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Corruption and the informal sector in Sub-Saharan Africa

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Abstract

This paper explores the link between corruption and the informal sector. Most of the literature focuses on macro data and cross section analysis, which presents important shortcomings. It usually relies on perception indexes and indirect macroeconometric estimates to measure corruption and the informal economy respectively. In another strand, our approach is based on micro data drawn from an original set of *1-2-3 surveys* conducted in seven major West African cities (Abidjan, Bamako, Cotonou, Dakar, Lome, Niamey and Ouagadougou), where more than 6,000 informal production units (IPUs) have been interviewed. Consequently, some methodological strong points should be stressed: the paper is based on a representative sample of the informal sector and its definition is in line the international recommendations; corruption is captured through real experience and not perception. Three main conclusions emerge from our analysis. First, only a minority of IPUs declares they had to pay bribes, making informality more an issue of weak law enforcement than corruption. Second, the determinants of corruption for the IPUs affected are similar to those prevailing in the formal sector: the most visible and profitable businesses being the most likely to face corruption. Finally, experience of corruption seems to have a disincentive effect on the will to formalize.

1. Introduction

In Sub-Saharan Africa (SSA) the informal sector is a major engine for employment, entrepreneurship and growth. The size of the sector is estimated to account on average for 42 percent of GDP in Africa in 2000 (Schneider 2007). According to the ILO 2002 report, the share of informal sector employment varies from nearly 20 percent in Botswana to over 90 percent in Mali[1]. Another distinctive feature of SSA is the high incidence of corruption. The latest Transparency International Corruption perception Index indicates that corruption is a major issue in SSA countries. Almost 70% of SSA countries ranked register score below 3, indicating that corruption is perceived as rampant. In comparison, this proportion is about 33% in the Americas, 43% in the Asian Pacific region and 55% in Eastern Europe and Central Asia.

However, to the best of our knowledge the corruption and informality nexus has never been explored in comprehensive empirical fashion in Sub-Saharan Africa. The importance of this issue was firstly driven by the transition process of countries in Eastern Europe and the former Soviet Union and more precisely to the need to understand why the transition process had coincided with the rise of unofficial activities[2]. In their seminal paper Johnson et al. (1997) explain the growth of the unofficial economy by the politicization of the economic life that in many transition countries had replaced the central planning instead of functioning market institutions. The politicization of the economic life refers to widespread political control over economic activities or in other words, to the large control rights politicians have over business[3]. The major issue with politicization is that officials have a great deal of discretion in the interpretation and the implantation of their control rights and that they can sell them against bribes. Thus politicization can lead to higher effective burden on business, more corruption[4] and a greater incentive for entrepreneurs to move in the unofficial economy. Johnson et al. (1997) show in a sample of 17 transitioning countries that countries with more regulation, higher tax burden and more corruption tend to have larger unofficial economies defined as activity that are not reported to the state statistical office and/or to the tax authorities. For instance, they find that a one point diminution of the corruption index[5], that is an increase of corruption, increases the share of the unofficial economy by 5 to 6 percentage points.

Expanded geographically, the subsequent papers also emphasize that poor institutions and large unofficial economy go hand in hand. In a broad set of countries, Johnson et al. (1998) find that countries with more corruption have higher share of unofficial economy. Using the

[1] The ILO report, presents informal sector employment using national definitions for countries reporting from Sub-Saharan Africa. The variation in this table of the percentage employed in the informal sector reflects the differences in national definitions.

[2] Estimating the share of the unofficial economy in total GDP using the consumption based methodology, Johnson and al. find that the average unofficial share in east European countries starts in 1989 at 16.6%, peaks at 21.3% in 1992 and falls to 19% by 1995 whereas in former Soviet Union it starts at 12% rises to 32.6 and drops to 34%. See: Johnson S., Kaufmann D. and Shleifer A. (1997). The Unofficial Economy in Transition. *Brookings Papers on Economic Activity*, 2, pp. 159-239

[3] These rights can go from the power to set price to the control over the use of the land and real-estate or the right to inspect firm and close them.

[4] The links between corruption and shadow economy are quite ambiguous. They can be either complements or substitutes. On the one hand, operating unofficially can be seen as a way to avoid the predatory behaviour by government officials, seeking bribes from anyone with officially registered activities. On the other hand, entrepreneurs may bribe public officials in order to secure their unofficial or informal activities.

[5] They use the CEER index of crime and corruption which ranges from 0 to 10, 10 denoting the absence of corruption.

Transparency International Perception Corruption Index, they show that a one point increase in this index (ie a decrease of corruption) implies a 5.1 percentage point fall in the unofficial economy. Friedman et al. (2000) address the issue of reverse causality. In other words they answer the question of which come first: does ill-functioning institutions cause high level of underground activities or high level of unofficial activities undermine the quality of institutions? Indeed, unofficial activities reduce state revenue and then undermine the ability of the State to provide public services such as law and order, effective tax and regulatory institutions and relatively incorrupt public administration. In a sample of 69 countries, they show that weak institutions drive business underground and suggest a downward spiral in which over regulation and corruption drive firm underground and thus undermine government revenue and the provision of public goods which in turn further reduces the incentives to register in the official sector.

Few studies have explored the links between informality and corruption at the firm level. Using a survey of private manufacturing firms in Poland, Romania, and Slovakia, Johnston et al. (2000) find that bureaucratic corruption is significantly associated with hiding output. Among four possible causes of hidden activity (tax, corruption, mafia and benefits of being in the informal sector), only corruption is significantly associated with unofficial activities. More precisely they find that managers saying that firms make extralegal payments for services report that hidden sales are 2.5 percentage points higher, and saying that firms make indirect payments for license is associated with almost 4 percentage points more hidden sales. Most of these empirical researches present a major drawback. They are done on the basis of surveys carried out only on registered firms, and analyses the reason why some of them hide at least some output. Thus they are missing a large part of the informal economy firms that are unregistered and hide all of their output which is certainly of primary importance in the African context.

