
- Unit profit of shops = 2.169Br.
- Unit selling price of shops = 16.473Br.

Example: trading across three business actors of supply chain of producers or importers (BC 1), whole sellers or retailers (BC 2), distributors or shops (BC 3) to reach end user with Initial cost of unit Commodity 4,000br and mean Commodity waiting days at actors varies across business chain as shown on figure.

<table>
<thead>
<tr>
<th>Chain</th>
<th>Unit Commodity waiting days</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC 1</td>
<td>16 M. days</td>
</tr>
<tr>
<td>BC 2</td>
<td>19 M. days</td>
</tr>
<tr>
<td>BC 3</td>
<td>20 M. days</td>
</tr>
</tbody>
</table>

Unit Commodity waiting days of Business chain
\[ Wd=\frac{55}{3} \approx 18.33 \text{ days} \]
Expected profit of unit Commodity of Business chain is:

\[ \text{Expected profit} = 4,000 \times \log_{10} 4,000 = 1402.798 \text{Br.} \]

Unit Commodity selling price at end of chain

\[ = 4000 + 1402.798 = 51402.798 \text{Br.} \]

Expected profit and selling price of unit Commodity at each Business chain

<table>
<thead>
<tr>
<th>Producers or importers unit Commodity profit</th>
<th>Producers or importers unit Commodity selling price</th>
</tr>
</thead>
<tbody>
<tr>
<td>408.087Br.</td>
<td>4408.087Br.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Whole sellers or retailers unit Commodity profit</th>
<th>Whole sellers or retailers unit Commodity selling price</th>
</tr>
</thead>
<tbody>
<tr>
<td>484.603Br.</td>
<td>4892.689Br.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Distributors or shops unit Commodity profit</th>
<th>Distributors or shops unit Commodity selling price</th>
</tr>
</thead>
<tbody>
<tr>
<td>510.108Br.</td>
<td>5402.798Br.</td>
</tr>
</tbody>
</table>

Example: trading across supply chain of single business actor act as producers or importers and sellers to reach end user acts with Initial cost of unit Commodity 300,000Br and mean unit Commodity waiting days of business chain is 20 days.

Expected profit of unit Commodity = 71261.705Br.

Unit Commodity selling price is = 371,261.705Br.

Note: as number of days increase income increase due to cost corresponding days. For instance, if mean unit Commodity waiting days of business chain of example 3 increase from 20 days to 29 days expected profit of unit Commodity at Business chain will be increased to 80,100.36276 with additional income of 8,838.657831.

Note: if there is shortage of supply of commodity we can manage it economically by:

1. Increasing initial cost of commodity economically as per supply and need and requirement of commodity and reducing days as per demand.
2. Increasing initial cost of commodity economically as per supply and lettings days constant as per need and requirement of commodity.
3. Using initial cost of commodity economically as per supply and lettings days constant and reducing chain actors as per need and requirement of commodity.

III. Discussion and Conclusion

Businesses have recognized that supply chain management is crucial for effective operations and meeting customer needs. In business today, operations are often highly decentralized and dispersed around the world. Consequently, managing a complex network of suppliers becomes a critical inter organizational issue. Suppliers play a vital role throughout from design through distribution. Suppliers can provide technology or production processes not internally available, early design advice, and increased capacity, which can result in lower costs, faster time-to-market, and improved quality for their customers. In turn, they are assured of stable and long-term business.

Supply chain management is crucial for effective operations and meeting customer and suppliers needs. Companies should try to establish economic productive relationships with their suppliers that they have with their customers. By developing partnerships, customers and suppliers can build relationships that will help them satisfy their shared customers further along the customer-supplier chain.

Three governing principles describe customer-supplier relationships:

- Recognition of the strategic importance of customers and suppliers,
- Development of win-win relationships between customers and suppliers, and
- Establishing relationships based on trust.

Customer must be at the center of the business universe. Satisfying their needs leads to repeat business and positive referrals, as opposed to one-shot business and negative referrals. Suppliers must also be considered crucial to Business success, because they make it possible to create customer satisfaction economically. Neither the quality nor the cost can be brought to competitive levels and continuously improved without the contributions of suppliers.

The second principle of customer-supplier relationships is the need to develop mutually beneficial (often called win-win) relationships between customers and suppliers economically. This was discussed previously as working together to increase the size of the pie, rather than competing over how to divide it. The goal of building partnerships with customers and suppliers can be seen as an extension of the teamwork principle that applies to economic activities and as recognition that the needs of both partners must be satisfied if economic productive long-term relationships are to be created.

The third principle of effective customer-supplier relationships is that they must be based on trust rather than suspicion. Aside from the obvious teamwork implications for relationships based on trust versus suspicion, monitoring supplier or customer behavior does not add any value to the product and customers satisfaction. If a trusting relationship between customers and suppliers can be developed so that neither must check up on the behavior and profitability of the other.

Customer-supplier chain can be broken at any point by one person or one piece of equipment not meeting the requirements of the customer. Failure to meet the requirements in any part of a chain has a way of multiplying, and failure in one part of the system creates problems elsewhere, leading to yet more failure and problems, and so the situation is exacerbated.
ability to meet requirements is vital. To achieve quality throughout a business, every person in the chain must be trained how to build and maintain customer-supplier relationships economically.

Acknowledgement

A lot of thanks to GGOOCHAA.

References Références Referencias

Management Control Instruments in SMES: Types and Their Effects on Performance

By Alain Takoudjou Nimpa, Clovis Miamo Wendji & Camille Kamga Wendji

Abstract- The main objective of this study is to examine the effects of management control instruments on the financial performance of Cameroonian small and medium size enterprises (SMEs). The data used is that collected within the framework of the project on the performance of companies in French speaking African countries and the sample is made up of 389 SMEs. The empirical analysis is carried out in two stages: an exploratory stage and a confirmation of the statistical analysis. The results show that a large proportion of SMEs (70, 18%) remain focused on traditional tools (calculation of costs and budgets). Also, the share of SMEs that associate modern tools to traditional ones is low; 21% of SMEs use dashboards and 9% use tools like benchmarking or the ABC method. The results of the analysis shows that only the combined use of traditional and modern tools have a significant effect on the financial performance of SMEs.

Keywords: management control; traditional management tools; modern management tools; financial performance; small and medium size enterprise; SME.

GJMBR-B Classification: JEL Code: M20
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Biographical notes: Alain Takoukdjou Nimpa holds a PhD in Management Sciences from the University of Yaoundé II-Soa. He is a Professor-Researcher at the Faculty of Economics and Management of the University of Dschang. He has published several articles in accounting, management control, sustainability of SMEs. In addition, he is the coordinator of the Master of Science in Accounting and tax system.

