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The Determinants Linked to the Trafficking of Precious and Semi-Precious Stones in Cameroon: The Case of Diamonds in the Eastern Region

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Abstract

The objective of this paper is to analyze the factors favoring the smuggling of rough diamonds in Cameroon. To achieve this objective, we carried out a survey in the eastern region of Cameroon using the quota sampling method, the data processing was done using mainly a factor analysis by the analytical principal components (PCA) method. The study proposes five key components that promote diamond trafficking among actors in Eastern

Cameroon helping to bring a new direction in the fight against trafficking in precious stones.

Keywords: determinant, diamond, precious stone, semi-precious stone, trafficking

1. Introduction

In Cameroon, diamonds are mainly found in the eastern region and being still mined in an artisanal way. On August 14, 2012, an official notification of the admission of Cameroon as a member of the Kimberley Process and the Certification System (SCPK) was signed by Ambassador Guillain A. Milovznovic President of the SCPK in the United States, which allowed Cameroon to be able to control and trace its diamond. But the fact remains that this task remains just as complex, because of its artisanal exploitation which favors the installation of illegal networks which constitute a hazard for tax revenue thus undermining transparency while promoting diamond trafficking in Eastern Cameroon. The illicit trade in rough diamonds is one of the biggest threats facing the Kimberley Process Certification Scheme (KPCS) for rough diamonds. By their very nature, diamonds pose enormous challenges for governments who wish to ensure that the extraction and trade of this natural resource promotes national and local economic development. Diamonds are easy to transport, market and remove from controls at national borders. These elements are rational for this study, which will attempt to uncover the key drivers of smuggling, but also to help improve policy making.

Legal exports of rough diamonds from Cameroon experienced a considerable drop from 2013 to 2019. While a certain proportion has always left the country without following the legal chain of custody of the Permanent National Secretariat of the Kimberley Process (PRECASEM- Preliminary Mapping-Elaboration 2021), this did not represent a major part of the production. In 2017, the legal production was 2848.49 carats, 4.67% more than the 2721.94 carats produced in 2013, but the striking finding here is observed at the level of the value at the point of export and the volume. exported which in 2017 was 109,000 USD and 1,294.63 carats while in 2013 they stood at 570,357 USD and 2,420.88 carats representing almost 3 times more than what is observed in terms of volumes and the value at the export point of 2017.

It is therefore reasonable to think, although considering that a quantity of diamonds is stored by collectors and buying offices, that smuggling has become dominant and involves a wide range of actors ranging from the formal supply chain which begins with the artisans who exploit, sell to local traders who in turn sell to authorized purchasing offices. In view of the interest in diamonds and the practices that have become fraudulent in the sector, it would be essential to find suitable solutions to allow the Permanent National Secretariat of the Kimberley Process to apply strict measures. It is in this context that our work takes place, which will have the following objectives: Collect and analyze the different points of view of the actors in the diamond sector in Cameroon on the factors favoring the smuggling of rough diamonds with an emphasis on borders and diamond trading towns in compliant areas. Although some authors such as De Jong, T. (2019).

In its work on “Diagnostic report on diamond smuggling in the Central African Republic”

analyzes the factors linked to diamond smuggling in the Central African Republic, its work has mainly focused on artisanal miners while we will take into account artisans but also collectors and buying offices by means of interview.

2. Literature Review

A number of theoretical and even empirical works have been interested in the determination and even the trafficking of precious substances in Cameroon and elsewhere.

2.1. Theoretical Review

Cordell et al. (1996) show that price positively influences the probability of buying counterfeit products. So the price may appear to be a determining variable in the attitude towards counterfeiting and the propensity to buy copies. The price effect has also been demonstrated for practices close to counterfeiting: compact disc piracy (Tom et al. (1998). Price is the main determinant of compact disc piracy and price sensitivity is positively related intending to buy imitation.

2.2. Empirical Review

Diderot Nguepjouo and Éric Manyacka (2008) in their thesis entitled "artisanal mining in the province of eastern Cameroon: case of the department of Boumba and Ngoko" based on a statement by the coordinator of the Support and Promotion Framework. the artisanal mining (CAPAM), Ntep Gwet, in January 2008, reported an enormous traffic of gold and diamonds in the country, and which would last according to some sources for 70 years. The elements thus evoked constituted the reason being, their investigation, which show us the general framework in which these activities are set up before attempting to account for the extent of the exploitation of the mentioned minerals (gold, diamonds), the conditions and processes of this exploitation, the problems it generates as well as the income it provides, to present the actors involved in this activity, the marketing methods used, and finally to give an account of the destination of the quantiti**es** produced.

