CORRUPTION, INVESTMENT AND ECONOMIC GROWTH IN WAEMU

ADEDODJA ADÉDOKOUN ELIE (PH.D)
University of Parakou, Benin,

ABSTRACT

The persistence of corruption is perceived as one of the main factors affecting public and private investment. The objective of this paper is to analyze the effect of corruption on public and private investment in the West African Economic and Monetary Union (WAEMU) on the one hand, and to assess their influence on economic growth on the other. Based on a dynamic panel model with simultaneous equations covering the eight WAEMU countries over the period 1995 to 2018, the findings show that corruption increases the volume of investment for corrosive effects on economic growth in the Union. Thus, the findings suggest the financial independence of each country's anti-corruption bodies from the central state. The aim is to create a common fund called the "anti-corruption fund" within the Union to finance the activities of these various bodies.

Keywords: Corruption, public and private investment, economic growth, WAEMU

JEL Classifications: C33, H54, R42, D73.

1.0 INTRODUCTION

1.1 Background

Institutional and political factors are the main explanatory factors of the delay of underdeveloped economies (Barro and Lee, 1994). Among these, corruption is one of the factors that has most often attracted the attention of economists. Corruption is much more common in poor countries with low levels of economic development than in rich countries (Gupta et al., 2002). For several years, the relationship between corruption and economic growth has long been the subject of scientific analysis and debate in economic and social terms.

Thus, the literature on these macroeconomic consequences has been on whether corruption greases or equips the wheels of economic growth (Campos et al., 1999). In this context, various organizations consider corruption as a major obstacle to good economic policy making (World Bank, 1997). Most studies find a negative relationship between corruption and growth.

In addition, other researches claim that, while corruption is likely to affect economic growth, its effect would be transmitted indirectly through the standard determinants of economic

growth, including investment (Ouattara, 2011). This has been reinforced by the results of a number of studies that have explicitly argued that the effects of corruption on economic growth can be decomposed into direct and indirect impact through a number of channels (Mo, 2001). Despite the existence of a broad consensus among economists on how corruption hinders economic development by discouraging savings and investment, some theoretical and empirical studies reveal divergent opinions on the different channels through which corruption could affect economic growth (Gyimah-Brempong, 2002).

The remainder of the paper is organized as follows. After the introduction, Section 2 presents the literature review, Section 3 discusses the methodology adopted, Section 4 is devoted to the presentation and discussion of the empirical results and finally, Section 5 outlines the policy implications arising from the findings.

1.2 Statement of the problem

Given the negative effects of this scourge on economic activity, the countries of the West African Economic and Monetary Union (WAEMU) have implemented numerous reforms to combat this phenomenon in order to boost economic growth. But the issue of institutional and economic development is still a concern in these Union Member States. For example, from 1995 to 2018, the average growth rate in the Union is 6% (IMF, 2018). Meanwhile, corruption is spreading to all Union countries (Abdoulaye, 2017). The average share of public and private investment in the gross domestic product (GDP) continues to increase from 17.22% and 8.85% respectively in 1995 to 23.23% and 14.92% in 2018. This situation justifies the need to investigate the nature of the relationship between corruption, investment and economic growth in the Union.

Indeed, many authors such as Celentani and Ganuza (2002), Ali and Isse (2003) have focused on the possible interrelationships between corruption and private investment; others have highlighted the negative effects of corruption on public investment. Unfortunately, very few publications on the triune corruption, public and private investment and economic growth concern WAEMU. This study partly responds to this theoretical and empirical deficiency. In this context, it is important to analyze the relationship between corruption, investment and growth in the Union. So the research question of this study is: does corruption affect economic growth through investment in WAEMU?

1.3 Objectives of the study

The objective of this study is to analyze the impact of corruption on public and private investment on the one hand, and assess their effects on economic growth in the WAEMU area on the other.

1.4 Hypothesis of the study

Our research hypothesis is as follows:
Corruption affects economic growth through investment in WAEMU.