Clovis Miamo Wendji holds a doctorate PhD in Economics from the University of Yaounde II Soa, mathematical economics option. Currently, he is an associate professor in the Department of Economic Analysis and Policies at the University of Dschang in Cameroon. In addition, he is the Coordinator of the Master of Science in Economics and the Deputy Head of the PhD Unit in Economics and Management. His research focuses on the study of deprivation, inequality and poverty, on game theory.

Camille Kamga Wendji holds a Doctorate/PhD in Management Sciences supported at the University of Dschang (West, Cameroon). He is an Associate Professor at the School of Business and Management of Yaoundé (SupDeCo-Yaoundé) and a researcher member of the Research Team on Strategies and Governance of Banks (ERSGO-BANQUE) of the University of Yaoundé 2. His work is mainly oriented towards management control, the relationship banking company, the management of the banks.

This paper is a revised and expanded version of a paper entitled ‘The Instruments of management control in SMEs: diversity and effects on performance’ presented at 3rd Days of the Association of French Speaking Accountants, Douala-Cameroon, 19–20 December 2018.

Keywords: management control; traditional management tools; modern management tools; financial performance; small and medium size enterprise; SME.

I. Introduction

Management instruments are being increasingly studied by researchers and professionals in the field of management. The main debate on these instruments relates to the relevance and role in the management control [Berland, (2009), pp.5–6] of SMEs with the coming of globalisation (Meyssonnier and Zawadzki, 2007). In fact, management control tools were developed in the middle of the 19th century with the birds of large companies. Initially related to accounting, they developed and diversified themselves through studies by authors like Taylor and Fayol. Their main function is to enable the control of organisational processes and inform the manager in his decision making. Many studies undertaken to identify these tools and develop theories on them reveal the important role they play in the process of piloting of companies and enable the building of a framework in which the discipline of management control gradually developed.

The definition of management control has evolved with time. In the 60s, management control is considered according to Bouquin (2001) as “the process through which managers ensure that resources are obtained and used effectively and efficiently to meet the objectives of the organisation” (Anthony, 1965). Towards the end of the Eighties, it is considered as “the process by which managers influence other members of the organisation to implement its strategies” (Anthony, 1988). Thus, it is no more an issue of referring to a standard of management, but to objectives predefined by the persons in charge of the organisation. From a function of verification, it has evolved to a function of piloting. Management control thus includes human aspects since it also aims at influencing behaviours. This close relationship between the ‘technical’ and ‘human’ aspects gives a new breath to the discipline (Simons, 1995) and conditions its main tools2, forms or approaches to management control (Calculation of costs, budgets, reporting and dashboards). We can thus question ourselves on the effects of this change on management control instruments in SMEs and their effects on the performance of these SMEs.

Author: a a p: Faculty of Economics and Management, University of Dschang, Cameroon.
e-mails: animpa2002@yahoo.fr, c_miamo_w@yahoo.fr, kawenca@yahoo.fr
An increase in studies on the specificities of management control practices in SMEs in developed countries (Mintzberg, 1979; Johnson and Kaplan, 1987; Kaplan and Norton, 1992, 2001; Moores and Yuen, 2001; Nobre, 2001a, 2001b; Lavigne, 2002; Van Caillie, 2003; Davila and Foster, 2005; Bélaid and Bergeron, 2006; Zawadzki, 2009; Duréndez et al., 2016; Nyakundi et al., 2014; Che Zuriana and Rapiah, 2013; Lowe and Mclnnes, 2015) shows the importance of this issue for a better comprehension of the main determinants of the performance of companies in general and SMEs in particular (Sandino, 2007). The majority of these studies highlight the importance of the practice of management control on the performance of companies and are performed mainly in the context of industrialised countries. In developing countries, particularly French-speaking sub-Saharan Africa, only large companies seem to effectively practice management control in the management of their activities. Furthermore, the prevalence of the informal sector and absence of reliable data on SMEs in these countries do not make it possible to arrive at a conclusion on the general management of companies (Abdelkader, 2006). The ignorance of management control practices in these companies also throws a veil on knowledge related to the determinants of the performance of SMEs and is a significant challenge to the scientific community.

Within the Cameroonian context, studies are few and are limited to the presentation of some management control approaches used by SMEs (Nyengue Edimo, 2003; Ngongang, 2005, 2010; Mayegle and Ngo Nguidjol, 2017) without referring to the effect of these tools on the performance of companies. This study thus seeks to study the effects of management control tools used on the performance of Cameroonian SMEs.

This study has a double objective. On the one hand, it seeks to identify the main tools of management control used by Cameroonian SMEs by focusing on the dichotomy that enables the comparison of traditional tools (calculation of costs, budgets) with modern tools (dashboards); on the other hand, it seeks to assess the effect of the tools considered to be relevant on the financial performance of the SMEs.

This study is organised in three parts. We begin by presenting the theoretical framework and the main studies having used it in different contexts. This helps us to formulate the hypotheses of this study. The methodological framework is then presented. Finally the results are analysed and discussed.

II. Theoretical Framework and Hypotheses of the Study

In this section, we recall the theoretical aspects. Then, we do a review of the literature on the approaches to management control and their possible effects on the performance of companies. Finally, we present the hypotheses of the study.

a) Theoretical aspects and controversy on management control

Three main opposing schools of thought are generally identified in research on management control: the rationalist vision which is mainly American and the contingency vision which is mainly French or European (Germain, 2003); and the psycho-cognitive approach. The first supposes that an organisation is effective when it functions on the basis of rational knowledge gathered using tools from the exact sciences. This is in line with the normative design of the management of organisations (Taylor, Fayol, Kaplan and Norton). Here, the instrument of management control used has a function of operator which supposes a direct action allowing the achievement of organisational goals without any interaction with the environment (Johnson and Kaplan, 1987; Kaplan and Norton, 2001; Simons, 1995).

The contingent vision, which is opposed to the school of thought above, is based mainly on studies from the contingency school (Woodward, 1965; Lawrence and Lorsch, 1973; Mintzberg, 1979). Many recent studies show the contingent nature of the approaches to management control in various contexts (Bergeron, 2000; Nobre, 2001b; Germain, 2004; Meyssonnier and Zawadzki, 2007; Benzerafa, 20073; Zawadzki, 2009; Ngongang, 2005, 2010; Elhamma, 2010, 2012; Condor, 2012). This school of thought integrates the concept of contextualisation of management tools in many studies following the example those of Moisdon (1997). Thus, an instrument will have different effects according to the type of organisation in which it is implemented. If we stick to this idea defended by Lorino (2000) or Bouguignon et al. (2004), there does not exist a universal model of piloting of the performance of the company, but various models adapted to the context in which the tool is used.