Offah Obale (2016) in his work on "From Conflict to Illegality: Mapping the Diamond Trade from the Central African Republic to Cameroon" shows us how diamonds are smuggled from the Central African Republic to Cameroon. In addition, it emphasizes Cameroon as the main transit country for the illicit trade in conflict diamonds from the Central African Republic to the legitimate diamond market, as well as the general integrity of the supply chain of the Central African Republic diamonds. The report describes the methods used and the main actors involved in this illicit trade. The report highlights the intersection between aspects related to the development of the artisanal and small-scale mining sector and its lack of formalization, and how this affects the traceability of minerals from the mine site to the point of export. The lack of formalization and the weakness of traceability in Cameroon, as in many African countries, contribute to the ability of some people to smuggle and take advantage of weak internal controls.

Christian Dietrich (2002) in his work on “Diamonds in the Central African Republic: Trade, Valuation and Laundering” makes a presentation starting from a conceptual analysis of the

diamond economy in the Central African Republic, including a description of taxes on the Central African Republic export of diamonds. It then examines the role of diamond exporting companies in relation to the external assessor. It examines the issue of fraudulent diamond exports and the government's efforts to curb smuggling and increase revenue from the diamond industry.

De Jong, T. (2019). In “Diagnostic report on diamond smuggling in the Central African Republic” analyzes the factors linked to diamond smuggling in the Central African Republic. And according to him these factors can be:

-factors related to the implementation of the Kimberley Process Certification System (KPCS) in Central African Republic;

- factors related to dysfunctions in the supply chain;

- factors linked to dysfunctions in repressive measures and internal controls. And then he takes stock of the supply chain and also presents a comparison between the current diamond production in the Central African Republic and that which the Central African Republic recorded years previously, thus proving a reduction in production that may be due to the existence of smuggling network.

3. Methodology

3.1. Data Collection

In order to be able to carry out this study we first have to determine our target population. The target population includes all artisanal miners, from the formal and informal sector in the East Cameroon region, on whom we wish to generalize the results of this study. To achieve the objectives, we oriented our survey through a quota survey in the Kentzou and Kette areas in the Kadey division, for 100 artisans on whom we asked a series of questions. with regard to the collectors and purchasing offices being less numerous, we conducted interviews with around ten collectors and purchasing offices. These sites constitute major embarkment and disembarkment points for diamonds sold in the informal sector.

3.2. Data Reduction by Factor Analysis

The goal is to reduce information without too much loss. The reduction of data by factorial analysis allows us to go from a large number of items or statements to a smaller number, by grouping together the items that measure the same dimension, thus obtaining a certain number of factors representing each a dimension of a studied variable.

3.2.1. Analysis of Correlations

The correlation coefficient gives the strength of the degree of connection between two quantitative variables. This measure can demonstrate the existence of a link between the independent and dependent variables. Correlation is a measure of linear link. Correlation analysis is performed when both variables are metric. The coefficient R (from –1 to 1) allows us to see the degree of linear link. The null hypothesis in the test (correlation test) is that there is no relationship between the two variables (r = 0). The decision rule for the SPSS test is

based on a level of statistical significance, the p-value. If p (significance) is less than 0.05, we reject H0. The conclusion will therefore be that, if p is less than 0.05, there appears to be a relationship between the variable

3.2.2. KMO Index and Bartlett's Sphericity Test

The KMO index is an index of the adequacy of the database that we submit, we will say that a KMO> 0.5 is a good index because we are looking for a relatively large KMO. And for a Bartlett test <0.05 this shows us that there is a minimum of correlation between the variables.

3.2.3. Principal component analysis

The PCA consists in synthesizing the number of observed variables, in other words it will attempt to summarize the information contained in the data table, in a reduced set of linear combinations of the initial variables, while taking care to minimize the loss of information from the data table. made this reduction. These new synthetic variables called "principal components or factors or even macro-characteristics" therefore have the following properties:

- The principal components, noted (C1, C2, ..., Cq), are linear combinations of the initial variables (X1, X2, XP): Cj = a1X1 + a2X2 + ... + apXp for all j = 1, q with q ⩽ p.

- They are uncorrelated (the linear correlation coefficients of the components taken in pairs are zero) which avoids the redundancy of the information already summarized.

- The first component carries or summarizes more information than the second which carries more than the third and so on, so that by limiting oneself to the first 2 or 3 components we have a good summary of the information contained in the data.

4. Results and Discussion

4.1. Results of the Factor Analysis

In order to be able to identify our key determinants of diamond trafficking, we had recourse to a factor analysis by the method of the analysis of principal components. It was a question for us, from our different study variables, to bring out the variables containing the maximum amount of information that will allow us to visualize our key determinants. For the specific case of our questionnaire on artisanal miners, we asked the SPSS software to retain only 5 determinants or factors.