2.0 LITERATURE REVIEW

2.1. Conceptual literature

The first (public) corruption models are thus agency models where an official (the agent) uses the power delegated to him by the community (the principal) to derive a private benefit from the sale of public goods or services (licenses, passports, public contracts, etc.) (Banfield, 1975; Rose-Ackerman, 1975). By taking into account individualistic, utilitarian and functional aspects, one can distinguish corruption in the strict sense and corruption in the broad sense. Strictly speaking, Nye (1967) argues that corruption is behavior that deviates from the formal obligations of a public service to obtain a private benefit, in terms of money or status; or that violates rules prohibiting the exercise of certain types of private influence. While in the broad sense, corruption is perceived as the misuse of public power for private gain (Rose-Ackerman, 1975). However, although defined in different ways by different authors, corruption can now be understood by the World Bank (1997) as the abuse of a public office for personal purposes, thus focusing exclusively on the public sector.

2.2 Theoretical approaches

In the literature, there are two theses on the relationship between corruption and growth through investment. The authors of the first thesis argue that corruption has positive effects on economic growth because it accelerates investment activities. Corruption and investment are therefore positively linked. The general idea is that bribes help businessmen to avoid administrative delays. For this current, corruption is a source of economic efficiency and increases economic growth through its positive impact on investment. According to these authors, efficiency must be measured in terms of time lost waiting; "corruption is fast money" (Leff, 1964).

Moreover, very few authors support this idea, which fundamentally challenges the principles of good governance (second thesis). Here, the idea is that corruption, when it gets involved in the management of public affairs, is a source of misallocation and resource allocation. Corruption in all its forms discourages potential investors, both domestic and foreign (Mauro, 1995; Tanzi and Davoodi, 1997).

2.3 Empirical approaches

The majority of the work focused on the link between corruption and economic growth through its negative impact on investment. Mauro, who has been interested in the issue for a number of years, argues that recent empirical studies suggest that corruption can have a significant negative impact on economic performance by limiting investment and diverting social projects from their intended objectives (Mauro, 1995). The author finds that corruption affects economic performance by discouraging investors, including private investors, and as a result, growth is slowed.

Mauro's thesis is widely shared by many other authors. For example, according to Tanzi and Davoodi (1997), corruption in general, but especially in the political sphere or "tall" corruption, creates distortions in the allocation of resources related to development projects. They have shown that corruption rhyme with an increase in the amount of public investment, low income for the state, low levels of maintenance and poor quality of public infrastructure. They also argue that corruption increases the volume of public investment while reducing its productivity and profitability. Similarly, Mo (2001) highlights a significant impact of corruption on growth. Moreover, he finds that the effect is indirect: more than half of the

impact of corruption is through its effect on political stability, more than 20 per cent through investment and 15 per cent through its negative impact on human capital formation.

Some studies on the interrelationship between investment and corruption argue that corruption directly reduces the level of economic growth and indirectly deteriorates the quality of public and private investment in Africa (Gyimah-Brempong, 2002). However, studies by Baliamoune-Lutz and Ndikumana (2007) suggest a negative and significant effect of corruption on domestic investment. Indeed, their results indicate rather a positive effect of corruption on public investment while it has a negative effect on private investment. They argue that the positive association follows corrupt bureaucrat behaviors that increase capital spending (more maintenance spending) to maximize rents. Thus, the discouragement of private investment is explained by the fact that corruption increases the costs of doing business while increasing uncertainty about the expected returns on capital. As a result, corruption undermines growth.

Corruption is a widespread phenomenon on all continents of the world. Based on a structural equation model with the double least squares estimator, Ouattara (2011) finds that corruption is a factor in overestimating the amount of investment in Côte d'Ivoire, which has perverse effects on economic growth. For Venard (2013), he uses the simultaneous equation model using the Ordinary Least Squares (OLS) method to analyze the relationship between institutional quality, corruption and economic development. The author finds that corruption has a negative impact on economic development. Ndikeu Njoya (2017), using the same methodology for the Cameroon case, confirms the Ouattara results.

Using different estimation models, d'Agostino et al (2016) reach the same conclusion as Venard (2013). But in contrast, these authors point out that investment is the channel through which corruption negatively affects economic growth.

Similarly, Cieślik and Goczek (2018) study the effects of corruption on growth from a new version of the endogenous growth model in an open economy with international capital mobility on a sample of 142 countries over a period from 1994 to 2014 using GMM methods. They suggest that corruption impedes economic growth by reducing the effect of investment. As a result, rich countries with better access to international finance should grow faster and be less exposed to the negative effects of corruption than emerging economies.