Within the context of SMEs and given the central role played by its manager, it is important for us to begin the theoretical aspects by a cognitive logic of the manager. We base ourselves on Justin (2004) who proposes the ‘behavioural’ approach of management tools. He shows that the tool is dependent on the manager and three types of intentions: strategic (conscious will of generating organisational performance), influence (the tool is selected according to its ability of persuasion or orientation of other actors) and manipulation (acting according to personal interests or personal values). The appropriation and the use of management tools would also depend on the intrinsic individual and behavioural characteristics (Piaget, 1996).
b) Management control tools and performance

The literature on the effects of management control tools on the performance of companies is not conclusive. In the Cameroonian context, this absence of consensus in the literature serves as a basis for the issues addressed in this study.

The adoption of management tools is presented in the literature as an approach that enables SMEs to face the current challenges of an increasingly complex environment (Julien, 2000) and those of its own growth (St Pierre, 2000). However, there is an unfavourable response to the prescription of management tools. Part of this unfavourable response is certainly due to criticisms of these management tools (Berry, 1983; Moisdon, 1997), and more especially to the specificities of SMEs (Julien, 2000; Schmitt et al., 2002). In fact, the introduction of management tools meets resistance to change which should be taken into account because they condition the success or the failure of the initiative.

The literature on management control concludes on the existence of traditional and modern tools. In fact, Fernandez et al. (1994) in a study on 102 SMEs identify budgets, dashboards and cost accounting. They note that the tools related to cost accounting are the most common. These results are confirmed seven years later in a study carried out by Nobre (2001b) on 86 SMEs with more than 50 employees in France. Several other authors (Lavigne, 2002; Van Caillie, 2003; Nyengue Edimo, 2003; Ngongang, 2005; Abi Azar, 2005; Bélaïd and Bergeron, 2006; Bampoky and Meyssonnier, 2012) identify these same tools, and make the same observations. Also, studies show that the piloting of SMEs is not completely intuitive. Thus Fernandez et al. (1996) through their study on 102 SMEs show that there are many management tools. They classify these tools into three groups: forecasting tools (plans and budgets), follow-up tools (dashboards) and analysis tools (management and financial accounting). In the Cameroonian context, several studies (Djoutsa et al., 2013; Ngongang, 2006, 2010; Nyengue Edimo, 2003), conclude that the tools mostly used in SMEs are traditional tools (the cost approach).

Since the second half of ‘80s, many studies conclude on the inefficiency of traditional tools (Johnson and Kaplan, 1987; Chassang, 1987). These tools are based mainly on financial statements with historical information which is not open to the environment. The knowledge that they bring to the managers is therefore not very relevant in helping them to make strategic decisions.

As concerns the relationship between management control tools and the performance of SMEs, the initial studies lead according to Van Caillie (2003) to not very homogeneous empirical findings. Thus, as highlighted by Chapellier (1997), results on this relationship suggest that SMEs should have an evolutionary management control and planning system if they want to survive (Robinson and Pearce, 1984; Holmes and Nicholls, 1988; D’Amboise and Bakanibona, 1990; Fernandez et al., 1994; Elhamma, 2010, 2012) and on the other hand suggest that SMEs can survive and control the risks which surround it using a management control system that is not formalised and based on the follow-up and regular analysis of some relevant indicators chosen by the owner-manager (Mintzberg, 1990). This implicitly means that dashboards, as a modern tool, are more likely to affect performance than the calculation of costs (Riggs and Bracker, 1986; Ahsina, 2011; Elhamma, 2012) which is paradoxically used in SMEs. The arguments given by authors are summarised by the fact that by associating dashboards with management, the follow-up of performance is done in a dynamic manner based on the objectives defined beforehand by the managers of the company, and give the possibility of introducing actions to correct decisions in time.

The intensity of the problem of the performance of management control tools in the Cameroonian context was exposed in June 2013 during the second annual conference of the GICAM University on the topic: how to build a performing and intelligent company?. At the end of this annual meeting, managers were advised to use several modern decision-making tools, among which is the balanced scorecard. However, after studies showing the failure of a good number of modern management tools in African companies (Kamdem, 2002) and given the increasing use of the traditional approach (cost approach) in SMEs (Nobre, 2001b; Nyengue Edimo, 2003; Ngongang, 2005, 2010), certain authors like Bergeron (2000) suggest avoiding completely copying management tools that have been successful in large Western companies to SMEs, but to adapt them to the determinants of SME performance. Moreover, a large majority of Cameroonian SMEs have a manpower of less than 20 employees which is below the critical level recommended for the use of modern tools of management control like balanced scorecards.

From this analysis, it arises that the instruments of management control which we wish to analyse within the framework of this study raise some questions as concerns their applicability in the Cameroonian context. The cost approach which, in spite of its popular use by SMEs remains focused on a posterior verification (Johnson and Kaplan, 1987) and does not seem to affect their performance positively, and the approach by dashboards whose introduction does not seem easy in the SME context (Zawadzki, 2009).

From this literature, we can formulate the following hypotheses.

Hypothesis 1: The combined use of traditional and modern tools significantly improves the financial performance of SMEs.
Hypothesis 2: The exclusive use of traditional tools does not significantly improve the financial performance of SMEs.

The hypotheses of this study having been stated, we now present the essential components of the methodological approach.

III. Methodology

This section is has four parts. We first present the specificities of SMEs in Cameroon, followed by the source of the data and methodology of the analysis. These are followed by the operationalisation of the variables and statistical model.

a) Specificities of SMEs in Cameroon

According to the provisions of law No 2015/010 modifying and supplementing certain provisions of law No 2010/001 of April 13th, 2010 on the promotion of the Small and medium-size enterprises in Cameroon, a small company (PE) is a company which employs between 6 and 20 people and whose net turnover is between 15 and 250 million CFAF. The medium enterprise employs between 21 and 100 people and has a net turnover between 250 million and 03 billion CFAF. SMEs constitute the pillar of the development of economic activities as shown by the last General Census of Companies of 2016 (RGE-2) carried out by the National institute of Statistics (NIS). According to the NIS (INS, 2018), there exist 209,482 production units in Cameroon with approximately 99.8% being SMEs. At the geographically level, these production units are mainly localised in the Littoral (37.0%) and Center (27.0%) regions; the metropolies of Douala and Yaoundé having 33.5% and 23.9% respectively. Cameroonian SMEs are mainly family businesses with a high concentration of the capital. The capital is gathered from the family, tribe or friends, with a high concentration on the shareholders after who the company is named (Sangué-Fotso, 2011). The management style of very the small companies is not very different from that of medium enterprises. In fact, the family significantly affects the decisions on the recruitment of personnel, etc. The owner-manager has almost all the powers, whatever the type of company. He relies on experience and empiricism to organise and manage his company. Cameroonian SMEs suffer from a structural and organisational weakness which does not enable them, as shown by the results of the last general enterprise survey (INS, 2018), to carry out a reliable accounting which allows the production of financial statements of synthesis and give a legibility on the activity. This weakness favours managerial proximity which leads to the mastery of the expectations of all the stakeholders.

