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## Article abstract

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# Issues and Challenges of African Small and Medium Sized Manufacturing Enterprises: The Case of Benin

by

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*These days, doing business in Africa is a necessity. But in view of the difficulties involved, knowing and understanding the current factors that govern Africa's business environment and impact firms' behaviour becomes an imperative for businesses to succeed on the continent. This study is therefore useful as it sheds light on those factors, in order to identify the available contours and technicalities, thereby providing information that can help in coming up with viable strategies for Small and Medium-sized Enterprises (SMEs).*

## 1. Introduction

In his book, *Strategic Choices and Competition*, Michael Porter (2001) explains that firms must consider the forces behind competition within their sector. Customer pressure is one of those forces. But how can firms consider forces they do not understand? How can they take customer pressure into consideration, if their strategy does not allow them to understand the priority needs? (Aïhounhin, 2012). In West Africa, for instance, on one side, there are people (potential customers) who express priority needs that are not perceived. On the other hand, there are SMEs that are being submerged by informal and international companies (Épargne Sans Frontière, 2009), and which do not deploy any winning strategies to apprehend these needs on which they can act so as to create more added value and thus ensure their own growth. Despite the progress made in the sectorial reforms initiated since the 2000s in several countries, the situation remains problematic.

The World Bank's annual Doing Business report for each year analyzes, among other things, the situation in several countries by highlighting the difficulties or facilities encountered by SMEs and other companies in their business. Using specific indicators, the report informs and evaluates countries' efforts in 11 domains which are key to the growth and lifecycle of SMEs operating in the formal sector. In Benin, the analysis of these indicators over the last five years shows that the country has excelled in terms of creating a permit issuance system and has made good progress on business creation procedures. However, in the sub-region, the country has been one of the worst players regarding tax payment systems and other areas related to improving the business environment (World Bank Group, 2015; 2014; 2013; 2020<sup>1</sup>). In order to come up with relevant proposals, it is useful to perform a diagnosis (Brouard, 2007) so as to draw the SMEs' attention to the realities of the context in which they are operating. This diagnosis will also highlight the current features of these SMEs. To this end, this research aims to give an update on the issues and challenges of African SMEs' growth. Using a main component analysis, we intend to identify the emerging factors which discriminate these SMEs.

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<sup>1</sup> <https://documents1.worldbank.org/curated/en/688761571934946384/pdf/Doing-Business-2020-Comparing-Business-Regulation-in-190-Economies.pdf>

This study adopts a quantitative research methodology with the use of documentary sources as well as secondary data, to investigate the features of the sampled firms from 2008 to 2013. The article is divided into the following major parts: introduction, theoretical framework, empirical framework, results and discussion, conclusion and contributions as well as limitations of the study, and avenues for future research.

## **2. Theoretical Framework**

### **2.1. Context of the study**

Small and Medium-sized Enterprises (SMEs) operating in West Africa are both formal and informal (Epargne Sans Frontière, 2009; Aïhounhin et al., 2018). They are heterogeneous and very few develop growth strategies. Since 1972, when the term "informal sector" appeared in an official report of the International Labor Office (ILO) on Kenya, the available research is still limited on the definition of instruments to assess the informal sector, analyses towards economic and social policies integration, formalization of the sector's concepts, etc. (Fafchamps, 1994; Ghana Statistical Service, 1995; Meagher, 1995; Rogerson, 1996; Sérurier, 2009). However, these informal businesses do not run out of survival strategies to stay in the "business". In Benin, for example, informal firms trading petroleum products are able to control the transnational space at two levels. First, locally, these firms would negotiate their tax system directly with some government officials, thus causing huge loss of revenues to the State. Then, at the sub-regional level, they use Nigerian border towns as their restocking centers (Igue et al., 1992). Aware of the fact that informal businesses in sub-Saharan Africa create more jobs, voices are calling for the formalization of businesses (Charbonneau et al., 2017).

Formal African SMEs do not have real growth strategies and therefore struggle to evolve. Some external and internal difficulties specific to the African countries make these companies bend under the weight of various constraints (Tsitsikalis, 2011; Aïhounhin, 2018) thus delaying the economic take-off desired by African nations. To mark the priority given to the growth of SMEs, several West African countries, including Benin, have created industrial free zones<sup>2</sup> in recent years thus encouraging all major initiatives to promote the growth of formal enterprises. According to the joint report of the African Development Bank (ADB), the Development Center of the Organization for Economic Cooperation and Development (OECD dev. center) and the United Nations Development Program (UNDP), *African Economic Outlook 2017: entrepreneurship and industrialization*, in Benin, economic growth fell from 6.5% in 2014 to 5.2% in 2015 and to 4.0% in 2016.

The reasons cited include electoral activity, power shortages, the economic slowdown in neighboring Nigeria, and inflation, which has remained low due to world oil prices and the depreciation of the naira, the Nigerian currency (ADB et al., 2017). According to the same report, the government's 2016-21 action program (called Revealing Benin) while driving the reforms, should be able to boost the economy by 5.5% in 2017 and 6.2% in 2018, and investment from 18.8% of the GDP in 2016 to an annual average of 34.0% until 2021. For the report's authors, stimulating sustainable and inclusive growth requires a special focus on industry and entrepreneurship, while initiating policies to identify the unknown factors that hamper businesses' growth. Through this research, we hope to improve knowledge of these factors that promote industry, entrepreneurship and to some extent business growth and progress of scientific knowledge.

### **2.2. Issues and Challenges in SMEs' Growth**

A good business environment offers better conditions for business growth (World Bank, 2006; kuindja, 2020). Since the 2000s, the World Bank has defined criteria for assessing business conduct (doing business). These business growth criteria include availability of loans, protection of investments, payment

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<sup>2</sup> <http://www.a-zfibenin.com> (website of Benin's industrial free zone. Accessed August 8, 2017).

of taxes, electricity supply, corruption, quality of financial institutions, political instability, and economic instability (with regard to inflation and public debt). In addition to the World Bank, there are several other institutions such as the International Institute for Management Development (IMD) in Lausanne which have been publishing an index (titled the *World Competitiveness Yearbook, WCY*) to appreciate competitiveness in 59 countries using 331 criteria (Fagerberg et al., 2017). It reveals the complexity and multiple aspects contributing to business growth. In Africa, the issues and challenges are related to access to energy (Karekezi, 2002), management of a bigger and less educated population (Asongu, 2013), management of foreign direct investments (Asongu, 2013; Nyaga, 2020), quality, usage, connectivity and impacts of transportation infrastructure (Abodohoui et al., 2014), intensification of cross-border trade (Oumar, 2008), and subtle strategies used by commercial partners like China (Esteban, 2010).

The issues raised also relate to industrial weakness (Morris et al., 2006, Hausmann et al., 2008, Brautigam, 2010), the presence of the informal sector (Devey et al., 2006), the fragile business environment (Ganson, 2014), competitiveness and innovation (Aglietta, 2014), social responsibility of multinational oil companies operating in Africa (Lado et al., 2013). These issues and challenges can also be analyzed from the perspective of the control of joint ventures (Becheikh et al., 2001) that are emerging on the continent (Hearn, 2012; 2014). African firms should also see how they can integrate and master the growth of the different markets available (Mucchielli, 1991; Mutinelli, 1998). Some authors (Harris et al., 2005) who have worked on the case of African-American companies operating in rural Africa point out that strategic governance problems and administrative difficulties are crucial problems faced by business owners.

