



Munich Personal RePEc Archive

## **Constraints of SME in West Africa: the case of Côte d'Ivoire after the crisis**

KOUADIO, Hugues

ENSEA

4 March 2015

Online at <https://mpra.ub.uni-muenchen.de/79055/>

MPRA Paper No. 79055, posted 18 May 2017 04:42 UTC

# Constraints of SME in West Africa: the case of Côte d'Ivoire after the crisis

KOUADIO Kouassi. Hugues<sup>1</sup>

## Abstract

Small and medium enterprises are key factors of economic development developing countries. It is crucial to identify the major constraints they face. This paper is interested in the constraints experienced by small and medium enterprises in Côte d'Ivoire from a collection of original data. An ordered probit analysis coupled with a *Directed Acyclic Graph* (DAG) show that the constraints on sales growth, as perceived by managers, differ according to the characteristics of the company. Also, improved water supply and a user friendly building licensing policy would allow companies to increase their profitability. Furthermore, a deterioration of access to finance entails a significant drop in business sales. Our analysis confirmed the interrelationship between various constraints. Thus, a business climate marked by political instability and insecurity inevitably affects corruption. Also, political stability, reform in tax policy and absence of corruption are likely to improve the financial conditions of companies and promote the growth of business sales. Thus, all the reforms undertaken by the government of Côte d'Ivoire to improve the business climate must take into account the characteristics of companies as well as the interrelationship between the various obstacles they encounter.

---

<sup>1</sup> Institution : Ecole Nationale Supérieure de Statistique et d'Economie Appliquée (ENSEA)

Postal Address: Avenue des Grandes Ecoles, Cocody,  
08 BP 3 Abidjan 08 Côte d'Ivoire

Email : [hkouadio@yahoo.fr](mailto:hkouadio@yahoo.fr); [hkouadio@ensea.ed.ci](mailto:hkouadio@ensea.ed.ci)

## Introduction

More than a decade ago, Côte d'Ivoire reaffirms its leadership position within the West African Economic Union (WAEU) with a preponderance of almost 33% of WAEU GDP. To boost its private sector, Côte d'Ivoire opted for economic liberalization in order to attract foreign investment in the country.

At the heart of this political choice is the special importance given to the development of the private sector. For Côte d'Ivoire regarded the private sector as a driver of economic growth, an economic integration tool, and a poverty reduction strategy through jobs creation and revenue generation.

According to the 2012 poverty reduction strategy document (DSRP, 2012), Côte d'Ivoire authorities emphasized the promotion of the private sector as the engine of growth to allow Côte d'Ivoire to join the ranks emerging countries in 2020.

To achieve this goal, it is important that the private sector operates in an optimal environment. That is, an environment where investment operations and resulting activities are protected and organized by credible laws and regulations. An optimal environment is also one that is governed by reliable structures and funded by dynamic institutions as well as an efficient financial market. The reason is that in the system of economic liberalism, all stakeholders base most of their decisions on the signals they receive from government and the market.

Unfortunately, Côte d'Ivoire private sector remains tainted by successive repeated crises which put its private sector in a really bad predicament. Indeed, the Ivorian economy has been affected by the sociopolitical crises of 1999 and 2011<sup>2</sup>. These crises started with a military coup, ended with the post-election crisis of 2011 and overall have affected the provision and quality of basic services. The effects of these crises were not without consequences for the economic and the SMEs. According to the World Bank 2015 Doing Business report, Côte d'Ivoire ranks 147th out of 189 world economies studied on ten indicators of business regulation framework, namely: enterprise creation, obtaining construction permits, hiring workers, registering property, getting credit, protecting investors, paying taxes, trading across borders, enforcing contracts and closing a business.

Also, according to the Ministry of Industry and Private Sector Promotion, the sociopolitical crises of 1999 and 2011 had four major consequences. First, was the disappearance of half of SMEs / SMIs and the destruction of 78 large companies. Second, was the partial or total closure of industrial units in areas affected by the crisis particularly in the center north and west zone. Third, was the relocation of several companies to other countries in the sub region, a total of 226 companies from 1999 to 2007. Fourth, was the loss of many jobs in the formal private sector (over 500 000 jobs by CCI-CI) and market share in the regional and international level. In sum, these crises have seriously affected the growth and balance of the national economy by putting the private sector in a very risky and non-favorable business environment (World Bank, 2015).

---

<sup>2</sup> The sociopolitical crises started with a military coup in 1999 attributed to disgruntled soldiers. In 2000, the military regime organized the presidential elections, which were marked by major unrest. The consequence was a precarious reign of the president-elect. In 2002, a rebellion divided the country into two until 2007. A peace agreement to end the conflict was signed on 4 March 2007. But the elections took place in October 2010 after being delayed six times. The report of the results led to severe tension and violent incidents which result into a post-election crisis in 2011.

Political support for the private sector implemented both by governments, international and private stakeholders has generally focused on improving the regulatory framework, funding, training support and various tax incentives for the maintenance and development of business activities. Thus, in recent years, Côte d'Ivoire recorded a considerable number of incentives and ad hoc discretionary tax exemptions aimed at supporting the private sector and post conflict recovery<sup>3</sup> (GCCl, 2016; CEPICI 2015, MEF 2010). However, the results of these policies remain mixed (ONUDI 2012). Ivorian companies are inefficient and today, the country manufacturing value added (MVA) per capita is well below the level it was twenty years ago. Following the various reforms proposed by the Ivorian government, it seems more than necessary to consider data from recent and on a microeconomic context, in order to understand constraints that companies operating in Côte d'Ivoire face. These major impediments to sales growth are identified by applying to the Ivorian economy, the method of direct acyclic graphs (DAGs).

The purpose of this paper is to address the following research question. Does the present state of the business environment in Cote d'Ivoire promote optimal recovery for the national economy in the post-crisis period? What are the main constraints that affect private companies in Cote d'Ivoire? Do these constraints vary according to the characteristics of the company? What priority reforms should be put in place in order to remove the major constraints to healthy and smooth business practices in Cote d'Ivoire? What need to be done to spur growth in the private sector in Cote d'Ivoire?

Up to now, studies on SME in Côte d'Ivoire are very scarce. Previous studies (Kouadio, 2011, Sleuwaegen and Goedhuys, 2002) have put emphasis on one specific constraint. This paper extend its analysis to various types of constraints reported by SMEs. However, we find that SMEs in Côte d'Ivoire faced three major constraints, namely, access to finance, water supply and building permit. The interest of this study is that it can provide an answer that can be leveraged to the intervention of those involved in the reforms of the business environment in response to the imperative of post-crisis economic recovery policies in Côte d'Ivoire. Moreover, the major contribution of this study lies primarily in the use of a raw database from companies in the entire Côte d'Ivoire. Also, the methodological approach used provided a much higher profile on the direct constraints and the channel through which obstacles interact to affect business growth.

The preliminary statistical results highlighted three major constraints, namely, access to financing, political instability, and availability of electrical power as major barriers for entrepreneurs.

Furthermore, analysis of the perception of constraints according to the characteristics of the company showed that the perception of a constraint level is a function of the characteristics of the business and therefore any political reform should be based on these business characteristics.

One important result of this study following the Beck, T. et al. (2005) approach, is that access to finance is considered the most important constraints that affect adversely the sales growth the company. We see a deterioration of 1 percentage point in terms of access to finance is accompanied by a drastic fall of 148 percentage points of the business growth. Also, we find that improved water supply conditions and permits building permits leads to improved business growth.

---

<sup>3</sup> Cf. Ordinance No. 2009-382 of 26 November 2009 on the State Budget for the 2010 Management and Tax Annex 2010.

The rest of the paper is divided as follows: Section 2 presents a literature review on corporate constraints, Section 3 outlines the methodology, Section 4 presents the results and Section 5 concludes.

## 2. Literature review

Several authors have studied constraints faced by SMEs (Beck, T. et al. 2005, Dollar, et al. 2005, 2006, ILO, 2015). While old studies focused on financial indicators, recent works, focused on wide variety of constraints provided by business surveys.

