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Factors Influencing Informal Cross Border Cattle Trade between Chad and Nigeria

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Abstract : *Trade relationship has long been in existence between Chad and Nigeria even before the creation of the so called colonial boundaries. After the creation of boundary, Chad extended its trade relationship to other francophone countries, but its relationship with Nigeria has continued, mostly at the informal level. This paper analyzes informal cross border cattle trade between the two nations with a view to assess the benefit to both. The study employed primary data and the tobit gravity model was used to determine the significant factors promoting informal cross border cattle trade. Results obtained showed that income of both importing and exporting countries exhibited strong positive significant effort at informal cross border trade while transport cost is used as a proxy for distance and is negative. Language and population of importing country on the other hand, play significant impact. Finally the paper recommends infrastructure development and formalization of the trade so as to allow the introduction of effective machinery for tax collection.*

Keywords: *Informal trade, Chad, Nigeria, revenue, torbit gravity model*

I. Introduction

The Historically, Chad and Nigeria have been countries of traders. The ancient kingdoms of Kanem Borno, and Wadai which presently occupied the Northern Borno in Nigeria, South West Niger and North Western Cameroon, built their power on trade with Libya, Egypt and Sudan. During the colonial period, Chad busted its trade with its francophone counterpart countries and Nigeria. In the 1970s, the structure and direction of external trade remained similar to the pattern of colonial times; the most important trading partners of Chad remained unchanged (France and Nigeria). Exports to France were principally cotton fibers, and imports were finished manufactured goods and equipment. Trade with Nigeria consisted of cattle, fish, neutron and other traditional products. However, trading activities within the two neighbors (Nigeria and Chad) were carried out at the informal level since most of the commodities traded were unrecorded and did not pass through the official channels. Trading activities continued between the two countries until the late 70s. After the Chadian civil upheavals of the late 1970s and early 1980s, that restricted all external trade, unofficial trade with Nigeria again resurfaced. Official trade with France declined after 1982, primarily because many French – affiliated firms closed during the conflicts.

Nigeria and Chad forged stronger ties during the 1980s with the hope of benefitting both commercially and diplomatically. Nigeria replaced France as Chad’s major source of export revenues. Bilateral trade agreements also recognized the potential value of the large informal trade sector across their borders which neither country regulated [1]. In addition, Nigeria however, was not without its strains. Beginning in the late 1970s, clashes occurred around Lake Chad, where both countries had the hope to exploit oil reserves. Both also sought to defuse these confrontations, first by establishing joint patrol and a commission to demarcate the boundary across the lake more clearly. Then in early 1980s, the low level of Lake Chad brought a series of tiny islands into view, leading to further disputes and disrupting long-standing informal trade networks. The Nigeria’s 1983 economic austerity campaign also produced strains with neighboring states. It expelled over 30, 000 Chadians. Despite these strains, Nigerians had assisted in the halting process to achieving stability in Chad and currently it is ranked the best trading partner at both formal and informal levels.

Chad’s unofficial (informal) trade with Nigeria has historical and social roots. Tribal and extended family connections across borders encouraged traders to maintain long–range commercial and financial networks beyond colonial and, later, national government control and taxes. Traders unofficially exported the bulk of Chad’s exports of cattle, fish and other traditional products. Unofficial imports consisted of petroleum products and consumer goods such as sugar, cooking oil, soaps and cigarettes that competed with produced by national industries. The permeability of Chads borders and the informality of traditional trading networks denied the government revenues ordinarily derived from export – import duties. Locally produced goods and legal imports fared badly in this market, burdened as they were with high production cost, lack of economies of scale, and price distortions imposed by government controls.

This paper therefore discusses the informal cattle trade relationship existing, gains from trade and revenue losses between the two countries. The importance of livestock to both Nigeria and Chad cannot be over emphasized as it contributed about N135.4 billion to GDP in Nigeria within the first half of 2007 [6]. Its contribution to Chad is more than 18% of the GNP. This contribution was made through the exports of the cattle that passed through the formal channel, hides and skins [2].