Some studies show that corruption in Africa heavily impacts business growth. According to Kodila-Tedika (2014), these high levels of corruption are justified not only because of economic, political, legal, cultural and geographical determinants, but also because of the fragility of states. Other authors, (Samiul et al., 2014), while not excluding the existence of corruption on the continent, criticize this analysis and explain that the high rates of corruption published here and there result from its definition, identification, and to some extent its measurement (validity of the data collected). Emerging issues include business ethics and governance (Mullins et al., 2011) and consideration of cultural issues (Becheikh et al., 2001). Political authorities in charge of the growth of SMEs should also reorient the education system (Blakemore et al., 2017) and promote entrepreneurship (Makosso, 2014).

Other authors analyze these issues in terms of attracting foreign direct investment (Belattaf et al., 2014). In short, all that is needed to build a good foundation is lacking on this resourceful continent (Peel et al., 2013). Similarly, authors of studies analyzing Africa's promising prospects agree on the fact that the rapid economic growth observed during the last decade is accompanied by a few structural changes from traditional products to manufactured products (Fine et al., 2012; Watson, 2014).

### **2.3. Relevance of the Analyzed Factors**

To conduct a study on this topic, we will assume that to grow and last over time, all companies operating in Africa must be able to adapt to the African environment or disappear. Therefore, like salmon (Roberta, 2016) which are sea fishes also found in freshwater, they should know and master the determinants that are specific to this environment so as to develop capacities allowing them to thrive there (Aihounhin, 2018). Starting from Morgan's theories (1986) which consider the organization a living organism that adapts to its environment, one would be tempted to say that it is the ignorance and lack of control of these determinants that will hamper the growth of some African SMEs and favour the disappearance of many others. Apart from the issues identified in the scientific literature that were mentioned in the previous section, some emerging factors which are as important to African SMEs' growth currently draw the attention of the SMEs themselves, political actors, decision-makers, business leaders, social actors, international organizations such as the World Bank, and universities (World Health Organization et al., 2016; Ntsonde et al., 2017).

The present study aimed to examine these factors and study their relevance. Through a search in the gray literature and data collected on the field, we have retained the following criteria to identify these factors: 1) the recurrence of these factors in articles on African SMEs' growth; 2) the factors' relevance to current issues in the African business environment; 3) accessibility of the information needed to measure the factors; 4) citations of the factors in the performance, implementation, end-of-program and international studies reports on Africa; (5) recurrence of the factors in reports of economic fora on African SMEs growth and in national business surveys; 6) opinions of resource persons contacted during the study's pre-data collection stage in May 2015. In the following paragraphs, we present the six factors selected: business growth, the firm's investment, corporate social responsibility, use of external expertise, access to energy, and taxes and duties.

### ***Business Growth (BG)***

According to some theories, growth determinants can be classified as internal and external (Milne et al., 1982; Birley et al., 1990; Janssen, 2002). Internal determinants are of a cultural nature (Moran et al., 2007; Su, 2010) and are related to: the firm's internal organization (Hannan et al., 1977), lack of competent human resources (Cooper et al., 1994; Woiceshyn et al., 1996; Foss 1997; Deeds et al., 1997; Ensley et al., 2002) and lack of innovation within the firm (Cressy 2000; Hurst et al., 2004). External determinants are not under the control of companies and are of a political, economic, socio-cultural, technological, ecological and legal nature (Gerry et al., 2014). Business growth is seen as the result of an organic process that involves a series of internal changes leading to an increase in size and a change in the characteristics of the growing object. Business growth can be analyzed from two angles (Penrose 2009; Rivard, 2014): the first has to do with quantitative increases (increase in company sales), while the second angle has to do with qualitative increases. In this study, both aspects will be taken into account through the selected factors. Several studies on growth focus on profitability or quality of firms' internal finances (Okpara, 2011) using indicators such as liquidity, profit margins, stock accumulation or staff turnover rate (Lambert et al., 2014; Claveau et al., 2014; Levratto et al., 2014). Other studies show that other tangible (business investment, company size) or intangible factors (access to external resources and skills, corporate social responsibility) can be taken into consideration depending on the business environment and sector.

### ***Firm's Investment (FI)***

A firm's investment is a commitment by the company and/or its shareholders. It can be a purchase of more efficient production equipment, construction of new annexes or new branches to sell the company's products, etc. (Pezet, 2009). The decision to invest is often tied to the notion of risk. Given the importance of risk-taking, traditional investment econometric models take into account the constraints perceived or anticipated by companies in the markets where they decide to invest. In Africa, more and more investments are being made by international companies (Adams et al., 2015, Schoneveld et al., 2015) but, the links between the companies' investments and the companies' growth remain unclear. According to the McKinsey Global Institute (2010), African SMEs are increasing their investments in research and development to improve their technological capabilities and make better use of globalization. According to this same source, the critical sectors in Africa, listed in their order of priority are: goods and services, natural resources, agriculture, infrastructure, and education.

### ***Corporate Social Responsibility (CSR)***

Corporate social responsibility which includes sponsorships, community relations, professional relationships within the firm, etc., must be distinguished from the firm's societal responsibility which emphasizes the responsibility of the firm itself (Arendt, 2005) in that each firm is responsible for its actions and the consequences that may arise from them. Corporate social responsibility (Attarça et al., 2005) is important to business owners as it reflects their desire to better control societal constraints in order to foster

business development and sustainable economic growth. Corporate social responsibility is "the voluntary integration of social and environmental concerns into business activities and relationships with stakeholders" (European Commission 2001; Attarça et al., 2005). In this study, we are interested in whether or not donations and sponsorships (Bulu 2005; Péklé 2006) used by SMEs in the sub-Saharan context can serve as discriminating factors.

### ***Use of External Expertise (UEE)***

Firms' access to external expertise is defined as access to knowledge or skills that are relatively rare within the firm (Viljamaa, 2011). Most studies recognize the crucial role of external skills in companies (Ifinedo, 2008; Ifino, 2011; Viljamaa, 2011, Fischer et al., 2012). However, these studies do not often take into account the different cultural perceptions within the company. For example, Robson et al. (2000) analyzed the relationship between SMEs' growth and acquisition of external advice, while controlling the influence of SME characteristics on age, manufacturing/services, high technology, etc. They found that the relationship between external skills and SMEs' performance is statistically significant for a small number of sources and domains. Thus, it is relevant to study the use of external skills especially in Africa where languages and morals differ between countries.

### ***Access to Energy (AE)***

The issue of African companies' access to energy can be appreciated from the point of view of volatility and the variability of product prices (UPDEA, 2009). According to this study, which takes into account most African countries, there is a great disparity in definitions of content and tariff structures. In each country, production or distribution companies have their own categorization, even those operating in similar socio-economic and political environments. Some companies use a single price for all customers while others use flat-rate billing for certain types of customers. Other studies provide information on the critical problem of energy dependence in Africa (Magrin, 2007; Sow, 2010; Adjamagbo et al., 2011; Dangbedji et al., 2011). These situations currently drive some African countries to undertake reforms in this sector. For example, since 2010, Nigeria has initiated a reform called the "*Electric Power Sector Reform - EPSR - Act*" supported by the World Bank. This reform led to the dismantling of the country's historic operator and the signature of electricity purchase contracts with new independent power producers (IPPs).

