Productivity and business performance: apprasail of SME in Côte d'Ivoire

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Summary

This paper proposes a nonparametric analysis of the performance of companies in Côte d'Ivoire. The study focuses, initially, on the determination of technical efficiency scores using the Data Envelopment Analysis method (DEA), and econometric modeling the type tobit to determine the factors associated with technical efficiency companies. Our results do not support the conclusion of the technical efficiency of enterprises. Only 12 companies of 727 or 1.67% of our sample companies have reached their production frontier. Among the explanations of business productivity business characteristics (size, nature of business), financial factors (debt burden) and environmental factors (labor movement, strikes and social unrest) predict the level of productivity of firms.

Introduction

The economic performance of emerging countries are increasingly conditioned by the dynamism of the private sector. The latter is regarded as virtually the sole channel for job creation and hence for reducing unemployment. According to the Ministry of Commerce and Handicrafts and the Promotion of SMEs (2013), SMEs generate over 55% of GDP and over 65% of total employment in high-income countries, over 60% of GDP and over 70% of the total number of jobs in low-income countries, and over 95% of total employment and about 70% of GDP in middle-income countries.

In Côte d'Ivoire, the evolution of business activities is closely linked to the different policies implemented and the country's economic performance. For example, the industry has experienced rapid growth in 1960-1980 (regular growth phase), a slowdown from 1980 to 1994 activities (period of slowdown in economic activity), followed by a recovery after the devaluation of the CFA Franc in January 1994. In 1999, the environmental constraints such as the socio-political crisis (1999- 2011) will plunge companies into a severe recession. According to the Chamber of Commerce and Industry of Côte d'Ivoire from 1999 to 2006, it was identified 580 claims. From January 2004 to February 2005, there were 174 companies which have ceased operations, with more than 30,000 lost jobs and a decline of 30 to 40% of the average turnover of the companies in 2005.

At present, facing the internationalization of economies and increased competition, it has become imperative to strengthen its competitiveness by improving productivity. Today, with the post-crisis recovery and in front of the heterogeneity of production between companies, it became crucial for the development prospects of private sector to measure the level of business productivity and understand what factors associated with an increase in productivity among businesses.

Among the explanations of the technical inefficiency of firms, Burkart et al. (1999) identified two main factors: first, productivity may be adversely affected by problems of internal organization (covered in the terminology of Leibenstein (1987)), the X-inefficiency[1] . Companies which make the best profits have no motivation to reduce their management costs and streamline operations. Secondly, the well positioned companies in terms of costs may choose (or are forced to do so, given the pressure of competition) an aggressive commercial policy, detrimental to their profitability. In this context, the key words that should guide companies should be : optimization, organization, computerization and efficiency. Unfortunately, it is clear that companies in Côte d'Ivoire are weakly productive and little competitive at international level.

We try to analyze in this paper, productivity and business performance in Côte d'Ivoire. The aim is to measure the level of business productivity and identify the determinants contributing to improve the efficiency and level of enterprise productivity.

We first present a review of literature on measuring the productivity of firms. The second section presents the data and methodological tools to calculate productivity and identify the factors explaining the productivity of firms. This is part of the nonparametric method called Data Envelopment Analysis (DEA) which is used to measure the efficiency of companies through the estimate of a score. And in other hand, a type of Tobit econometric modeling of scores obtained which will identify the determinants of technical efficiency of sample firms. Section 3 presents the estimation results and Section 4 concludes and provides recommendations.

Literature review

The measurement of productivity is initially appeared first in the work of Koopmans (1951) related to the analysis of production. Debreu (1951) introduced the coefficient of resource utilization. As for Farrell, he established in 1957 that the effectiveness of the firm can be calculated empirically. It offers, for the first time, a method of estimating the efficiency frontier from the observation of real production situations.

[1] This concept has been developed by Leibenstein (1987). It highlights, in his theory that inefficiencies are related to the internal functioning of the firm

Thus, the first steps of the technical efficiency of means of production are traditionally attributed to Farrell (1957). The latter defines efficiency by separating the technical origin of that due to a poor choice in terms of combination of inputs, relative to their price (products). He added that the technical efficiency measure how a firm chooses the quantity of inputs that go into the production process, when the factors of the use of proportions are given.