Moreover, in WAEMU countries, Ouattara (2007) finds that the level of corruption is not induced by economic growth in WAEMU. Using the same methodological approach, Abdoulaye (2017) confirms the conclusion of Ouattara (2007) that growth has no impact on corruption while corruption undermines economic growth in Union countries. But this work did not focus on the main channel through which corruption affects growth in the Union.

3. STYLIZED FACTS AND METHODOLOGY

3.1 Stylized facts

3.1.1 Evolution of WAEMU economic growth between 1995 and 2018.

Figure 1: Evolution of the WAEMU growth rate between 1995 and 2018
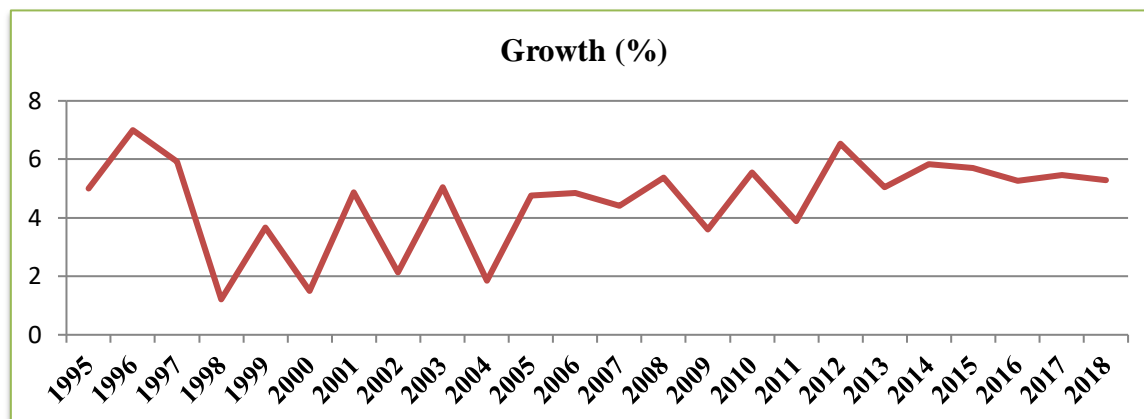
Source: Author based on World Bank data (2019)

Figure 1 shows the evolution of the average growth rate in the WAEMU region between 1995 and 2018. The analysis of this figure shows that growth in the area evolved almost in a saw-tooth fashion between 1995 and 2018. The growth rate has been reinforced by the preservation of the stability of the macroeconomic framework within this Union. Although in recent decades, the economic environment seems to have been favorable to WAEMU member countries to increase their economic activities, the growth rate has remained at around 4 to 6%, whereas a higher growth rate could be achieved. The low growth rate can be explained by several factors, including political and institutional factors, including corruption.

3.1.1 Evolution of the corruption perception index in WAEMU countries

Table 1: Evolution of the Corruption Perception Index between 2011 and 2018

Countries	2011	2012	2013	2014	2015	2016	2017	2018
Bénin	3	3,6	3,6	3,9	3,7	3,6	3,9	4
Burkina Faso	3	3,8	3,8	3,8	3,8	4,2	4,2	4,1
Cote D'ivoire	2,2	2,9	2,7	3,2	3,2	3,4	3,6	3,5
Guinée Bissau	2,2	2,5	1,9	1,9	2,5	1,6	2,7	2,8
Mali	2,8	3,4	2,8	3,2	3,5	3,2	3,1	3,2
Niger	2,5	3,3	3,4	3,5	3,4	3,5	3,3	3,4
Sénégal	2,9	2,9	4,1	4,3	4,4	4,5	4,4	4,5
Togo	2,4	3	2,9	2,9	3,2	3,2	3,2	3
WAEMU	**2,6**	**3,2**	**3,2**	**3,3**	**3,5**	**3,4**	**3,6**	**3,6**

Source: Author based on Transparency International data (2018).

The CPI is an indicator that ranks countries on a scale from 0 (high perceived corruption) to 10 (low perceived corruption). With regard to this table, we can affirm that corruption is a reality in WAEMU countries. The WAEMU region is therefore operating in an economic environment dominated by corruption. On the basis of analyses and graphical trends, it seems likely that there is a very strong correlation between the generalized corruption environment and growth. In an attempt to confirm or refute this research hypothesis, it seems important to define a methodological framework.