According to the survey on business climate (WBES, 2010, see also ILO, 2015) constraints face by businesses can be divided into several categories namely: financial : credit cost, access to credit; effectiveness of the judicial system: safety, protection of property rights, effective administration of justice; taxes and regulation: taxes, regulation, unfair competition; infrastructure problems: quality and practicability of roads, electricity, water, telephone, postal service; corruption: quality of the relationship with public services, broader macroeconomic environment: crime, political instability, fluctuating exchange rates, inflation.

Many empirical studies identified limited access to funding and ineffectiveness of the judiciary system as major constraints to business growth. Several authors like La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1998) argue that the difference between the legal systems and financial systems across countries may explain variations in performance of businesses in the world<sup>4</sup>.

Several studies (Fjose, S., et al. 2010, ILO 2015) described how an unfavorable business climate negatively affected the functioning and growth of businesses. However, many of them are limited to data from one country and focus generally on a single constraint. For example, studies focus on the constraints related to infrastructure, and regulation (Beck, T. et al., 2005). Klapper, Laeven and Rajan (2005) using data on businesses in Eastern Europe and the West show that unfair competition as the barriers to entry is a barrier to business growth.

Dollar, Hallward-Driemeier, and Mengistae (2006), using data from the survey of companies showed that the costs of various bottlenecks such as days to clear goods, days to get phone lines, lost sales due to power outages, affecting the performance of companies in Bangladesh, China, India and Pakistan. Using similar data on companies in countries of Africa, Eifert, Gelb and Ramachandran (2005) show that the business climate variables affect business productivity. Sleuwaegen and Goedhuys (2002) from data on businesses in Côte d'Ivoire show that inadequate financial infrastructure negatively affects the development of small businesses. Levine (2005) emphasizes the importance of financial development on economic growth through better availability of credit. Also, other researchers have placed particular emphasis on corruption compared to the payment of taxes. One of the first papers in this area was proposed by Shleifer and Vishny (1993). They argue that corruption can be more damaging than the payment of taxes due to the uncertainty and secrecy that

---

<sup>4</sup> Regarding judicial efficiency, Johnson, McMillan and Woodruff (2000) analyzed employment and sales growth between 1994-1996 in five countries and these authors found that non-compliance of property rights have a more negative effect on sales growth than financial constraints. In a study conducted on SMEs, Russia and Bulgaria, Pissarides, Singer and Svejnar (2003) showed also that financial constraints were the largest and most burdensome for companies over the rights of property. Also the data Cull and Xu (2005) show that respect for property rights and access to finance are important in the corporate reinvestment rate.

accompanies the payment of gratuities. Using data on Uganda companies, Fisman and Svensson (2004), show that corruption especially the payment of gratuities negatively affect the development of enterprises more than the payment of taxes. Gaviria (2002) also found that corruption and crimes substantially reduce the competitiveness of businesses in Latin America<sup>5</sup>. Although these studies have helped improve the understanding of the effects of the business environment on the development of business between countries, they examine a particular aspect of the constraints from there, they have limited recommendations.

Other authors analyze the constraints in a much more complex environment. Kouadio (2011) showed that the difficulties hindering the development of the Ivorian firms are threefold: (i) financing constraints, (ii) the low rate social performance factors of production (unfavorable geographical factors or insufficient investment in complementary factors such as human capital and infrastructure) (iii) and the weakness of the private appropriation capacity (high macro and micro risks, inefficient taxation rights property and contract enforcement, very little or no product innovations or lack of self-discovery, significant externalities). Moreover, other studies other than those carried out in Côte d'Ivoire, identified as major constraints of business, lack of funding and the lack of corporate network (Marshall and Oliver, 2005). Herrington et al. (2009) found meanwhile that the lack of education (one in human capital) and training was the most important cause of failure for new SMEs in South Africa.

In addition, data on the business climate (WBES, 2010) also provide information on the quality of macroeconomic governance through variables such as political instability, fluctuations in exchange rates, inflation. While the effects of inflation on growth and business investment have been widely studied in the literature of finance and controlled in the most business growth regressions, there is little microeconomic data on the impact of political instability and the exchange rate on corporate growth (Beck, T. at al. 2005). It is conceivable that political instability, fluctuations in exchange rates have an indirect effect on the growth of corporate sales by affecting the type of funding available to businesses. For example, Desai, Foley and Forbes (2004) show that the depreciation of the exchange rate increases the level of corporate indebtedness that restrict the ability of companies to obtain new capital to adjust their capital structure.

## 3 Data and Methodology

### 3.1- data

Our data come from the survey of the business climate in Côte d'Ivoire conducted in 2012 (Kouadio, H. et al. 2013). This survey identifies all obstacles to the performance and growth of firms in 6 regions of the country. This survey contains a number of important questions about the nature of the severity of different obstacles. Specifically, business leaders are invited to give their views on the obstacles related to finance, corruption, tax and regulation, infrastructure, justice, crime, political instability, and the macroeconomic environment.

---

<sup>5</sup> There are several papers in the macroeconomic literature that study the obstacles of change in the business environment on the enterprise level. For example, Mauro (1995) and Friedman et al. (2000) examine the effects of corruption, crime, taxes, the growth of GDP and the level of business investment.

The purpose of this survey was to (i) provide statistical indicators on the business environment (ii) to understand the constraints to private sector growth and (iii) to stimulate policy reforms to improve the business climate. The survey covered 727 companies located throughout selected cities including 414 formal and 313 informal enterprises (cf. Table 5). The survey sample was stratified according to the following layers<sup>6</sup>: industry, size, and region. Including government departments, military bases, police prefectures, schools, universities, public health centers or other characters to public structures were excluded from the sample.

The questionnaire contains several thematic structure, the characteristics of the firm (firm age, size, legal status etc.), access to infrastructure (electricity, transport, water), a relationship with the government ( regulatory, administrative duties, corruption, permits or licenses), employees (number of permanent and temporary employees) firm performance (capacity utilization, sales, exports), access to finance (account banking, funding source, etc.) and the main barriers (barriers near 15 identified).

### 3.2 Statistical Methods

Our method consisted of three successive approaches. The first step is to analyze the determinants of obstacles, the second step is to analyze the most binding constraints for the company particularly on the sales growth , and the third step consists in examining, using the methodology of Directed Acyclic Graph, all interrelations between the constraints<sup>7</sup> of the company.

To find out factors that may be associated with the constraints faced by SMEs, we used an ordered probit regression as described in the following equation:

$$Y_i = \alpha + F(X'\beta) + \varepsilon \quad (1)$$

Where  $Y_i$  is the constraints reported by entrepreneur for firm  $i$ .  $F$  is link function,  $X$  is the vector of independent variables reflecting the characteristics of firm  $i$ ;  $\beta$  is the coefficient vector that characterizes the business; and  $\varepsilon$  is the error term that is assumed to be normal. Variables that characterize business are those proposed by Batra, G. et al (2003).

Business leaders have given their opinions on a set of 14 identified constraints. These constraints were ranked according to their degree of severity (1-no, 2-Moderate, 3-High, 4-severe). Ordered probit models are particularly interesting to analyze the dependent variables that are ordered. In the presence of scheduling the dependent variable estimated by OLS can lead to biased results. To remove this limit we consider the following model:

$$y_i^* = x_i'\beta + \varepsilon_i \quad (2)$$

---

<sup>6</sup> The study was carried out throughout the Ivorian territory according to a stratified representative sampling at four degrees: geographical location, formal or informal character, type and size. The localities of Abengourou, Bouaké, Daloa, Korhogo, Abidjan and San-Pedro were retained for this investigation. These are the main localities of the economic regions of the country. They make it possible to gauge the main routes and better capture the economic and geographical diversity of Côte d'Ivoire.

<sup>7</sup> Access to land, access to finance, tax rates, administrative fee, electricity, water, corruption, political instability, crime, theft and disorder, justice, customs, unfair competition, telecommunications etc.

$$\text{With } y_i^* = \begin{cases} 1 & \text{si } y_i^* \leq \alpha_1 \\ 2 & \text{si } \alpha_1 \leq y_i^* \leq \alpha_2 \\ 3 & \text{si } \alpha_2 \leq y_i^* \leq \alpha_3 \\ 4 & \text{si } \alpha_3 \leq y_i^* \end{cases}$$

Where  $y_i^*$  is an unobservable variable and  $x_i'$  represents the characteristics of firm  $i$ ,  $\beta$  is the coefficient vector that characterizes the business.

