

Research Article

CORRUPTION AND BUSINESS GROWTH: THE CASE OF AFRICAN FRANC ZONE COUNTRIES

* DONTSI

Professor at the FSEG of the University of Yaounde II, Cameroon.

Received 24th May 2024; Accepted 25th June 2024; Published online 30th August 2024

ABSTRACT

This paper analyses the impact of corruption on the growth of companies in African countries of the Franc zone. The analysis shows that the 14 African countries of the Franc zone are more corrupt than the countries of North Africa and that some Anglo-Saxon African countries. These countries therefore have much lower business growth than those two African group countries. Theoretically, we used a Cobb-Douglas production function to establish a relationship between the corruption rate and the added value of the firm. The econometric analysis has shown that corruption is negatively and significantly correlated with the growth of the added value of Franc zone companies. For example, a decrease in corruption to a 10%, leads to an increase in overall added value of 1.35 percentage point. This result implies some economic policy recommendations, in particular the establishment of transparency and competence in the award of public contracts.

Keywords: Corruption, Bribery, Value added, Human Capital, Business growth, public goods.

J.E.L. classification: D24, D73, H41, O43.

INTRODUCTION

In every country in the world, every company has relationship with its suppliers, its customers and possibly its banks. But the company also has relationship with public administrations (payment of taxes, requesting the necessary authorizations and approvals provided for by the laws and regulations, submission to administrative procedures, etc.). In order to facilitate obtaining some of these public services, the company often uses corruption, which occurs when bribes are paid to public officials in order to obtain preferential treatment or to circumvent the regulations in force (Kaufmann and We, 1999; Lui, 1985). Some companies are even suppliers to the state. They often have to pay large sums of money to obtain public contracts or to be paid after receiving their services. Otherwise, the interest paid on bank loans increases.

The effects of corruption on economic growth have been analyzed by several authors. For some, corruption has long been presented as a mean to compensate for the deficient functioning of public institutions (Lowallée and Roubaud, 2012). Corruption would thus be a way of 'oiling the wheels' of economic activity in countries characterized by a slow and fussy bureaucracy (Leff, 1964; Leys, 1965; Huntington, 1968; Lui, 1985; Flatters and Macleod, 1995). Some analysts suggest that corruption is positive for growth in contexts where institutions do not play their full role (Yéon and Sékkat, 2005; Méon and Weill, 2010; Mendez, 2006; Egger and Winner, 2005; Aidt and Dutta, 2008; Houston, 2007).

Other authors, however, demonstrate that corruption has a direct negative impact on economic growth and development. Corruption leads to a misallocation of resources and diverts talent and resources away from products and towards rent-seeking activities (Marw, 1995; Tanzi, 1997; Gupta, 2000; Ali and Isse, 2003; Gymiah-Bremong, 2002; Guetat, 2006; Anoruo and Braha, 2005; Aysan, Nabin and Varoudakis, 2007; EL Jabri and EL Khider, 2020).

While there is an extensive literature on the relationship between corruption and economic growth, very few studies have, to our knowledge, looked at the link between corruption and business growth, as there is a close relationship between business growth and economic growth.

The objective of this paper is to conduct research on the link between corruption and business growth in African countries of the Franc zone, an economic zone composed of 14 countries, 6 of which are in Central Africa and 8 in West Africa, whose exports consist largely of natural resources and/or agricultural products. Their market share in manufactured goods and services exports is very reliable (0.18% for manufactured goods, and 0.17% for services for the period 2003 - 2005).

This objective leads us to ask the following research question: **"What is the impact of corruption on business growth in African Franc zone countries?"**

The choice of the Franc zone is based on the fact that the debate has not yet been settled on the benefits of a country's membership of this economic zone. A study of the state of play will make it possible to examine the situation of corruption as well as the growth of enterprises within the Franc zone (I). A review of the literature is necessary to provide a modest added value to the analyses carried out so far (II). This review will lead to the most appropriate methodology for this work (III). The econometric regression will lead to a discussion of the results and to policy recommendations, thus concluding the analysis (IV).

CORRUPTION AND BUSINESS GROWTH: STILYZED FACTS

According to El Jabri and El Kittidir (2020), corruption is endemic and widespread in most African countries. In the same way, the United Nations Office on Drugs and Crime (UNODC) reports that the education and health sectors are not spared from corruption.

*Corresponding Author: DONTSI,

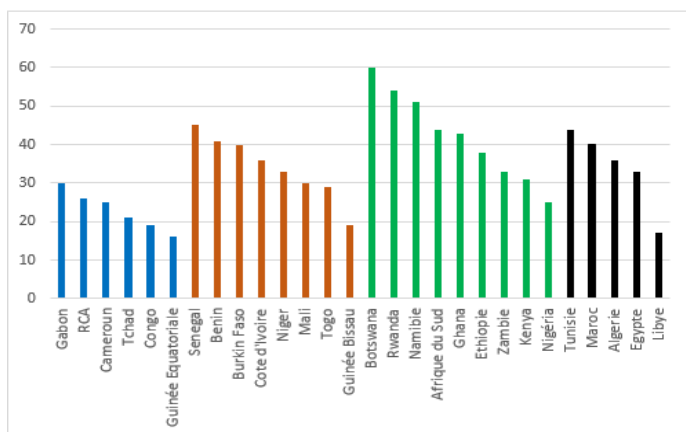
Professor at the FSEG of the University of Yaounde II, Cameroon.

Academic fraud, considered a serious threat to the integrity and reliability of higher education diplomas, is rampant in many African countries. As a result, young people leave school with few skills and contribute very little to economic growth (UNODC, 2015).