3.2 Methodological framework

3.2.1 Model specification

This study follows some recent studies that have dealt with the subject using the Simultaneous Equation Model (SEM), including those of Ouattara (2011) and Ndikeu Njoya (2017). Unlike these authors, we apply this model to a dynamic panel data composed of eight countries. Thus, our model is as follows:

$$
\begin{cases}
Invpub_{i,t} = \alpha_0 + \alpha_1 Corr_{i,t} + \alpha_2 Crois_{i,t} + \alpha_3 Oc_{i,t} + \alpha_4 Invpri_{i,t} + \alpha_5 Dex_{i,t} + \alpha_6 Démo_{i,t} + \varepsilon_{i,t} \\
Invpri_{i,t} = \beta_0 + \beta_1 Invpri_{i,t-1} + \beta_2 Corr_{i,t} + \beta_3 Crois_{i,t} + \beta_4 Oc_{i,t} + \beta_5 Invpub_{i,t} + \beta_6 Mmo_{i,t} + \varepsilon_{i,t} \\
Crois_{i,t} = \lambda_0 + \lambda_1 Invpub_{i,t} + \lambda_2 Invpri_{i,t} + \lambda_3 Oc_{i,t} + \lambda_4 Inf_{i,t} + \lambda_5 kh_{i,t} + \lambda_6 Popa_{i,t} + \theta_{i,t} .
\end{cases}
$$

With **Invpub**: the share of public investment in GDP; **Invpri**: the share of private investment in GDP; **Crois:** the GDP growth rate; **Corr:** the corruption rate; **Oc:** trade openness; **Dex:** the external debt to GDP rate; **Demo:** demography, referred to here as the annual population growth rate; **Mmo:** the money supply in relation to GDP; **Inf:** the inflation rate; **Kh:** the human capital represented by the higher education enrolment rate; **Popa:** the rate of the active population in relation to the total population.

3.2.2 Data source

Our study used secondary data from the Non-Governmental Organization (NGO) Transparency International (2018) and the 2019 World Bank's World Development Indicators. The period of our study extends from 1995 to 2018.

3.2.3 Descriptive statistics of SEM variables

Table 2: Descriptive statistics of the variables of the SEM

Variables	Obs	Mean	Std. Dev.	Min	Max
Invpub	192	19.61838	6.986873	4.703723	39.95105
Invpri	192	11.81781	6.183545	1.455396	33.06692
Crois	192	4.574295	4.122149	-28.09998	14.66122
Corr	192	7.015079	0.6543476	5.5	8.4
Oc	192	59.16107	17.6146	27.17369	118.1023
Dex	192	52.79226	18.52729	5.8197	89.3119
Kh	192	41.75453	35.79719	.96924	84.227
Démo	192	11.25373	21.3587	.8982	69.295
Inf	192	3.396315	6.609837	-4.883464	50.73405
Mmo	192	26.4385	9.864304	6.546494	58.65543
Popa	192	60.16497	23.44026	2.445904	80.923

Source: Author based on the estimation results.

Table 2 shows that overall the standard deviations are generally small, which means that the variances are minimal between the values of the variables. It can be estimated that it is not necessary to make a logarithmic transformation to normalize the series.

3.2.4 Estimation method

We have verified that the variables are stationary in first differences as defined by Im, Pesaran and Shin (2003). As with any estimation of a simultaneous equation model, it is important to solve the problems of identification. The econometric literature specifies that an over-identified or just identified model is estimable by double least squares (2SLS) or triple least squares (3SLS). On the other hand, an under-identified model (more parameters than equations) remains difficult to estimate (Greene, 2005). A necessary condition for identifiability (or over-identifiability) for a structural equation is that the number of exogenous variables absent from it is equal to (or greater than) the number of endogenous variables in the minus one. The condition returns is:

$$G-1 \leq K-K_1$$

Where G is the number of endogenous variables in the model, K is the number of exogenous variables in the model and K_1 is the number of exogenous variables in the equation.

As part of our study, our calculations show that all the equations in the model are over-identified. Therefore, our model is over-identified and can therefore be estimated. The equation models as a whole can only be estimated if they are globally identified or in other terms if all equations are just-identified or over-identified. At this time, the method used is that of 3SLS (Greene, 2005). Thus, since our model is over-identified, we can use the 3SLS estimator. The results of the estimation are presented in the following section.