After analyzing the perception of constraints, the second step is to identify which are considered the most important for the company.

We face several difficulties to conduct such an analysis. First, the potential problem with the use of data on the business climate is that business leaders can identify several obstacles as binding when in fact they are not. Therefore, Beck, T. al. (2005) examine the extent to which barriers reported by entrepreneurs can be binding on them. According to these authors, a barrier is only considered a "constraint" or a "constraint restrictive" only if it significantly affects the growth of the company. The significant impact implies that the coefficient of the obstacle in the growth regression is statistically different from zero and the value of the coefficient of the obstacle is greater than 1, indicating that entrepreneurs consider the constraint as an obstacle<sup>8</sup>. The regression equation to estimate is:

$$Z_i = \delta + \theta_i B_j + \sigma_i H(X' \gamma) + \mu \quad (3)$$

Where  $Z_i$  is the sales growth rate of firm  $i$  between 2009 and 2011  $B_j$  denotes the obstacle  $j$  identified by the firm,  $H(X' \gamma)$  is the vector of characteristic variables to the firm as in Batra G. et al (2003). They also refer to all control variables to take into account in the econometric model heterogeneity between firms.  $\mu$  is the distribution of assumed normal errors.  $\delta$ ,  $\theta_i$ , and  $\sigma_i$  are the model parameters. Following Beck, Demirguc-Kunt and Maksimovic (2005)'s approach, we perform a set of statistical test on  $\theta_i$  parameter. Formally it will proceed to the next test:

$$H_0: \forall i = 1, \dots, N, \theta_i = 0 \text{ vs } H_1: \forall i = 1, \dots, N, \theta_i \neq 0 \quad (3)$$

Each test will be associated with a p-value, thus we say that the obstacle  $i$  is binding on the company if  $\theta_i \neq 0$  and  $sign(\theta_i) < 0$ .

One of the limitations identified in the approach suggested by Beck, T. et al. (2005) is in the presence of a strong correlation between the error terms of the constraints, the estimated  $\theta_i$  parameters may be biased or give inconsistent results. To remove this limit, Beck, T. et al. (2005) proposes to analyze the constraints using the Directed Acyclic Graph (DAG) methodology.

---

<sup>8</sup> Alisena et al (1996), Alesina and Perotti (1996) find that political instability is negatively related with the growth of firms and the distribution of income. However, their paper use panel data therefore these give little information on the effects of political instability on the firms individually. In panel data, or data on a country, the significance of the coefficient is currently sufficient to determine whether the obstacle is considered to be binding or not. However, to determine the relative impact, it is important to take into account the level of the obstacle (Beck, T. et al., 2005)

This method assumes that all variables are potentially linked. Using an algorithm, it uses the conditional correlation between variables, it seeks to highlight the relationships of cause and effect existing between the different variables (Kalisch, and Buhlmann, 2007; Wheeler, and Scheines, 2010). The final output of the algorithm is a list of possible causal relationships between variables that are highlighted and shows (i) the variables that have a direct effect on the dependent variable, (ii) the variables that have only an indirect effect the dependent variable through other variables, (iii) the variables that have no statistical association with other variables (Shrier, and Platt, 2008).

The DAG method imposes stricter criteria than the linear regression in identifying variables that have a direct effect on the dependent variable (Beck, T. et al. 2005). In OLS regression, variables that are identified as statistically significant and therefore correlated to the dependent variable Y are those having a conditionally significant partial correlation to all of the matrix  $(X'X)$ . In contrast, with the DAG algorithm, a variable is identified as having a direct effect on the dependent variable Y only if it has a significant partial correlation conditionally on the whole matrix  $(X'X)$  and conditionally to any subset of the matrix  $(X'X)$ . Thus, if the DAG identifies a particular obstacle having a direct effect on the growth of the firm, this variable is expected to have a significant effect in the OLS regression (Wheeler, and Scheines, 2010, Scheines, et al. 1994).

More formally, the DAG methodology provides a compact representation of probability distributions with nodes attached graphs showing the random variables and the edges represent the assertions of conditional independence. Briefly, a directed graph is a graph reflecting the conditional causal relationship between the variables. The tip of the arrow in the graph reflects this causal relationship. For example, consider four vertices  $\{A_1, A_2, A_3, A_4\}$  and a set of edges among these vertices  $\{A_1 \rightarrow A_2, A_2 \rightarrow A_3, A_3 \rightarrow A_4\}$ . The corresponding DAG will be  $\{A_1 \rightarrow A_2 \rightarrow A_3 \rightarrow A_4\}$ . The directed graph provides a visual representation of causality, independent variables, and conditional independence.

The causation standard in the methodology of the DAG is derived from the application of Bayes' rule and assumptions on the probability distributions of variables, even more, the causal Markov condition. Markov condition of causality asserts that every variable  $X$  is independent of other variables that are not the direct causes. In graph theory the causal Markov condition refers to the d-separation<sup>9</sup>.

## 4 Empirical Results

### 4.1- Preliminary Results

Table 1 summarizes the level of barriers as perceived by business leaders. This table also shows how the constraints varied according to company size. It is clear from this analysis that three obstacles are considered severe for the functioning of the company. These include access to electricity, access to funding and political instability problem. Indeed, nearly 59% of business leaders reported that electricity constraints forced the company's business while 60% think that the financial constraints penalize the operation of the business. They are about nearly 80% who said that political instability does not allow the growth of their business.

---

<sup>9</sup> Ayyagari, Demirguc-Kunt and Maksimovic (2013) explain in their paper in more detail the DAG method.

The results in Table 1 also show that neither the constraints of land, or transportation, or administrative fees nor the drinking water supply are seen as major constraints for the development of the company.

In addition, although not having occupied the first rank among the ranking of constraints, they are more than 40% said that the constraints of telecommunications (45%), unfair competition (47.87%), the crimes (45%), the tax rate (48%), corruption (42%) represent serious obstacles to the growth of their businesses.

Table 1 shows, however, differences in perception according to company size. It can be noted from Table 1 that micro enterprises mainly (64%) consider the problem of access to finance as a severe obstacle to the growth of their businesses. They are followed by small (57%), medium (49%) and large companies (35%).

Regarding constraints on electricity, perception vary according to company size. Small and medium enterprises are the most numerous considered that these barriers are a constraint for their businesses. These represent about 65% of all small and medium enterprises.

Table 2 summarizes the correlation matrix between constraints. The obstacles reported by firms are important but correlations remain quite low below 0.5. The correlation between political instability and crime and corruption remains relatively high. This result indicates that an economic environment marked by political instability necessarily affect corruption. It is important to also note that the correlation between access to financing and other barriers are relatively high thus highlighting that any reform policy must take into account possible interrelationships between this constraints.

We also find that only the financing obstacle is negatively correlated with the sales growth of the company. We will discuss this result in the following sections.

## **4.2- Results of the econometric estimation**

The information provided by the business climate data in Côte d'Ivoire allows to analyze, depending on the characteristics of the companies, their perceptions of the obstacles they face.

Results (see Table 3 and 4) suggests that it is the oldest enterprises that are owned by Ivorians, who are generally small in size and are not export-oriented and located in Korhogo , Daloa and Bouaké, which tend to face the most acute business constraints; while large enterprises, export-oriented and located in areas other than Korhogo, Daloa and Bouaké are less confronted by obstacles. There are some notable exceptions to certain constraints of enterprises. For example, large<sup>10</sup> companies report that they are more constrained by transport barriers than smaller firms.

Results also suggest a complex interaction between the characteristics of the firms with the conditions of the business environment. For example, corruption is perceived as more binding not only by companies located in the north of the country but also by exporting companies. The problems related to administrative fees affect more domestic firms than foreign companies. Also, inadequate water supply affects more both small and medium enterprises than the others.