Table 1. KMO index and Bartlett test

Kaiser-Meyer-Olkin index		0.536
Bartlett's sphericity test	Chi-square approx.	400.816
	Ddl	42.4
	Meaning	0.000

Source: Author’s compilation

When analyzing our KMO index, we realize that it is equal to 0.536 which is a good result for us, because we wanted a high KMO to be greater than 0.5 and this means that our sample is adequate for a principal component analysis.

Regarding our Bartlett sphericity test whose null hypothesis states that all the variables are two by two independent or discolored while the alternative hypothesis states that, there are at least two variables in the database which have a significant degree of correlation. In our case, the p-value of our Bartlett test is 0.000 which is less than 0.05 so we reject the null hypothesis.

Table 2. Total variance explained

	Initial Eigen values			Sums extracted from the load square			Sums of rotation of the load square		
Components	Total	% of variance	% cumulative	Total	% of variance	% cumulative	Total	% of variance	% cumulative
1	2.94	21.05	21.05	2.948	21.05	21.05	2.48	17.75	17.75
2	2.15	15,41	36,46	2,158	15,411	36,46	2,30	16,43	34,18
3	1.63	11.70	48.17	1.638	11.70	48.17	1.63	11.70	45.88
4	1.44	10.29	58.46	1.441	10.2	58.46	1.46	10.46	56.35
5	1.159	8.27	66.74	1.159	8,27	66.74	1.45	10.39	66.74
6	0.97	6.92	73.67						
7	0.82	5.86	79.53						
8	0.74	5.29	84.83						
9	0,52	3,77	88,60						
10	0.45	3.77	91.88						
11	0.37	82.65	94.54						
12	0.312	52.291	96.837						
13	0.275	11.964	98.801						
14	0.168	41.199	100.00						

Source: Author's compilation

When analyzing our table of explained variances which are also our eigenvalues, we realize that the first five values of our table are those containing the maximum amount of information. We therefore have for the first value 2.948 which alone captures 21.057% of the information which is strong enough and therefore which has the most information compared to the 4 other values which are 15.411%, 11.703%, 10.294%, 8.277%. With regard to the other values from the sixth to the thirteenth, we realize that the level of information decreases as we go and cannot therefore be part of our study because their variance is less than 1. Regarding the Cumulative percentages, we realize that our five eigenvalues retained alone accumulate 66.743% of the information which is a good thing for the rest of our study.

Table 3. Rotation of the matrix of the components

Components	1	2	3	4	5
Sex	-0,769				
Number of children in charge	0,686				
selling diamond	-0,646				
Marital status	-0,584				
Be part of a GIC		0,572			
Diamonds customers		-0,77			
Reasons for doing the activity		-0,766			
have the artisanal mining authorization		0,632			
Age			-0,734		
know the international rough diamond price			0,614		
Level of study				0.869	
know the diamond certification system					0.835
selling price fixed in advance					-0,563
The purchase of the stones following a formal observation provided for the purpose			0,702		0,508

Source: Author's compilation

In view of these results after rotating the matrix of main components, we realize that the first component is made up of the variables: sex, family in charge, marital status, do you prefer to sell your diamond directly or wait? we can therefore conclude that the first determinant which promotes diamond trafficking among artisans is strongly correlated with the family variable in charge which indicates to us that the majority are artisans who have a family in their charge and with the aim of meeting their different needs are pushed to work in the informal sector and more specifically in trafficking. And we call this determinant the economic level of artisanal miners.

Regarding the second component, we realize that it is made up of the variables: are you part of a GIC? Who are you selling your diamond to? why are you doing this activity? do you have the artisanal mining authorization? We can therefore see that the second determinant is

strongly correlated with the variable are you starting from a GIC? and do you have the authorization of a craftsman? We can therefore conclude that our second determinant of traffic among artisans is the weakness in the implementation of compliance procedures and monitoring of artisanal miners.

Regarding the third component, which is made up of the variables: Age, do you know the international price of rough diamonds? does the purchase of the stones follow a formal observation? we realize that the third component is strongly correlated with the variables do you know the international price of rough diamonds? and does the purchase of the stones follow a formal observation? We can therefore conclude that the third determinant of diamond trafficking among artisans is the non-formalization of traceability documents during the sale of their product.

As for the fourth component, it is strongly positively correlated with a single variable which is the level of education of artisans and we can therefore say that the level of education of artisans is a key determinant of diamond trafficking.