This paper aims at extending the analysis of the corruption and informal sector nexus in the sub Saharan Africa. The SSA context is completely different from the one of countries in Eastern Europe and the former Soviet Union from which most of the literature on corruption and informality is driven. There operating in the informal sector is rather the rule than the exception and no recent systemic change may explain this fact. Thus, concepts used to analyze the informal sector elsewhere are not necessarily applicable to SSA, or at least, their focus may be less relevant in this context.

The paper makes use of a unique data set, called *Enquête 1-2-3*, collected in seven capitals in countries of the West-African Monetary and Economic Union (WAEMU) in the early 2000s. The survey combines an employment survey (phase 1), a detailed survey on informal (not tax-registered) entrepreneurial activities (phase 2) and an expenditure survey (phase 3). More precisely, we use the phase 2 of these surveys which interviews heads of informal production units[6] (IPU) and aims at assessing their principal economic and productive characteristics (production, value added, investment, financing), their difficulties and their demands for public support. As phase 2 data cover in detail only informal enterprises, we won't be able to assess the role played by corruption in firms' decision to operate in the informal sector. We propose to first conduct study on the incidence and intensity of graft among IPU. In a second step, we would then assess the impact of corruption on firm formalization prospects.

[6] An IPU is defined as a production unit with no fiscal registration number and no formal written book-keeping

The paper is structured as follows. Section 2 briefly describes our data and provides descriptive statistic on the scope and characteristics of the informal sector in WAEMU capital cities. Section 3 analyses what drives informal payments in the informal sector. We study the effects of corruption on IPU's readiness to register in section 4. Our concluding comments are contained in section 5.

2. The informal sector in West African capital cities

2.1. Presentation of the data

Our data are taken from an original series of urban household surveys in West Africa, the *1-2-3 Surveys* conducted in seven major WAEMU cities (Abidjan, Bamako, Cotonou, Dakar, Lome, Niamey and Ouagadougou) from 2001 to 2002[7]. The surveys were carried out by the countries' National Statistics Institutes (NSIs), AFRISTAT and DIAL as part of the PARSTAT Project[8].

As suggested by its name, the *1-2-3 Survey* is a three-phase survey, the basic rational of this tool is the following. The first phase is a labour force survey (LFS) on employment, unemployment and working conditions of households and individuals. It allows to document and to analyse the labour market functioning and is used as a filter for the second phase, where a representative sample of IPUs is surveyed. Thus, in the second phase of the survey a sample of the heads of the IPUs identified in the first phase are interviewed: it aims at measuring principal economic and productive characteristics of the production units (production, value added, investment, financing), the major difficulties encountered in developing the business activity, and the demands for public support by the informal entrepreneurs. Finally in the third phase, a sub-sample of households, selected from phase 1, is administrated a specific income/expenditure survey, designed to estimate the weights of the formal and informal sectors in households consumption, by products and type of household. The phase 3 also allows estimation of households' living standards, and monetary poverty, either based or income or expenditures.

The following presents a brief description of the sampling plan and the content of the questionnaires implemented. Although we use solely phase 2 data, it is worthy to describe phase 1 methodology since it had been used as a filter to draw phase 2 sample. For the LFS (Phase 1), the sampling plan chosen used the classic technique of two-stage area sampling. Primary and/or secondary stratification was conducted where possible. The primary sampling units were small area units: Enumeration Areas (*Zones de Dénombrement*), Census Districts (*Districts de Recensement*), segments or even Enumeration Sections (*Sections d'Enumération*), depending on the country. Each area unit contained an average of 200 households. In general, a full list of these units was available from the last population census. Following a stratification of the primary units based on socio-economic criteria, 125 primary units were sampled with probabilities proportional to their size. An exhaustive enumeration of the households in the selected primary units was then conducted. Following a stratification of the secondary units where possible, systematic random sampling was applied to sample

[7] The surveys were carried out in 2001 in Cotonou, Ouagadougou, Bamako and Lomé and in 2002 in Abidjan, Dakar and Niamey.

[8] Regional Statistical Assistance Programme for multilateral monitoring sponsored by the WAEMU Commission.

approximately 20 households with equal probabilities in each primary unit (see Brilleau, Roubaud and Torelli, 2004, 2005 for more detail).

For phase 2, a stratification of IPUs has been implemented, using phase 1 rich information. 20 strata were defined by industrial sector (10 industries) and the status of IPU's head (employer and/or own account worker). The unequal probabilities in 22 each stratum have been determined according to the number of IPUs in the Labor Force Surveys (LFS) sample and to its economic potential in terms of development policies. A total 6 111 IPUs were interviewed in the seven capitals cities, among which 938 in Cotonou, 979 in Ouagadougou, 997 in Ivory Coast, 986 in Mali, 742 in Niger, 1011 in Dakar and 958 in Lomé.

Phase 2 questionnaire comprises eight modules dealing with: i) the characteristics of the establishment, ii) labour force, iii) production, iv) Expenditure and costs, v) customers, suppliers, competitors, vi) capital, investment and financing, vii) problems and prospects, viii) social insurance. Previous to these subject specific modules, the first page of questionnaire begins with a "Filter module". This module aims at checking that information about the IPUs collected in phase 1 are exact. Relevant information from phase1on the IPUs selected for the phase 2 (main characteristics of the IPU – address, industry, legal status, type of accounts, registers, type of premises, etc. - and the IPU's holder - name, age, gender, relation with household's head, job status, etc.) are reported *ex ante* in the phase 2 questionnaire. Then, the same information is collected again in the "Filter module". If the answers are consistent, the others modules are applied. Otherwise, the reason of the change between phases 1 and 2 is collected and if the selected informant is not holding an IPU, the survey stops.