---

<sup>10</sup> The size of the company is referring to the logarithm of the sales company or type of company (micro, small, medium, large). These variables were used by Kaufmann D., et al (2003) as a proxy for firm size.

In terms of geographical location of the company, those located in the main economic zone like San Pedro and Abidjan face fewer constraints than those located in Korhogo, Bouaké, Daloa and Abengourou. This could be explained by the fact that companies located in Abidjan or San-Pedro are more resilient to constraints than other companies.

One key result is that national companies face more binding constraints than foreign firms. An implication of these results is that political reform must take into account the characteristics of enterprises. Special emphasis should be given to domestic companies.

Following the approach suggested by Beck, T et al. (2005), we examine whether constraints as perceived by business leaders actually affect the growth of the company. To do so, we analyzed constraint after constraint and test the significance of the coefficient to determine if the constraint actually affects the growth of the company.

The results summarized in Table 4 show that, when taken individually, no constraints except the provision of water and building licenses that are significantly related to the sales growth of the company. The results show that a 1% improvement in constraints to the provision of water and construction permits increased sales of the company respectively 152 and 233 percentage points.

In the last column of Table 4 (column 14), we have included all the obstacles in the equation of the regression of the growth of the company. In this specification only access to funding, barriers to the provision of water and construction permits have proven significant. However, accesses to finance constraints are negatively and significantly correlated with sales growth at 10% level while the other two variables are positively correlated to the growth of the company. A deterioration of conditions for access to funding reduce the sales growth of nearly 148 percentage points. Neither corruption nor political instability or tax rates or administrative charges or transport infrastructure etc. (cf. column 14 of Table 4) seem to directly affect the sales growth of the company. The only constraint that affects negatively the sales growth of companies in Côte d'Ivoire is the constraint of access to finance.

These results shows that policies reforms should put special emphasis on improving access to financing conditions for businesses but also, reforms should be undertake to improve the supply of drinking water, and facilitate the acquisition building licenses. These results are consistent with those found by Kouadio (2011), Fjose et al. (2010), ILO (2015) which shows that access to finance is one of the most binding constraints that hinder the development of enterprises. Moreover, it is possible that other variables can affect business growth through their impact on other variables but do not have direct effect on sales growth of the company.

To analyze the constraints that indirectly affect the sales growth of the company we used the DAG methodology as performed in Beck, T et al. (2005).

DAG methodology was implemented using software programmed in TETRAD V<sup>11</sup> (Wheeler, G., and Scheines, R. 2010, Scheines, R et al., 1994). This methodology was adopted to check the robustness of our results (Shrier, and Platt, 2008) and especially to analyze existing causality between the

---

<sup>11</sup> Several algorithms are proposed by TETRAD V. For this analysis we used the stable PC method with a threshold of 10%.

barriers of companies. The blue colored arrows show the direction of causality while the red arrows illustrate the bidirectional causality between obstacles.

Figure 1 illustrates the results of the algorithm used in TETRAD V. It reflects the correlation between sales growth and companies constraints. Figure 1 shows that obstacles that have a direct impact on the sales growth of firms are building permits, and water supply. Results show that problems of electricity cause problems of insecurity, theft or disorder which in turn cause problems of corruption. Barriers to trade and customs regulation have a causal effect on corruption problems and transport constraints. Also, telecommunication problems cause corruption. The other obstacles are mutually causing, although the sense of causality is not determined.

In addition, Figure 1 shows that the relationships between the obstacles are quite complex and that there are multiple causal directions between these obstacles. However, this analysis will restrict itself to identifying the variables that directly affect the firms and also to know the mechanism by which the obstacles indirectly influence the company. An important result suggested by the DAG methodology is that water supply and obtaining building permits are the barriers directly affecting sales growth as suggested by the results in Table 2. Access to finance indirectly affects the sales growth from the interrelationship between the constraints of access to finance and the constraints related to the building permit. Companies that face significant financing constraints also face constraints in obtaining building permits, which affects sales growth of business.

The DAG analysis also suggests that the reforms should be conducted concomitantly. Thus, any reform aimed at improving access to business financing should be accompanied by tax reforms. It will also be necessary to reduce or eliminate political tensions, to improve the supply of electricity, and to alleviate problems related to corruption. It is only by considering all these factors at the same time that the proposed reforms can have the desired effect.

## 5. Conclusion

On the basis of primary data on the business climate in Côte d'Ivoire collected throughout the country in 2012, this paper proposed to make a diagnosis of the constraints of companies in Côte d'Ivoire and to understand the factors that explain them.

In order to do so, the methodological approach consisted of a descriptive analysis of the obstacles encountered by firms supplemented with an ordered probit model to explain the perception of constraints according to the characteristics of the firms.

Then, the individual effects of constraints on the sales growth were analyzed according to the approach proposed by Beck, T. (2005). The last step in our methodology was to use the acyclic graph method to analyze the barriers that directly affect the firm and especially to understand the mechanism by which the other variables act indirectly on the growth of the firm.

The preliminary results made it clear that constraints on access to finance, political instability and electricity constraints are the most worrying obstacles for entrepreneurs.

Moreover, the analysis of the perception of constraints according to the characteristics of the company has shown that the perception of a level of constraint depends on the characteristics of the

company. Thus, any reform policy should take into account the characteristics of enterprises, especially since SMEs are very heterogeneous.

An important result following the approach of Beck, T. et al. (2005), is that access to finance is considered the most important constraint that significantly and negatively affect the rate of growth of the company's sales. We find that a 1 percentage point decline in access to finance is accompanied by a drastic drop of 148 percentage points in the growth rate of business sales. We therefore find that improved water supply conditions and permits for building permits result in improved business growth.

Based on the DAG methodology, we find that water supply constraints and building permit constraints are the variables that directly affect the sales growth of the firm. We also find that constraints on access to finance affect the growth of firms through the constraints of building permits. Indeed, companies constrained financially, are struggling to get building permits that affect the company's sales growth. The DAG analysis also suggests that maintaining political stability, tax policy reforms and an environment marked by the absence of corruption is likely to improve the financial conditions of enterprises and thus promote sales growth.

Our analyses suggest that more complex challenges remain for the government to address amongst constraints. It is clear that a range of important economic and social policies, such as those centred on macroeconomics, infrastructure or social protection, have a substantial impact on SMEs. However, the two main economic justifications for SME policies are: (1) to address market failures specific to this size segment; and (2) to promote the special economic contributions of SMEs. Considering financial access, rather than concentrating on assisting SMEs directly through financial contributions, the government should focus on investing in skills upgrading and human capital development. Value chain development interventions are becoming increasingly popular because of their strong emphasis on scale and financial sustainability. A way forward for future research on SMEs constraints is to consider a value chain intervention.