According to the same source, in some African countries the health system is perceived as the most corrupt public service institution. According to the World Health Organisation (WHO), countries with the highest levels of corruption are those with the highest child mortality rates (WHO, 2009). In the case of Cameroon, for example, which is twice cited as the most corrupt country in the world, the 10^{eme} annual report 2020 of the National Anti-Corruption Commission (CONAC) indicates that corruption is far from being eradicated in this country. It affects all areas of activity, including finance, land, justice, education, health, public procurement, public works and especially law enforcement (CONAC, 2020). In the law enforcement sector, only 500 CFA francs, i.e. less than 1 Euro, is needed to bribe a police officer when driving a vehicle without a license or insurance. As a result, the majority of motorcyclists do not have any documents required for driving.

The case of the Franc zone in general is also worrying. Corruption is rampant in all 14 African countries of the zone, with magnitudes that generally differ from one country to another. Figure 1 shows the corruption perception index for the year 2020 in the Franc zone countries as well as in other African countries considered for comparison.

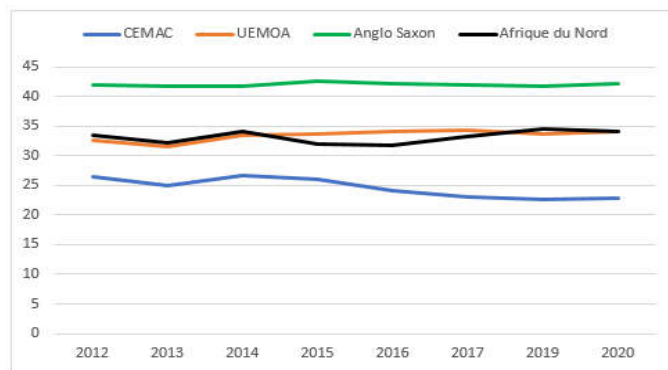
Figure 1: Corruption perception index in selected African countries in 2020



Data source: Transparency International (2020).

Figure 1 shows that the Economic and Monetary Community of Central Africa (EMCCA) countries are the most corrupt countries in Africa, followed by the West African Economic and Monetary Union (WAEMU) countries. The Anglo-Saxon countries are the least corrupt. North Africa has about the same corruption scores as the WAEMU in 2020.

Figure 2: Evolution of the corruption index in Africa by country group



Source of raw data: Transparency International (2020).

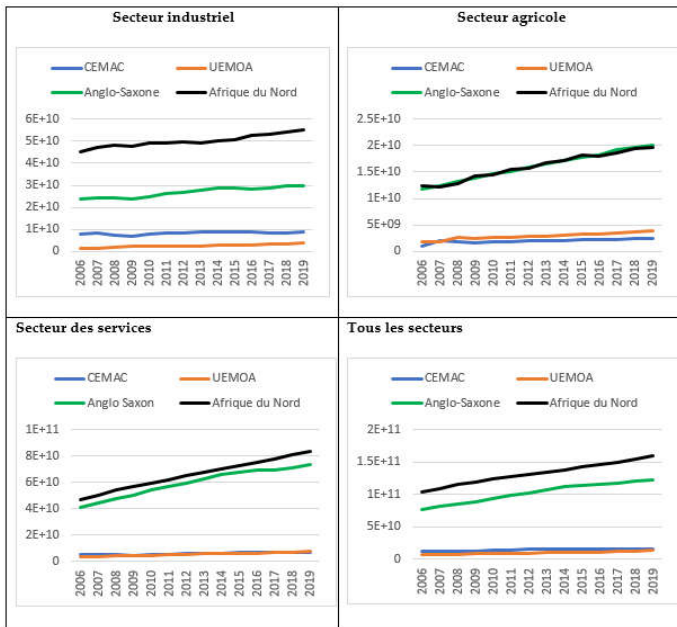
The evolution of the corruption index in African countries is shown in Figure 2 for the period 2012 to 2020. This graph is plotted using data from Transparency International.

According to Figure 2, EMCCA countries are the most corrupt countries not only in the Franc zone, but also in the four sub-regions represented. More seriously, the curve representing the corruption index in EMCCA is decreasing, unlike in all other sub-regions. This means that the phenomenon is becoming more and more widespread in EMCCA over time. Countries in the WAEMU sub-region are less corrupt than those in EMCCA. The corruption index in the WAEMU has about the same level and evolution as in the North African countries. The representative curves of the corruption index in WAEMU and North Africa are almost merged with almost zero slopes. The Anglo-Saxon countries have much more integrity than the Franc zone and North African countries. Thus, it can be seen that the countries of the Franc zone are countries where corruption is rife in almost all areas of economic activity. This scourge exists in this zone with greater acuity than in Anglo-Saxon countries. This raises the question of whether this phenomenon of corruption has an impact on the growth of companies in this economic area.

The growth of the company can be defined as the sustainable quantitative development, i.e. the modification of its size (number of employees, turnover, market shares, etc.) (Silem and Albertini, 1989). The relevant indicators for measuring the growth of a company can therefore be: production and thus turnover, value added, number of employees, market share, exports and increase in the stock of productive capital. The assessment of the growth of enterprises in the African countries of the Franc zone is based on two of the indicators mentioned above, namely value added and exports, for which statistics are available for several countries. We proceeded by calculating the average value of these indicators for each of the sub-regions. Figure 3 shows the evolution of value added by sector of activity and by group of countries.