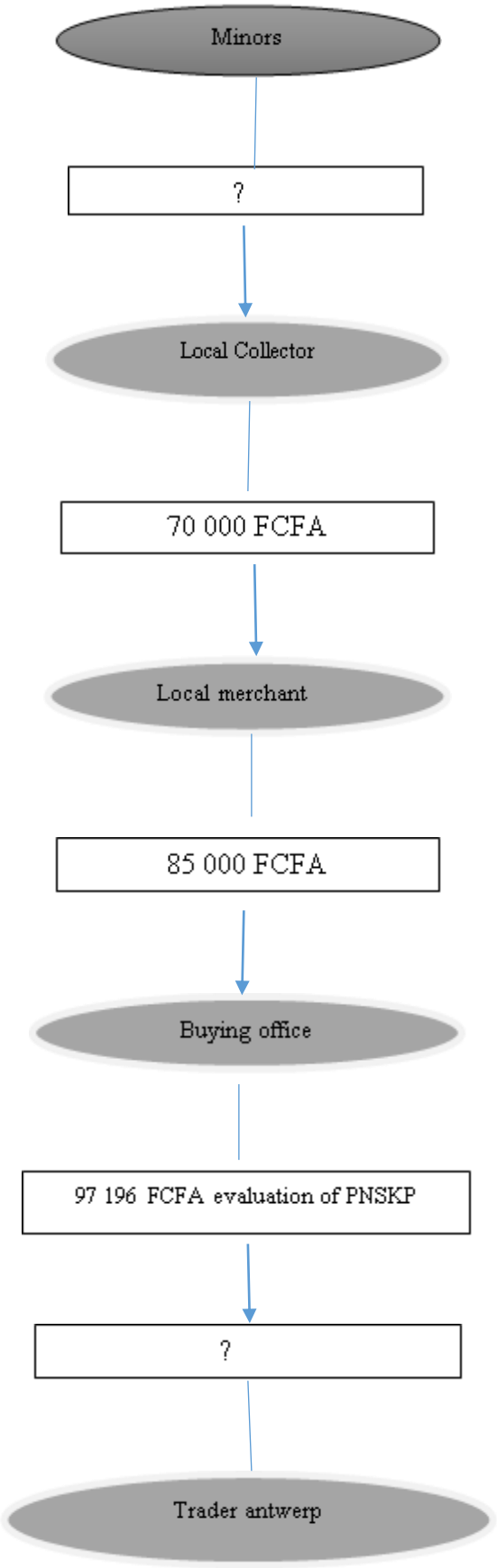
Finally, with regard to the fifth component which consists of variables: do you know the diamond certification system? does the purchase of the stones follow a formal observation? is your price fixed in advance? it seems clear that our component is strongly correlated to the variables do you know the diamond certification system? does the purchase of the stones follow a formal observation? which tells us here that the level of information available to artisans is a key factor in diamond trafficking in Cameroon.

4.2. Presentation of results to collectors and purchasing offices

Since diamonds are not a commodity, it is very difficult to put a price on an imaginary stone. In order to analyze the added values along the chain, an experiment conducted by SNPPK experts purchased a stone which served as a standard of measurement for our study.

This standard stone was chosen for its production frequency, its size and whose gemological characteristics, according to the GIA standard, are as follows: weight 94 carats, color j, purity SI 2, form MBA2 (SNPPK evaluation).

The flow gram below shows the evolution of its price along the marketing chain.


Minors
?
Local Collector
70 000 FCFA
Local merchant
85 000 FCFA
Buying office
97 196 FCFA evaluation of PNSKP
?
Trader antwerp

In view of this sales flow chart, we notice here that the diamond is estimated at 97,196 CFAF by the Permanent National Secretariat of the Kimberley Process (PNSKP) and taking into account that an export tax must be applied to this sum, i.e. 20, 5%, the buying office will therefore have to pay an amount of 19,925.18 CFAF as tax and will therefore end up with a stone with a value of 77,270.82 FCFA and in this situation it does not generate a profit from its purchase to the local merchant. of 85,000CFAF. From a regional perspective, on the other hand, Cameroonian production may be of interest to actors in the informal sector, because Cameroonian volumes aggregate to Central African volumes, the stones of which have, moreover, similar characteristics.

The very high export tax is therefore an obstacle to the formalization of the diamond sector, and is therefore an essential determinant for collectors-traders but also for buying offices.

5. Conclusion

We have tried to verify in this work the relevance of the factors linked to diamond trafficking by a factor analysis through a PCA. The results of the study shows that: the economic level of artisanal miners, the level of education of artisans, the low level of information of artisanal miners, the high imposition of the export tax, the non-formalization of documents of traceability during the sale of diamonds by artisans, the absence of monitoring and control through a GIC mainly among artisans, are our key determinants that explain the traffic of this resource in the east region. While they offer a significant advantage for the actors involved in the informal chain, they also have an impact on the structural development of the extraction zones and, by extension, on the national economy, since export taxes and especially the 8% of the ad-valorem tax contribute enormously to the development of the nation, these determinants thus presented gives a new direction in the fight against the trafficking of precious stones. The limitation of this study is that we were not able to survey all the diamond production basins in the Eastern region, but also we were not able to have a considerable sample of buying office on whom to invest.

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