## References

- Alesina, A., & Perotti, R., (1996). Income Distribution, Political Instability, and Investment. *European Economic Review* 40 (6), 1203-1228
- Alesina, A., Ozler, S., Roubini, N., & Swagel, P., (1996). Political instability and economic growth, *Journal of Economic Growth* 1 (2), 188–211.
- Ayyagari, M., Demirgüç-Kunt, A., & Maksimovic, V., (2008). How well do Institutional theories Explain Firms' Perceptions of Property Rights?, *The Review of Financial Studies* 21, 1833-1871
- Ayyagari, M., Demirgüç-Kunt, A., & Maksimovic, V., (2013). What determines protection of property rights? An Analysis of Direct and Indirect Effects, *Journal of Financial Econometrics* 11(4), 610-649
- Banque Mondiale, (2015). *La Force de l'Elephant : pour que sa croissance génère plus d'emploi de qualité*, série Situation économique en Côte d'Ivoire
- Batra, G., Kaufmann, D., & Stone, A., (2003). The Firms Speak: What the World Business Environment Survey Tells Us about Constraints on Private Sector Development. *World Bank mimeo*.
- Beck, T., Demirgüç-Kunt, A., & Maksimovic, V., (2005). Financial and Legal Constraints to Firm Growth: Does Firm Size Matter. *Journal of Finance* 60(1), 137-177.
- Beck, T., Demirgüç-Kunt, A., Laeven, L. & Levine, R., (2008). Finance, Firm Size, and Growth, *Journal of Money, Credit, and Banking* 40 (7), 1379-1405
- CEPICI (2015). Retrospective doing business 2015, newsletter novembre 2015
- Cull, R., & Xu, C. L., (2005). Institutions, ownership and finance: The determinants of profit reinvestment and Chinese firms. *Journal of Financial Economics* 77 (1), 117-146
- Desai, M., Dyck, A., & Zingales, L., (2007). Theft and Taxes, *Journal of Financial Economics*, 84, 591-623
- Desai, M., Foley, C.F., & Forbes, K. J., (2004). Financial Constraints and Growth: Multinational and Local Firm Responses to Currency Depreciations, SSRN Working Paper Series
- Dollar, D., Hallward-Driemeier, M., & Mengistae, T., (2005). Investment Climate and Firm Performance in Developing Economies, *Economic Development and Cultural Change* 54 (1), 1- 21.
- Dollar, D., Hallward-Driemeier, M., & Mengistae, T., (2006). Investment climate and international integration, *World Development*, 34(9), 1498-1516, September.
- DSRP (2012), *Stratégie de Relance du Développement et de Réduction de la Pauvreté*, République de Côte d'Ivoire
- Eifert, B., Gelb, A., Ramachandran, V., (2005). Business Environment and Comparative Advantage in Africa: Evidence from the Investment Climate Data, World Bank mimeo.
- Fisman, R., Svensson, J., (2004). Are Corruption and Taxation Really Harmful to Growth? Firm-Level Evidence. World Bank Policy Research Working Paper # 2485
- Fjose, S., Grünfeld, L. A. & Green, C. (2010). SMEs and growth in Sub-Saharan Africa : Identifying SME roles and obstacles to SME growth, MENON-publication no. 14/2010
- Friedman, E. S. Johnson, D. Kaufmann and P. Zoido-Lobaton (2000). Dodging the Grabbing Hand: The Determinants of Unofficial Activity in 69 Countries, *Journal of Public Economics*, Vol. 76: 459-493.
- Friedman, E., Johnson, S., Kaufmann, D., Zoido-Lobaton, P., (2000). Dodging the grabbing hand: The determinants of unofficial activity in 69 countries. *Journal of Public Economics* 76,459-93.

- Gaviria, A., (2002). Assessing the Effects of Corruption and Crime on Firm Performance : Evidence from Latin America. *Emerging Markets Review* 3(3).
- GCCI (2016). Note sur l'environnement des affaires en côte d'ivoire, secrétariat technique du Groupe Consultatif Plan National de Développement 2016-2020, Côte d'Ivoire
- Herrington M, Kew J, Kew P (2009). Global Entrepreneurship Monitor, South African Report. [Online]. Available: <http://www.gbs.nct.ac.za/gbswebb/userfiles/gemsouthafrica2000pdf>
- ILO (2015). *Small and medium-sized enterprises and decent and productive employment creation*, Report IV, International Labour Conference, 104th Session, Geneva, 2015
- Johnson, S., McMillan, J., Woodruff, C., 2000. Entrepreneurs and the Ordering of Institutional Reform," *Economics of Transition*, Vol. 8(1), 1–36.
- Johnson, S., Mitton, T., 2003. Cronyism and capital controls: evidence from Malaysia, *Journal of Financial Economics* 67, 351-382.
- Kalisch, M. & Buhlmann, P. (2007). Estimating High-Dimensional Directed Acyclic Graphs with the PC-Algorithm, *Journal of Machine Learning Research* 8, 613-636
- Kaufmann, D., A. Kraay and M. Mastruzzi. (2003). "Governance Matters III: Governance Indicators for 1996-2002." *World Bank Policy Research Working Paper 3106*. Washington DC: World Bank.
- Klapper, L., Laeven, L, Rajan, R., (2005). Barriers to Entrepreneurship. World Bank Mimeo.
- Kouadio, K., H., Soro, N., Gbenro, N., & Kanga, D. (2013). *Climat des affaires Côte d'Ivoire 2012 : Méthodologie et Outils de Collecte*, Rapport d'étude, ENSEA
- Kouadio, Y.M. (2011) : Environnement des affaires et relance économique post-crise en Côte d'Ivoire, Université d'Auvergne - CEFEB - Matser Economie et Développement International
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R.W., (1997). Legal determinants of external finance. *Journal of Finance* 52, 1131-1150.
- La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R.W., (1998). *Law and finance*. *Journal of Political Economy* 106, 1113-1155
- Levine, R., (2005). Finance and Growth: Theory and Evidence forthcoming in Philippe Aghion and Steven Durlauf, eds. *Handbook of Economic Growth*. The Netherlands: Elsevier Science.
- Marshal ML & Oliver WN (2005). The Effect of Human Financial and Social on Entrepreneurial Process for Entrepreneurs in India. Masters Thesis, Unpublished. Purdue: Purdue University.
- Mauro, P.,(1995). Corruption and growth, *Quarterly Journal of Economics* 110, 681-712.
- Ministère de l'Economie et des Finances (2010). Annexe fiscal 2010, Abidjan Côte d'Ivoire
- ONUDI (2012). *Nouvelle politique Industrielle de la Côte d'Ivoire*, Vienne (Autriche)
- Pissarides, F., Singer, M., Svejnar, J., (2003). Objectives and Constraints of Entrepreneurs: Evidence from Small and Medium-Sized Enterprises in Russia and Bulgaria. *Journal of Comparative Economics*, Vol. 31(3), 503–531.
- Saleem, Q. (n.d.). *Overcoming Constraints to SME Development in MENA Countries and Enhancing Access to Finance*. International Finance Corporation, IFC0513. Online available: [http://www.ifc.org/wps/wcm/connect/1e6a19804fc58e529881fe0098cb14b9/IFC+Report\\_Final.pdf?MOD=AJPERES](http://www.ifc.org/wps/wcm/connect/1e6a19804fc58e529881fe0098cb14b9/IFC+Report_Final.pdf?MOD=AJPERES)
- Scheines, R.; Spirtes, P., Glymour, C., & Meek, C. (1994). TETRAD II: Tools for causal modeling. User's manual. Hillsdale, NJ: Erlbaum.

Shleifer and Vishny (1993). Corruption. *The Quarterly Journal of Economics*, Vol. 108, No. 3. (Aug., 1993), pp. 599-617.

Shrier, I & Platt, R. W. (2008). Reducing bias through directed acyclic graphs, *BMC Medical Research Methodology*, 8(70) doi:10.1186/1471-2288-8-70

Sleuwaegen, L., & Goedhuys, M., (2002), Growth of firms in developing countries, evidence from Cote d'Ivoire, *Journal of Development Economics*, 68 (1), 117-135

Sleuwaegen, Leo and Goedhuys, Micheline, (2002), Growth of firms in developing countries, evidence from Cote d'Ivoire, *Journal of Development Economics*, 68, issue 1, p. 117-135

WBES (2010). *Enterprise Surveys: CÔTE D'IVOIRE Country Profile 2009*, IFC, The World Bank Group

Wheeler, G., and Scheines, R. (2010). Causation, Association, and Confirmation in Explanation, Prediction, and Confirmation: New Trends and Old Ones Reconsidered, edited by Stephan Hartmann, Marcel Weber, Wenceslao, J. Gonzalez, Dennis Dieks, Thomas Uebe, Springer.