### ***Duties and Taxes (DT)***

In Africa, as elsewhere, there are direct and indirect taxes (Cagnat, 1982; Degos et al., 2017; Saiche et al., 2017). However, in Africa direct taxes contribute heavily to tax revenues in many countries (Chambas, 2005). In these countries, because of the existence of informal SMEs that are not controlled by the State, tax incomes weigh heavily on formal SMEs, and are often concentrated in a small number of them (Tanzi et al., 2000). For Chambas et al. (2005), these SMEs inject a large number of taxes (value-added taxes, taxes on employees' incomes, excise duties, etc.) into the state coffers. On the other hand, when analyzing companies' taxation in the sense of reducing what they receive from the State, opinions are mixed (Chirinko et al., 1999; Bloom et al., 2002; Parisi et al., 2003; Mairesse et al., 2004; Czarnitzki et al., 2011). Perception of companies' tax rates and their effect on companies' growth differs between authors. For some, it's interesting as we noted above. For others, it raises the issue of firms' competitiveness (Ngok, 2015) as they are overtaxed by the state.

### **3. Empirical Framework of the Study**

#### **3.1. Data**

Data access and the reformist character of Benin conditioned its choice as a case study. It is during the reforms that the monitoring of Beninese SMEs began. SMEs send their annual certified financial statement to the National Institute of Statistics and Economic Analysis (NISEA/INSAE). Our data was collected from the financial statements produced by Beninese SMEs from 2008 to 2013. Data collection was limited to six years because of study budget constraints. Initially there were 12 variables in the database, but due to the unavailability of data on "other investments" (advertising and publications costs as well as those of receptions and missions) and "other energies" (solar and biomass) there were finally 10 variables evaluated: business growth (BG), use of external expertise (UEE), investments in consumer goods and services (ICGS), investments in infrastructure (II), investment in research and development (IRD), corporate donations (CD), corporate sponsorship (CS), direct taxes and duties (DTD), indirect taxes and duties (ITD) and access to energy (AE).

The database initially included 1,738 companies of different sizes. As a result of missing data, the database was audited using SPSS software. In the process, the following operations were carried out: 1) we calculated the after-tax growth rate per year; 2) 731 companies whose growth rate result was not available for at least four years over the study period were subsequently deleted from the database; 3) the selected companies are those that provided results for at least three fiscal years. Of these, 13 had data covering 3 years, 26 had data covering 4 years, and 14 had data covering 5 years. The missing data of these firms (1.7%) were estimated as the average value of the available data. Overall, 1,007 firms were analyzed, yielding a total of 6,042 observations (1,007 x 6). The first step was to present the evolution of the average annual growth rates of the internal (UEE, ICGS, II, IRD, CD, CS) and external (DTD, ITD, AE) factors. For a factor X, the annual growth rate (ARR) over n period is calculated as follows:

$$ARR_x = \frac{1}{5} * \sum_{k=1}^5 T^{(k)}_x$$

where  $x$  is the value of variable X, and time period T is from 2008 to 2013.

At the second step, variables were coded (see Table 1 below):

**Table 1. Variable Coding.**

| Coded Variables                  |                  | Codes | Intervals | Meaning                     |
|----------------------------------|------------------|-------|-----------|-----------------------------|
| <b>Business growth</b>           |                  | 1     | > 1       | Very good growth            |
|                                  |                  | 2     | 0 to 1    | Good growth                 |
|                                  |                  | 3     | > 0       | Poor growth                 |
| <b>Size</b>                      |                  | 1     | 1 to 9    | Very small enterprise       |
|                                  |                  | 2     | 10 to 49  | Small enterprise            |
|                                  |                  | 3     | 50 to 499 | Medium enterprise           |
| <b>Firm's investment</b>         | ICGS, II, IRD    | 1     | > 1       | High risk                   |
|                                  |                  | 2     | 0 to 1    | Moderate risk               |
|                                  |                  | 3     | > 0       | Low risk                    |
| <b>Corporate responsibility</b>  | social<br>CD, CS | 1     | > 1       | Proactive Enterprise        |
|                                  |                  | 2     | 0 to 1    | Fairly proactive Enterprise |
|                                  |                  | 3     | > 0       | Less proactive Enterprise   |
| <b>Duties and taxes</b>          | DTD, ITD         | 1     | > 1       | Less favorable taxation     |
|                                  |                  | 2     | 0 to 1    | Fairly favorable taxation   |
|                                  |                  | 3     | > 0       | Favorable taxation          |
| <b>Access to energy</b>          |                  | 1     | > 1       | High billing                |
|                                  |                  | 2     | 0 to 1    | Normal billing              |
|                                  |                  | 3     | > 0       | Low billing                 |
| <b>Use of external expertise</b> |                  | 1     | > 1       | High risk                   |
|                                  |                  | 2     | 0 to 1    | Moderate risk               |
|                                  |                  | 3     | > 0       | Low risk                    |

Legend: **CD:** corporate donations; **CS:** corporate sponsorship; **DTD:** direct taxes and duties; **ICGS:** investments in consumer goods and services; **II:** investments in infrastructure; **IRD:** investment in research and development; **ITD:** indirect taxes and duties.

The coding was designed to highlight the evolution of each variable. The company's size was not selected as an explanatory variable. However, it was coded to serve as a pooling variable during the discriminant factor analysis. Table 2 in the annex gives the information about the categories of sizes, sectors, and the business lines.

### 3.2. Methodology of Discriminant Factor Analysis

We first tested the fit between our data and the factor model using the Kaiser-Mayer-Olkin (KMO) and Bartlett (Greene, 2005) tests. The KMO coefficient evaluates the fit of the factorial solution: when it is high, it suggests a statistically acceptable factorial solution and reflects the relationships between the variables. The KMO test is very good, good, average, and poor/unacceptable if the coefficient is respectively greater than 0.8, between 0.6 and 0.8, between 0.5 and 0.6, and lower than 0.5 (Greene, 2005).

The Bartlett test measures sphericity, which is the fit between the data and the factor model. In order to continue the factor analysis, this test must be significant. If the coefficient of the Bartlett test is greater than 200, it is excellent, between 100 and 200 it is good, between 0.5 and 1 it is poor, and below 0.50 it is unacceptable, and the factor model is inadequate/unfit (Greene, 2005). In conclusion, KMO and Bartlett tests evaluate the fit of the factorial model which explains interdependencies but cannot be used to evaluate causality.



The variables must be joined in order to achieve homogeneity and establish a hierarchy between the factors. First, we will estimate the KMO coefficient to test the fit of the factor solution. Then, we will check the robustness of the linear association between the variables through the *communality*, an indicator that measures the proportion of common variance between a variable and the other variables of the model (Field, 2009).

The communality must be greater than 0.5; if it is not, the variable must be removed from the model; only variables with a communality greater than 0.5 will be retained. It is the magnitude of the common variance of a given variable with other variables that will influence its removal and determine in which factor it will later be found. Variables with communalities lower than 0.5 will be removed one at a time starting from the weakest then studying the communalities before removing the next variable. It should be noted that three methods are recommended for the extraction of variables: *the Eigen value*, *captured variance*, and *the Cattell test*. The Eigen value is the total variance explained by each of the factors and can be used to know if there is a variable that explains the variance. Here, we only consider factors whose Eigen values are greater than 1. The Eigen value should be used with caution as it is less reliable (Valette-Florence, 1998; Morizet et al., 2006).