4.0 PRESENTATION AND DISCUSSION OF THE RESULTS

4.1 Main results of the diagnostic test

Table 4: Results of the SEM unit root test (IPS)

Variables	In level		Decision	In first difference		Decision
	Statistical value	P-value		Statistical value	P-value	
Invpub	-1.6558	0.0489	Stationary	-	-	-
Crois	-6.1719	0.0000	Stationary	-	-	-
Corr	-3.7816	0.0001	Stationary	-	-	-
Oc	-1.9055	0.0284	Stationary	-	-	-
Dex	-2.0389	0.0207	Stationary	-	-	-
Inf	-7.2160	0.0000	Stationary	-	-	-
Mmo	-2.3126	0.0104	Stationary	-	-	-
Invpri	-0.7602	0.2236	No stationary	-6.8260	0.0000	Stationary
Kh	0.2654	0.9952	No stationary	-1.2148	0.0325	Stationary
Démo	2.6841	0.9979	No stationary	-2.6584	0.0025	Stationary
Popa	2.6934	0.9965	No stationary	-2.6633	0.0039	Stationary

Source: Author based on the estimation results.

Table 4 shows that the variables Invpub, Crois, Oc, Dex, Inf and Mmo are stationary in level while the variables Invpri, Kh, Demo and Popa are stationary in first difference at the 5% critical threshold. Our variables are therefore not integrated in the same order, suggesting the existence of several cointegration vectors.

Table 5: Main results of the SEM cointegration test

Variables	Value of the probability associated with PP -Statistic Panel -	Decision
Equation 1 of the SEM	0,0001	cointegrated
Equation 2 of the SEM	0,0000	cointegrated
Equation 3 of the SEM	0,0015	cointegrated

Source: Author based on the estimation results

The Pedroni test performed on the variables of the different equations of the SEM, attests that the variables of each equation of the model are cointegrated. Thus, our variables are stationary and cointegrated, thus satisfying the time series estimation conditions.

4.2 Presentation and discussion of the results

Table 6: Results of the SEM estimation

Variables	Coefficient	Ecart-type	Probabilité
Invpub (public Investment): dependente Variable			
Corr	3,003376***	0,6611255	0,000
Crois	1,050549***	0,203172	0,000
Oc	-0,010574**	0,0229676	0,028
Invpri	-0,625269***	0,0568503	0,000
Dex	-0,03344***	0,0095002	0,003
Démo	0,038095**	0,0178854	0,045
_Cons	28,94566***	5,362858	0,000
Invpri (private Investment): dependente Variable			
Invpri-1	0,672703***	0,0800713	0,000
Corr	1,716605**	0,6785002	0,026
Crois	0,4544393**	0,2069693	0,028
Oc	0,022821*	0,0146602	0,120
Invpub	-0,393673***	0,1321037	0,003
Mmo	0,0611134**	0,0255705	0,038
_Cons	-9,960147*	6,035761	0,099
Crois (Growth rate): dependente Variable			
Corr	-2,766665**	1,183851	0,019
Invpub	0,0267945**	0,0126389	0,038
Invpri	0,1584035**	0,0672645	0,023
Oc	0,0128477	0,0247138	0,603
Inf	-0,420764**	0,2003640	0,032
Kh	0,0001297	0,0338159	0,997
Popa	0,3212307**	0,0158241	0,027
_Cons	-26,86509***	7,837302	0,001

Endogenous variables: invpub invpri crois
Exogenous variables: corr oc dex dmo L,invpri mmo inf kh popa

With *** Significance at the 1% threshold; ** Significance at the 5% threshold and * Significance at the 10% threshold.
Source: Author based on the estimation results

The empirical results of our study are presented in Table 6. The results obtained inspire several comments. Only the main results and lessons learned are presented in this section. When considering the results of the first equation of the SEM, it can be noted that all the coefficients of the model are significant at the 5% threshold. Corruption contributes to public over-investment. This result is in line with the conclusions of Ouattara (2011). It can then be argued that a climate of widespread corruption leads agents to overestimate the volume of investments in anticipation of their profit margin, it being understood that not all funds are spent on infrastructure development for example.