Figure 3 shows that the value added of the industrial sector is very high in North Africa, followed by the Anglo-Saxon countries. On the other hand, the value added of the countries of the two sub-regions of the Franc zone is very low. The industrial sector in the EMCCA zone has a consistently higher value added than in the WAEMU zone. More seriously, the value added of the industrial sector of the African countries of the Franc zone (EMCCA and WAEMU) has a constant evolution (horizontal curves) whereas for the Anglo-Saxon and North African zones, the curves representing the value added of the industrial sector are increasing. It can be concluded that firms in African Franc zone countries have almost zero growth compared to those in Anglo-Saxon and North African countries.

Figure 3: Evolution of value added by sector of activity and by country group



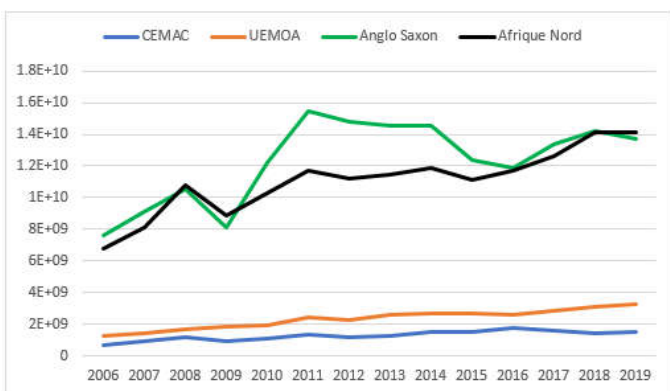
Data source: World Development Indicators (2020)

The same observation is made with regard to the agricultural sector. The curves representing the value added of this sector in the Anglo-Saxon and North African countries practically merge, remain well above those relating to the African countries of the Franc zone, and are increasing with a very high growth rate (steep slope). The WAEMU zone is slightly above the EMCCA zone; the two curves representing the value added of the agricultural sector are weakly increasing (practically zero slope).

The same conclusions are drawn with regard to service sector value added and overall value added. The representative curves of these two indicators are almost merged, horizontal, and close to the x-axis for the two sub-regions of the Franc zone. On the contrary, they are parallel, very high and strongly increasing for the Anglo-Saxon countries and for North Africa.

With regard to exports, we have preferred to consider non-fuel exports for the purpose of comparison because the oil sector is strongly controlled in each country by the government. The evolution of non-fuel exports is shown in Figure 4.

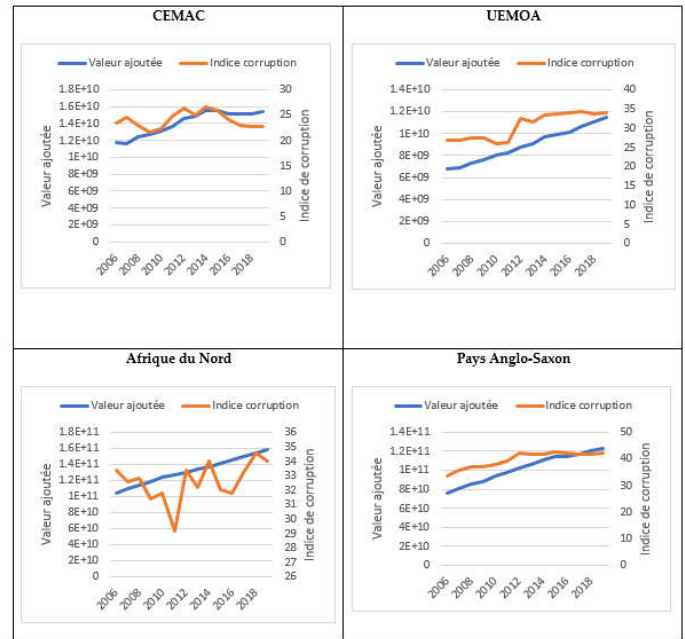
Figure 4: Evolution of non-fuel exports (in constant dollars) by country group



Source of raw data: UNCTAD database (2020).

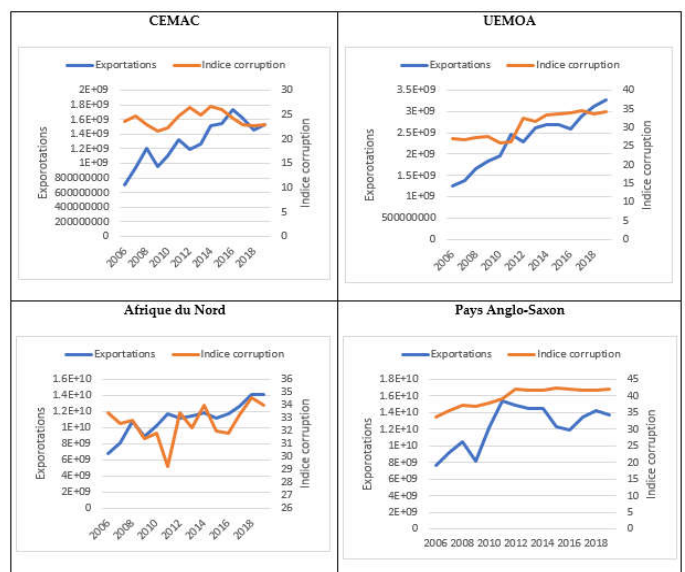
Figure 4 shows that, in terms of exports, the EMCCA zone is still mediocre compared to the Anglo-Saxon countries and North Africa. Within the latter, exports from the WAEMU zone are consistently higher than those from the EMCCA zone. The two curves representing the Franc zone are almost parallel, close to the x-axis, very slightly increasing. While the curves representing exports from Anglo-Saxon countries and North Africa are high and strongly increasing.

Figure 5: Comparative evolution of the corruption index and total value added (in constant dollars)



Data source: World Development Indicators (2020) for value added; Transparency International (2020) for corruption.

Figure 6: Comparative evolution of the corruption index and non-fuel exports (in constant dollars)



Source of raw data: UNCTAD (2020) database for exports; Transparency International (2020) (2020) for corruption.