To identify the factors that best describe the behavior and characteristics of companies, the Cattell test was conducted given that our study included only four factors. Finally, we interpreted the selected variables by giving them a name. The remainder of this study was used to identify among the selected variables those that significantly explained companies' growth (i.e., help to understand their different behaviours in terms of their size and sector).

This was performed with a discriminant analysis (DA) used to detect discriminatory variables, test homogeneity of covariance matrices, calculate discriminant coefficients and structure coefficients, and classify companies into different groups using SPSS software. The discriminant (or independent) variables are II, CD, CS, ITD, AE, and UEE. Analyses were stratified by size, business lines and sector in the annex (Table 2).

## 4. Results and Discussion

### 4.1. Discriminant Factors

Table 3 presents the results of the correlation analysis.

**Table 3. Correlation Matrix.**

|      | DTD    | AE           | IRD          | CS           | CD     | CSR    | II           | ICGS  | ITD |
|------|--------|--------------|--------------|--------------|--------|--------|--------------|-------|-----|
| DTD  | 1      |              |              |              |        |        |              |       |     |
| AE   | 0,034  | 1            |              |              |        |        |              |       |     |
| IRD  | -0,024 | -0,104       | 1            |              |        |        |              |       |     |
| CS   | 0,2    | 0,043        | -0,011       | 1            |        |        |              |       |     |
| CD   | 0,096  | 0,042        | 0,00         | <b>0,804</b> | 1      |        |              |       |     |
| CSR  | -0,042 | -0,132       | <b>0,862</b> | -0,03        | -0,003 | 1      |              |       |     |
| II   | 0,027  | <b>0,633</b> | -0,154       | 0,064        | 0,052  | -0,226 | 1            |       |     |
| ICGS | 0,051  | <b>0,867</b> | -0,164       | 0,059        | 0,046  | -0,226 | <b>0,804</b> | 1     |     |
| ITD  | 0,278  | 0,047        | -0,009       | 0,27         | 0,091  | -0,019 | 0,063        | 0,064 | 1   |

**AE:** access to energy; **CD:** corporate donations; **CS:** corporate sponsorship; **CSR:** corporate social responsibility; **DTD:** direct taxes and duties; **ICGS:** investments in consumer goods and services; **II:** investments in infrastructure; **IRD:** investment in research and development; **ITD:** indirect taxes and duties.

The correlation matrix reveals a high correlation ( $> 0.5$ ) between AE and II, AE and ICGS, IRD and UEE, CS and CD, II and ICGS. It is therefore possible to factorize certain factors to facilitate the discriminant analysis. As shown in Table 4 below, the KMO and Bartlett tests confirm this approach (5% significant threshold).

**Table 4. Kaiser-Meyer-Olkin (KMO) and Bartlett tests.**

| <b>KMO and Bartlett tests</b>                     |           |
|---|-----------|
| Measurement of the sampling precision with KMO    | 0.572     |
| Bartlett sphericity test and Khi-square approximé | 31979.119 |
| Degree of freedom                                 | 36        |
| Significance of the Bartlett test (P-value)       | <0.0001   |

As the conditions (Correlation, KMO, and Bartlett) are met, we can try to identify the different clustering dimensions of these factors. In the literature, three equivalent rules can be used: i) the Kaiser rule based on Eigen values  $> 1$ , ii) the choice of the number of axes according to the minimal level of information desired (rule of explained variance) and iii) the scree-test (Torrens-Ibern, 1972). In this study, we chose the rule of explained variance which identified four grouping actors (components). Factor 1, *recurrent expenses for the financial year* includes: ICGS, II and AE; factor 2, *corporate social responsibility* includes: CD and CS; factor 3, *research and external expertise* includes: IRD and UEE; factor 4, *taxes* includes: DTD and ITD. Factor 1, 2, 3 and 4 respectively account for 30.808%, 21.5%, 18.557% and 12.608% of the total variability (Table 5). The dimensions components' matrix is presented in Table 6. Factors were organized by size, business lines, and sector, which were coded as shown in Table 7.

**Table 5. Explanation of Total Variance.**

| Component<br>(factor) | Factor's name                          | Initial values |                  |              | Sum of the squares of the<br>factors selected |                  |              | Sum of the squares of the<br>factors selected for rotation |                  |              |
|-----------------------|--|----------------|------------------|--------------|---|------------------|--------------|--|------------------|--------------|
|                       |  | Total          | % of<br>variance | Cumulative % | Total   | % of<br>variance | Cumulative % | Total  | % of<br>variance | Cumulative % |
| 1                     | Recurrent expenses for the fiscal year | 2.773          | 30.808           | 30.808       | 2.773   | 30.808           | 30.808       | 2.543  | 28.254           | 28.254       |
| 2                     | Corporate social responsibility        | 1.935          | 21.5             | 52.307       | 1.935   | 21.5             | 52.307       | 1.866  | 20.737           | 48.991       |
| 3                     | Research and external expertise        | 1.67           | 18.557           | 70.864       | 1.67  | 18.557           | 70.864       | 1.796  | 19.957           | 68.947       |
| 4                     | Taxes                                  | 1.135          | 12.608           | 83.472       | 1.135   | 12.608           | 83.472       | 1.307  | 14.525           | 83.472       |
| 5                     |  | 0.724          | 8.04             | 91.512       |   |                  |              |  |                  |              |
| 6                     |  | 0.369          | 4.095            | 95.608       |   |                  |              |  |                  |              |
| 7                     |  | 0.175          | 1.943            | 97.551       |   |                  |              |  |                  |              |
| 8                     |  | 0.134          | 1.487            | 99.038       |   |                  |              |  |                  |              |
| 9                     |  | 0.087          | 0.962            | 100          |   |                  |              |  |                  |              |

**Factor 1:** Investment in Consumer Goods and Services (ICGS), Investment in Infrastructure (II), Access to Energy (AE).

**Factor 2:** Corporate Donations (CD) and Corporate Sponsorship (CS).

**Factor 3:** Investment in Research and Development (IRD), Use of External Expertise (UEE).

**Factor 4:** Direct and Indirect Taxes and Duties (DTD and ITD).

**Table 6: Dimensions Components.**

| Components' Matrix |   |                                    |                                    |                     |
|--------------------|---|------------------------------------|------------------------------------|---------------------|
|                    | 1. Recurrent expenses for the fiscal year | 2. Corporate social responsibility | 3. Research and external expertise | 4. Duties and taxes |
| ICGS               | <b>0.906</b>                              | -0.112                             | 0.329                              | -0.008              |
| II                 | <b>0.83</b>                               | -0.097                             | 0.274                              | -0.025              |
| AE                 | <b>0.82</b>                               | -0.104                             | 0.382                              | -0.018              |
| CS                 | 0.211                                     | <b>0.896</b>                       | -0.106                             | -0.225              |
| CD                 | 0.179                                     | <b>0.835</b>                       | -0.081                             | -0.425              |
| IRD                | -0.457                                    | 0.198                              | <b>0.826</b>                       | 0.031               |
| CSR                | -0.513                                    | 0.19                               | <b>0.795</b>                       | 0.02                |
| DTD                | 0.131                                     | 0.379                              | -0.084                             | <b>0.688</b>        |
| ITD                | 0.154                                     | 0.428                              | -0.039                             | <b>0.655</b>        |

**AE:** access to energy; **CD:** corporate donations; **CS:** corporate sponsorship; **CSR:** corporate social responsibility; **DTD:** direct taxes and duties; **ICGS:** investments in consumer goods and services; **II:** investments in infrastructure; **IRD:** investments in research and development; **ITD:** indirect taxes and duties.