According to the Food and Agricultural Organization the estimated population of cattle in Nigeria is about 14 to 20 million in 2008, while Chad has an estimated population of cattle of about 8 million and its contribution to Chadian GDP in 2006 was $126 million. However, there exists a reasonable amount of cattle inflow from neighboring countries of Benin, Cameroun, Chad and Niger. The Nomadic nature of rearing cattle makes the estimation of its population difficult. There is an age- long established traditional pattern of movements of pastoralist in the dry season in search of pasture from the north to the south and during rainy seasons they return to the north. These movements involve the crossing of borders, particularly between Chad and Nigeria. This long trans-border movement forces most of the cattle thrive at a subsistence level and more energy and vitality that would have been used for production purposes is now wasted in moving. The high level of cattle production in the zone is made possible by the favorable ecological features such as accessible drinking water of Lake Chad, River Benue and its tributaries, as well as free-abundant natural pasture along Gamboru Ngala – Marte plains, Ganye plains in Adamawa State and Ogudu in Cross River State of Nigeria.

There exist long trade relationships between Nigeria and Chad at the informal level, resulting loss of revenues being lost to both countries. The pattern and the significant factors that determine this trade relationship need to be analyzed and earlier studies [2], [5] have paid little attention to it, hence the study. There is also the need to access the informal cross-border cattle trade between the two countries with a view to quantify the magnitude of benefits to both. Unfortunately, not much research is done in this regard in recent times and this paper is designed to bridge that gap.

The main objective of this paper is to determine the significant factors promoting informal cross – border cattle trade between Nigeria and Chad republic. The paper is hoped to assist governments of both nations to identify revenue losses in informal cross – border cattle trade to them, and in further understanding of how the market operates. The basis for further exposition of the trade relationship between Nigeria and Chad will also be created, thereby, providing grounds for encouraging nationwide informal cross border trade studies. This paper might in the long run assists policy makers in formulating policies in the area of cross border trade generally. Finally, the paper will help add to existing literature and indicate the recent changes that have taken place in the cattle business.

The paper covers activities in the informal cross – border cattle trade between Nigeria and Chad for a period of twenty years (1989 – 2009) and covers an area of over 1000 square kilometers of the North Eastern part of Nigeria and Southern part of Chad Republic. The selection of the period was purposely done to mark the period of stability in the region. Immediately towards the end of 2009 "book haram" disturbed the area. Obtaining data within the insurgency period was difficult and both formal and informal trades were suspended. Trade between nations known as international trade is a sub – field of International Economics, which deals with the exchange of goods and services between nations [4]. Cross – Border trade is a branch of international trade in which goods and services move across the common border of two countries and this can be classified into two: - the formal and the informal cross – border trade [3].

The word informal is perceived (by some) to denote (i) illegal economic activities, (ii) parallel market while others, (iii) extra-legal markets, there is an illegal component to informal trade if we consider trafficking in drugs, firearms or narcotics [8]. If informal trade refers to pure smuggling of goods across borders, it is taking place primarily to circumvent tariff and non-tariff barriers, this could be termed as illegal trade [2]. It is, however, possible that greater part of informal trade is in the nature of extra – legal trading, tolerated in practice even if illegal in the letter of the law [8]. This occurs due to the fact that the government or the state machinery does not extend to corners of society in a developing country like Nigeria e.g. informal trading enterprise would be those that are unlicensed and unregistered.

Informal trade hinges on how traders could obtain information on commodities and qualities to be traded. This is done through personal trips, authorized channels, distribution network, official means, enforcement agencies and trade fairs. Transaction costs include payment to law enforcement agencies as bribes, transportation cost, cost of credit and cost of currency conversion. [5] it has been pointed out that in developing countries, bribes have been in the increase rather than declining because most of the custom officials in the border areas and officials from the border security forces see this as an opportunity to raise their personal income. Moreover, bribes had become pervasive with linkage from border officials; through the bureaucracy to politicians – frequent changes of officials at border post is another factor.