In view of the results of the third equation, the positive sign and the low value of the public investment coefficient show that these investments have a low added value on the level of economic growth. This result confirms the idea that corruption has perverse effects on GDP growth. Mauro (2004) and Ouattara (2011) and achieve the same results in their studies. The same is true when considering the effect of corruption on private investment and the effect of corruption on economic growth. Corruption positively and significantly affects the investments of private operators who do not generate economic growth. The relentless fight against corruption will then have to continue in order to improve the management and allocation of public finances. It can also be noted that, whatever the variable considered as explained or explanatory, the coefficient linking public and private investment has a negative sign. This could partly explain the eviction of the private sector as a result of state intervention.

5. CONCLUSION AND POLICY IMPLICATIONS

In this study, we examined the effect of corruption on public and private investment on the one hand, and assessed their different influences on economic growth in the WAEMU region on the other. To achieve this, we have tested the existence of a negative effect of corruption on economic growth through investment within the Union.

The main results mainly show that corruption contributes to over-investment for perverse effects on economic growth in the WAEMU region. Moreover, these results suggest that the perverse effect is higher in terms of public than private investment. Thus, we note that corrupt behavior is more developed in the public than in the private sector. Our results confirm the pessimistic theory of corruption developed by Myrdal (1971) and the empirical work of Mo (2001), Ouattara (2011), Ndikeu Njoya (2017).

These different results can be justified by the complexity of the control of public procurement units within the Union. This encourages the artificial inflation of the price of public investments, leading to overbilling of public investment projects. The increase in these public investments is mainly dedicated to private gains and therefore constitutes a waste of resources, instead of being truly invested in a productive way. Private companies are forced to

make illegal payments that reduce their potential to contribute effectively to GDP growth. It can also be noted that, whatever the variable considered as explained or explanatory, the coefficient linking public and private investment has a negative sign. This could partly explain the eviction of the private sector as a result of state intervention.

In terms of policy implications, the results suggest intolerance towards corruption, as this cannot accelerate economic mechanisms. The idea that corruption was a necessary evil is not acceptable in the countries of the Union. Thus, we suggest the financial independence of each country's anti-corruption bodies from the central state. The aim is to create a common fund called the "anti-corruption fund" within the Union to finance the activities of these various bodies.

REFERENCES

Abdoulaye, D. (2017), Corruption and Economic Growth in the Countries of The West African Economic and Monetary Union: An Econometric Analysis, *Indian Journal Applied Research,* 7 (1), 774-777.

Ali A.M. et Isse, H.S. (2003), Determinants of Economic Corruption: A Cross-Country Comparison, *Cato Journal*, 22 (3), 449-466.

Baliamoune-Lutz, M. and Ndikumana, L. (2007), Corruption and Growth in African countries: Exploring the Investment Channel, *African Economic Conference 2007,* United Nations ECA Working Papers.

Banfield, E. (1975), Corruption as a feature of governmental organization, *Journal of Law and Economics*, 18 (3), 587- 606.

Banque Mondiale (1997), Corruption et Développement Economique (en) Helping Countries Combat Corruption: The Role of the World Bank, chapitre Corruption and Economic Development.

Barro, R. J. and Lee, J.-W. (1994), Sources of Economic Growth, *Carnegie-Rochester Conference Series on Public Policy*, 1- 46.

Celentani, M. et Ganuza, J-J. (2002), Corruption and Competition in Procurement, *European Economic Review*, 46 (7), 1273-1303.

Campos, J. E., Lien, D. and Pradhan, S. (1999), The Impact of Corruption on Investment: Predictability Matters, *World Development,* 27 (6), 1059-67.

Cieślik, A. and Gocze, L. (2018), Control of corruption, international investment, and economic growth – Evidence from panel data, *World Development* , *Elsevier*, 103, 323-335.

d'Agostino, G., Paul Dunne, J. and Pieroni, L. (2016), Government Spending, Corruption and Economic Growth, *World Development*, 84 (C), 190 – 2015.

Greene, W. (2005), Reconsidering Heterogeneity in Panel Data Estimators of the Stochastic Frontier Model, *Journal of Econometrics*, 126, 269-303.

Gupta, S., Davoodi, H. and Alonso-Terme, R. (2002), Does Corruption Affect Income Inequality and Poverty?, *Economics of Governance*, 3, 23-45.

Gyimah-Brempong, K. (2002), Corruption, Economic Growth and Income Inequality in Africa, *Economics of Governance*, 3, 183-209.

Im, K.S., Pesaran, M.H et Shin, Y. (2003), Testing for Unit Roots in Heterogeneous Panels, *Journal of Econometrics,* 115 (1), 53-74.