**Table 7: Grouping Variables' Coding**

| Variables | Categories               | Business lines  |
|-----------|--------------------------|---|
| Size      | 1 Very small enterprise  | None  |
|           | 2 Small enterprise       |   |
|           | 3 Medium-size enterprise |   |
| Sector    | 1 Primary                | (3) Mining; (4) Agriculture, livestock and fisheries  |
|           | 2 Secondary              | (6) Construction and agro-food  |
|           | 3 Tertiary               | (1) Accommodation and catering; (2) Health and social action; collective or personal activities; (5) Trade; (7) Education and other business services activities; (8) Transport, Telecommunications and Financial Activities. |

### ***Selection of Discriminant Variables and Covariance Matrix Homogeneity Test***

F and Wilks' lambda tests were used to identify the variables that significantly contribute to the difference between the firms' sizes, business sectors and business lines. The ANOVA results are presented in Table 8:

**Table 8: Equality Test for the Size, Business Line and Sectors' Groups Average**

|                                    |  | Size          |       |     |      |              |
|------------------------------------|--|---------------|-------|-----|------|--------------|
| Function                           |  | Wilks' Lambda | F     | df1 | df2  | Significance |
| BART factor score 1 for analysis 1 |  | 1             | 0,416 | 4   | 6037 | 0,797        |
| BART factor score 2 for analysis 1 |  | 0,997         | 4,292 | 4   | 6037 | 0,002        |
| BART factor score 3 for analysis 1 |  | 0,999         | 0,992 | 4   | 6037 | 0,411        |
| BART factor score 4 for analysis 1 |  | 1             | 0,736 | 4   | 6037 | 0,567        |
|                                    |  | Sector        |       |     |      |              |
| Function                           |  | Wilks' Lambda | F     | df1 | df2  | Significance |
| BART factor score 1 for analysis 1 |  | 0,999         | 4,075 | 2   | 6039 | 0,017        |
| BART factor score 2 for analysis 1 |  | 0,997         | 9,287 | 2   | 6039 | 0            |
| BART factor score 3 for analysis 1 |  | 0,999         | 1,973 | 2   | 6039 | 0,139        |
| BART factor score 4 for analysis 1 |  | 0,998         | 5,436 | 2   | 6039 | 0,004        |
|                                    |  | Business line |       |     |      |              |
| Function                           |  | Wilks' Lambda | F     | df1 | df2  | Significance |
| BART factor score 1 for analysis 1 |  | 0,998         | 1,933 | 7   | 6034 | 0,06         |
| BART factor score 2 for analysis 1 |  | 0,993         | 6,573 | 7   | 6034 | 0            |
| BART factor score 3 for analysis 1 |  | 0,999         | 0,96  | 7   | 6034 | 0,459        |
| BART factor score 4 for analysis 1 |  | 0,998         | 2,012 | 7   | 6034 | 0,05         |

At a 5% significance level, the F test indicates that *factor 2* discriminates the different sizes and business lines, and *factors 1, 2 and 4* discriminate the different sectors of activity. However, at a 10% significance level, factors *1, 2 and 4* also discriminate the different branches of activity. Given that factor 3 does not discriminate at a 10% threshold it can be removed and the discriminant analysis presented above will be limited to the discriminant effects of factors 1, 2 and 4. The discriminant functions per size are presented in Table 9 (at a 5% statistical threshold). The Box's M test was used to verify the validity of the factors' discriminant effects (Table 10).

**Table 9: Result of Box Test for Size, Sector and Business Lines**

|                          |               |            |
|--------------------------|---------------|------------|
| <b>Size</b>              |               |            |
| Box's M                  |               | 14.054     |
| F                        | Approximately | 3.501      |
| Degree of freedom1 (df1) |               | 4          |
| Degree of freedom2 (df2) |               | 478311.349 |
| Significance             |               | 0.00       |
| <b>Sector</b>            |               |            |
| Box's M                  |               | 255.786    |
| F                        | Approximately | 21.28      |
| Degree of freedom1 (df1) |               | 12         |
| Degree of freedom2 (df2) |               | 11329949   |
| Significance             |               | 0.00       |
| <b>Business line</b>     |               |            |
| Box's M                  |               | 41.467     |
| F                        | Approximately | 5.907      |
| Degree of freedom1 (df1) |               | 7          |
| Degree of freedom2 (df2) |               | 1033817    |
| Significance             |               | 0.00       |

The F test's p-value tends towards 0. Similarly, the values of Box's M are high, indicating that the analysis is valid and confirms the discriminant effects of factors 1, 2 and 4.

#### 4.2. Estimation of the Discriminant Function

Discriminant analysis was performed on the nine variables and the results are in Table 10:

**Table 10: Estimation for Size, Business Sector and Business Line**

| Function                           | Values | % of Variance | Cumulative % | Economic correlation |
|------------------------------------|--------|---------------|--------------|----------------------|
| <b>Size</b>                        |        |               |              |                      |
| BART factor score 2 for analysis 1 | 0.116  | 100           | 100          | 0.322                |
| <b>Sector</b>                      |        |               |              |                      |
| BART factor score 2 for analysis 1 | 0.127  | 90.4          | 90.4         | 0.336                |
| BART factor score 4 for analysis 1 | 0.012  | 8.2           | 98.6         | 0.107                |
| BART factor score 1 for analysis 1 | 0.002  | 1.4           | 100          | 0.044                |
| <b>Business line</b>               |        |               |              |                      |
| BART factor score 2 for analysis 1 | 0.093  | 99.3          | 99.3         | 0.291                |
| BART factor score 4 for analysis 1 | 0.001  | 0.35          | 99.65        | 0.026                |
| BART factor score 1 for analysis 1 | 0.001  | 0.35          | 100          | 0.025                |

All (100%) of the variation between sizes is explained by factor 2. For the business lines, 99.3% of the total variation is explained by factor 2 and 0.70% by factors 1 and 4. For the business sectors, 90.4%, 8.2% and 1.4% are explained by factors 2, 1 and 4 respectively.