In order to see the effect of corruption on the indicators analysed below, it would be better to put the corruption perception index and these indicators on the same graph. This is what we have done in Figures 5 and 6

The relationship between the corruption index and value added is shown in Figure 5.

Figure 5 shows that there is a strong correlation between the corruption index and total value added in the EMCCA and WAEMU sub-regions, but also in the Anglo-Saxon countries. The increase in the corruption index, which means more integrity in the country, is accompanied by an increase in value added in these three economic areas. The effect of corruption on value added is no longer clear for North Africa. In this group of countries, value added has been steadily increasing, while the curve representing the corruption index is up and down. In relation to exports, Figure 6 shows the effect of corruption on this indicator.

Figure 6 shows that the corruption index has a positive effect on the value of non-fuel exports in the Franc zone. The representative curves of the corruption index and non-fuel exports move in almost the same direction in the EMCCA and WAEMU sub-regions. This result does not hold for North African countries and Anglo-Saxon countries. In the first case, exports are almost increasing while the corruption index is fluctuating. In the second case, it is the corruption index that is increasing while exports are fluctuating.

REVIEW OF THE LITERATURE

Many studies have looked at the analysis of corruption in various economic spaces. Some of these studies have focused either on the causes and manifestations of corruption, or on the fight against it. But most have analysed the relationship between corruption and economic growth or the relationship between corruption and development or human development. Few studies have analysed the effect of corruption on firm growth. Both theoretical and empirical analyses of this effect exist, but most have not been formalised.

Theoretical analysis

At the level of firm growth, there is a fairly recent literature that analyses the impact of corruption on firm growth. According to Chêne and Hodess (2014), corruption has a corrosive impact on firms' activities in the long run. Indeed, even small facilitation payments used to circumvent the administrative burden imposed on businesses by excessive bureaucracy can have a negative impact on business operations and the business climate.

In addition, at the company level, corruption increases costs and introduces uncertainty, reputational risk and vulnerability to extortion. It depreciates the value of the company and makes access to capital more expensive. It impedes fair competition (Transparency International, 2009). In the same way, a report by Price Waterhouse Coopers shows that companies lose significant business opportunities because of corruption. A survey by this institution of 390 business leaders in 14 countries confirms the high price companies pay in terms of market distortions, reputational damage, legal risks and deterioration of internal structures (Pricewaterhouse Coopers, 2008). Furthermore, a study on the comparative impact of the effects of bribery (bribery tax) and administrative burden (time tax) shows that only the "bribery tax" seems to have a negative impact on firm productivity, while the impact of the "time tax" is almost insignificant (De Rosa, Goorochurin and Gorg, 2010).

For some authors, corruption discourages business investment in the sense that the various forms of taxation increase uncertainty about the return on capital invested and increase the cost of production. Corruption is thus seen by firms as a tax on capital that is uncertain

and unpredictable and therefore difficult to internalise (Mauro, 1995; Tanzi and Davoodi, 2002).

Empirical analyses

Some authors have shown empirically that corruption reduces the productivity of capital and is an important element in the decision-making process of investors. In this sense, Lambsdorff (2003) shows that an increase in corruption by one point (and thus a decrease in the corruption index by one point on a scale of 0 (very corrupt) to 10 (very honest)) reduces productivity by 4 Gross Domestic Product (GDP) points and net capital inflows by 0.5% of GDP. In the same way, Guetat (2006) and Gymiah-Brempong (2002) find that corruption negatively impacts investment and consequently slows down growth in MENA countries. Finally, Anoruo and Braha (2005) suggest through their analysis that corruption hinders the growth of African economies directly through the reduction of productivity by 0.87% and indirectly through investment, which falls by 4.69%.

In the specific case of businesses, empirical studies show that their growth is negatively impacted by the scourge of corruption. In this sense, business surveys conducted in Africa in 2007 indicate that petty corruption may account for the equivalent of 2.5% to 4.5% of sales (Clarke, 2008). Similarly, corruption is likely to have a negative effect on business growth. For example, a study of Dutch firms found that the number of bribes is negatively correlated with firm growth and that bribery has a much more negative effect on growth than taxation (Fisman and Skensson, 2007).

On the other hand, a study of companies in 13 Latin American countries shows that those in the most corrupt countries are less efficient and require more human resources to produce the same results (Rossi and Dal Bo, 2006). The authors conclude that corruption diverts funds from management, supervision and coordination of production processes, forcing companies to call on additional resources to compensate for the defective coordination and resulting inefficiency (Chêne and Hodess, 2014).

In addition, Balamoune-lutz and Ndikumana (2007) show from a sample of 33 African countries that corruption has a positive effect on public investment and a negative effect on private investment. The positive effect on public investment is related to rent-seeking, while private investment is affected by uncertainty and high production and transaction costs in the presence of corruption.

In short, most analyses conclude that corruption has a negative impact on firm growth. However, some marginal analyses have obtained contrary results, showing that in some cases and under certain conditions, corruption has a positive effect on firm growth. In this sense, Vial and Hanoteau (2010), using a panel of Indonesian manufacturing firms during the Suharto reign, find a positive relationship between corruption and firm revenue on the one hand, and between corruption and labour productivity on the other. They find that firms with higher bribe rates (relative to value added) have better performance and higher productivity growth. On the whole, the current theoretical and empirical analyses have not been formalised with regard to the growth of firms, whereas this formalisation has been done in the analyses of the impact of corruption on economic growth. We will try to fill this gap by considering a representative firm in the economy.