The methodology border allows the identification, measurement and analysis of technical or productive efficiency. Three types of efficiency can be observed at the enterprise level (Chaffai, 1989):

- Technical efficiency. A firm is technically efficient when it is located on the border; that is to say with a certain amount of factors, it gets the highest level of output;

- The allocative efficiency. It implies that the company minimizes its share of total production costs, and secondly it chooses the level of that which is socially optimal (including a sale price or pricing policy, appropriate);

- The efficiency scale. This is the case of a firm in perfect competition, and operates at an appropriate scale, that is to say, its marginal cost must equal the market price of its product.

In economics, whatever productive activity that is studied, we always think in terms of objectives. The aim of technical efficiency is unique in that it is compatible with the other objectives, whatever their weight, there is no justification for the technical inefficiency (Gathon, Pestieu 1985).

Both methods universally recognized for understanding the production frontier based on a parametric stochastic approach and a non-parametric approach based on data envelopment method (DEA) developed by Charnes et al. (1978) Banker et al. (1984).

In a parametric approach, it is assumed that the boundary is representable by an analytic function depending on a finite number of parameters. The problem is to specify this function and to estimate the parameters, either by statistical methods in econometrics, or by methods from linear programming. In contrast, in non-parametric methods, a particular analytic form for the border is not specified, but the formal properties that all production is expected to meet (puff, 1998). The nonparametric approach stems from the initial work of Farrell and involves using the techniques of linear programming.

It describes the two types of model that we find in the literature: the parametric boundary deterministic and stochastic parametric frontier. The first attributes the gap to the border only to factors that are under the manager's control while the latter assume that there are other factors that

influence the effectiveness and which are not controllable. Based on linear programming, DEA method is also called '' extreme point method '': it determines the border at the top of the comments rather than a regression plane in the center.

In the first variant of the DEA model, we assume that technology is constant returns (The Constant Returns to Scale Model); CCR model (Charnes, Cooper and Rhodes (1978)). In the second, this hypothesis to admit no croissants or variable return is released (The Variable Returns to Scale Model); BCC model (Banker, Charnes and Cooper (1984)).

The choice between the two approaches[2] is not always easy. Bosman and Frecher (1992) recommend to rely on the knowledge that we have the technology of the studied area. These authors believe that when we have a fairly clear idea of what the underlying technology for the agricultural sector and manufacturing industries, for example, the econometric estimation of parametric production frontiers makes sense. By cons, when it comes to a decision unit whose activity is the production of services, a nonparametric approach seems appropriate advantage, since it is not based on explicit assumptions regarding technology and it applies to activities with several outputs and multiple inputs.

Methodology and Data

Determining efficiency by wrapping method data (DEA)

The method of data envelopment (DEA) is based on the principle that a certain number of inputs is used in the production of a determined number of outputs. Thus, a score of efficiency and production capacity is provided for each firm. This measure indicates the individual efficiency level for each unit for a given period and the quantity of inputs used.

The construction of a nonparametric production frontier[3] can be used as reference for all efficiency measures, implies the existence of K inputs and outputs M of N firms over a period t ($t = 1 \ldots . T$). The vectors $x_{it} \in \mathfrak{R}_+^K$ et $y_{it} \in \mathfrak{R}_+^M$ are the inputs and outputs of firm i at time t, respectively. For any period t, the matrix X_t of size ($K \times N$) and y_t of size (MxN) represent the inputs and outputs of the N firms in period t.

The idea of the DEA is to solve for each firm the program simultaneously which determines the vectors of optimal weights of M outputs (u) and K inputs (v) by solving the following mathematical program:

[2] parametric and nonparametric approach
[3] Referring to the model Charnes, Cooper and Rhodes (1978)

$$Max_{u,v}\left(\frac{u'v}{v'x_i}\right)$$

$$\text{sc } \frac{u'y_j}{v'x_j} \leq \mathbf{1} \quad , \quad j = 1, \dots \dots \dots \dots, N \qquad (1)$$

$$u, v > \mathbf{0}$$

This program means that the efficiency of the i-th firm will be obtained as a ratio between outputs and inputs on the condition that this ratio is less than or equal to 1 for all other sample firms. However, this form of the program is quite difficult to solve. She would admit an infinite number of solutions. It can in this case be reprogrammed by introducing a constraint on the components of the vector that v from which $v'x_i = \mathbf{1}$. By changing the notation to differentiate between variables, the new program is then written :