b) Data sources and sample

The data used in this study comes from a survey carried out in September 2013 within the framework of the international project on the analysis of the determinants of the performance of companies in French-speaking sub-Saharan Africa funded by the Research Center for International Development (CRDI) within the framework of its Growth for all programme. The collection of the data is done on 642 companies (including 400 informal) in the three main cities of Cameroon (Yaoundé, Douala and Bafoussam) based on data from the Regional Program for Enterprise Development Cameroon-2009 (RPED) of the World Bank. Other existing databases and various reports on them are also used to refine the database. These databases are specifically: data from the World Bank (World Development Indicators, African Development Indicators, 2012) and the 2009 General Company Survey (RGE). The reprocessing of the data (suppression of the missing data, non-responses, and the elimination of the large companies from the database) enables us to obtain a sample made up of 389 SMEs concerned with the management control tools related to financial performance. This information on the nature of the data greatly affects the choice of the methods of analysis.

c) Methods of analysis and justification

We use a hypothetico deductive approach. The data is analysed in two phases. We first analyse them using frequency tables and multiple correspondence factorial analysis (AFCM). This enables us to highlight the general characteristics of Cameroonian SMEs related to the research question and select the concepts which will undergo a deeper analysis. Secondly, we analyse the relationship between the management control tools used in Cameroonian SMEs and their financial performance using a logistic regression. It should be noted that only the management control tools considered to be relevant at the end of the AFCM are subjected to a deeper analysis at this stage. We also calculate the marginal effects in order to know the sensitivity of the probability to changes in an explanatory variable. The significance of the coefficients is measured using ratios known as ‘Z-statistics’ because the distribution of the ratios of the coefficients to their standard deviations do not follow a student’s distribution as in the case of a general linear model, but follows a normal distribution.

The operationalisation of variables is presented in Table 1.
Table 1: Operationalisation of variables

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Financial performance (PERFIN)</th>
<th>Operationalisation</th>
<th>Description</th>
<th>Theoretical basis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>*Returns on equity ratio (<em>perfiRCP_D</em>)</td>
<td>Number of SMEs that combine dashboards with traditional tools</td>
<td>Binary variable taking the value 1 if yes and 0 if no</td>
<td>Elhamma (2012), Ahsina (2011), Lavigne (2002), Germain (2004, 2005) and Kaplan and Norton (1992, 2001)</td>
</tr>
<tr>
<td></td>
<td>*Cash flow to revenue ratio (<em>CAF_ChaffD</em>)</td>
<td>Number of SMEs that use only the calculation of costs</td>
<td>Binary variable taking the value 1 if yes and 0 if no</td>
<td>Bélaïd and Bergeron (2006)</td>
</tr>
<tr>
<td></td>
<td>*Budgetary management (gesbudg)</td>
<td>Number of SMEs that combine budgetary control and the calculation of costs</td>
<td>Binary variable taking the value 1 if yes and 0 if no</td>
<td>Berland (2009) and Meyssonnier (2012)</td>
</tr>
</tbody>
</table>

Source: The authors going from the survey data

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>Management control tools (OUCDG)</th>
<th>Operationalisation</th>
<th>Description</th>
<th>Theoretical basis</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Dashboards (tablobord)</em></td>
<td>Number of SMEs combining dashboards with traditional tools</td>
<td>The variable takes the value 0 if financial performance is &lt;0.5 and 1 if financial performance ≥0.5</td>
<td></td>
<td>Kharti (2014), Elhamma (2012), Bélaïd and Bergeron (2006) and Lavigne (2002)</td>
</tr>
<tr>
<td><em>Calculation of costs (calcout)</em></td>
<td>Number of SMEs using only the calculation of costs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Budgetary management (gesbudg)</em></td>
<td>Number of SMEs combining budgetary control and the calculation of costs</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Operationalisation of variables (continued)

<table>
<thead>
<tr>
<th>Structural contingency factors</th>
<th>Operationalisation</th>
<th>Description</th>
<th>Theoretical basis</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Type or size of SME (ME_D)</em></td>
<td>The company can be very small enterprise (TPE), small enterprise (PE), or medium sized enterprise (ME)</td>
<td>Categorical variable with two classes. This variable takes the value 0 if it is a TPE or PE and 1 if it is an ME</td>
<td>Bahyaoui (2017)</td>
</tr>
<tr>
<td><em>Age of the SME (agPME)</em></td>
<td>Age of the SME in years (classified)</td>
<td>This variable takes the value 0 if the age of the SME &lt;=10 and 1 if age of SME &gt; 10</td>
<td>Bahyaoui (2017) and Kharti (2014)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Behavioural contingency factors</th>
<th>Operationalisation</th>
<th>Description</th>
<th>Theoretical basis</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Training and abilities of the manager (formdir)</em></td>
<td>Trainings related to the activities of the enterprise</td>
<td>Binary variable that takes the value 1 if the manager has a professional training related to the activities of the company and 0 if not</td>
<td>Ngongang (2005), Condor (2012), Julien and Marchesnay (1996), Chapellier (1994) and D’Amboise and Verna (1993)</td>
</tr>
<tr>
<td><em>Future projections of strategic vision (bplanD)</em></td>
<td>Future projections measured by the existence of a form of strategic planning</td>
<td>Binary variable taking the value 1 if the company uses a form of planning close to a business</td>
<td>Bahyaoui (2017), Condor (2012), Ngongang (2005), Lavigne (2002), Marchesnay and...</td>
</tr>
</tbody>
</table>
d) **Statistical modelling**

The variables retained in this study to measure financial performance are the returns on equity ($perfiRCP_D$) and the cash flow to revenue ratio ($CAF_{ChaffD}$) respectively. These variables enable us to obtain the two econometric models presented below (model 1 and 2). Our objective here is to identify the variables that are significant or that determine financial performance, whatever the measure used. The explanatory variables used in the econometric models are obtained at the end of the exploratory phase of the analysis. An AFCM is performed on all the variables mentioned in the table of operationalisation and the analysis of their correlation matrix at the 5% level enabled us to retain the explanatory variables of the model.