The sources of finance to informal cross – border traders include the following: friends, relatives, informal money lenders, Bureau de Change, banks and own finance. In informal trade between India and Nepal finalization of trade include the following: advance payment, collateral use, prior dealings, third party reference and goods sold on credit. According to [8,] the risk for export under informal trade could arise due to delay in the delivery of the goods. Default in payment due to seizure while the importers' risk could be due to goods not conforming to specifications and etc. However, cross – border traders have developed a mechanism to mitigate this risk e.g. non anonymous transaction is an important mechanism; they make payment to law enforcement agencies to mitigate risk. In informal cross border trade, it is the sender who bears the risk. The mechanism for dispute settlement among contracting parties is to refer to ethnicities to restore conflicts as practiced among the Chadian traders [2].

[2] have shown that what facilitates informal trade between nations are the difference in natural resource endowment and socio – cultural factors. In their study of informal cross border trade between Nigeria and the Republic of Benin, they pointed out that informal trade exist in the area because the inhabitants of the border towns in both countries share some cultural and religious ties.

II. Methodology

Brief Description of the Study Area

Nigeria lies on the shores of the Gulf of Guinea bounded by the Niger Republic in the North, Chad in the North – East, Cameroun in the East and Benin Republic in the West. Nigeria has a population of 146 million inhabitants and an area of 923, 768 square kilometers. The Nigerian official language is English. Nigeria is endowed with a number of mineral resources, including crude oil, tin, iron ore, gold, etc.

Chad on the other hand is located in Central Africa with a surface area of 1, 248, 000 square meters bordered in the North with Libya, East with Sudan, West with Niger and Nigeria and Cameroun in the South. Chad has a population of about 10, 780 million. Chadian official languages are Arabic and French.

The study applied tobit gravity model to examine the fundamental variables that determine informal cross border cattle trade (i.e. Factors like income, population density inclusive, language and other socioeconomic factors) of cattle trade between Nigeria and Chad. Maximum Likelihood Method of Estimation was employed. The paper also used simple descriptive statistical tools such as percentages and absolute numbers to show at a glance the benefit or losses of the informal cross – border cattle trade between the two countries.

The main ingredients of bilateral trade flow patterns are foreign goods demand, foreign goods supply, trade resistance or promotion factors. Out model is of the form

$$y_{ij} = f(\Omega_{pi}), (\Omega_{pj}), (\Omega_{aj})$$

Where

y_{ij}= measure of trade flows from i to j

Ω_{pi}= a vector of trade potentials in the original country i,

Ω_{pj}= a vector of trade potentials in the destination country j,

Ω_{aj}= the vector of trade attraction between countries i and j

The supply factor in country i depend on its economic size and it is proxied by Gross Domestic Product (GDP) of the particular country. Trade intensity of i for instance, is, another factor which is expected to influence cattle supply. For the exporter, GDP determines economic capacity, while per capita GDP determines the production for export [7].

The next set of variables reflect trade resisting or promoting factor. These variables can, to a reasonable extent, be regarded as the total cost of transaction, which include, among others, cost of transportation, distance between trading partners trade policies and preferential arrangements. There is a high correlation between transportation cost and distance, hence [7] proxies total cost of transaction by distance between trading partners. The torbit gravity model that was estimated is of the form:

$$x_{ij} = \beta_0 + \beta_1 \log(y_i) + \beta_2 \log\left(y_j\right) + \beta_3 \log(p_i) + \beta_4 log\left(p_j\right) + \beta_5 \log(d_{ij}) + \beta_6 \log(l_i)$$
$$+ \beta_7 \log\left(cy_i - cy_j\right) + \beta_8 \log\left(ch_i - ch_j\right) + \varepsilon$$

Where x_{ij} is export from country i to j, y_i and y_j denote incomes of the two countries while p_i and p_j is population of the importing and exporting countries and d_{ij} represents the distance and l_i signifies common language. The $cy_i - cy_j$ and $ch_i - ch_j$ represent per capita income of the importer minus per capita income of the exporter and per capita cattle head of the importer minus per capita cattle head of the exporter.