Formalisation

To formalise the model, we will consider that the production function of the representative firm is of the Cobb-Douglas form. This function

has three factors of production: capital (K), labour (L) and public goods (G).

The public good is the whole of the infrastructures implemented by the State which are used without exclusion by the companies (roads, telecommunications, ports, airports, hospitals, etc). The stock of public capital is in fact an important factor of production for the firm. For example, the poor state of roads causes enormous damage to the firm for the transport of both inputs and finished products. The cost of transport in this case is a significant proportion of the cost of manufacturing. It is as if the firm buys a third factor of production in the market, namely communication infrastructure. The purchase cost of this factor is the sum of all the expenses related to the quality of the infrastructure. This cost is therefore high for poor quality and low for good quality.

The production function of the representative firm is therefore written as follows:

$$Q_t = AK_t^\alpha L_t^\beta G_t^\gamma \tag{1}$$

With $0 < \alpha < 1$, $0 < \beta < 1$ and $0 < \gamma < 1$

Q_t is the company's output.

K_t represents the private capital stock.

L_t is employment.

G_t represents the public capital stock.

A is the scaling parameter.

α , β , and γ are the elasticities of output to different factors.

However, it is preferable to consider in equation (1) Q_t as the firm's value added rather than its output. Indeed, the real output of a firm is its value added. For example, the baker produces bread but buys the flour from the miller. He needs the factors of production to transform the flour already produced elsewhere into bread. His real output is the value added, i.e. the new value created during the production process. In the following we will consider Q_t as the value added of the representative firm.

At the level of theoretical analysis, it has been shown that production increases the cost of capital. It has thus been considered for firms as a tax on capital (Mauro, 1995; Tanzi *et al.*, 2002). Thus, if K_t denotes the capital needed for a firm's level of production in an honest country (absence of corruption), the firm operating in a corrupt country and paying various bribes will only use a fraction a of the capital K_t to actually produce the good and service. The part $(1-a) K_t$ is used in corruption (with $a < 1$).

Similarly, we also noted above that according to UNODC (2015) corruption in education leads to young people graduating with few skills; contributing very little to economic growth. The human capital (skill) actually used by the firm is therefore in a corrupt country equal to a fraction b of the same capital in a clean country i.e. $L'_t = bL_t$ with $b < 1$.

Corruption, especially in taxation, reduces public revenues and consequently public expenditure for the production of public goods. Furthermore, companies that pay bribes to win public contracts do not perform well. The latter deteriorate rapidly. The stock of public capital actually available in a corrupt country is : $G'_t = cG_t$ with $c < 1$.

Equation (1) can therefore be rewritten to take account of corruption in a corrupt country as follows:

$$Q_t = A(aK_t)^\alpha (bL_t)^\beta (cG_t)^\gamma \tag{2}$$

The coefficients a , b , c in equation (2) can be taken as the corruption rates in the areas of finance (taxation, customs), education (training and recruitment of labour) and production of public goods (public procurement in particular) respectively. Unfortunately, the statistics available so far do not provide corruption rates by sector of activity. We can therefore adopt the simplifying hypothesis that the extent of corruption is the same in all sectors, especially in a highly corrupt country. Consequently, we consider that all the factors of production of the company are reduced by a coefficient $\theta < 1$. This allows equation (2) to be rewritten in the following form:

$$Q_t = A(\theta K_t)^\alpha (\theta L_t)^\beta (\theta G_t)^\gamma \tag{3}$$

Or :

$$Q_t = A(\theta)^{\alpha+\beta+\gamma} (K_t)^\alpha (L_t)^\beta (G_t)^\gamma \tag{4}$$

Since the Cobb-Douglas function is homogeneous of degree $\alpha+\beta+\gamma$, we can derive some interesting results from equation (4).

(i) Compared to a country with integrity, in a corrupt country where firms really use only a fraction of the factors at their disposal, the value added obtained in the corrupt country is equal to that of the firm in the country with integrity multiplied by the coefficient of variation. θ of the factors at their disposal, the value added obtained in the corrupt country is equal to that of the firm in the integrated country multiplied by the coefficient $(\theta)^{\alpha+\beta+\gamma}$ which is strictly less than 1 in all cases. The lower the coefficient, the greater the level of corruption.

(ii) While corruption affects all sectors of activity to the same extent, it has a much more negative impact on sectors with increasing returns than on sectors with constant and decreasing returns. The latter sectors are the least negatively impacted.

(iii) In sectors with increasing returns, the high cost of corruption may lead to the partial or total withdrawal of some firms from the market. Firms that are willing to pay bribes to stay may see their production costs decrease, which significantly increases their profit performance. This result may explain at least in part the thesis that corruption has a positive effect on the growth of firms. Thus, the study by Vial and Hanoteau (2010) that finds a positive relationship between corruption and firm income, as well as labour productivity, during the Suharto regime can be explained. The Suharto regime in Indonesia (31 years in power) was marked by very strong authoritarianism and widespread corruption. Transparency International considers Suharto to be the most corrupt leader in the world in the 1980s and 1990s (L'Orient-Le Jour, 2008). The authors' result above can be explained by noting that this high level of corruption partially or totally excluded some (the most successful?) companies and favoured corrupt companies that thus violated regulations. Moreover, manufacturing is a sector of increasing returns where the exclusion of some firms through corruption decreases the cost of production of those that remain, thus increasing their revenues. Furthermore, the manufacturing sector in an underdeveloped country in the 1980s and 1990s such as Indonesia uses an abundance of unskilled labour; this results in low average productivity (recruitment beyond the point of equality between marginal productivity and the wage rate). In this case, downsizing due to bribe payments can lead to an increase in average worker productivity. Results obtained by Vial and Hanoteau (2010).