$$Max_{u,v}(u'y_i)$$

$$\text{sc } v'x_i = \mathbf{1}$$

$$u'y_j - v'x_j \leq 0 \qquad j = 1, \dots \dots \dots \dots, N \qquad (2)$$

$$u, v > \mathbf{0}$$

This new program u and v is linear and is therefore easier to solve. The use of linear programming duality theorems lead to the equivalent program (2) in the form of an envelope:

$$Min_{\theta,\lambda}\ \theta$$

$$\text{Sc : } -y_i + Y\lambda \geq \mathbf{0} \qquad (3)$$

$$\theta x_i - X\lambda \geq \mathbf{0}$$

$$\lambda \geq \mathbf{0}$$

Where λ is a vector of N variables of this dual program.

A program of this type must be solved N times; once a sample firm. The estimated value of the obtained scalar variable θ_i gives the estimation of technical efficiency (TE) of firm i at time t.

Force found that the value of θ is between 0 and 1 (0≤θ≤1). The unit value (θ = 1) has a point on the boundary and therefore a technically efficient firm as defined by Farell (1957). If θ <1, the firm is technically inefficient.

The use of fixed inputs and variables contained in vector x is limited to their actual level observed. Then θ indicates the maximum level that the output can reach through the use of all considered inputs. It is, therefore, an analysis based on outputs. The level of technical efficiency of production (which will be denoted $Y_i(TE)^{\uparrow *}$) is the result of the θ value for the observed production of Y.

The method of DEA point out the hypothesis of constant returns to scale, however, the assumption of constant returns is really appropriate if the company operates at optimum level. This is not always the case (imperfect competition, financial, etc.). Banker, Charnes and Cooper (1984) proposed a model to determine if production occurs in a region of increasing returns, constant, or decreasing. Their model leads to decomposition of technical efficiency into pure technical efficiency and scale efficiency. The assumption of constant returns to scale, leads to the measurement of the total efficiency; assuming variable returns to scale leads to that of pure technical efficiency. Thus, the model described above can be modified taking into account the assumption of variable returns to scale. Simply add a constraint $N\mathbf{1}'\lambda = \mathbf{1}$ in the program (3) to give:

$$Min_{\theta,\lambda}\ \theta$$

$$\text{Sc}: -y_i + Y\lambda \geq \mathbf{0} \qquad (4)$$

$$\theta x_i - X\lambda \geq \mathbf{0}$$

$$N\mathbf{1}'\lambda = \mathbf{1}$$

$$\lambda \geq \mathbf{0}$$

Where N1 is a unit vector (N1).

Analysis of the determinants of productivity of firms

After obtaining a measure of production efficiency of firms, we examine factors that determine productivity. We test the factors normally used in the analysis of the determinants of productivity. The economic literature identifies the internal factors including (the size of the company, the level of instruction of the manager, the manager of sex, access to credit etc. Athanasoglou et al. 2006). As external factors , the characteristics specific to the industry within which the firm including competition and macroeconomic variables that reflect the environment in which the institutions operate are identified.

Efficiency is bounded between 0 and 1 in the optical measuring of Farrell or superior to 1 if we consider the perspective of Shepard, it is then appropriate to estimate a Tobit model (Tobin, 1958). This takes into account the limited nature of the explanatory variable.

This model is written in the case of cross-section data as follows:

$$y_i = \max[(1, x_i\beta + c_i + \varepsilon_i])] \quad (5)$$

With y_i the level of efficiency of the firm i in the sense of Farell, x_i is the matrix of explanatory variables for the firm i, β is the vector of coefficients for each firm i. $c_i | x_i \sim N(0, \sigma_c^2)$, the random effect that takes into account factors not specified by the firm i and $\varepsilon_i | x_i \sim N(0, \sigma_c^2)$, $c_i \sim N(0, \sigma_c^2)$ the random residual model.

Another solution to model the limited variables between 0 and 1 is supplied by the betareg (Cribani-Neto et al, 2004). We will retain the estimation of a Tobit model to analyze the determinants of productivity of firms.