The effect of historical tie is assumed to be reflected in the official languages of the trading partners, which take a value of (1) if both partners share the same language and (0) if otherwise. Please note that language plays an important role here because of its informal nature. Chadian cattle traders feel more comfortable in dealing with people that share the same language with them.

Sources of Data

Data for this paper were obtained from both primary and secondary sources. The later were obtained from publications of Borno State Ministry of Agriculture, World Bank reports, African Development Bank, Central Bank of Nigeria annual reports, International Monetary Fund (IMF), National Livestock Development Program (NLDP) and Economic Community of West African States (ECOWAS). The primary data were obtained through questionnaires and interviews with the major players, custom officials, village heads at the border settlements and officials of Nigerian Road Transport Workers' Union who were requested to give estimate of the number of trucks, pick-up vans and those using foot path that cross the border with cattle on a daily basis. Tax collectors at both Ngala and Maiduguri were not left out. A total of 150 traders were interviewed at the Cattle market in Nigeria in both Maiduguri and Gamboru Ngala Markets. Only 50 were interviewed in Chad. Traders were randomly selected in both countries. However, one major problem encountered is that of language. The Chadians could neither communicate in English or Hausa (the most widely spoken language within the Northern Part of Nigeria). However, interpreters were employed to help mitigate this problem.

III. Analysis

The consolidation of the operating accounts of the various agents who intervene throughout different stages of the business from the area where the cattle were collected in Chad to the final destination in Lagos- Nigeria, allowed us to assess and analyze how the costs are spread and margins are shared out by groups and by countries. For example, a a medium size adult bull from Chad and was bought at Moshodi at a price of 172, 980 CFA Francs i.e. N55, 353.60 (at the exchange rate of 3.145 CFAF to 1Naira as at January 15, 2015) and taken to Lagos, Nigeria where it is sold for N115, 000.00 or 359, 375.00 CFA Francs. This means that the cow had a retail value of N115, 320.00 or 360, 375.00 CFA Francs. For the purpose of our economic analysis, we make the following assumptions and use the following conversions as at December 2009;

- Sale by breeder of an adult bull weighing 380 kilograms in the area near Moshodi to a collector at the price of 172, 980.00 CFAFs or N55, 353.60. The sale price at Maiduguri is N85, 336.80, the final valuation of the animal (retail sale of the meat + remains) in Lagos is N115, 320.00 or 360, 375.00 CFA Francs.
- Exchange rate at Maiduguri; 3.125 CFA Francs to N1.00.
- The Chadian trader buys the animal at Moshodi and t taken to Maiduguri by foot, and transferred to Lagos by lorry/truck where it is sold to the final user.
- All the cost and margins have been calculated for one animal taking into account that sometimes buying was done in batches and the conveyance was done on foot in a herd and that transport by lorry was in groups.

On this basis, we find 48% (as shown in table 1) of the final valuation of the animal goes to the stock breeder not counting his cost. About 47% made up of the value added after it has been raised (traders' butchers' margin, salaries of shepherds and other handlers, official and unofficial taxes) and that 5% represent the consumables in between while (fodder for the animals in transit and in the markets) and the services (transport by lorry). The consolidated margin of the various players who intervene in the business amount to 28%, a narrow share goes to retail butcher while the trader gets a margin of 13%. The official and unofficial taxes amount to 10% of the final value of the animal in Lagos. Table 1 shows the share of revenue among the players in the cattle business. Note that we still use our example of a bull of 172, 980.00 CFA Francs in Chad or N55, 353.60 which represents only 48% of its value in Lagos. About 47% is shared in this manner 24%, or N27, 676.80 (87, 210.00 CFAF) goes to collectors, retailers and other intermediaries as revenue, official and unofficial taxes take 10% of the total value (N6, 919.20 and N4, 612.80 respectively). Collectors in Maiduguri get N14, 991.60 (46,849.031CFAF) or 13% of the total value of the bull in Lagos.

Table: 1 Revenue share among in the cattle business from collection stage to final Stage.