The general form of the model is as follows:

$$PERFIN_i = \alpha_0 + \alpha_1 OUCDG_i + \alpha_2 VARCON_i + \epsilon_i$$  \hspace{1cm} (1)

Where $i$ represent the individuals or SMEs of the sample, $PERFIN$ – the financial performance, $OUCDG$ – the vector of the management control tools considered to be relevant for the continuation of the analysis after the AFCM, and $VARCON$ – the vector of control variables. To enable us confirm the results obtained at the end of the AFCM, we build a correlation matrix on all the operationalised variables. The AFCM and correlation matrix enable us to retain seven explanatory variables for our two econometric models. Model 1 is presented as follows:

$$perfiRCP_D_i = \alpha_0 + \alpha_1 tablobord + \alpha_2 calcout + \alpha_3 ME_D + \alpha_4 formelD + \alpha_5 NivUnivD + \alpha_6 bplanD + \alpha_7 gratspD + \epsilon_i$$  \hspace{1cm} (2)

And the second econometric model:

$$CAF_{ChaffD} = \alpha_0 + \alpha_1 tablobord + \alpha_2 calcout + \alpha_3 ME_D + \alpha_4 formelD + \alpha_5 NivUnivD + \alpha_6 bplanD + \alpha_7 gratspD + \epsilon_i$$  \hspace{1cm} (3)

where $perfiRCP_D$ represents the returns on equity (net profits divided by stockholders’ equity); $CAF_{ChaffD}$ – the ratio of the cash flow to revenue ratio, $tablobord$ – the use of dashboards, $calcout$ – the exclusive use of calculations of costs, $ME_D$ – medium sized enterprises, $formelD$ – the formality of the SME, $NivUnivD$ – the university education of the main manager, $bplan$ – the existence of a business plan in the SME, $gratspD$ – special bonuses to the employees in the event of positive results and $\epsilon$ the regression coefficients.

### IV. **Results of the Study and Main Findings**

We respectively present the results obtained at the two phases of the empirical analysis, the preliminary multidimensional exploratory phase and the confirmatory phase of statistical analysis.

a) **A preference of the entrepreneurs for the cost approach**

The analysis of the frequency table aims at identifying the main modes of management control used in Cameroonian SMEs. Figure 1 gives us elements to address the first objective of this study.
We find that a high ratio of SMEs (70.18%) remain focused on traditional tools (calculation of costs and budgets). Moreover, the ratio of SMEs that associate traditional tools to modern ones is low; 21% of SMEs associate dashboards and 9% other tools such as benchmarking or the ABC method. In addition, 77.6% of the companies of the sample are TPE, 12.9% are PE and 9.5% are ME. Moreover, we find that 85.6% of the companies of the sample are informal companies. Formal companies that account for 14.4% of the sample consist of TPE (1.5%), PE (3.8%) and ME (9.1%). These statistics reveal that the informal companies of the sample considerably use the cost approach (55%) in the implementation of management control. This is contrary to formal companies which make more use of dashboards (9.9%). These results confirm those obtained in the majority of studies on management control in SMEs (Fernandez et al., 1994; Ngongang, 2005, 2010; Nyengue Edimo, 2003; Bampoky and Meyssonnier, 2012; Van Caillie, 2003; Elhamma, 2010, Bélaïd and Bergeron, 2006) according to which the majority of SMEs use traditional tools.

The second phase of the analysis consists in an AFCM analysis. The table of eigenvalues or inertia enables us to identify the first four factorial axes accounting for more than 50% of the information in the database. The projection of the scatter plot of the variables in the reduced dimension facilitates the understanding of the relationship between them. This is done in the 1 and 2 (Figure 2) dimensional spaces; followed by the 3 and 4 dimensions (Figure 3).
The projection of the scatter plot of variables in space made up of the first two dimensions enables us to notice that the variables which contribute more to the formation of the first factorial axis are respectively the medium enterprise (16.5%), formal SMEs (20.9%), the use of dashboards (16.7%), the educational level of the main manager higher than the advanced level (6.9%), the existence of a business plan (9.1%), and the offering of special bonuses to the employees in the case of positive results (11.8%). Those which contribute more to the formation of the second factorial axis are other tools (41.4%), and the combination of calculation of costs and other tools (43.4%).

From Figure 3, we notice that the variable calculation of costs is represented better in the third dimension; and the combined use of budgetary control and costs, the training of the main manager related to the business of the company, and the age of SME higher than 10 years, are better represented in the space made up of dimension 4. The contributions in connection with the variables are respectively: calculation of costs (34.3%), combined use of the budgetary control and costs (30.8%), training of the main manager related to the business of the company (25.9%), and the age of SME higher than 10 years (12.1%).

At the end of this exploratory phase, we retain in our model six variables which contribute more to the formation of the first factorial axis and have a better quality of representation. These include: dashboards (tablobord), Medium enterprises (ME_D), formality of SME (formelD), level of education of the manager higher than the advanced level (NivUnivD), existence of a business plan (bplanD), and the offering of special bonuses in the event of positive results (gratspD).

b) A diversified effect of dashboards on financial performance

The relationship between the set of explanatory variables and the dependant variables are analysed to identify the variables that have a significant effect at the 5% level on performance. Table 2 summarises the results of the various correlation matrices built to examine the relevance of the variables selected for the econometric model. It should be noted that despite the non-significance of management control tools like dashboards and costs in the correlation matrix are introduced into the model if their corresponding calculated statistics are not very far from the threshold of significance and given that they are variables of interest.

It is easy to notice in the table of correlations above that the variables selected are the same as those variables retained at the end of the AFCM. This conclusion enables us to go directly to the analysis of the binary logistic regression.

Table 3 presents a summary of the results of the logistic regression carried out on the two econometric models (model 1 and model 2).

We notice in the first model that dashboards have a positive but non-significant effect on the financial performance of SMEs (as captured by returns on equity). When an SME leaves the status of small or very small company for that of medium enterprise negatively affects its profitability (-18%). This is same for the formalisation of SMEs. This can justify the fact that many SMEs owe their survival to their size and the informal nature of their activity (sector of activity).

As concerns the second model, we notice that the dashboards have a positive and significant effect on the relationship between the capacity of auto-financing and the turnover. It also arises that the fact for an SME
of being a medium enterprise has a negative effect (27%) on the cash-flow to revenue ratio. This is same for special bonuses which have a negative and significant effect on the capacity of self-financing that the SME generates on its turnover.

In the light of the results of the logistic regression above, Research Hypothesis 1 which presupposes that the combined use of traditional and modern tools significantly improves the financial performance of SMEs in Cameroon is accepted. This result is in line with those of the majority of authors (Duréndez et al., 2016; Ahsina, 2011; Elhamma, 2012).