Leff, N. (1964), Economic Development Through Bureaucratic Corruption, *American Behavioral Scientist*, 1, 8-14.

Mauro, P. (1995), Corruption and Growth, *Quarterly Journal of Economics*, 60 (3), 681-712.

Mo, P. H. (2001), Corruption and Economic Growth, *Journal of Comparative Economics,* 29, 66-79.

Ndikeu Njoya, N. A. (2017), Corruption and economic growth in Cameroon: direct and indirect effects through the distribution of public expenditure, PhD thesis in Economics and Finance, Université Rennes 1, 320p.

Nye, J. S. (1967), Corruption and Political Development: A Cost-Benefit Analysis', *American Political Science Review*, 61 (2), 417-427.

Ouattara, W. (2011), Corruption, investments and economic growth in Côte d'Ivoire, Savings and Development, XXXV (1), 55-73.

Ouattara, W. (2007), Public Expenditures, Corruption and Economic Growth in WAEMU Countries: A Granger's Perspective on Causality, African Integration Review, 1 (1), 139-160.21. Rose-Akerman, S. (1975), The Economics of Corruption, *Journal of Public Economics,* 4: 187-203.

Tanzi, V. and Davoodi, H. R. (1997), Corruption, Public Investment and Growth, International Monetary Fund Working Paper No. 97/139.

Venard, B. (2013), Institutions, Corruption and Sustainable Development, *Economics Bulletin*, 33 (4), 2545-2562.

APPENDICE

```
Three-stage least-squares regression

--------------------------------------------------------------------
Equation          Obs  Parms      RMSE    "R-sq"        chi2       P
--------------------------------------------------------------------
invpub            192     6    0.484229   0.6584      311.24  0.0000
invpri            192     6    0.610227   0.8029      835.02  0.0000
crois             192     7    0.504919   0.7266      163.73  0.0000
--------------------------------------------------------------------

--------------------------------------------------------------------
          |     Coef.    Std. Err.     z    P>|z|    [95% Conf. Interval]
----------+---------------------------------------------------------
invpub    |
     corr |  3.003376   .6611255    4.54   0.000    1.707594   4.299158
    crois |  1.050549   .203172     5.17   0.000    .6523395   1.448759
       oc | -.0105736   .0229676   -0.46   0.645   -.0555893    .034442
   invpri |  -.625269   .0568503  -11.00   0.000   -.5138445   .7366934
      dex |  -.033440   .0095002   -3.52   0.003   -.0136787   .0235613
     demo |   .038095   .0178854    2.13   0.045    .0326897   .0374198
    _cons |  28.94566   5.362858    5.40   0.000    18.43465   39.45667
----------+---------------------------------------------------------
invpri    |
   invpri |
      L1. |   .672703   .0800713    8.40   0.000    .5157663   .8296398
          |
     corr |  1.716605   .6785002    2.53   0.026   -.2923605   2.367311
    crois |  .4544393   .2069693    2.20   0.028    .0487869   .8600918
       oc |  .022821    .0146602    1.56   0.120   -.0059126   .0515545
   invpub | -.3936731   .1321037   -2.98   0.003   -.6525917  -.1347546
      mmo |  .0611134   .0255705    2.39   0.038   -.0600268   .0402076
    _cons | -9.960147   6.035761   -1.65   0.099   -21.79002   1.869727
----------+---------------------------------------------------------
crois     |
   invpub |  .0267945   .0126389    2.12   0.038    .5158881   1.337701
   invpri |  .1584035   .0672645    2.23   0.023    .3135251   .8545452
       oc |  .0128477   .0247138    0.52   0.603   -.0355904   .0612858
      inf | -.4207645   .2003640   -2.10   0.032   -.0395011   .0436539
       kh |  .0001297   .0338159    0.00   0.997   -.0661483   .0664076
     popa |  .3212307   .0158241    2.03   0.027    .0832756   .0857371
    _cons | -26.86509   7.837302   -3.43   0.001   -42.22592  -11.50426
--------------------------------------------------------------------
Endogenous variables:  invpub invpri crois
Exogenous variables:   corr oc dex dmo L.invpri mmo inf kh popa
--------------------------------------------------------------------
```

WAEMU countries

Benin
Burkina Faso
Côte d'Ivoire
Guinea Bissau
Mali
Niger
Senegal
Togo