	CFAF	Naira	% Final Value
Value of the Animal in Lagos Nigeria	360,375.00	115,320.00	100
Purchasing price of the animal at the breeder stage.	172,980.00	55,353.60	48
Revenue of other actors	87,210.00	27.676.80	24
State: official taxes	21,622.50	6,919.20	06
Agents of State unofficial taxes	14.415.00	4,612.80	04
Salaries and pay	28,830.00	9,225.60	08
Direct expenses purchase of food trans.	18,018.75	5,766.00	05
Trade margins	100,905.00	32,289.60	28
Collection-Maiduguri	46,848.75	14,991.60	13
Final user in Lagos	7,207.50	2,306.40	02

Source: Field survey 2010.

Sequel to the analysis of the sharing formula on page 10, only 6% or 21,622.5 CFA (N6,919.20) is shared as revenue is shared between the two countries in informal trade.

Share of Revenue between the Two Nations

Ignoring the direct expenses on transport and animal feeds, and further, disregarding the cost of raising the cattle up to adulthood, Table 2 shows explicitly the sharing formula of the added value. About 72% of the business is concentrated in Chad, Cameroon takes 2%. Nigeria gets 26% of the revenue, of which half is taken as trade margin by traders and the rest is shared between the fifteen different players.

In table 2, Cameroon Republic featured because all the cattle that were exported to Nigeria (formal or informal) most cross the country before reaching its final destination, except those that cross the border by water through Lake Chad. Therefore, out of the N6, 919. 20, revenue that accrues to Nigeria and Chad, Cameroon takes N2, 306.40 which is more than the N1, 532.2 Nigeria gets. Chad realizes N3, 459.6 as revenue.

TABLE: 2 Share of Revenue by Country

	CFAF	Naira	Percentage
Chad Purchase price of animal at stock breeder stage	172, 980.00	55, 353.6	48
Revenue of other players	28, 830.00	9, 225.6	8
State official taxes	10, 811.25	3, 459.6	3*
Agents of States (unofficial) taxes	3, 603.75	1, 153.2	1*
Salaries and pay	18, 018.75	5, 766.0	5*
Direct expenses	7, 207.50	2, 306.4	2*
Margin of the traders in Maiduguri	46, 848.75	14, 991.6	13
Sub-Total Chad	255, 866.25	81, 877.2	72
Cameroon			
Revenue: Other Players	7, 207.5	2, 306.4	2
State: official Taxes	7, 081.0	2, 265.9	2*
Salaries and pay	472.1	151.0	0*
Sub-Total Cameroon	7, 207.5	2, 306.4	2
Nigeria			
Revenue: Other Players	28, 830.00	9, 225.6	8
State: official Taxes	3, 603.75	1, 153.2	1*
Agents of States (unofficial) taxes	14, 415.00	4, 612.8	4*
Salaries and pay	14, 415.00	4, 612.8	4*
Direct expenses	10, 811.25	3, 459.6	3
Butcher’s margin	7, 207.50	2, 306.4	2
Trader’s margin	46, 848.75	14, 991.6	13
Sub-Total Nigeria	97, 301.25	31, 136.4	26
Final Total Value	360, 375.00	115, 320.0	100

Source: Field Survey 2009

Note *not included in the computation

The Tobit Model

Torbit gravity model- Statistically, it means that if we have a simple model in the form: $Y_1 = \beta_1 + \beta_2 X_i + u_i$ (Y_1 being the dependent variable, βs are the parameters X_1, the independent variable and u_i the stochastic term).

If RHS = 0 can the above model be estimated using only n_i observation and not to worry about the remaining n_2 observation? The answer is no for OLS estimates of the parameters obtained from the subset of n_1 observation will be bias as well as inconsistent: that is, they are biased even asymptotically. Therefore, if OLS is applied to estimate the data on population, distance between trading partners, common language and incomes of two countries proxied by GDP, the possibility of having an inconsistent and bias estimate cannot be ruled out. Maximum Likelihood Method of estimation is therefore, applied so as to avoid inconsistency of estimates. Again, the choice of this model is justified by the fact that variables such as, the use of common languages which are not easily quantifiable were applied. Therefore, application of a censured model is paramount, hence the choice of tobit gravity model. The tobit gravity model was applied on GDP of Chad and Nigeria (being the dependent variable), population of the importing and exporting country, distance and common language. The results are shown on Table 3.