## Annex

Table 1. Descriptive statistics of constraints according to company size

Obstacles		micro	small	medium	large	Total
Electricity	No	32,41	24,45	20,41	11,76	28,61
	Moderate	11,81	10,92	14,29	29,41	12,1
	Major	19,68	29,69	32,65	11,76	23,52
	Severe	36,11	34,93	32,65	47,06	35,76
Water	No	74,54	54,59	46,94	47,06	65,75
	Moderate	7,64	11,79	26,53	17,65	10,45
	Major	9,26	15,72	14,29	11,76	11,69
	Severe	8,56	17,9	12,24	23,53	12,1
telecommunication	No	33,56	34,93	34,69	23,53	33,84
	Moderate	24,07	17,47	10,2	11,76	20,77
	Major	24,07	34,06	36,73	47,06	28,61
	Severe	18,29	13,54	18,37	17,65	16,78
Competition	No	35,19	34,06	38,78	52,94	35,49
	Moderate	18,06	17,03	8,16	0	16,64
	Major	22,69	26,64	26,53	23,53	24,21
	Severe	24,07	22,27	26,53	23,53	23,66
Crime, robbery	No	41,2	41,48	44,9	47,06	41,68
	Moderate	12,27	13,54	12,24	11,76	12,65
	Major	22,69	21,83	18,37	23,53	22,15
	Severe	23,84	23,14	24,49	17,65	23,52
access to finance	No	22,22	27,51	36,73	35,29	25,17
	Moderate	13,66	14,85	14,29	29,41	14,44
	Major	27,31	29,26	14,29	23,53	26,96
	Severe	36,81	28,38	34,69	11,76	33,43
tax rate	No	29,86	29,26	30,61	29,41	29,71
	Moderate	21,99	19,21	24,49	35,29	21,6
	Major	27,08	30,13	28,57	23,53	28,06
	Severe	21,06	21,4	16,33	11,76	20,63

Source: Survey of the business climate in Côte d'Ivoire, 2012 / author

Table 1: Descriptive statistics of constraints according to company size (continued)

Obstacles		micro	small	medium	large	Total
administrative taxe	No	39,35	37,99	34,69	47,06	38,79
	Moderate	23,84	22,71	22,45	23,53	23,38
	Major	23,15	27,07	28,57	23,53	24,76
	Severe	13,66	12,23	14,29	5,88	13,07
Political instability	No	6,02	7,42	2,04	5,88	6,19
	Moderate	5,32	3,06	4,08	5,88	4,54
	Major	20,14	22,71	32,65	11,76	21,6
	Severe	68,52	66,81	61,22	76,47	67,68
corruption	No	45,37	48,03	36,73	47,06	45,67
	Moderate	13,66	9,17	12,24	5,88	11,97
	Major	20,14	22,27	20,41	5,88	20,5
	Severe	20,83	20,52	30,61	41,18	21,87
land	No	70,37	67,25	81,63	76,47	70,29
	Moderate	7,64	11,79	2,04	5,88	8,53
	Major	12,27	14,85	10,2	17,65	13,07
	Severe	9,72	6,11	6,12	0	8,12
transport	No	53,24	54,15	51,02	23,53	52,68
	Moderate	16,9	14,41	18,37	35,29	16,64
	Major	15,51	22,27	18,37	17,65	17,88
	Severe	14,35	9,17	12,24	23,53	12,79

Source: Survey of the business climate in Côte d'Ivoire, 2012 / author

Table 2: Correlation matrix between constraints and sales growth

	sales_growth	électricité	télécom	competition	crime, robbery	Tax_rate	finance	instability	corruption	transport	taxe adm
sales_growth	1										
electricity	0,0033	1									
télécom	-0,0502	0,3016*	1								
competition	0,0233	0,0847*	0,1131*	1							
crime, robbery	0,0516	0,2228*	0,2466*	0,0613*	1						
Tax rate	-0,0463	0,1200*	0,1379*	0,1267*	0,1163*	1					
finance	-0,0628*	0,1848*	0,2326*	0,0807*	0,1664*	0,1813*	1				
instability	0,0148	0,1722*	0,1943*	0,0247	0,1682*	0,1063*	0,2543*	1			
corruption	0,0567	0,1738*	0,3428*	0,0541	0,2571*	0,2026*	0,2290*	0,2533*	1		
transport	-0,0019	0,1542*	0,3189*	0,1243*	0,2606*	0,1945*	0,1561*	0,1245*	0,2465*	1	
taxe adm	-0,0081	-0,0081	0,1157*	0,1390*	0,1031*	0,0711*	0,6374*	0,1529*	0,2242*	0,1945*	1

Source: Survey of the business climate in Côte d'Ivoire, 2012 / author

Table 3: explanatory factors of companies' constraints perception in Côte d'Ivoire by ordinary least square

	c30a	c30a	c30b	c30b	c30x	c30x	i30	i30	j30a	j30a	j30b	j30b
age	0,008	0,008	-0,002	-0,002	0,026	0,025	0,01	0,01	0,012	0,011	0,014	0,012
	(-0,65)	-0,59	-0,19	-0,21	(2,46)*	(2,31)*	-0,85	-0,89	-1,18	-1,14	-1,38	-1,27
age2	0	0	0	0	0	0	0	0	0	0	0	0
	-0,46	-0,38	-0,19	-0,15	(2,34)*	-1,94	-0,93	-1,04	(2,13)*	(2,11)*	(2,01)*	-1,82
f1	-0,005	-0,006	-0,004	-0,005	0	-0,002	-0,005	-0,005	0	0	0,004	0,004
	-1,45	-1,69	-1,37	-1,69	-0,07	-0,26	-1,4	-1,48	0	-0,03	-1,39	-1,35
2bn.a6	0,068		-0,032		0,373		-0,178		-0,042		-0,032	
	-0,63		-0,34		(3,68)**		-1,63		-0,43		-0,34	
3.a6	-0,004		0,114		0,365		-0,132		0,013		0,208	
	-0,02		-0,58		(1,99)*		-0,64		-0,08		-1,24	
4.a6	0,128		0,328		1,141		-0,098		-0,169		-0,014	
	-0,41		-1,32		(2,49)*		-0,38		-0,58		-0,06	
foreign	-0,384	-0,377	-0,352	-0,357	-0,106	-0,085	-0,47	-0,48	0,259	0,255	0,353	0,345
	(2,31)*	(2,28)*	(2,42)*	(2,47)*	-0,7	-0,55	(3,33)**	(3,40)**	-1,79	-1,78	(2,54)*	(2,49)*
2bn.ville	0,415	0,445	-0,057	-0,049	-0,036	0,021	-0,432	-0,472	-0,189	-0,166	-0,161	-0,091
	-1,77	-1,92	-0,25	-0,22	-0,19	-0,11	(2,29)*	(2,52)*	-0,99	-0,87	-0,88	-0,5
3.ville	-0,14	-0,157	-0,016	-0,034	0,195	0,166	-0,506	-0,503	0,73	0,72	0,54	0,504
	-0,78	-0,87	-0,1	-0,21	-1,26	-1,06	(3,06)**	(3,06)**	(4,49)**	(4,42)**	(3,37)**	(3,12)**
4.ville	0,232	0,228	0,514	0,501	0,464	0,48	0,546	0,532	0,584	0,574	0,372	0,348
	-1,38	-1,37	(3,51)**	(3,47)**	(3,13)**	(3,22)**	(3,49)**	(3,43)**	(4,16)**	(4,13)**	(2,75)**	(2,58)*
5.ville	-0,349	-0,35	-0,096	-0,108	0,226	0,199	0,616	0,616	0,4	0,403	-0,006	-0,011
	-1,92	-1,94	-0,61	-0,69	-1,47	-1,32	(3,50)**	(3,50)**	(2,35)*	(2,36)*	-0,04	-0,08
6.ville	0,497	0,502	0,808	0,79	0,236	0,264	0,654	0,625	0,358	0,354	-0,028	-0,037
	(3,16)**	(3,25)**	(5,33)**	(5,23)**	-1,62	-1,83	(4,03)**	(3,88)**	(2,49)*	(2,48)*	-0,21	-0,28
d3abis1	-0,353	-0,296	0,103	0,153	-0,194	0	-0,431	-0,492	0,245	0,262	-0,003	0,099
	-1,73	-1,43	-0,42	-0,63	-0,95	0	-1,81	(2,06)*	-1,16	-1,26	-0,01	-0,47
sales		-0,017		0,003		0,023		0,002		-0,018		-0,031

		-0,8		-0,16		-0,94		-0,09		-0,89		-1,55
_cons	3,185	3,498	2,564	2,578	1,252	1,119	2,771	2,704	1,764	2,037	1,364	1,896
	(10,56)**	(7,40)**	(10,79)**	(6,51)**	(4,55)**	(2,46)*	(10,51)**	(6,16)**	(6,51)**	(4,60)**	(5,69)**	(4,51)**
R <sup>2</sup>	0,07	0,07	0,11	0,1	0,06	0,03	0,14	0,13	0,05	0,05	0,06	0,06
N	692	692	692	692	692	692	692	692	692	692	692	692