The two following sub-section present the general characteristics of the informal sector in the WAEMU capital cities and first general lessons that can be drawn from these surveys concerning the relationships between the informal sector and the State. These sections use extensively the principal results of phase 2 survey exposed by Brilleau et al. (2005).

2.2. Extent and characteristics of the informal sector in WAEMU capital cities

In 1-2-3 surveys the criterions used to identify IPUs are the absence of an administrative registration number and/or of a written book-keeping. Labour forces surveys allowed to count 1 906 000 IPUs in the seven capital cities. Once excluded primary sector production units, 1 761 800 UPIs belonging to non agricultural sectors are enumerated, that is to say as many UPIs as households. These UPIs generated 2 671 000 jobs in the seven capital cities which makes the informal sector the first source of employment in these cities (Brilleau et al., 2005).

A three branches nomenclature shows that trade accounts for a major share of informal sector UPIs. 46% of UPIs operate in this sector, against 28% in industry, and 26% in services. The supremacy of trade is observed in almost all the capital cities. Its share goes from 40% in Abidjan to 52% in Bamako. Nevertheless, the weight of other sectors varies dramatically from a city to another. For instance, industry accounts for 43% of UPIs in Niamey against 22% in Cotonou. The share of UPIs belonging to the sector of services is the highest in Abidjan (32%) and Cotonou (28.9%) whereas it is the lowest in the landlocked cities of Niamey and Ouagadougou (17 % and 16 % respectively).

Except for the trade sector greatly predominated by out-of-shop retail sales (street vendors…), the distribution of UPIs' activities within sectors varies dramatically from a city to another. For instance, in Dakar, Niamey and Ouagadougou industrial activities are concentrated in the

"other industries and agribusiness" rather than in the clothing industry as in Bamako and Cotonou. Phase 2 surveys also reveal great differences across cities in the services sector. Indeed, in Niamey only 3% of tertiary sector's UPIs operate in catering against 36% in Cotonou and 28% in Ouagadougou.

Table 1: Structure of UPIs by areas of activities (%)

	Cotonou	*Ouagadougou*	*Abidjan*	*Bamako*	*Niamey*	*Dakar*	*Lomé*	**Total**
Industry	**21,9**	**34,2**	**28,5**	**27,3**	**43,2**	**31,1**	**23,0**	**28,4**
Clothing, leather, shoe industry	9,2	7,5	12,4	10,9	8,2	7,6	9,1	**10,1**
Other industries, agribusiness	8,1	21,1	9,4	10,3	32,0	15,9	10,2	**12,4**
Building and civil engineering	4,6	5,6	6,7	6,2	3,0	7,6	3,8	**5,9**
Trade	**49,2**	**48,7**	**40,0**	**51,5**	**40,6**	**47,3**	**48,5**	**45,5**
In-shop retail and whole sale	13,5	11,4	11,1	9,1	7,3	11,1	11,9	**11,1**
Out-of-shop retail sale	35,7	37,3	28,9	42,4	33,3	36,2	36,5	**34,4**
Services	**28,9**	**17,1**	**31,5**	**21,3**	**16,2**	**21,6**	**28,5**	**26,1**
Catering	10,5	4,8	7,0	3,0	0,5	4,1	7,0	**6,0**
Repair	3,5	4,8	6,0	2,7	2,8	2,1	5,3	**4,3**
Transport	5,2	1,0	4,1	2,9	1,9	4,3	4,4	**3,8**
Other services	9,7	6,4	14,4	12,7	10,9	11,1	11,8	**12,0**
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Source: Brilleau et al. (2005) on the basis of *1-2-3 surveys*, phase 2, Informal sector, 2001-2003, National Statistics Institutes, AFRISTAT, DIAL.

In the seven capital cities, IPUs produce for 3 840 billions of CFA francs of goods and services and create 2 322 billions of CFA francs of value added the 12 months before the surveys. The economic weight of the informal sector varies greatly from a city to another. Abidjan's UPIs make up respectively 46% and 54% of the aggregated turnover and value added. The contributions of IPUs of Dakar and Bamako are also significant. IPUs located in these only three cities represent more than 81% global aggregated value added (Brilleau et al., 2005).

Table 2: **Annual turnover, output and value added of the informal sector (in billions of CFA francs)**