Data

Our data come from the survey of the Côte d'Ivoire business climate for 2012. The main objective of the survey was to identify barriers to the performance of the company in Ivory Coast. Thus, the survey contains a number of questions about the nature and severity of obstacles, such as infrastructure, crime, macroeconomic policies, corruption, deficiencies in legal systems and financing. The database also contains information on business characteristics, such as property, sales, employment and growth. The data also indicate if the company is national or not and also the sector in which it operates. The data can also apprehend the firms sales volume and the inputs used in their sales process. In total, almost 727 companies were interviewed, the number varying according to region. Data were collected through personal interviews conducted with business leaders. Besides this, these data allow to know the level of sales of goods and services of companies and all costs incurred by them.

Results

Measuring technical efficiency of firms by the DEA approach

Table 1 provides the characteristics of firms according to the different technical efficiency scores calculated. The analysis of technical efficiency was made according to the input-oriented approach; ie, we understand business efficiency from excess inputs used by firms. The technical efficiency

scores were calculated according to that we make the assumption of constant returns to scale (CRS) or variable returns to scale (VRS).

Table 1: Results of the average scores of efficiency following the technique DEA approach

	CRS				VRS				I_TE[4]
	Moy	sd	25%	75%	Moy	sd	25%	75%	Moy
Score	0,738	0,083	0,687	0,788	0,811	0,080	0,756	0,865	7,3%
service	0,764	0,074	0,713	0,810	0,811	0,080	0,756	0,865	4,6%
industry	0,725	0,084	0,674	0,780	0,774	0,095	0,720	0,832	4,9%
Micro	0,732	0,082	0,682	0,783	0,790	0,085	0,745	0,841	5,8%
small	0,739	0,085	0,697	0,788	0,756	0,090	0,705	0,809	1,7%
medium	0,767	0,080	0,728	0,813	0,838	0,085	0,779	0,900	7,2%
Great	0,778	0,058	0,732	0,832	0,932	0,075	0,912	1,000	15,4%
Exporter	0,777	0,085	0,715	0,834	0,846	0,099	0,774	0,838	6,9%
No Exporter	0,736	0,083	0,686	0,787	0,783	0,091	0,731	0,837	4,7%
Abidjan	0,728	0,066	0,685	0,752	0,785	0,079	0,736	0,818	5,7%
San-Pedro	0,736	0,113	0,663	0,813	0,790	0,137	0,677	0,918	5,4%
Abengourou	0,739	0,087	0,684	0,810	0,800	0,102	0,745	0,886	6,1%
Bouaké	0,766	0,080	0,714	0,808	0,789	0,083	0,735	0,844	2,3%
Daloa	0,716	0,078	0,667	0,769	0,778	0,089	0,726	0,834	6,2%
Korhogo	0,736	0,078	0,689	0,781	0,775	0,081	0,723	0,830	3,9%
Woman	0,730	0,077	0,679	0,765	0,780	0,087	0,728	0,835	5,0%
Man	0,739	0,084	0,688	0,790	0,787	0,093	0,733	0,840	4,8%

Source: Author / business climate in 2012

In general, the score of technical efficiency of enterprises is 79% with a less dispersion of productivity among businesses. Nearly 25% of firms in our sample have a lower productivity than or equal to 75% and almost 75% of companies have an estimated productivity of 86%. It is clear from the analysis that

[4] I TE denotes the technical efficiency obtained from the difference between the technical efficiency with variable returns to scale (VRS) and technical efficiency at constant returns to scale (CRS). For more detail or Tim Coelli, (2008).

the majority of firms in the sample have not yet reached their production frontier. In other words, these companies use more than a factor of production (inputs) for little return (output). In other words, these companies are inefficient in the sense of Farell. The calculated technical inefficiency was 7.3%; it would mean that companies can still increase productivity level of 7% with the same level of inputs they hold.

Also, one of the objectives of our study was to analyze the productivity of companies by the sectors. We notice that the service sector firms are more productive than industry sector companies. There is a 3.63% difference in productivity between companies in the two sectors. Furthermore, they can further improve productivity of 4%.

A comparison of productivity by size shows that productivity is a function of firm size. Companies that have a larger size has a significant level of productivity (93%), while small companies have lower productivity (75%). However, Table 1 shows that the productivity of large enterprises should be further improved with the same factor of production they have. Indeed, they could increase their productivity by 15% while the smaller by 1.7%.

The productivity analysis depending on the nature of the activity (ie. Exporter or not) shows greater technical efficiency among exporters that among non-exporters. Several authors have confirmed the thesis that companies that export benefit from scale efficiencies linked to their different activities (Bernard and Jensen (1995) and Aw, Chen, and Roberts (2001)). For others, companies which face foreign competition are forced to improve their productivity(Kraay (1999) and Van Biesebroeck (2003)). Furthermore, the technical inefficiency of exporting companies is located at 6.9% against 4.7% for non-exporters.