Table 2: Matrix of correlations between variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>perfIRCP_D</th>
<th>CAF_ChaffD</th>
<th>tablobord</th>
<th>calcout</th>
<th>gesbudg</th>
<th>ME_D</th>
<th>formelD</th>
<th>NivUnivD</th>
<th>bplanD</th>
<th>gratspD</th>
</tr>
</thead>
<tbody>
<tr>
<td>perfIRCP_D</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAF_ChaffD</td>
<td>0.4108*</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>tablobord</td>
<td>−0.1138*</td>
<td>0.0761</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>calcout</td>
<td>0.0598</td>
<td>−0.0944</td>
<td>−0.5063*</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>gesbudg</td>
<td>0.0076</td>
<td>0.0610</td>
<td>−0.0642</td>
<td>−0.1236*</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ME_D</td>
<td>−0.2038*</td>
<td>−0.1140*</td>
<td>0.2736*</td>
<td>−0.1556*</td>
<td>−0.0349</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>formelD</td>
<td>−0.2112*</td>
<td>−0.0551</td>
<td>0.3558*</td>
<td>−0.2268*</td>
<td>−0.0418</td>
<td>0.6687*</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NivUnivD</td>
<td>−0.1365*</td>
<td>−0.0015</td>
<td>0.1583*</td>
<td>−0.0546</td>
<td>−0.0069</td>
<td>0.2471*</td>
<td>0.3560*</td>
<td>1.0000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>bplanD</td>
<td>−0.1227*</td>
<td>0.0224</td>
<td>0.3740*</td>
<td>−0.2484*</td>
<td>−0.0056</td>
<td>0.2093*</td>
<td>0.2355*</td>
<td>0.1940*</td>
<td>1.0000</td>
<td></td>
</tr>
<tr>
<td>gratspD</td>
<td>−0.1572*</td>
<td>−0.0894</td>
<td>0.3411*</td>
<td>−0.1373*</td>
<td>0.0074</td>
<td>0.2556*</td>
<td>0.3370*</td>
<td>0.2054*</td>
<td>0.2054*</td>
<td>1.0000</td>
</tr>
</tbody>
</table>

Source: Authors going from the survey data
Note: *Significant at the 1% level.

Table 3: Summary of the results of the logistic regressions

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>perfIRCP_D</td>
<td>CAF_ChaffD</td>
</tr>
<tr>
<td>tablobord</td>
<td>0.002795</td>
<td>0.1699982**</td>
</tr>
<tr>
<td>calcout</td>
<td>−0.026706</td>
<td>−0.0705462**</td>
</tr>
<tr>
<td>ME_D</td>
<td>−1.809798**</td>
<td>−0.2717629**</td>
</tr>
<tr>
<td>formelD</td>
<td>−1.177968**</td>
<td>0.0244381</td>
</tr>
<tr>
<td>NivUnivD</td>
<td>−0.0527389**</td>
<td>0.0265375</td>
</tr>
<tr>
<td>bplanD</td>
<td>−0.0535827**</td>
<td>0.0144425</td>
</tr>
<tr>
<td>gratspD</td>
<td>−0.0756761**</td>
<td>−0.1003243**</td>
</tr>
</tbody>
</table>

Source: Authors going from the survey data
Note: **Significant at the 5% level.

Research Hypothesis 2 is also accepted since the majority of studies record the relevance of costs only in stable environments. These tools consequently become insufficient within the context of globalisation since they do not make it possible to integrate the information related to stakeholders which plays an important role in the performance of SMEs.

These results can initially be justified by the small size of Cameroonian SMEs (90.5% of the companies with less than 20 employees) relative to SMEs of North Africa or the West which is generally larger better structured. These results can also be justified by the fact that the dashboards of Cameroonian SMEs are based on financial indicators. However, according to Chiapello and Delmond (1994) for a company to be reactive and performing, it should take into account financial and non-financial indicators in its dashboards.
V. Conclusions

The main objective of this study is to evaluate the effect of management control tools on the performance of Cameroonian SMEs. The literature review and an exploratory analysis enable us to identify three main management control tools used by SMEs as: dashboards, the calculation of costs, and budgets. Using data on a sample of 389 SMEs, we first perform an exploratory analysis to identify the variables of the econometric model, followed by a logistic regression. We obtain three main results.

Our first result shows that the majority of SMEs (70%) exclusively use traditional tools, as against close to 30% of SMEs who combine modern and traditional tools. Secondly, our test results show that only the combined use of traditional and modern tools has a significant effect on the financial performance of SMEs, although this result is moderated by the fact that this relationship is not-significant when a financial performance is measured by the returns on equity. The results finally show that it is advantageous to use the educational level of the main manager (higher than the Advanced level) and the training of the manager or persons in charge to the business of the company. The absence of these can constitute an obstacle to the use of the modern tools in SMEs.

The main lesson that we can draw from this study is that the majority of SMEs that use other tools of management control (benchmarking, ABC9, etc) should think of using balanced scorecards and preferably dashboards because of their predictive and reactive capacity and long-run orientation.

In future, it would be interesting to integrate large companies in the study in order to be able to compare the effect of the approaches to management control on the performance of large companies with that of SMEs and integrate the notion of time by comparing the evolution between two to ten years. It would also be interesting to carry out analysis in connection with the interaction between the management tools or using an inductive approach explore the roots of the implementation of each tool in the entrepreneurial context.

References Références Referencias

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68. Sangué-Fotso, R. (2011) L’efficacité de la structure de contrôle des entreprises camerounaises, These de Doctorat, Université de Franche Compte, Institut d’Administration des entreprises.

Notes
1. Researchers frequently talk of instruments or decision making tools.
2. According to Berland (2009), the numerous management control methods observed in the field by researchers can be classified into three main...
groups: the calculation of costs, budgets and dashboards. Transfer pricing is also one of the main internal control tools used but this is generally in relatively large companies with autonomous units but this study focuses on SMEs that are of a smaller size.


4. The set of tools contained in cost accounting and certain methods in financial analysis (for example the use of financial ratios) constitute what researchers in management control term: the calculation of costs.
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<table>
<thead>
<tr>
<th>ASSOCIATE</th>
<th>FELLOW</th>
<th>RESEARCH GROUP</th>
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Unless specified in the notification, the Editorial Board’s decision on publication of the paper is final and cannot be appealed before making the major change in the manuscript.

Acknowledgments

Contributors to the research other than authors credited should be mentioned in Acknowledgments. The source of funding for the research can be included. Suppliers of resources may be mentioned along with their addresses.

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Preparing your Manuscript

Authors can submit papers and articles in an acceptable file format: MS Word (doc, docx), LaTeX (.tex, .zip or .rar including all of your files), Adobe PDF (.pdf), rich text format (.rtf), simple text document (.txt), Open Document Text (.odt), and Apple Pages (.pages). Our professional layout editors will format the entire paper according to our official guidelines. This is one of the highlights of publishing with Global Journals—authors should not be concerned about the formatting of their paper. Global Journals accepts articles and manuscripts in every major language, be it Spanish, Chinese, Japanese, Portuguese, Russian, French, German, Dutch, Italian, Greek, or any other national language, but the title, subtitle, and abstract should be in English. This will facilitate indexing and the pre-peer review process.