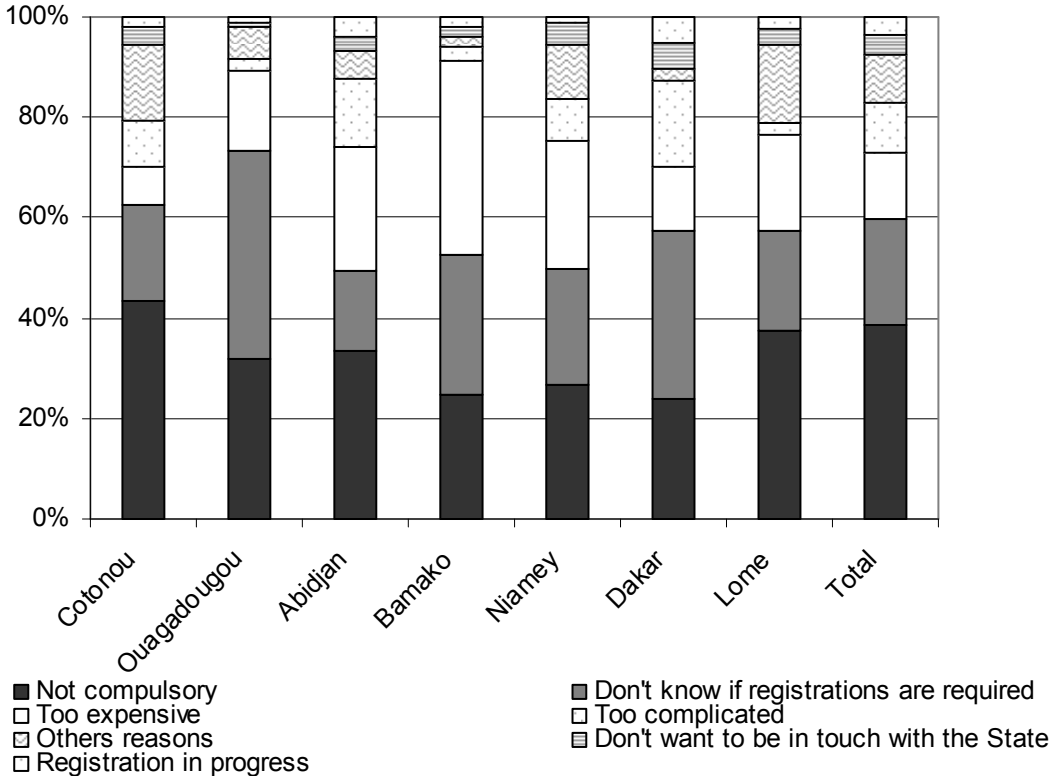
	Cotonou	*Ouagadougou*	*Abidjan*	*Bamako*	*Niamey*	*Dakar*	*Lomé*	**Total**
Turnover	571,8	478,5	2 631,9	776,9	207,5	787,2	245,4	**5 699,3**
Among which: Industry	12 %	15 %	26 %	27 %	31 %	25 %	18 %	**24 %**
Trade	56 %	69 %	34 %	53 %	60 %	56 %	49 %	**46 %**
Services	32 %	15 %	40 %	20 %	9 %	18 %	33 %	**30 %**
Production	329,8	199,5	2 112,8	450,9	106,9	482,3	157,9	**3 840,1**
Among which: Industry	30 %	40 %	22 %	28 %	28 %	31 %	27 %	**26 %**
Trade	19 %	36 %	32 %	43 %	56 %	41 %	25 %	**34 %**
Services	51 %	24 %	46 %	30 %	16 %	28 %	48 %	**40 %**
Value added	173,7	127,2	1 251,4	301,4	60,7	335,4	72,5	**2 322,3**
Among which: Industry	19 %	27 %	29 %	42 %	41 %	40 %	27 %	**32 %**
Trade	28 %	50 %	26 %	28 %	48 %	37 %	34 %	**30 %**
Services	54 %	23 %	45 %	30 %	11 %	23 %	40 %	**38 %**

Source: Brilleau et al. (2005) on the basis of *1-2-3 surveys*, phase 2, Informal sector, 2001-2003, National Statistics Institutes, AFRISTAT, DIAL.

2.3. Informal sector and the State: some descriptive statistics

Phase 2 data strongly suggest that in WAEMU capital cities the informal economy is above all an issue of weak law enforcement than of corruption, or in other words of a will to avoid the predatory behaviour by government officials seeking bribes from anyone with officially registered activities. In all WAEMU capital cities, in addition to the administrative or fiscal registration number there is at least three records with which a law enforcing firm should register: licence, trade register and social security (for IPUs with employees). According phase 2 data, in WAEMU capital cities, less than 20% of IPUs record to at least one of these registers. The most extreme cases are Dakar and Lomé where this rate is less than 10%. In almost 60% of the case, the non registration is due to the ignorance of the law: 39% of IPU think that registrations are not compulsory and 21% don't know if they are required.

Figure 1: Reasons why IPUs' activities are not registered



Source: Authors' calculations on the basis of *1-2-3 surveys*, phase 2, Informal sector, 2001-2003, National Statistics Institutes, AFRISTAT, DIAL

The surveys results suggest that there is no will of the State to force UPIs to enforce the law. In the seven capital cities, only 6.2% of the heads of UPIs say they got into trouble with public agents the year before the surveys; this proportion ranges from 4% in Bamako to 9% in Dakar. This proportion is particularly high (30%) in the sector of transports. This result illustrates the real harassment of police forces towards taxis-drivers, moto-taxi and so one.

Table 2 : Proportion of UPI that got into trouble with public agents during the past year

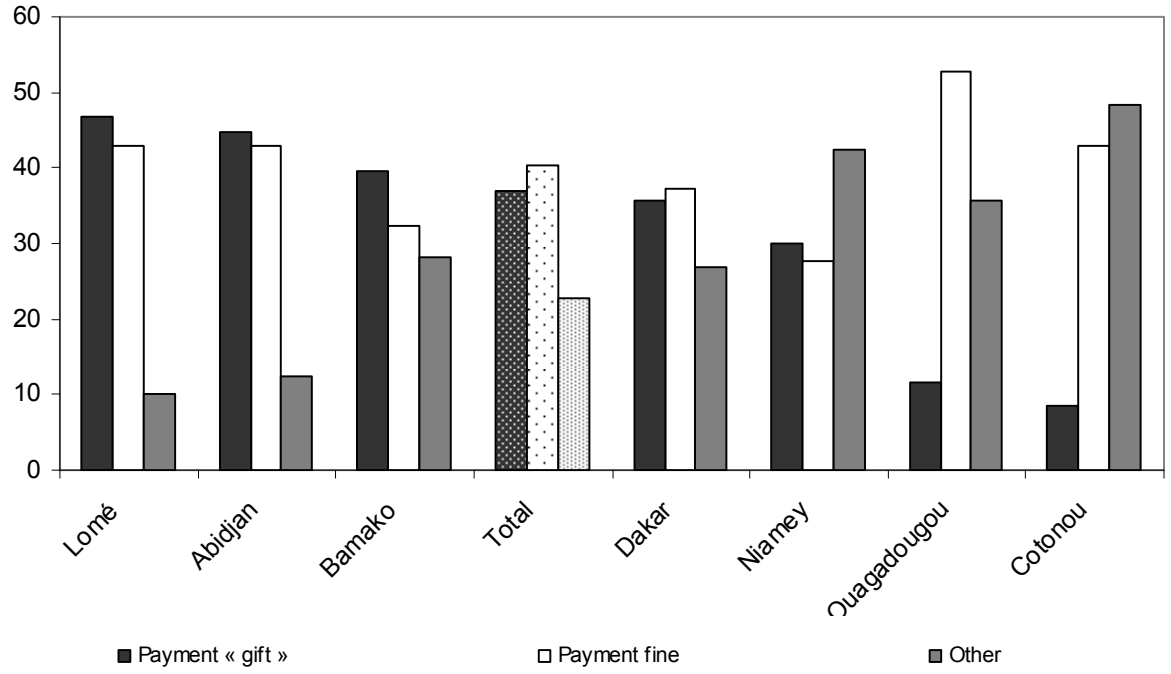
(%)	***Cotonou***	***Ouagadougou***	***Abidjan***	***Bamako***	***Niamey***	***Dakar***	***Lomé***	**Total**
Industry	5,8	5,9	7,5	3,0	3,7	2,9	3,3	**5,2**
Trade	4,8	3,9	4,8	3,2	8,5	9,5	5,0	**5,4**
Services	3,5	6,4	9,3	5,2	7,2	14,5	10,6	**8,7**
Total	**4,7**	**5,0**	**7,0**	**3,5**	**6,2**	**8,5**	**6,2**	**6,2**