In addition, productivity analysis by geographical location allows us to understand the company's productivity level per region. For Liedholm and Mead (1999), a company that operates in major cities will not have the same level of productivity than those located in secondary or rural towns. Thus, it is apparent from Table 1, for 2012, the most productive companies are located in the city of Abengourou (80%) followed by the city of San Pedro (79%), Bouake (78%), Abidjan (78.5%), Daloa (77.8%) and Korhogo (77.5%). Also, the variability (below 10%) of productivity per region remains fairly low level indicating a relatively identical productivity across cities.

The study by gender shows a relatively similar productivity between businesses run by men and businesses run by women. Furthermore, the technical inefficiency is more pronounced among businesses run by women than those managed by men. From the results of Table 1, women can improve their productivity by around 5% 4% for men. The technical inefficiency of firms managed by

women is explained by the fact that businesses run by women are often micro enterprises, which are subject to many constraints (Liedholm and Mead 1999).

The determinants of technical inefficiency of firms

The analysis of the determinants of technical inefficiency brings out the inefficiencies of companies. Technical efficiency of enterprises depends on both their internal behavior of the influence of the environment in which they operate. The object here is to understand the impact of these two components through a set of variables.

Three types of factors were taken into account this analysis. These include environmental factors with, for example, civil unrest, strikes, and labor movements, too, factors related to manager's abilities and characteristics of the firm including the experience of the manager, his level instruction, company size, and finally, financial factors measured through the amount of loans contracted by the company, and the bank overdraft and guarantees required by the bank.

The table below shows the determinants of technical efficiency of enterprises for the year 2012. We will limit ourselves in this section the results of the equation[5]

[5] The dependent variable is measured through the ratio CRS / VRS measuring the ration of technical efficiency of enterprises. According to Tim Coelli (2008), CRS technical efficiency can be decomposed as the product of pure technical efficiency (VRS) and technical efficiency of the firm (SCALE).

Table 2: Determining the corporate technical inefficiency

		[1]	[2]	[3]
	Manager_Experience	0.001	0.001	0.000
		(1.68)*	(1.37)	(0.97)
	Woman_Manager	0.000	0.002	-0.002
		(0.05)	(0.20)	(0.43)
	Primary/coranic	-0.006	-0.007	0.001
		(0.61)	(0.69)	(0.29)
	secondary	-0.005	-0.008	0.004
		(0.49)	(0.75)	(0.98)
	Supérior	-0.030	-0.037	0.007
		(2.68)***	(3.12)***	(1.40)
	Small	0.012	-0.028	0.051
		(1.78)*	(3.96)***	(17.33)***
	Medium	0.060	0.073	-0.010
		(4.57)***	(5.22)***	(1.69)*
	Great	0.054	0.156	-0.084
		(2.50)**	(6.54)***	(8.88)***
	Industry	-0.030	-0.026	-0.007
		(4.26)***	(3.43)***	(2.29)**
	Exporters	0.031	0.027	0.004
		(1.85)*	(1.51)	(0.58)
	Bank overdraft	-0.026	-0.025	-0.005
		(2.72)***	(2.42)**	(1.08)
	loan tot amount	-0.000	0.000	-0.000
		(0.75)	(0.83)	(2.92)***
	ollateral requirements	-0.000	0.000	-0.000
		(0.38)	(0.08)	(1.18)
	disorder	-0.000	0.000	-0.000
		(0.96)	(1.80)*	(7.67)***
	absenteeism	0.000	-0.000	0.000
		(0.29)	(0.12)	(0.92)
	_cons	0.760	0.813	0.935
		(74.86)***	(75.05)***	(209.59)***
Sigma	_cons	0.078	0.084	0.034
		(37.86)***	(37.54)***	(37.86)***
N		722	722	722

Source: Author / business climate in 2012.