Taking the logarithms, equation (4) can be linearized like this:

$$LogQ_t = LogA + (\alpha + \beta + \gamma)Log\theta + \alpha LogK_t + \beta LogL_t + \gamma LogG_t \tag{5}$$

Relationship (5) can be tested empirically.

METHODOLOGY AND DATA

Methodology

We estimate a model whose explained variable is the value added of the company. The explanatory variables are those of equation (5) to which other control variables should be added, in this case the inflation rate and the business climate measured by the time taken to create a company. The econometric specification of the model to be estimated is given by equation (6) below:

$$LogQ_{it} = LogA + \alpha_1 Log\theta_{it} + \alpha_2 LogK_t + \alpha_3 LogL_t + \alpha_4 LogG_t + \alpha_5 Inf_{it} + \alpha_6 LogDCE_{it} + \epsilon_{it} \tag{6}$$

Where:

- **Q** is the total value added (**VAJ**) in constant 2010 dollars.
- **Log A** represents the constant.
- **θ** is the corruption indicator (**Cor**) given by the Corruption Perception Index.
- **K** represents the stock of physical capital measured by private sector gross fixed capital formation (**InvPriv**) as a % of GD.
- **L** is the human capital stock, captured by the human capital index (**KH**).
- **G** is the stock of public goods, given by the transport quality index (**Transp**). This is a synthetic indicator that takes into account the capillarity of the road and rail network and air connectivity.
- **Inf** is the inflation indicator, given by the rate of change of the consumer price index at base 100 in 2010.
- **DCE** is the time it takes to set up a business (in days).
- ϵ_{it} is the error term.

Using the abbreviations of the variables in brackets above, equation (6) can be rewritten as follows:

$$LogVAJ_{it} = C + \alpha_1 LogCor_{it} + \alpha_2 LogInvPriv_{it} + \alpha_3 LogKH_{it} + \alpha_4 LogTransp_{it} + \alpha_5 Inf_{it} + \alpha_6 LogDCE_{it} + \epsilon_{it} \tag{7}$$

The regression of equation (7) is carried out using the specific effects panel method. This consists first of all of estimating the fixed-effects model, then the random-effects model, and finally the Hausman test is used to choose the best adapted model.

Data

The statistics used in the estimates are derived from four databases, namely: *Transparency International (2020)* for the corruption index; *Doing Business (2020)* for the time to start a business; the *UNCTAD database (2020)* for the human capital index and the transport quality index; and the *World Development Indicators (2020)* for the inflation and private investment variables.

The model is estimated using data from the fourteen African countries of the Franc zone (excluding Comoros), covering the period 2006-2019. Descriptive statistics for all variables are reported in Table 1.

Table 1 shows that dispersion is high for some variables (value added, time to start a business and inflation) while it is low for the other variables.

Table 1: Descriptive statistics of the variables used

Variable	Obs	Mean	Std. Dev.	Min	Max
InVAJ	196	22.80823	0.9883312	20.38156	24.3104
InCor	196	-1.331814	0.263433	-1.832581	-0.7985077
InKH	196	3.456723	0.1556485	3.063086	3.713572
InTransp	196	2.246557	0.2930523	1.489266	2.803129
InInvPriv	196	2.758241	0.4414344	1.26574	4.278936
InDCE	196	3.235129	1.008119	0.9162907	5.562603
INF	196	2.33979	3.026281	-8.97474	12.10199

Table 2: Correlation matrix between variables in the model

	InVAJ	InCor	InKH	InTransp	InInvPriv	InDCE	INF
InVAJ	1,0000						
InCor	0,2618	1,0000					
		0,0002					
InKH	0,1972	0,2136	1,0000				
		0,0056	0,0027				
InTransp	-0,0534	-0,3621	0,5168	1,0000			
		0,4569	0,0000	0,0000			
InInvPriv	0,5225	0,1786	0,1702	-0,0798	1,0000		
	0,0000	0,0123	0,0171	0,2662			
InDCE	-0,0061	-0,5797	-0,1030	0,3785	0,1906	1,0000	
	0,9319	0,0000	0,1506	0,0000	0,0074		
INF	-0,1267	-0,2386	-0,1468	0,0641	-0,0562	0,2657	1,0000
	0,0769	0,0008	0,0401	0,3721	0,4342	0,0002	

Table 2 presents the correlation matrix of the variables in the model to be estimated.

Table 2 shows that there is a positive and significant correlation between value added (VAJ) and the corruption perception index (Cor), which implies a negative relationship between corruption and firm growth. The correlation is also significant between value added and some variables (human capital, private investment and inflation), which is not the case between corruption and the time taken to set up a firm and the quality of transport.

RESULTS AND DISCUSSION

The Fisher test shows that the estimated model is globally significant. The Hausman test allows to retain the random effects model. The results of the random effects model obtained by the generalized least squares (GLS) method are given in Table 3 below:

Table 3: Regression results for the random effects model

Explained variable: lnVAJ	Coefficient	Student's T	Probability	Significance level
lnCor	0,135	1,88	0,06	10 %
lnKH	1,316	7,66	0,000	1 %
lnTransp	0,184	3,32	0,001	1 %
lnInvPriv	0,097	2,76	0,006	1 %
lnDCE	-0,043	-3,27	0,001	1 %
INF	-0,0008	-0,32	0,74	/
Cons	17,89	27,6	0,000	1 %
Hausman test (P> Chi2)		0,9777		