Source: Brilleau et al. (2005) on the basis of *1-2-3 surveys*, phase 2, Informal sector, 2001-2003, National Statistics Institutes, AFRISTAT, DIAL.

As a consequence, only a minority of IPUs (4.2%) declare they had to pay bribes the year before the survey. Nevertheless, if we take into account only IPUs that had contact with the State that year before the survey, this proportion rises to 37% which makes bribery a significant mean of settling disputes with public agents. The incidence of corruption varies dramatically from a city to another; it is particularly high in Lomé (47%), Abidjan (45%), and

Bamako (40%). Moreover, IPU's declarations reveal that the value of bribes paid is low and represents a minor part of their value added.

Figure 2: Settlement of disputes with public agents



Source: Authors' calculations on the basis of *1-2-3 surveys*, phase 2, Informal sector, 2001-2003, National Statistics Institutes, AFRISTAT, DIAL

A last set of question deals UPIs prospect. One of they question heads of UPIs on the will to register officially their activities. Only 35% of heads of UPI declare they are willing to register their activities. This rate goes from 21% in Lomé to 44% in Dakar.

Table 3: % of IPUs ready to register their activities

Areas of activities	*Cotonou*	*Ouagadougou*	*Abidjan*	*Bamako*	*Niamey*	*Dakar*	*Lomé*	**Total**
Industry	37,6	36,8	46,8	33,1	33,1	47,3	24,7	**40,1**
Trade	30,0	32,6	25,9	25,2	31,9	42,2	14,9	**28,2**
Service	32,6	45,0	45,6	32,4	36,7	44,2	28,8	**40,1**
Total	32,4	36,0	38,1	28,9	33,2	44,2	21,1	34,7

Source: Authors' calculations on the basis of *1-2-3 surveys*, phase 2, Informal sector, 2001-2003, National Statistics Institutes, AFRISTAT, DIAL

3. What drives corruption in the informal sector?

3.1. Literature overview

The empirical literature on the determinants of corruption has of late received a boom. With few exceptions, the existing literature on the causes of corruption focuses mainly on national-level determinants using cross-country databases. The general picture that emerges from this literature is that common law legal system, Protestant traditions and British colonial rule

(Treisman, 2000), fiscal decentralization (Fisman and Gatti, 2002), higher relative civil service pay (van Rijckeghem and Weder, 2001) and the absence of an industrial policy (Ades and Di Tella, 1997) are associated with lower corruption. But most of these studies are plagued by methodological issues, such as reverse causation, and fail to provide clear guidance for policy design. Another strand of the existing literature explores the determinants of corruption at the individual level. The growing availability of micro-level data on corruption enables to understand the individual or firm characteristics associated with the probability of being victim of corruption or on the proneness to tolerate corruption (Swamy *et al*., 2001; Miller, 2006; Hunt, 2006, 2007; Lavallée, 2007; Svensson, 2003; Safavian, Graham and Gonzalez-Vega, 2003).

However, micro-level studies dealing with the determinants of bribes payments across firms are quite rare, especially in Africa despite the fact that corruption is widespread in this area of the world. To the best of our knowledge, the only exception is the study by Svensson (2003) that analyses the incidence and magnitude of graft across 250 Ugandan formal firms. As regards the incidence of bribery, Svensson shows that firms receiving public services, firms engaged in trade and firms paying more types of taxes face a higher probability of having to pay bribes. His results also indicate that firm with extensive dealing with the public sector face a higher probability of having to pay bribe; but that the firm profitability and the size of the firms have no significant impact on the probability bribe paying. As far as the amount of bribes paid is concerned, the basic findings are the following. The more a firm can pay; i.e. the higher are its current and expected future profits, the more it must pay. The more profitable is outside option for the firm, the less it must pay.

We propose to first extend Svensson's (2003) analysis of the incidence of graft to firms operating in the informal sector. The novelty of our approach is not only its extension to the informal economy but also its cross-country dimension. Indeed, our data were collected trough questionnaires that were perfectly harmonized, which guarantee comparability across countries.

3.2. Empirical strategy and construction of the variables

This section aims at identifying the factors that influence the risk for IPUs of paying bribes. The issue is that only IPUs that get into trouble with public agents are exposed to bribery. But, several theoretical arguments suggest the absence of trouble with public agents is potentially a consequence of corruption. For instance, corruption is often presented as reducing the quantity (Shleifer and Vishny, 1993) and the quality (Bearse, Gloom and Janeba, 2000) of publicly provided goods and then corruption could reduce the administrative controls over firms and particularly UPIs. Therefore, an analysis done exclusively on a sample of IPUs that got into trouble with public agents could be biased by under-estimating potential bribe payments. Our analysis of the determinants of bribe payments tests the existence of such a selection bias and corrects it. More precisely, we use a probit model with sample selection (van de Ven et van Pragg, 1981).