**Table 11: Discriminant Functions for Size and Business Sector**

| Function                           | Very small<br>enterprise | Small enterprise | Medium-size<br>enterprise |
|------------------------------------|--------------------------|------------------|---------------------------|
| <b>Size</b>                        |                          |                  |                           |
| BART factor score 2 for analysis 1 | 0.015                    | -0.001           | -0.179                    |
| (Constant)                         | -1.61                    | -1.609           | -1.626                    |
| <b>Sector</b>                      |                          |                  |                           |
| BART factor score 1 for analysis 1 | -0.061                   | 0.085            | -0.008                    |
| BART factor score 2 for analysis 1 | 0.048                    | -0.138           | 0.018                     |
| BART factor score 4 for analysis 1 | -0.049                   | 0.104            | -0.012                    |
| (Constant)                         | -1.103                   | -1.117           | -1.099                    |

**Table 12: Discriminant Functions for Business Lines**

| Function                           | 1     | 2      | 3      | 4     | 5     | 6      | 7      | 8      |
|------------------------------------|-------|--------|--------|-------|-------|--------|--------|--------|
| BART factor score 2 for analysis 1 | 0.144 | -0.258 | 0.05   | 0.016 | 0.02  | -0.138 | -0.023 | 0.151  |
| (Constant)                         | -2.09 | -2.113 | -2.081 | -2.08 | -2.08 | -2.089 | -2.08  | -2.091 |

The coefficients indicate that factor 2 discriminates the size, the sector of activity and the branch of activities of the companies while factors 1 and 4 only discriminate the business sector (Tables 11 and 12).

#### 4.3. Efficiency of the different discriminant functions

The discriminant function used correctly estimated the size of 71.53% of the companies, the business sector of 77.66% and the business line of 44.49% (see supplementary tables). In the case of equal-sized groups, a random allocation method yielded 50% of correct classifications. The difference between the percentage of correct classifications obtained by discriminant analysis (DA) and the 50% resulting from random allocation measures the quality of the model. The significance of this difference is verified using the z test calculated as follows:  $z = (p-0.5) / (0.52 / n)$ . If the absolute value of the result obtained is  $>1.96$ , the result is significant and is better than a random model at a 5% threshold. The results are presented in Table 13.

**Table 13: Efficiency of the Discriminant Functions**

| Grouping variables | p- value | n | z       |
|--------------------|----------|---|---------|
| Size               | 0.7153   | 3 | 4.306   |
| Sector             | 0.7766   | 3 | 3.3192  |
| Business line      | 0.4449   | 8 | -1.7632 |

#### 4.4. Discussion of Descriptive Analysis

This analysis showed that African SMEs' growth is discriminated by the following factors: recurrent expenses for the financial year (ICGS, II and AE), corporate social responsibility (CD, CS), research and external expertise (IRD, UEE), and taxes (DTD, ITD).

##### *Recurrent Expenses for the Financial Year (REFY)*

The figure below indicates that for SMEs in the secondary sector, the average recurrent expenses for the fiscal year increased between 2008 and 2010 and then declined over the rest of the period. Infrastructure investments increased from 2008 to 2011 and then declined in 2012 and 2013. Expenses related to AE had a jagged evolution over the entire study period. ICGS had a jagged evolution from 2008 to 2011 and then increased from 2012 to 2013. The growth rate of expenses related to AE and ICGS' was higher than the average of the factor "recurrent expenses for the financial year". Despite the increase in II between 2008 and 2011, the growth rates are below average over the entire period. The changes in II's growth are mainly located in the lower part of the graph while AE and ICGS are at the top of the graph (Figure 2-1, factor 1). This reflects increases and decreases in expenses. For example, II's growth variation was -149.25 in 2008; -71.62 in 2009; it then increased until 2011 to reach a value of 17.57, before decreasing to -32.50 in 2013. With this information we cannot infer the effects that could be provided by more detailed studies.

Given that ICGS is included in factor 1, our results are consistent with the literature and confirm that ICGS are one of the leading sectors in Africa. However, it is important to note the effect of this factor on business growth in other studies. In its studies the McKinsey Global Institute does not make a strict separation between the micro (Gross Domestic Product/GDP), and the macro (Gross National Product/GNP) which takes into account all the companies of a country including those operating abroad. The institute's remarks should equally be taken with caution when considering the various business sectors, because primary and secondary sectors are mostly dedicated to consumer goods whose raw materials vary according to the sector and the industry and the tertiary sector is mostly dedicated to services. Most sub-Saharan countries are lagging behind in terms of electrification due to the massive power cuts in these countries (Kouzan, 2010; KOTY, 2011; Dangbedji et al., 2011). In addition to the power cuts, there are

issues related to poor power flow rate and high cost of access (Meleu, 1999). This issue is crucial given that without electricity SMEs cannot truly prosper.