Table 3 shows that the corruption index has a positive and significant effect on value added. An increase in the corruption index of 10% leads to an increase in overall value added of 1.35%, indicating that reducing corruption stimulates value creation at the firm level. This result, obtained on a sample of 14 African countries in the Franc zone, is consistent with those found by Clarke (2008) based on surveys of firms in Africa, Fisman and Skensson (2007) on a sample of Dutch firms and Rossi and Dal Bo (2006) through a survey of 13 Latin American countries. It is contrary to that of Vial and Hanoteau (2010) who used a panel of Indonesian manufacturing firms during the Suharto era,

Physical capital, human capital and the stock of goods also have a positive and significant impact on value added:

- An increase in the physical capital stock of 10% leads to an increase in value added of 0.97%;
- An increase in the human capital index of 10% leads to an increase in value added of 13.16%;
- An increase in the transport quality index of 10% leads to an increase in value added of 1.84%;

These results corroborate those of Romer (1990), King and Levine (1993), Berthélemy, Varoudakis and Dessus (1997), Dessus and Herrera (1999) and Asteriou and Spanos (2019),

Finally, a reduction in the time to start a business of 10% leads to an increase in value added of 0.43%. This result is consistent with those of North (1990), Rodrik and Subramanian (2003) and Belaïd *et al.*, (2009),

CONCLUSION AND RECOMMENDATIONS

The objective of this paper was to analyze the impact of corruption on the growth of firms in African Franc zone countries. A comparative analysis showed that African Franc zone countries are more corrupt than some Anglo-Saxon African countries such as Ghana and Rwanda and some North African countries (Morocco, Tunisia, Egypt). The consequence of this situation is that the growth of enterprises, measured by value added, is much stronger with increasing curves in all sectors of activity in North African and Anglo-Saxon African countries than in the African countries of the Franc zone where its curves are close to the abscissa axis and horizontal. Within the Franc zone, the results are more serious with regard to the EMCCA zone in which corruption is higher than in the WAEMU zone

Theoretically, we formalized the relationship between corruption and firm growth using a Cobb-Douglas production function. This allowed us to define a methodology for econometrically estimating the effect of corruption on firm growth. Thus, a reduction in corruption and thus an increase in the corruption index of 10% leads to an increase in the

overall value added of 1.35%. This impact ranks third after the effects of human capital (13.16%) and the transport quality index (1.84%). The reduction of corruption thus has a much greater impact on business growth than private investment (0.97%), inflation (0.008) and the time to start a business (-0.43%). From these results the following policy recommendations can be derived:

- The African countries of the Franc zone must wage a relentless fight against corruption in all areas by :
 - This exists in the texts but the application is difficult because most often technical specifications are given in the calls for tenders that favour one or a few companies or those that do not respect the regulations are not punished. Lastly, some tender files are put together by the civil servants in charge of awarding contracts, which creates conflicts of interest,
 - In Cameroon, for example, recruitments in high schools and colleges of the 5^e in T^{le} are done by the Heads of schools without competition; It is therefore necessary to institute entrance examinations in all classes, supervised by officials appointed by the Minister of Education,
 - Setting up commissions to assess and determine the amounts of taxes and duties as well as the important customs duties on the import of goods, whenever a tax or customs inspector is left to decide on his own the amount of taxes or customs duties to be paid by the taxpayer, there will inevitably be bribes, A commission made up of representatives of several ministries would be preferable to an individual, It must be competent when the taxpayer's turnover exceeds a certain threshold (e.g. 100 million FCFA), It is indeed more difficult to convince 10 people than 1 person, This policy would thus make it possible to increase public revenue and consequently the stock of public goods which has an important effect on the growth of companies
 - Favouring excellence in the recruitment and promotion of public officials to ensure that those who have paid large sums of money to be recruited or appointed to positions of responsibility do not seek to recoup these sums through corruption,
- The African countries of the Franc zone must invest more in education and health, To give a quality education to the youth in adequacy with the needs of the company, The equipment of the research laboratories as well as the training workshops must become the priority of the States, With the creation of the private universities in Africa, the recruitment in the State universities must be limited in order to improve certain ratios today catastrophic such as the number of students by seat, the number of students by teacher, the number of students by workstation in the laboratory, ...An education fund paid by companies and possibly development partners would allow the financing of these actions,
- Some of them have instituted road tolls to "maintain" asphalted roads. Unfortunately, the funds collected are returned to the treasury and used for common expenses,

REFERENCES

- AIDT T.S. and DUTTA, J. 2008. "Policy compromises: corruption and regulation in a democracy". *Economics and Politics*, 20(3), 335-360.