We study the probability of a firm *i* to face bribery when it gets into trouble with public officials, event coded $corruption_j=1$, when the firm vulnerability or propensity to corruption $(corruption_i^*)$ is unobservable. This vulnerability or propensity to corruption is supposed to be linked to characteristics of UPIs.

$$Corruption_i = \begin{cases} 1 & si \quad Corruption_i^* = \alpha_0 + \sum \gamma_{0,n} X_i + \varepsilon_{0,i} > 0 \\ 0 & sinon \end{cases}$$

Where :

- X_i : is a vector of n characteristics of the UPI i (age, educational level of the head of the UPI, turnover…) ;
- $\varepsilon_{0,i}$ est une perturbation (N(0,1))

However, this dependant variable is not always observed. Its probability of observation ($contact_{ij}=1$) also depend of a latent variable unobservable linked to characteristics of UPIs.

$$Contact_i = \begin{cases} 1 & si \quad Contact_i^* = \alpha_1 + \sum \gamma_{1,n} Z_i + \varepsilon_{1,i} > 0 \\ 0 & sinon \end{cases}$$

Where:

- Z_i is a vector of *m* UPI *i* characteristics ;
- $\varepsilon_{1,i}$ id a disturbance trem ;
- and corr($\varepsilon_{0,j}$, $\varepsilon_{1,j}$)=ρ, when $\rho \neq 0$ the standard regression technique applied to the first equation yield biased results.

For the model to be well identified, the selection equation should have at least one variable that is not in the first equation. Otherwise the model is identified only by functional form, and the coefficient has no structural interpretation. We therefore computed a dummy variable taking the value of 1 if IPU's premises are favourable to control and zero otherwise. More precisely, we consider that UPIs which activities take place on highways, public markets or permanent locals are particularly exposed to control by public agents.

3.3. Variables of interest

We now turn to an explanation of the key variables we use. Our dummy variables of contact with public agents and experience with corruption are built based on the following series of questions in the *phase 2* surveys: *"In the past year, did you get into trouble with public official for exercising your activity?"; "How did the dispute settle: by the payment of a fine, of a bribe, or by other means?"*

We explain the probability of having paid a bribe by three types of independent variables. The first one refers to IPUs' characteristics. Optimal harassment theories (Myrdal, 1968; Kaufmann et Wei, 1999) suggest that the ability to bribe varies greatly from a firm to another. Rent-seeking officials manipulate regulation, tax, and bureaucratic red tape and their discretionary enforcement according to the firm "ability to pay" in order to induce firm to pay, and to pay the maximum amount of bribe it is willing to tolerate. We use three firms' characteristics: the size of the UPI (in term of employees and turnover), the area of activities, and the fact the UPIs is a start up. As regard the size of the UPIs, we argue that the larger the firm, the more it is likely to be harassed by rent seeking officials. The descriptive statistics suggest that some areas of activities are particularly prone to corruption and especially transport. This fact could be explained by the huge impact of discretionary police control on the business operations in this sector. At last, one can think that start-up pay more bribes

because they do not benefit from the experience and from repeated interactions with public officials.

The second type of independent variables deals with the personal characteristics of the heads of IPUs. We introduce the educational level of the head of UPI. The link between corruption and education is quite ambiguous. On the one hand, people with higher educational level may be less victim of corruption because they may know better their right and their means of defence. One the other hand, educational level can be seen by public officials as a proxy of heads of UPIs ability to pay. We also use gender as an independent variable because numerous studies show that women are less victim of corruption than men. Ultimately, we introduce a dummy variable denoting that the head of UPI is a migrant as proxy for social integration.

The third one is a set of cities fixed effects which aims at capturing cities heterogeneity and unobservable characteristics.

3.4. Results

Our results are depicted in tables 4 and 5. Table 5 presents our estimations of the selection equation and table 5 of the corruption equation. Above all, these estimations confirm the first conclusion drawn from descriptive statistics i.e. that in Sub-Saharan Africa the informal sector is rather an issue of weak law enforcement than of corruption. Indeed, our estimation shows that the estimated probability for an IPU to get into troubles with public agent is very low, around 5%. Then, an UPI has less than 2 chances over 100 to face corruption. Nevertheless, it is worth noting that if an UPI get into trouble with public official, its probability to have to pay bribe is around 30% which quite significant.

As regards the selection equation, some findings are in keeping with our expectations. The larger the workforce size, the more UPI is likely to get into trouble with public official. For instance, having a workforce size of 3 to ten people rather than one, increase the probability of getting trouble with public agents by 3%. Transport is the area of activities where the probability of control is the greatest. For instance, doing in-shop retail and whole sale rather than transport decreases the probability of getting into trouble with public by 5%.

As regards our results concerning, the probability to pay bribe, some findings are quite surprising. For instance, they show that workforce size, the educational level of the head of UPI have no impact of the probability to bribe whereas starts up are less likely to bribe. Other results are in keeping with our expectations. Our estimations confirm that transport is the area of activity the most exposed to the predatory behaviour of public official. Operating in any other sector decrease drastically the chance to have to pay bribe. There is also strong evidence that turnover influences positively the likelihood of having to pay bribes and than women are less exposed to corruption than men.