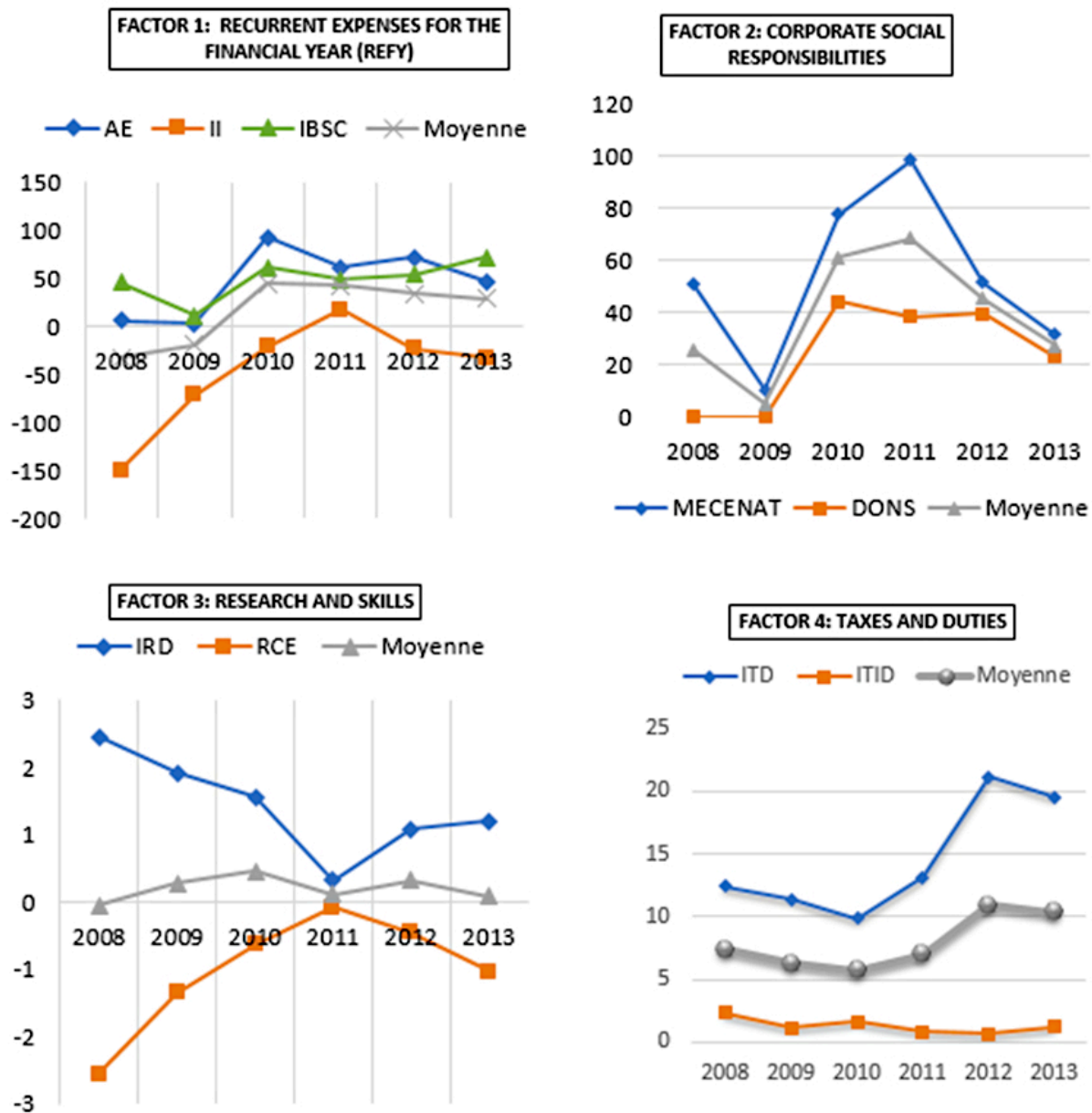


Figure 1: Analysis of the Factors

### *Corporate Social Responsibilities (CSR)*

On average, CSR expenses increased over the entire study period. CS increased over the entire period while CD remained relatively constant between 2008 and 2009 before reaching a peak in 2010 and evolving in a jagged pattern till 2013. Throughout the whole study period, CS' growth is higher than that of CD. Even though CSR expenses have a positive effect on growth, they must be considered carefully because they generate additional costs that may make the firm less competitive (Vance 1975; Bragdon et al., 1972). According to Good (2001), costs resulting from actions on the field such as CD, promotion of



local projects, implementation of environmentally friendly procedures, etc., limit the company's strategic choices. For this author, CSR actions should be preceded by a rigorous analysis before any commitment. This helps to improve the company's image, its relationships with its economic partners, and in the long run, its competitive position (Freeman, 1984; Jones, 1995).

### Research and External Expertise (REE)

On average, REE expenses varied slightly over the period. However, they increased between 2008 and 2010 before falling in 2011, then increasing in 2012 and falling again in 2013. IRD in particular dropped between 2008 and 2011 before increasing in the rest of the period. UEE expenses moved in the opposite direction. For the purposes of this study, the REE factor includes UEE and IRD (research and documentation expenses, fees for patents, royalties paid to the Beninese copyright office BUBEDRA, software acquisition fees and consulting fees). Our results are consistent with that of studies which showed a positive effect of UEE and IRD on business growth. Kamau & Namuye (2012) showed that open source software (OSS) can generate substantial savings through automation of operations and reduction of the cost of doing business. Several authors showed that UEE can greatly increase business performance (Hagedoorn & Schakenraad, 1994; Siebert, 1996), productivity (Belderbos et al., 2004), the number of new products, patents, and business turnover (George et al., 2002).

### Taxes and Duties

On average, taxes increased in 2011 and 2012, while decreasing slightly the other years. This trend is strongly linked to the evolution of DTD, which experienced a similar fluctuation over the entire period. ITD fluctuated very slightly with an increase in 2010 and 2013.

### General Observations

When examining all the factors we note that, apart from II and CS, there is a systematic decrease of expenses related to the remaining factors. Benin's presidential elections took place in 2011; this can explain the decrease of all investments including II and CS which are investments that are totally under the companies' control. DTD, IRD, AE and ICGS which are not totally controlled by the companies experienced slight changes after 2011.

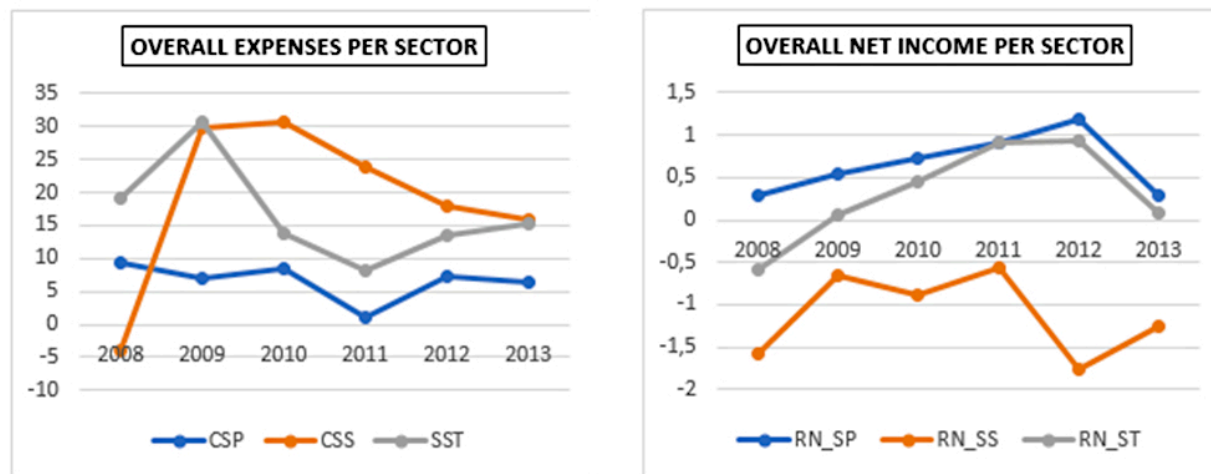


Figure 2: Overall Expenses and Overall Net Income Per Sector

The above figures were designed to show how all the selected factors affect end-of-period income. In 2010 and 2012, the increase in expenses resulted in a less proportional increase in the net income of primary sector companies. The decrease in expenses recorded in 2009 and 2011 were accompanied by an increase in income. On the contrary, 2013 was characterized by a consecutive decrease in total expenses and net income. It also appears that in secondary sector companies, net income is mildly sensitive to variations in expenses as the 2008-2009 large increase in expenses was only accompanied by a slight increase in net income. Likewise, the decreases in expenses over the rest of the period have only slightly affected the companies' income. In the tertiary sector, changes in expenses have a mild impact on the company's income. In fact, net income remained almost constant over the entire period, while expenses fluctuated sharply. Given these sectorial trends it is useful to study growth factors per sector in order to precisely describe their roles. However, in terms of developing strategies it is very likely that the factors we have identified are the most relevant to business owners.