- ANORUO E. and BRAHA, H. 2005. "Corruption and Economic Growth: The African Experience". *Journal of sustainable development in Africa*, 7(1), 43-55.
- ASTERIOU D. and SPANOS, K. 2019. "The relationship between financial development and economic growth during the recent crisis: Evidence from the EU". *Finance Research Letters* 28, 238-245.
- BALIAMOUNE-LUTZ M. and NDIKUMANA, L. 2007. "Corruption and Growth in African Countries: The Investment Channel". *Proceedings of the 2007 conference organised by the African Development Bank and the United Nations Economic Commission for Africa in Addis Ababa, Ethiopia*, 15-17 November 2007, <https://www.afdb.org>.
- BELAÏD R., GASNI F. and RECUERO VIRTO, L. 2009. "Does the quality of institutions influence economic performance? The case of telecommunications in developing countries". *Revue d'Economie du Développement*, 17, 51-81.
- BERTHÉLEMY J-C, VAROUDAKIS A-A and DESSUS, S. 1997. "Human capital and growth: the role of the trade regime". *Revue Economique*, 48(3), 419-428.
- Clarke G. 2008. "How Petty is Petty Corruption? Evidence from Firm Survey in Africa". <http://www.sciencedirect.com/science/article/pii/S0305750X10002196>.
- CONAC. 2020. 10e annual anti-corruption report in 2019, Cameroon, <https://www.koaci.com>,
- DE ROSA D., GOOROOCHURN N. and GÖRG, H. 2010. *Corruption and Productivity: Firm-level Evidence from the BEEPS Survey*. <https://ideas.repec.org/p/kie/kieliw/1632.html>
- DESSUS S., and HERRERA, R. 1999. "Public capital and growth: a study in panel econometrics". *Revue Economique*, 50(1), 113-126.
- EL JARRI S., and EL KHIDER, A. 2020. "The impact of corruption on growth and human development, An exploratory study in the African context". *Alternatives Managériales et Economiques*, 2(3), 459-479.
- FISMAN R., and SVENSSON, J. 2007. "Are Corruption and Taxation Really Harmful to Growth?". <http://www.sciencedirect.com/science/article/pii/S0304387806001106>
- FLATTERS F., and MACLEOD, W.B. 1995. "Administrative corruption and taxation". *International Tax and Public Finance*, 2(3), 397-417.
- GUETAT, I. 2006. "The effects of corruption on growth performance of the MENA countries". *Journal of Economics and Finance*, 30(2), 208-221.
- GYIMACH-BREMPPONG, K. 2002. "Corruption, economic growth, and income inequality in Africa". *Economics of Governance*, 3(3), 183-209.
- HUNTINGTON, S. 1968. *Political Order in Changing Societies*. London: Yale University Press.
- HYSA, E. 2016. "Corruption and Human Development: Albania and EU-27". <https://www.researchgate.net/publication/308111538>.
- KING, R. and LEVINE, R. 1993. "Finance, entrepreneurship, and growth: Theory and Evidence". *Journal of Monetary Economics*, 32, 513-542.
- LAMBSDORFF, J. 2003. "How Corruption Affects Economic Development", http://www.wiwi.uni-passau.de/fileadmin/dokumente/lehrstuehle/lambsdorff/Papers/C_Development.pdf
- LEFF, N. 1964. "Economic Development through Bureaucratic corruption". *The American Behavioural Scientist*, 8(2), 8-14.
- LEYS, C. 1965. "An Equilibrium Queuing Model of Bribers". *Journal of political Economy*, 93(4), 760-781.
- L'ORIENT-LE JOUR. 2008. « Indonesia-The most corrupt leader of modern times will be buried today in Java, The former dictator Suharto is dead but his legacy lives on”, www.lorientlejour.com
- LUI, F. 1985. "An equilibrium queuing model of bribery". *Journal of political economy*, 93, 760-781.
- MAURO, P. 1995. "Corruption and Growth. *Quarterly journal of Economics*", 60(3), 681-712.
- MENDEZ, F. and FACUNDO, S. 2006. "Corruption, growth and political regimes: Cross country evidence". *European Journal of Political Economy*, 22(1), 82-98.
- MÉON, P. G. and SEKKAT, K. 2005. "Does corruption grease or sand the wheels of growth". *Public choice*, 122(1-2), 69-97.
- MOUSSONE, E. 2010. "Insertion of African Franc zone countries in world trade: study of an impoverishing specialisation and the problem of financing the economy". Working papers 231, Industry and Innovation Research Laboratory, ULCO, Industry and Innovation Research Unit.
- NORTH, D. 1990. *Institutions, Institutional Change and Economic Performance*. Cambridge University Press.
- OAK M., and HODESS, R. 2014. *The impact of corruption on growth and inequality*. Transparency International internal document, tihelpdesk@transparency.org.
- PRICEWATER HOUSE COOPERS. 2008. *Confronting Corruption: The Business Case for an Effective Anti-Corruption Programme*, <http://www.pwc.com/gx/en/forensic-accounting-dispute-consulting-services/business-case-anti-corruption-programme.html>
- RODRIK, D. and SUBRAMANIAN, A. 2003. "The primacy of institutions", *Finance and Development*, 31-34.
- ROMER, P. 1990. "Human capital and growth: theory and evidence". *Carnegie-Rochester Conference Series on Public Policy*, Elsevier, 32(1), 251-286.
- ROSE-ACKERMANS, S. 1998. "Corruption and Development" in PLESKOVIC B. and STIGLITZ, J. (eds.) *Annual World Bank Conference on Development Economics-1997*, Washington, DC: The World Bank.
- ROSSI, M. and DAL BO, E. 2006. *Corruption and Inefficiency: Theory and Evidence from Electric Utilities*. <http://www.sciencedirect.com/science/article/pii/S004727270600154X>
- SILEM, A. and ALBERTINI, J. 1989. *Lexique d'économie*, 3ème édition, DALLOZ.
- TANZI, V. and DAVOODI, H.R. 2002. "Corruption, growth, and public finances" in ABED, G.T. and GUPTA, S. (eds) *Governance, Corruption, and Economic Performance*, Washington, DC: IMF, 197-222.
- TRANSPARENCY INTERNATIONAL. 2009. *Global Corruption Report: Corruption and the Private Sector*. <http://www.cgu.gov.br/conferenciabrode/arguivos/English-Global-Corruption-Report-2009.pdf>
- UNODC. 2015. *Corruption and Development*, notes, www.anticorruptionday.org,
- VIAL, V. and HANOTEAU, J. 2010. "Corruption, Manufacturing Plant Growth, and the Asian Paradox: Indonesian Evidence". *World Development*, 38(5), 693-705.
- WHO. 2009. *Medicines: Corruption in the pharmaceutical sector*. Fact Sheet 335, <http://www.who.int/mediacentre/factsheets/fs335/en/index.html>
- WORLD BANK. 2020. *Doing Business database 2020*, Washington DC.