Table 4: Determinants of contact with the State

	1	*2*
UPI's characteristics		
Workforce's size *(Reference: 1 person)*		
2 peoples	0.18***	0.16**
	[0.07]	[0.08]
3-10 peoples	0.23***	0.24***
	[0.07]	[0.07]
> 10 peoples	0.31*	0.31*
	[0.18]	[0.18]
Area of activity *(Reference: transport)*		
Clothing, leather, shoe industry	-0.76***	-0.66***
	[0.12]	[0.12]
Other industries, agribusiness	-0.87***	-0.78***
	[0.10]	[0.11]
Building and civil engineering	-1.18***	-1.21***
	[0.15]	[0.16]
In-shop retail and whole sale	-0.80***	-0.69***
	[0.11]	[0.12]
Out-of-shop retail sale	-0.86***	-0.72***
	[0.10]	[0.11]
Catering	-1.07***	-0.88***
	[0.13]	[0.15]
Repair	-0.70***	-0.69***
	[0.12]	[0.13]
Other services	-0.93***	-0.88***
	[0.13]	[0.13]
Others:		
Premises favourable to control	0.47***	0.41***
	[0.08]	[0.08]
Start-up	-0.13**	-0.09
	[0.06]	[0.07]
Turnover	0.10***	0.08***
	[0.02]	[0.02]
Manager's characteristics		
Educational level *(Reference: secondary education and more)*		
No formal schooling		-0.07
		[0.07]
Primary education		-0.16**

		[0.07]
Others:		
Woman		-0.23***
		[0.07]
Out of town migration		0.07
		[0.05]
Constant	-1.88***	-1.62***
	[0.18]	[0.20]
Wald test of independent equations		
Chi2(1)	6.57	8.56
Prob>Chi2(1)	0.01	0.00
Number of observations	6291	5483

Robust standard errors in brackets
* Significant at 10%; ** significant at 5%; *** significant at 1%

Table 5: Determinants of bribe payments

	1	*2*
UPI's characteristics		
Workforce's size *(Reference: 1 person)*		
2 peoples	0.09	0.12
	[0.13]	[0.12]
3-10 peoples	-0.24	-0.24
	[0.19]	[0.15]
> 10 peoples	-0.10	0.02
	[0.34]	[0.31]
Area of activity *(Reference: transport)*		
Clothing, leather, shoe industry	-0.61***	-0.54***
	[0.22]	[0.19]
Other industries, agribusiness	-1.00***	-0.88***
	[0.19]	[0.17]
Building and civil engineering	-1.06***	-0.97***
	[0.35]	[0.27]
In-shop retail and whole sale	-0.77***	-0.64***
	[0.17]	[0.17]
Out-of-shop retail sale	-0.90***	-0.66***
	[0.15]	[0.15]
Catering	-1.29***	-0.90***
	[0.25]	[0.27]
Repair	-0.64***	-0.64***
	[0.19]	[0.18]
Other services	-1.34***	-1.24***

	[0.24]	[0.23]
Others:		
Start-up	-0.35***	-0.27**
	[0.12]	[0.11]
Turnover	0.16***	0.14***
	[0.04]	[0.04]
Manager's characteristics		
Educational level		
(Reference: secondary education and more)		
No formal schooling		-0.04
		[0.12]
Primary education		-0.06
		[0.11]
Other		
Woman		-0.40***
		[0.12]
Out of town migration		0.10*
		[0.06]
Country *(Reference: Togo)*		
Benin	-0.56***	-0.43***
	[0.21]	[0.16]
Burkina Faso	-0.77***	-0.64***
	[0.28]	[0.21]
Cote d'Ivoire	-0.00	0.08
	[0.15]	[0.13]
Mali	-0.19	-0.17
	[0.17]	[0.15]
Niger	-0.35**	-0.34**
	[0.18]	[0.17]
Senegal	-0.28*	-0.23*
	[0.15]	[0.13]
Constant	-1.94***	-1.91***
	[0.39]	[0.34]
Number of observations	6291	5483

Robust standard errors in brackets
* Significant at 10%; ** significant at 5%; *** significant at 1%

4. Is corruption a barrier to the formalisation of IPUs?

If the State and UPIs have few contacts, this situation is far from benefiting to the economies under review. Indeed, the situation reveals the weak law enforcement that prevails in WAEMU capital cities. It would be better that law are effectively enforce and that IPUs progressively become integrated into the formal legal framework.

To the best of our knowledge, there is no study that analyses the influence of experience with corruption with IPUs' formalisation prospect. Indeed, the literature deals rather with the impact of corruption on firms' decision to be informal. The literature on this topic suggests that high marginal corporate or personal income tax rates are not the only reason why firms

choose to operate underground. But, that high level of regulation, bureaucratic discretion and corruption are also to blame.

Our problematic is quite different. Indeed, we would like to understand what deter firm from formalising their activities. Unfortunately, we don't have enough information to model properly the trade-off for firm between formality and informality. For instance, we have no data on the effective regulatory burden, tax rate or corruption faced by formal firms in WAEMU capital cities. Therefore, we study only the influence of experienced with corruption and of contact with public official on UPIs readiness to register their activities.

Our estimations on IPUs' formalisation prospects reveal that IPUs that got into trouble with pubic agents are more likely to be ready to register their activities. It seems that contact with public agents helps to spread the law and that once known, sanctions for non registrations are in fact sufficiently dissuasive. However, corruption appears to be completely counterproductive. Indeed, whereas paying a fine or settling disputes by others means increase the chance of registration, paying a bribe has no significant effect, ie an IPU that had to pay a bribe is as likely to be ready to register as an IPU that had no problem with public agents.