Source: Survey of the business climate in Côte d'Ivoire, 2012 / author, 2012 \*  $p < 0.05$ ; \*\*  $p < 0.01$

Table 3: explanatory factors of companies' constraints perception in Côte d'Ivoire by ordinary least square (continued)

	j30f	j30f	d30a	d30a	g30a	g30a	k30	k30	d30b	d30b	h30	h30
age	0,003	0,002	0,011	0,013	0,007	0,007	0,026	0,023	-0,008	-0,007	0,011	0,011
	-0,21	-0,17	-1,07	-1,24	-0,79	-0,81	(2,22)*	(2,04)*	-0,92	-0,84	-1,27	-1,33
age2	0	0	0	0	0	0	0	0	0	0	0	0
	-0,37	-0,28	-1,62	-1,88	-1,82	-1,94	-1,65	-1,59	-0,83	-0,65	-1,47	-1,48
f1	0,001	0,001	-0,007	-0,009	-0,006	-0,006	-0,001	-0,001	-0,001	-0,001	0	0,001
	-0,14	-0,25	-1,9	-1,81	-1,57	-1,53	-0,42	-0,29	-0,33	-0,28	-0,01	-0,22
2bn.a6	-0,111		-0,126		-0,073		-0,252		-0,139		0,031	
	-1,01		-1,31		-0,87		(2,41)*		-1,91		-0,39	
3.a6	0,275		0,046		-0,144		-0,29		-0,159		0,263	
	-1,35		-0,25		-0,91		-1,4		-1,08		-1,68	
4.a6	-0,29		0,889		0,072		-1,074		-0,088		-0,093	
	-0,74		(2,34)**		-0,24		(3,39)**		-0,29		-0,4	
foreign	-0,052	-0,071	-0,266	-0,278	0,218	0,218	-0,001	-0,009	0,143	0,136	-0,01	-0,019
	-0,34	-0,47	-1,75	-1,85	(2,09)*	(2,09)*	-0,01	-0,06	-1,42	-1,37	-0,1	-0,19
2bn.ville	-0,302	-0,247	0,035	-0,068	0,128	0,098	-0,42	-0,303	-0,137	-0,188	-0,064	-0,047
	-1,51	-1,28	-0,2	-0,4	-0,9	-0,69	-1,86	-1,34	-1,04	-1,42	-0,44	-0,33
3.ville	0,275	0,255	0,263	0,272	0,394	0,395	-0,004	-0,064	0,058	0,07	0,136	0,145
	-1,63	-1,52	-1,9	-1,93	(2,99)**	(3,00)**	-0,03	-0,38	-0,55	-0,66	-1,17	-1,26
4.ville	0,245	0,225	0,317	0,312	0,321	0,315	0,07	0,01	0,25	0,245	0,238	0,247
	-1,57	-1,46	(2,52)*	(2,45)*	(2,75)**	(2,73)**	-0,44	-0,06	(2,38)*	(2,32)*	(2,00)*	(2,12)*
5.ville	0,178	0,176	0,723	0,696	0,106	0,105	-0,173	-0,149	0,293	0,295	-0,003	-0,005
	-1,03	-1,03	(4,66)**	(4,45)**	-0,93	-0,93	-1	-0,87	(2,15)*	(2,14)*	-0,03	-0,04
6.ville	0,657	0,646	0,764	0,715	0,675	0,659	0,324	0,302	0,05	0,029	0,052	0,064
	(3,86)**	(3,85)**	(5,54)**	(5,27)**	(5,08)**	(5,04)**	(2,16)*	(1,98)*	-0,44	-0,25	-0,47	-0,59
d3abis1	0,769	0,82	0,093	0,047	0,028	-0,002	0,16	0,227	0,63	0,551	0,5	0,51
	(2,40)*	(2,68)**	-0,42	-0,22	-0,14	-0,01	-0,7	-0,97	(2,55)*	(2,31)*	(2,11)*	(2,12)*

sales		-0,02		0,066		0,001		-0,128		0,01		0,016
		-0,91		(3,29)**		-0,07		(6,46)**		-0,65		-0,99
_cons	1,92	2,207	2,097	1,135	1,478	1,46	2,709	4,661	1,287	1,077	1,274	0,998
	(6,58)**	(4,94)**	(8,00)**	(2,83)**	(5,87)**	(3,78)**	(9,91)**	(11,29)*	(6,64)**	(3,44)**	(6,27)**	(3,25)**
$R^2$	0,05	0,04	0,09	0,09	0,07	0,07	0,06	0,1	0,04	0,04	0,03	0,03
$N$	692	692	692	692	692	692	692	692	692	692	692	692

Source: Survey of the business climate in Côte d'Ivoire, 2012 / author \*  $p < 0.05$ ; \*\*  $p < 0.01$

Table 4: Barriers to business growth in Côte d'Ivoire.

	(1)	(2)	(3)	(4)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
age2	-11.599 (1.03)	-11.516 (1.04)	-11.560 (1.04)	-12.161 (1.05)	-9.546 (1.02)	-10.508 (1.04)	-11.335 (1.03)	-12.122 (1.02)	-11.629 (1.04)	-11.338 (1.04)	-18.333 (0.94)	-16.712 (0.86)	-18.897 (0.97)
age3	0.141 (0.97)	0.134 (0.98)	0.144 (0.99)	0.156 (1.00)	0.107 (0.93)	0.107 (0.95)	0.136 (0.96)	0.151 (0.96)	0.146 (0.98)	0.136 (0.97)	0.250 (0.58)	0.251 (0.58)	0.282 (0.65)
fl	-0.866 (0.78)	-1.226 (0.84)	-0.846 (0.73)	-0.651 (0.62)	-1.107 (0.78)	-1.001 (0.77)	-0.982 (0.77)	-0.838 (0.77)	-1.053 (0.78)	-1.034 (0.81)	-1.843 (0.26)	-0.388 (0.06)	-0.947 (0.13)
2bn.a6	265.137 (1.07)	264.970 (1.07)	263.604 (1.06)	280.463 (1.07)	248.636 (1.06)	263.646 (1.07)	266.654 (1.06)	267.642 (1.06)	277.342 (1.07)	266.175 (1.06)	220.991 (1.20)	297.898 (1.65)	205.192 (1.11)
3.a6	39.845 (0.58)	46.341 (0.63)	38.535 (0.57)	49.910 (0.64)	18.810 (0.34)	40.710 (0.58)	40.613 (0.60)	39.956 (0.58)	13.717 (0.27)	39.971 (0.59)	-24.586 (0.07)	84.779 (0.25)	-38.508 (0.11)
4.a6	12.622 (0.22)	34.692 (0.54)	5.784 (0.10)	23.272 (0.40)	-61.654 (0.88)	3.185 (0.05)	15.696 (0.28)	14.450 (0.27)	43.262 (0.57)	20.079 (0.35)	-85.578 (0.14)	98.070 (0.16)	-51.270 (0.08)
foreign	132.838 (1.02)	103.158 (1.03)	140.218 (1.06)	159.599 (1.06)	123.359 (1.05)	142.664 (1.05)	124.916 (1.07)	130.780 (1.03)	128.379 (1.05)	122.147 (1.05)	182.928 (0.77)	120.911 (0.51)	213.963 (0.87)
2bn.ville	181.738 (1.14)	188.630 (1.24)	185.124 (1.22)	225.182 (1.46)	161.640 (1.05)	177.859 (1.12)	191.221 (1.25)	190.642 (1.24)	220.509 (1.46)	192.060 (1.26)	206.114 (0.50)	170.669 (0.42)	132.040 (0.32)
3.ville	96.889 (1.22)	92.550 (1.25)	80.489 (1.26)	132.417 (1.20)	93.145 (1.25)	147.677 (1.16)	95.705 (1.30)	111.455 (1.14)	67.411 (1.24)	94.736 (1.27)	96.786 (0.30)	38.771 (0.12)	100.802 (0.30)
4.ville	-6.030 (0.27)	29.302 (0.90)	-16.227 (0.61)	-42.367 (0.90)	4.667 (0.21)	43.016 (0.90)	1.205 (0.06)	11.885 (0.46)	-23.579 (0.69)	1.194 (0.06)	-49.336 (0.17)	-79.479 (0.27)	-44.027 (0.14)
5.ville	294.863 (0.99)	280.817 (1.00)	275.246 (1.00)	238.929 (0.99)	273.827 (1.00)	316.052 (1.00)	286.311 (1.00)	296.776 (0.99)	269.501 (1.00)	289.851 (1.01)	378.231 (1.28)	387.248 (1.31)	336.367 (1.10)
6.ville	-18.390 (0.59)	40.369 (0.96)	-1.715 (0.08)	-56.540 (0.96)	17.147 (0.63)	20.341 (0.66)	-6.353 (0.30)	1.240 (0.06)	-68.474 (0.98)	-2.522 (0.12)	-25.683 (0.09)	- 153.888 (0.51)	-96.603 (0.30)
d3abis1	-89.075 (1.33)	-91.759 (1.30)	-97.721 (1.34)	-64.546 (1.11)	-86.205 (1.26)	-79.540 (1.30)	-97.718 (1.35)	-89.300 (1.32)	- 170.559 (1.28)	-97.254 (1.35)	-94.290 (0.21)	- 148.589 (0.34)	- 126.287 (0.28)
c30a	24.459												11.992