The following is the official style and template developed for publication of a research paper. Authors are not required to follow this style during the submission of the paper. It is just for reference purposes.
**Manuscript Style Instruction (Optional)**

- Microsoft Word Document Setting Instructions.
- Font type of all text should be Swis721 Lt BT.
- Page size: 8.27” x 11”", left margin: 0.65, right margin: 0.65, bottom margin: 0.75.
- Paper title should be in one column of font size 24.
- Author name in font size of 11 in one column.
- Abstract: font size 9 with the word “Abstract” in bold italics.
- Main text: font size 10 with two justified columns.
- Two columns with equal column width of 3.38 and spacing of 0.2.
- First character must be three lines drop-capped.
- The paragraph before spacing of 1 pt and after of 0 pt.
- Line spacing of 1 pt.
- Large images must be in one column.
- The names of first main headings (Heading 1) must be in Roman font, capital letters, and font size of 10.
- The names of second main headings (Heading 2) must not include numbers and must be in italics with a font size of 10.

**Structure and Format of Manuscript**

The recommended size of an original research paper is under 15,000 words and review papers under 7,000 words. Research articles should be less than 10,000 words. Research papers are usually longer than review papers. Review papers are reports of significant research (typically less than 7,000 words, including tables, figures, and references)

A research paper must include:

a) A title which should be relevant to the theme of the paper.
b) A summary, known as an abstract (less than 150 words), containing the major results and conclusions.
c) Up to 10 keywords that precisely identify the paper’s subject, purpose, and focus.
d) An introduction, giving fundamental background objectives.
e) Resources and techniques with sufficient complete experimental details (wherever possible by reference) to permit repetition, sources of information must be given, and numerical methods must be specified by reference.
f) Results which should be presented concisely by well-designed tables and figures.
g) Suitable statistical data should also be given.
h) All data must have been gathered with attention to numerical detail in the planning stage.

Design has been recognized to be essential to experiments for a considerable time, and the editor has decided that any paper that appears not to have adequate numerical treatments of the data will be returned unrefereed.

i) Discussion should cover implications and consequences and not just recapitulate the results; conclusions should also be summarized.
j) There should be brief acknowledgments.
k) There ought to be references in the conventional format. Global Journals recommends APA format.

Authors should carefully consider the preparation of papers to ensure that they communicate effectively. Papers are much more likely to be accepted if they are carefully designed and laid out, contain few or no errors, are summarizing, and follow instructions. They will also be published with much fewer delays than those that require much technical and editorial correction.

The Editorial Board reserves the right to make literary corrections and suggestions to improve brevity.
 FORMAT STRUCTURE

It is necessary that authors take care in submitting a manuscript that is written in simple language and adheres to published guidelines.

All manuscripts submitted to Global Journals should include:

Title

The title page must carry an informative title that reflects the content, a running title (less than 45 characters together with spaces), names of the authors and co-authors, and the place(s) where the work was carried out.

Author details

The full postal address of any related author(s) must be specified.

Abstract

The abstract is the foundation of the research paper. It should be clear and concise and must contain the objective of the paper and inferences drawn. It is advised to not include big mathematical equations or complicated jargon.

Many researchers searching for information online will use search engines such as Google, Yahoo or others. By optimizing your paper for search engines, you will amplify the chance of someone finding it. In turn, this will make it more likely to be viewed and cited in further works. Global Journals has compiled these guidelines to facilitate you to maximize the web-friendliness of the most public part of your paper.

Keywords

A major lynchpin of research work for the writing of research papers is the keyword search, which one will employ to find both library and internet resources. Up to eleven keywords or very brief phrases have to be given to help data retrieval, mining, and indexing.

One must be persistent and creative in using keywords. An effective keyword search requires a strategy: planning of a list of possible keywords and phrases to try.

Choice of the main keywords is the first tool of writing a research paper. Research paper writing is an art. Keyword search should be as strategic as possible.

One should start brainstorming lists of potential keywords before even beginning searching. Think about the most important concepts related to research work. Ask, “What words would a source have to include to be truly valuable in a research paper?” Then consider synonyms for the important words.

It may take the discovery of only one important paper to steer in the right keyword direction because, in most databases, the keywords under which a research paper is abstracted are listed with the paper.

Numerical Methods

Numerical methods used should be transparent and, where appropriate, supported by references.

Abbreviations

Authors must list all the abbreviations used in the paper at the end of the paper or in a separate table before using them.

Formulas and equations

Authors are advised to submit any mathematical equation using either MathJax, KaTeX, or LaTeX, or in a very high-quality image.

Tables, Figures, and Figure Legends

Tables: Tables should be cautiously designed, uncrowned, and include only essential data. Each must have an Arabic number, e.g., Table 4, a self-explanatory caption, and be on a separate sheet. Authors must submit tables in an editable format and not as images. References to these tables (if any) must be mentioned accurately.
Figures

Figures are supposed to be submitted as separate files. Always include a citation in the text for each figure using Arabic numbers, e.g., Fig. 4. Artwork must be submitted online in vector electronic form or by emailing it.

Preparation of Electronic Figures for Publication

Although low-quality images are sufficient for review purposes, print publication requires high-quality images to prevent the final product being blurred or fuzzy. Submit (possibly by e-mail) EPS (line art) or TIFF (halftone/photographs) files only. MS PowerPoint and Word Graphics are unsuitable for printed pictures. Avoid using pixel-oriented software. Scans (TIFF only) should have a resolution of at least 350 dpi (halftone) or 700 to 1100 dpi (line drawings). Please give the data for figures in black and white or submit a Color Work Agreement form. EPS files must be saved with fonts embedded (and with a TIFF preview, if possible).

For scanned images, the scanning resolution at final image size ought to be as follows to ensure good reproduction: line art: >650 dpi; halftones (including gel photographs): >350 dpi; figures containing both halftone and line images: >650 dpi.

Color charges: Authors are advised to pay the full cost for the reproduction of their color artwork. Hence, please note that if there is color artwork in your manuscript when it is accepted for publication, we would require you to complete and return a Color Work Agreement form before your paper can be published. Also, you can email your editor to remove the color fee after acceptance of the paper.