Table 3: Maximum Likelihood Estimates of the Tobit Gravity Model or Censored Regression Model.

Chad Republic			**Nigeria**	
Description	Estimates	t – ratio	Estimates	t – ratio
Dependent variable - log of average exports				
Constant	6.6528	2.07	- 2.17	- 1.08
Exporter’s income	0.9724	6.01	0.6667	6.13
Importer’s income	1.1120	9.04	0.7546	5.92
Importer’s Population	- 0.0076	- 0.08	- 0.0818	- 9.08
Exporter’s Population	0.0183	0.18	0.4081	3.23
Distance between importer & exporter	- 1.9159	- 7.10	- 0.1062	- 3.01
Common Language	2.9732	3.18	1.442	2.63

Source: Computed by the Author

IV. Findings

Results for the Tobit Gravity Model were presented in Table 3. For Chad, the table indicates that the estimated coefficients showed that the incomes of both exporting and importing country exert strong positive significant effects on the cross – border bilateral trade flows between the two countries. Among the set of natural trade promotion/resistance variables included in the model, distance between the trading partners a proxy for transaction costs, came up with a negative coefficient. Transaction cost and inadequate infrastructural facilities are the major obstacle to increasing cross – border cattle trade in the area. The longer the distance between the trading partners, the lower the volume of the trade in cattle. This shows that the higher the cost of transaction (especially transport cost) the lower the level of trade.

The results of the estimates further showed that two partners with the same language were likely to trade more with each other when compared with partners that do not share the same language. Language represents not only the means of communication but also connotes socials and cultural ties. Population of the exporting country did not exhibit any significant impact on the trade. On the contrary, the higher the population and per capita income of the importing country the higher will be the demand for the goods in question.

The income of Nigeria was a determining factor of its demand on Chadian cattle. Transaction cost exerted strong negative effects on the cross – border cattle trade. Similarly, common language among the key players in trade, influence its direction (note that the Fulani tribe dominates the Mubi axis while Shuwa, Kanuri and Kanembus dominate the Maiduguri axis. The noticeable change from the Chad Republic model was in the population as indicated in table 3. It shows that population of the importing country is also a significant factor in influencing the cross-border cattle trade. There was lack of adequate data on informal cattle trade between Nigeria and Chad, because most of the animals enter into Nigeria through bush tracks. Though this is allowed by law (since there was a signed agreement between Nigeria and its neighbors to the free flow of animals for grazing purposes, it means loss of statistics and revenue to both countries.

V. Conclusion

The informal cross – border trade in cattle between Nigeria and Chad Republic is mostly done at the unofficial level. Neither Nigeria nor chad can individually control its border. The trade cannot wholly be explained by comparative cost advantage but by the theory of complimentary as differences in economic policies of the two countries. There are several factors underlying or providing the basis for this informal trade between Nigeria and Chad. The trade relationship dated back to Trans-Saharan days, ethnic, religion and socio cultural ties provide the basis for informal cattle trade. Per capita income and growth in population size were the factors responsible for the demand for Chadian cattle. The impact of the unofficial cross border cattle trade between the two countries means less revenue to the government and weakens its activities.

The paper recommends the working together of both nations towards formulating policies to formalize informal cross border trade so as to improve their revenue base. Once the trade is formalized, effective machinery for tax collection should be introduced and the present system be restructured. Such restructuring should also involve the removal of the barriers to free flow of investment for investors to invest in the production of cattle in both countries. Infrastructure should be adequately taken care of particularly accessible roads and where possible a rail line linking the nations will assist not only in facilitating trade but development. To ensure a high-quality product, diagrams and lettering MUST be either computer-drafted or drawn using India ink.

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