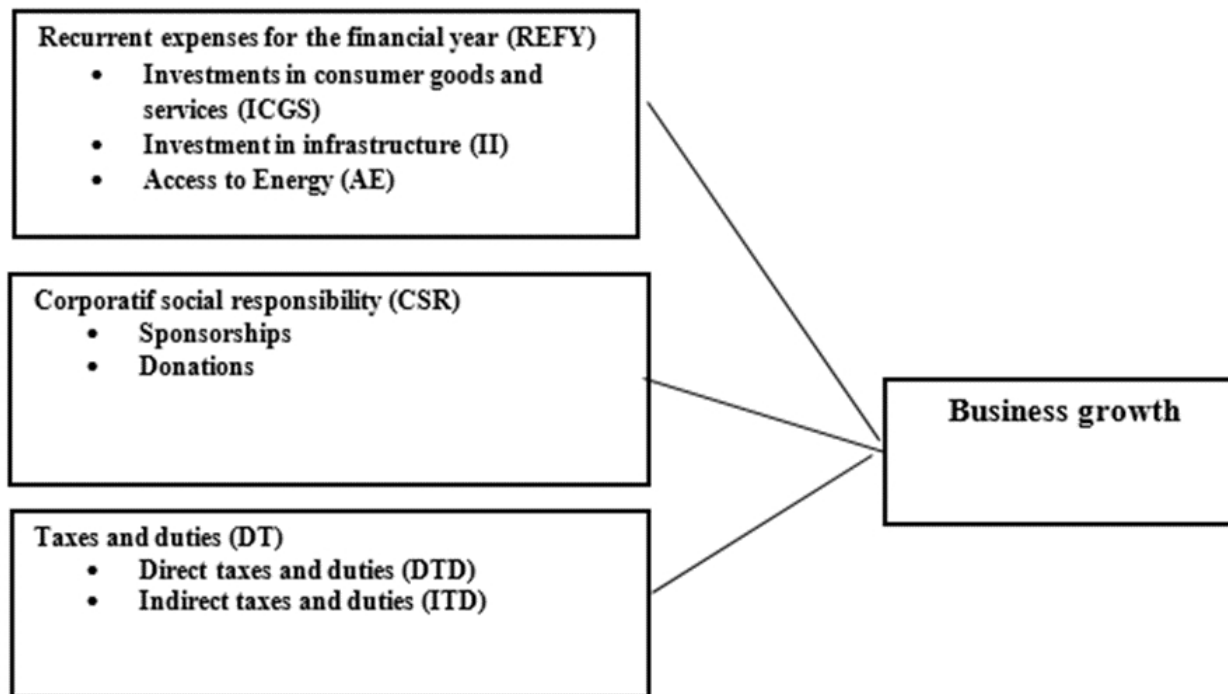


Figure 3: Diagram Illustrating the Discriminant Factors

## 5. Conclusion and Contributions

This study aimed to identify the variables discriminating companies' sizes, sectors and business lines. At the end of the analysis, the 10 variables analyzed were grouped into four discriminating dimensions/factors:

- Factor 1: *recurrent expenses for the financial year* which includes: investments in consumer goods and services (ICGS), infrastructure investments (II), and access to energy (AE).
- Factor 2: *corporate social responsibility (CSR)* which includes corporate donations (CD) and corporate sponsorship (CS).
- Factor 3: *research and external expertise* which includes investments in research and development (IRD) and use of external expertise (UEE).
- Factor 4: *duties and taxes* which include direct and indirect duties and taxes (DTD and ITD).

All (100%) the variations in companies' sizes are explained by factor 2. For the business lines, 99.3% of the total variation is explained by factor 2 and 0.7% by factors 4 and 1. Regarding the business sector, 90.4%, 8.2% and 1.4 % of the total variation are explained by factors 2, 4 and 1 respectively. At a 10% significance threshold, factor 3 was not discriminant and was therefore not taken into account in this analysis.

The empirical results of this study are applicable to all African manufacturing SMEs in the sense that the emerging determinants studied, such as the use of external expertise, investments in research and development and corporate social responsibility, investments in infrastructure, corporate taxation, etc., are not only a reality in Africa and everywhere else, but also have various policy implications. For example, corporate behavioural skills would be linked to donations and sponsorships, which are expenditures incurred by firms towards their growth, which this study has also corroborated through factor analysis. In the same vein, the validation of ITDs shows that they are linked to a difficult regulatory environment. Finally, the use of external expertise (UEE) and investments in research and development (IRD) are technical capabilities in which companies invest heavily to boost their growth.

In view of the results obtained and discussed so far, we could say that one of the major limitations of the study was that it did not consider all the fundamental factors or determinants affecting SMEs' growth. Indeed, this study does not cover specific determinants such as the profile of the business owner (his training, networks, management style), company's sector (production, service, food, informal sectors), relationship with the environment (status, plurality of forms of formalization, etc.), operational barriers (access to funds, quality of internal finance, infrastructure, lack of training, start-up capital), potential for development, etc. (Aïhounhin et al., 2018).

Similarly, it did not consider fundamental determinants such as environmental determinants (barriers to entry, concentration, dynamism, and generosity), strategic determinants pertaining to market choice and scope, market positioning, planning, or managerial determinants (Janssen, 2002; Aïhounhin, 2018). Including these factors in our discriminant analysis would likely change our results. However, the factors were not included because we chose to focus on emerging factors that have not yet been examined in studies on African SMEs' growth. In future studies, it would be interesting to build a model to see the factors (emerging or not) interact and what factors will be finally retained, and then, to analyze the effect of the factors retained on SMEs growth in the highly multicultural West African sub-region.

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## Appendix

**Table 2. Business lines, size and sectors of the study**

### Sectors

#### Classification results

| Planned assignment class (es) |        |            |         |           |          |       |
|-------------------------------|--------|------------|---------|-----------|----------|-------|
| Original                      |        | Sector     | Primary | Secondary | Tertiary | Total |
|                               | Number | Primaire   | 2109    | 233       | 55       | 2397  |
|                               |        | Secondaire | 304     | 2033      | 114      | 2451  |
|                               |        | Tertiaire  | 258     | 410       | 634      | 1302  |
|                               | %      | Primaire   | 87.98   | 9.72      | 2.29     | 100   |
|                               |        | Secondaire | 12.40   | 82.95     | 4.65     | 100   |
|                               |        | Tertiaire  | 19.82   | 31.49     | 48.69    | 100   |

### Sizes

#### Classification results

| Original |        | Size | 1     | 2     | 3     | Total |
|----------|--------|------|-------|-------|-------|-------|
|          | Number | 1    | 52    | 68    | 218   | 364   |
|          |        | 2    | 16    | 315   | 538   | 1456  |
|          |        | 3    | 8     | 35    | 1890  | 2110  |
|          |        | 4    | 1     | 2     | 20    | 1917  |
|          |        | 5    | 0     | 0     | 21    | 303   |
|          | %      | 1    | 14.29 | 18.68 | 59.89 | 100   |
|          |        | 2    | 1.10  | 21.63 | 36.95 | 100   |
|          |        | 3    | 0.38  | 1.66  | 89.57 | 100   |
|          |        | 4    | 0.05  | 0.10  | 1.04  | 100   |
|          |        | 5    | 0.00  | 0     | 6.93  | 100   |

### Business Lines

|      | DTD    | AE           | IRD          | CS           | CD     | CSR    | II           | ICGS  | ITD |
|------|--------|--------------|--------------|--------------|--------|--------|--------------|-------|-----|
| DTD  | 1      |              |              |              |        |        |              |       |     |
| AE   | 0,034  | 1            |              |              |        |        |              |       |     |
| IRD  | -0,024 | -0,104       | 1            |              |        |        |              |       |     |
| CS   | 0,2    | 0,043        | -0,011       | 1            |        |        |              |       |     |
| CD   | 0,096  | 0,042        | 0,00         | <b>0,804</b> | 1      |        |              |       |     |
| CSR  | -0,042 | -0,132       | <b>0,862</b> | -0,03        | -0,003 | 1      |              |       |     |
| II   | 0,027  | <b>0,633</b> | -0,154       | 0,064        | 0,052  | -0,226 | 1            |       |     |
| ICGS | 0,051  | <b>0,867</b> | -0,164       | 0,059        | 0,046  | -0,226 | <b>0,804</b> | 1     |     |
| ITD  | 0,278  | 0,047        | -0,009       | 0,27         | 0,091  | -0,019 | 0,063        | 0,064 | 1   |