Tips for Writing a Good Quality Management Research Paper

Techniques for writing a good quality management and business research paper:

1. Choosing the topic: In most cases, the topic is selected by the interests of the author, but it can also be suggested by the guides. You can have several topics, and then judge which you are most comfortable with. This may be done by asking several questions of yourself, like "Will I be able to carry out a search in this area? Will I find all necessary resources to accomplish the search? Will I be able to find all information in this field area?" If the answer to this type of question is "yes," then you ought to choose that topic. In most cases, you may have to conduct surveys and visit several places. Also, you might have to do a lot of work to find all the rises and falls of the various data on that subject. Sometimes, detailed information plays a vital role, instead of short information. Evaluators are human: The first thing to remember is that evaluators are also human beings. They are not only meant for rejecting a paper. They are here to evaluate your paper. So present your best aspect.

2. Think like evaluators: If you are in confusion or getting demotivated because your paper may not be accepted by the evaluators, then think, and try to evaluate your paper like an evaluator. Try to understand what an evaluator wants in your research paper, and you will automatically have your answer. Make blueprints of paper: The outline is the plan or framework that will help you to arrange your thoughts. It will make your paper logical. But remember that all points of your outline must be related to the topic you have chosen.

3. Ask your guides: If you are having any difficulty with your research, then do not hesitate to share your difficulty with your guide (if you have one). They will surely help you out and resolve your doubts. If you can’t clarify what exactly you require for your work, then ask your supervisor to help you with an alternative. He or she might also provide you with a list of essential readings.

4. Use of computer is recommended: As you are doing research in the field of management and business then this point is quite obvious. Use right software: Always use good quality software packages. If you are not capable of judging good software, then you can lose the quality of your paper unknowingly. There are various programs available to help you which you can get through the internet.

5. Use the Internet for help: An excellent start for your paper is using Google. It is a wondrous search engine, where you can have your doubts resolved. You may also read some answers for the frequent question of how to write your research paper or find a model research paper. You can download books from the internet. If you have all the required books, place importance on reading, selecting, and analyzing the specified information. Then sketch out your research paper. Use big pictures: You may use encyclopedias like Wikipedia to get pictures with the best resolution. At Global Journals, you should strictly follow here.
6. **Bookmarks are useful:** When you read any book or magazine, you generally use bookmarks, right? It is a good habit which helps to not lose your continuity. You should always use bookmarks while searching on the internet also, which will make your search easier.

7. **Revise what you wrote:** When you write anything, always read it, summarize it, and then finalize it.

8. **Make every effort:** Make every effort to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in the introduction—what is the need for a particular research paper. Polish your work with good writing skills and always give an evaluator what he wants. Make backups: When you are going to do any important thing like making a research paper, you should always have backup copies of it either on your computer or on paper. This protects you from losing any portion of your important data.

9. **Produce good diagrams of your own:** Always try to include good charts or diagrams in your paper to improve quality. Using several unnecessary diagrams will degrade the quality of your paper by creating a hodgepodge. So always try to include diagrams which were made by you to improve the readability of your paper. Use of direct quotes: When you do research relevant to literature, history, or current affairs, then use of quotes becomes essential, but if the study is relevant to science, use of quotes is not preferable.

10. **Use proper verb tense:** Use proper verb tenses in your paper. Use past tense to present those events that have happened. Use present tense to indicate events that are going on. Use future tense to indicate events that will happen in the future. Use of wrong tenses will confuse the evaluator. Avoid sentences that are incomplete.

11. **Pick a good study spot:** Always try to pick a spot for your research which is quiet. Not every spot is good for studying.

12. **Know what you know:** Always try to know what you know by making objectives, otherwise you will be confused and unable to achieve your target.

13. **Use good grammar:** Always use good grammar and words that will have a positive impact on the evaluator; use of good vocabulary does not mean using tough words which the evaluator has to find in a dictionary. Do not fragment sentences. Eliminate one-word sentences. Do not ever use a big word when a smaller one would suffice. Verbs have to be in agreement with their subjects. In a research paper, do not start sentences with conjunctions or finish them with prepositions. When writing formally, it is advisable to never split an infinitive because someone will (wrongly) complain. Avoid clichés like a disease. Always shun irritating alliteration. Use language which is simple and straightforward. Put together a neat summary.

14. **Arrangement of information:** Each section of the main body should start with an opening sentence, and there should be a changeover at the end of the section. Give only valid and powerful arguments for your topic. You may also maintain your arguments with records.

15. **Never start at the last minute:** Always allow enough time for research work. Leaving everything to the last minute will degrade your paper and spoil your work.

16. **Multitasking in research is not good:** Doing several things at the same time is a bad habit in the case of research activity. Research is an area where everything has a particular time slot. Divide your research work into parts, and do a particular part in a particular time slot.

17. **Never copy others’ work:** Never copy others’ work and give it your name because if the evaluator has seen it anywhere, you will be in trouble. Take proper rest and food: No matter how many hours you spend on your research activity, if you are not taking care of your health, then all your efforts will have been in vain. For quality research, take proper rest and food.

18. **Go to seminars:** Attend seminars if the topic is relevant to your research area. Utilize all your resources.

19. **Refresh your mind after intervals:** Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.

20. **Think technically:** Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.

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21. Adding unnecessary information: Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn't be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

22. Report concluded results: Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

23. Upon conclusion: Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium through which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

Informal Guidelines of Research Paper Writing

Key points to remember:

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

Final points:

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

The introduction: This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

The discussion section:

This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear: Adhere to recommended page limits.

Mistakes to avoid:

- Insertion of a title at the foot of a page with subsequent text on the next page.
- Separating a table, chart, or figure—confine each to a single page.
- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.
• Use paragraphs to split each significant point (excluding the abstract).
• Align the primary line of each section.
• Present your points in sound order.
• Use present tense to report well-accepted matters.
• Use past tense to describe specific results.
• Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
• Avoid use of extra pictures—including only those figures essential to presenting results.

Title page:

Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

Abstract: This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

Reason for writing the article—theory, overall issue, purpose.

• Fundamental goal.
• To-the-point depiction of the research.
• Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

Approach:

- Single section and succinct.
- An outline of the job done is always written in past tense.
- Concentrate on shortening results—limit background information to a verdict or two.
- Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

Introduction:

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.

The following approach can create a valuable beginning:

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- Briefly explain the study's tentative purpose and how it meets the declared objectives.
Approach:
Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

Procedures (methods and materials):
This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

*Materials may be reported in part of a section or else they may be recognized along with your measures.*

Methods:

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that's all.

Approach:
It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

What to keep away from:

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.

Results:
The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.
Content:
- Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation of an exacting study.
- Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

What to stay away from:
- Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- Do not include raw data or intermediate calculations in a research manuscript.
- Do not present similar data more than once.
- A manuscript should complement any figures or tables, not duplicate information.
- Never confuse figures with tables—there is a difference.

Approach:
As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

If you desire, you may place your figures and tables properly within the text of your results section.

Figures and tables:
If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

Discussion:
The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."

Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.
- You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.
**Approach:**

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

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