	(0.66)												(0.16)
c30b		-57.652											-
		(1.14)											119.940
e30			29.884										(1.40)
			(1.09)										69.292
i30				76.978									(0.96)
				(1.06)									69.043
k30					-72.091								-
					(1.17)								147.540
j30a						-74.302							-
						(0.98)							138.915
j30b							-4.170						(1.44)
							(0.50)						10.406
j30e								40.067					(0.10)
								(0.71)					63.978
j30f									94.719				(0.61)
									(1.05)				133.427
d30a										-4.861			(1.77)
										(0.58)			-25.400
c30x											152.100		(0.31)
											(1.98)*		145.760
g30a												233.255	(1.82)
												(2.77)**	258.462
													(2.93)**
_cons	-	-	-	-	-	-	-	-	-	-	-	-	-
	124.054	101.680	130.823	259.461	149.149	84.915	-40.459	207.671	227.966	-35.954	216.758	372.726	503.376
	(0.79)	(0.97)	(1.08)	(1.07)	(1.06)	(0.77)	(0.70)	(0.79)	(1.07)	(0.65)	(0.41)	(0.70)	(0.72)
R <sup>2</sup>	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.05
N	692	692	692	692	692	692	692	692	692	692	692	692	692

Source: Survey of the business climate in Côte d'Ivoire, 2012 / author

**Table 1 : Characteristics of the sample**

<b>Sample size: 727</b>		<b>Formal Entreprises: 414</b>		<b>Informal Entreprises: 313</b>	
	<b>Formal</b>	<b>Informal</b>		<b>Formal</b>	<b>Informal</b>
<b>Town (en %)</b>			<b>Age (en %)</b>		
Abidjan	10,1	14,4	1 à 5 years	36,0	38,0
San-Pedro	8,0	3,8	6 à 10s years	20,5	21,1
Abengourou	21,0	20,1	11 à 15 years	12,1	14,4
Bouaké	23,0	16,6	16 à 20 years	8,5	11,2
Daloa	20,5	20,8	21 à 25 years	6,0	4,8
Korhogo	17,4	24,3	26 à 30 years	5,3	3,2
			> 30 years	11,6	7,3
<b>Status of enterprises (en %)</b>			<b>Firm size (en %)</b>		
Anonymous society	12,3	0,3	Micro	46,2	77,0
SARL	21,3	-	Small	37,9	23,0
Individual business	58,5	93,0	Medium	11,8	-
Partnership	3,4	3,2	Large	4,1	-
Société en commandite	0,5	0,3			
Other	4,1	3,2			
			<b>Sector (en %)</b>		
			Industry	18,6	49,2
			service	81,4	50,8

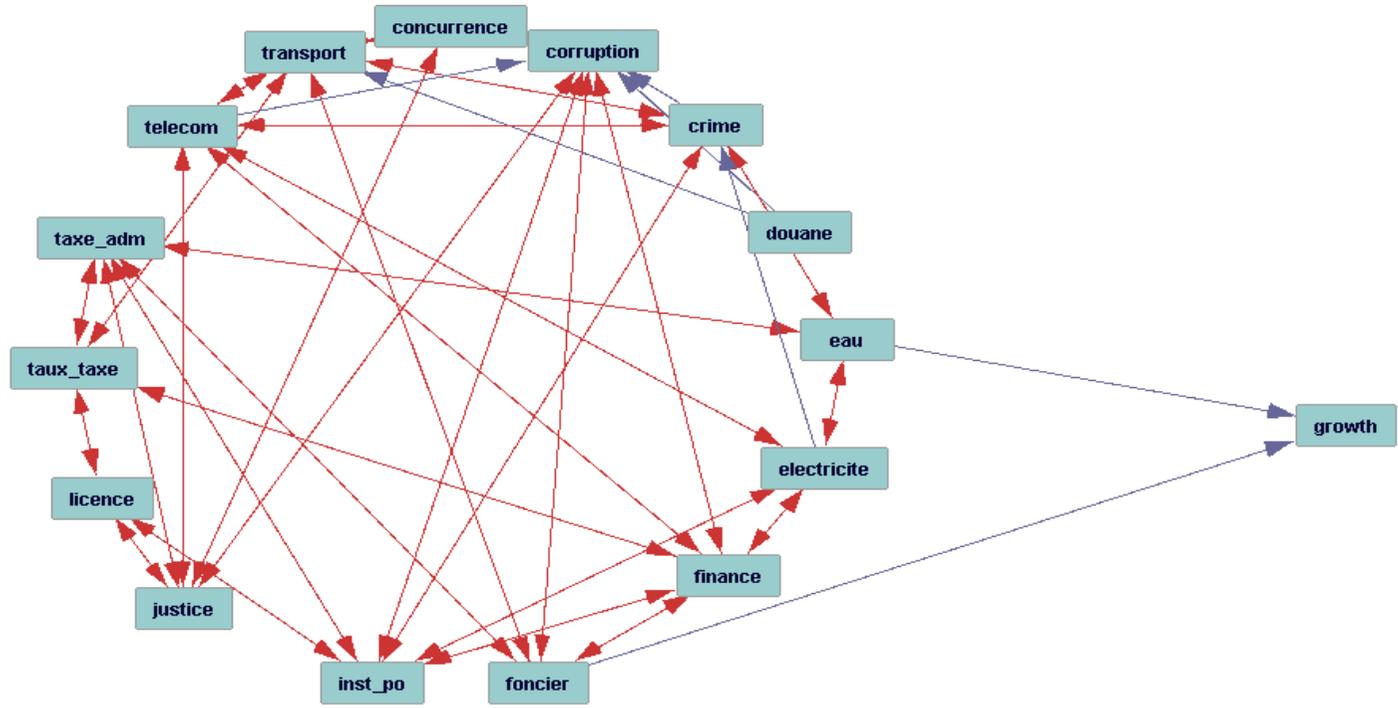
Source: Survey of the business climate in Côte d'Ivoire, 2012 / author

**Tableau 2 : Breakdown of companies according to the origin of the majority shareholders and the size of the company**

Characteristics of companies	Nationality of major shareholders	Micro	Small	Medium	Large	Total
Formal	National	67,5	73,9	59,2	47,1	68,1
	Foreign	14,1	14,6	24,5	41,2	27,1
Informal	National	68,5	93,1	-	-	85,3
	Foreign	14,5	4,2	-	-	26,2

**Source** : Survey of the business climate in Côte d'Ivoire, 2012 / author

Figure 1: Result of estimates by methodology directed acyclic graphs



Source: Survey of the business climate in Côte d'Ivoire, 2012 / author