Table 6: Determinants of the readiness to register

	1	*2*	*3*
Characteristics of the head of UPI			
Educational level *(Reference: secondary education and more)*			
No formal education	-0.25***	-0.25***	-0.19**
	[0.05]	[0.05]	[0.09]
Primary education	-0.14***	-0.14***	-0.06
	[0.05]	[0.05]	[0.07]
Others			
Woman	-0.27***	-0.27***	-0.31***
	[0.05]	[0.05]	[0.07]
Out of town migration	-0.09**	-0.10***	-0.08
	[0.04]	[0.04]	[0.06]
Characteristic of the UPI			
Turnover	0.16***	0.16***	0.16***
	[0.02]	[0.02]	[0.02]
Date of creation of the UPI *(Reference before 1980)*			
1980-1989	0.04	0.02	0.10
	[0.09]	[0.09]	[0.15]
1990-1999	0.14	0.13	0.28*
	[0.10]	[0.10]	[0.17]
>= 2000	0.06	0.05	0.05
	[0.10]	[0.10]	[0.16]
Workforce's size *(Reference: 1 person)*			

2 peoples	0.29***	0.29***	0.24***
	[0.05]	[0.05]	[0.08]
3-10 peoples	0.31***	0.30***	0.30***
	[0.05]	[0.05]	[0.09]
> 10 peoples	0.31**	0.30**	0.44**
	[0.15]	[0.15]	[0.20]
Premise *(Reference: permanent local)*			
Door-to-door	-0.47***	-0.46***	-0.57***
	[0.08]	[0.08]	[0.12]
Improvised post on the public highway	-0.53***	-0.52***	-0.64***
	[0.08]	[0.08]	[0.12]
Permanent post on the public highway	-0.32***	-0.31***	-0.30***
	[0.07]	[0.07]	[0.11]
Vehicle	-0.06	-0.11	-0.02
	[0.17]	[0.17]	[0.24]
Costumer's domicile	-0.52***	-0.50***	-0.82***
	[0.09]	[0.09]	[0.16]
Own domicile with no particular installation	-0.51***	-0.49***	-0.62***
	[0.07]	[0.07]	[0.12]
Own domicile with particular installations	-0.36***	-0.34***	-0.22
	[0.08]	[0.08]	[0.14]
Improvised post in a market	-0.28***	-0.27***	-0.32***
	[0.08]	[0.08]	[0.11]
Area of activity *(Reference: transport)*			
Clothing, leather, shoe industry	0.03	0.05	0.05
	[0.12]	[0.12]	[0.18]
Other industries, agribusiness	-0.21*	-0.20*	-0.21
	[0.11]	[0.11]	[0.17]
Building and civil engineering	0.18	0.21	0.14
	[0.13]	[0.13]	[0.21]
In-shop retail and whole sale	-0.18	-0.16	-0.11
	[0.12]	[0.12]	[0.18]
Out-of-shop retail sale	-0.31***	-0.29***	-0.44***
	[0.11]	[0.11]	[0.17]
Catering	-0.32**	-0.30**	-0.27
	[0.13]	[0.13]	[0.21]
Repair	-0.11	-0.09	-0.12
	[0.13]	[0.13]	[0.19]
Other services	-0.14	-0.13	-0.15
	[0.12]	[0.12]	[0.18]

Country *(Reference: Togo)*			
Benin	0.22***	0.23***	0.00
	[0.07]	[0.07]	[0.24]
Burkina Faso	0.57***	0.57***	0.27
	[0.08]	[0.08]	[0.24]
Cote d'Ivoire	0.30***	0.30***	0.33***
	[0.08]	[0.08]	[0.09]
Mali	0.25***	0.27***	0.30
	[0.07]	[0.07]	[0.23]
Nigeria	0.36***	0.36***	0.37***
	[0.08]	[0.08]	[0.09]
Senegal	0.53***	0.54***	0.15
	[0.07]	[0.07]	[0.20]
Contact with public administration *(Reference: had no problem)*			
Had a problem		0.25***	
		[0.07]	
Fine paid			0.43***
			[0.15]
Bribe paid			0.16
			[0.15]
Other			0.47***
			[0.17]
Constant	-	-	-
	1.12***	1.12***	1.11***
	[0.19]	[0.19]	[0.30]
Number of observations	5497	5459	2388
Pseudo R^2	0.13	0.13	0.17

Robust standard errors in brackets
* Significant at 10%; ** significant at 5%; *** significant at 1%

Table 7: Predicted probability of the will to register according to the types of contact with public agents

Ideal Type	*Probability of willing to register*	*95% confidence interval*
An "average" IPU that had no problem with public agents	0.30	0.28-0.33
An "average" IPU that had to pay a bribe	0.36	0.27-0.46
An "average" IPU that had to pay a fine	0.46	0.36-0.58
An "average" IPU that used other means to settle its dispute with public agents	0.48	0.36-0.6

Source: authors' estimations on the basis of *1-2-3 surveys*, phase 2, Informal sector, 2001-2003, National Statistics Institutes, AFRISTAT, DIAL.
Note: These predicted probabilities are computed on the basis of a probit model explaining the head of UPIs will to register officially their activities. The values of the other independent variables (turnover, size, educational level…) are held at their mean.

5. Conclusion

This paper analysis the links between two major features of SSA economies, the large weight of the informal sector and the high prevalence of corruption. This paper makes use of a unique data set, called *1-2-3 surveys*, which covers seven major Western African Economic and Monetary Union (WAEMU) cities. It uses specifically the phase 2 of these surveys which interviews heads of informal production units (IUP). A detailed analysis of these data leads to three conclusions.

The informal economy is rather an issue of weak law enforcement than of corruption, or in other words of a will to avoid the predatory behaviour by government officials seeking bribes from anyone with officially registered activities. As a consequence, only a minority of IPUs declare they had to pay bribes the year before the survey. Nevertheless, if we take into account only IPUs that had contact with the State that year before the survey, this proportion rises dramatically and makes bribery a significant mean of settling disputes with public agents. Our analysis of the determinants of corruption among UPIs shows that the mechanisms are not different from those prevailing in the formal sector. The more profitable firms, firms operating in transports are more likely to face the predatory behaviour by government officials. However our findings strongly suggest that experience with corruption has counterproductive effects on firms' formalisation prospects. An IPU that had to pay a bribe is as likely to be ready to register as an IPU that had no problem with public agents whereas other mean of settling disputes with public agents increase the chance that the UPI is ready to register its activities.

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