* P <0.1; ** P <0.05; *** P <0.01

Note: [1] the estimate was made by me assumption of constant returns to scale, [2] the estimate was made on the assumption of variable returns to scale [3] the dependent variable is the technical efficiency ratio (SCALE)

According to the results of Table 1, concerning the characteristics of the manager, we find that his experience and education level have no significant influence on the company's technical efficiency. Therefore, the company's productivity can not be explained by either their level of experience or by level of education. Moreover, the size of the company has a significant influence on the level of business productivity. Small businesses are more likely to increase their level of productivity that micro enterprises, while large and medium-sized enterprises are less likely to increase their level of productivity that businesses microphones.

Also, the sector of activity the firm seems to have a significant influence on the level of business productivity. Indeed, we note that companies operating in the industrial sector are less likely to increase their productivity than those in services.

On financial factors, only the weight of the debt of companies with a significant and negative impact on the level of business productivity. Plus the amount of the debt contracted by the firm, the greater its technical efficiency is reduced.

Regarding environmental factors, social factors such as strikes, labor movements, civil disturbances reduce business productivity. Absenteeism agents for reasons of illness has no effect on business productivity.

The literature provides a set of factor explaining the determinants of business productivity and that are consistent with our results. For example, a number of authors have shown the beneficial effects of exports on total productivity of business factors. (Kraay, 1999; Blalock and Gertler, 2004; Fernandes and Isgut, 2006)[6] .Also, several authors have shown that over the business environment has deteriorated, most companies operate in an uncertain and consequently reduce their productivity level (Hallward-Driemeier, et al. , 2003; Dollar, et al, 2005).. Furthermore, our results are not in line with those of (Tan and Lopez-Acevedo, 2002; Aw et al., 2005). Indeed, they have shown the positive influence of the manager's level of education on its ability led the company which does not seem to be the case according to our estimates.

As limitation of this paper, productivity analysis must be done in a more dynamic and not static framework as is the case with our data since it is normal for birth businesses have a low level of

[6] See Wagner (2006) for details

productivity more than which have existed for several years. However this study to have a better visibility on the level of business productivity and their main determinants

Conclusion and Recommendations

The aim of this study was to measure the level of business productivity through the calculation of efficiency scores and identify the factors explaining the level of productivity of companies in Côte d'Ivoire. For this, the study uses a nonparametric approach namely the Data Envelopment Analysis method (DEA), and econometric modeling the type tobit to determine the factors associated with the technical efficiency of enterprises.

Our results do not support the conclusion of the technical efficiency of enterprises. Only 12 companies of 727 or 1.67% of our sample companies have reached their production frontier. Among the explanations of business productivity, business characteristics (size, nature of business), financial factors (debt burden) and environmental factors (labor movement, strikes and social unrest) predict the level of productivity firms. Moreover, neither the experience nor sex, nor the manager's education level can predict the level of business efficiency.

This observation leads to a number of recommendations which are summarized below. The first is the need for weight reduction in overheads. Indeed, the importance of these overhead costs (mainly wage costs and costs of physical capital) reduces efficiency despite a high level of output. In other words, the human and material used have low productivity compared to the new demands of the competitive environment. This poor result from either overstaffed or inadequate qualification. The management of a qualifying labor proves a necessity to increase the level of business productivity; human capital plays a crucial role in the performance. Today, the private sector is facing a major challenge of sustainability expertise and rigorous management skills.

Preferably, companies must reassess their positioning to respond to major changes in the environment or in anticipation of high internal stresses. Indeed, in an uncertain economic environment, companies must develop innovative strategies in several dimensions. Thus, any internal restructuring should aim the improvement of pure efficiency. In this regard, it would be desirable to target best practices in identifying operational performance adjustment opportunities and developing specific actions that would generate positive change.

Finally, the low level of productivity of firms is attributable to the weakness of productivity gains. To solve this problem, it would be very helpful if companies follow the specific technological developments in trade. A process of internal benchmarking the sector is needed. Indeed, competition between companies require sector institutions to optimize their costs and their organization. In this context, the benchmarks help to compare with best practice and can thus analyze the gaps with its competitors. Meanwhile, they provide predetermined specifications to facilitate the structuring and implementation of a discipline based on the cost measuring their evolution in time and space.

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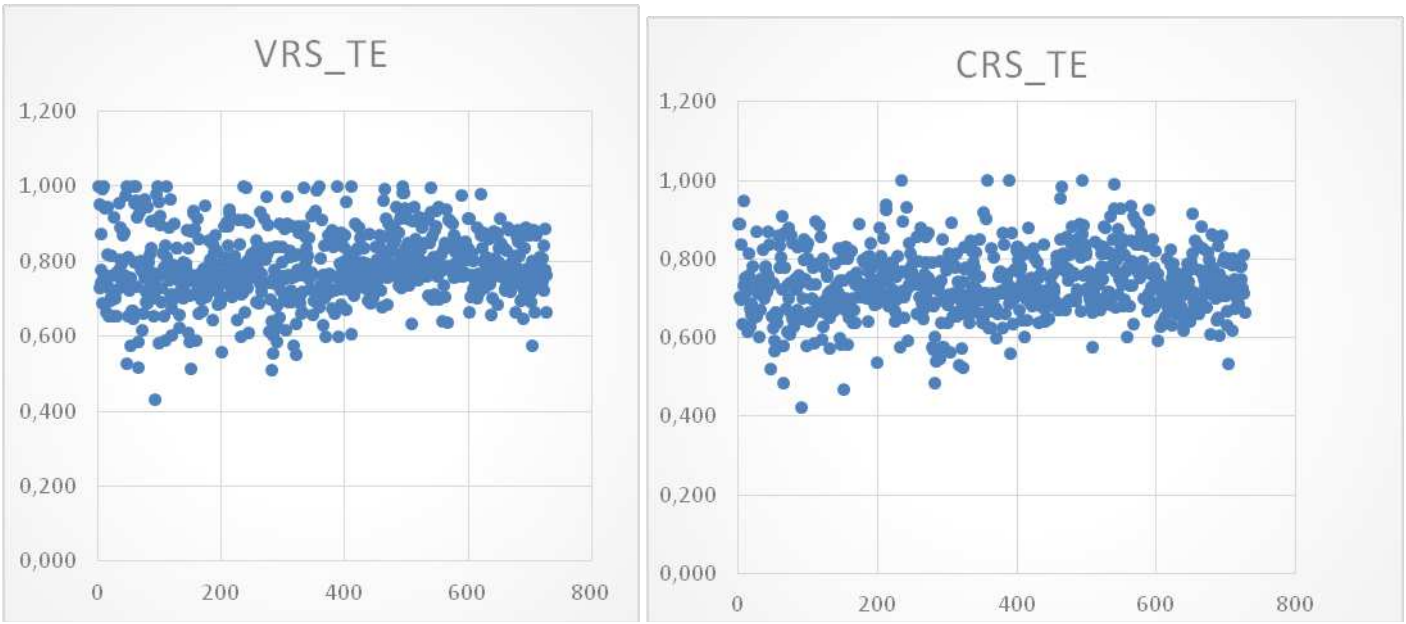
ANNEX

Figure 1: Cloud points of efficiency scores of firms in 2012



Source: Author / business climate in 2012

TableA1 : Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Log_Ventes	727	16,01	2,48	11,41	27,30
Log_Capital	727	13,67	1,94	8,41	23,80
crs_te	727	0,74	0,08	0,42	1,00
vrs_te	727	0,79	0,09	0,43	1,00
nirs_te	727	0,79	0,10	0,42	1,00
scale	727	0,94	0,05	0,73	1,00
Chef_femme	727	0,14	0,35	0,00	1,00
Auc_Niveau	727	0,13	0,34	0,00	1,00
Sec	727	0,29	0,45	0,00	1,00
Sup	727	0,33	0,47	0,00	1,00
Prim_Cor	727	0,24	0,43	0,00	1,00
ISO	727	0,03	0,18	0,00	1,00
Site_Web	727	0,10	0,30	0,00	1,00
Internet	727	0,24	0,43	0,00	1,00
achat_line	727	0,11	0,31	0,00	1,00
vendre_line	727	0,10	0,31	0,00	1,00
Rech_Dvpt	727	0,17	0,37	0,00	1,00
Telph	727	0,95	0,22	0,00	1,00
Export	727	0,04	0,20	0,00	1,00
Dec_banc	727	0,13	0,34	0,00	1,00
Credit	727	0,07	0,25	0,00	1,00
prêt_pers	726	0,15	0,36	0,00	1,00
Demde_prêt	727	0,17	0,37	0,00	1,00
strike	727	3,26	32,08	0,00	800,00
crise_2011	727	42,72	54,43	0,00	365,00
trouble_so~x	727	2,49	14,35	0,00	240,00
absenteeism	727	0,99	3,68	0,00	60,00

Source: Author / business climate