

Examining the Role of Private Researchers in Informal Cross-Border Trade Data Quality: A Further Investigation

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Abstract: *Informal trading is very popular at the border towns of developing countries, as occurs daily. However, activities of informal cross-border trade in Africa are not being recorded or documented by customs statistics and/or official trade records. This paper extends the work of a baseline study to evaluate the likely impact of private researchers' involvement on the quality of border trade data collection in developing countries, with a specific focus on informal trade activities at Oja-Odan (a border town between Nigeria and the Benin Republic). The study randomly selected a sample of 217 owners and/or managers of micro and small-scale enterprises in the study area to collect data via a simple structured questionnaire. A more sophisticated analysis through Structural Equation Modelling (SEM) with STATA 12.1 revealed that the collection of data on micro and small-scale informal cross-border trade by private researchers has a potential positive and significant implications for increasing the quality of international trade statistics in developing countries. The study concludes that involving private researchers in the collection and dissemination of informal trade data has significant and positive implications for the high quality of international merchandise trade statistics. The study recommends that the United Nations Conference on Trade and Development, the Economic Commission for Africa, the World Bank, national statistical offices and other agencies responsible for collecting, compiling, and disseminating data on international merchandise trade involving developing countries should involve private researchers in the process.*

Keywords: Informal Trade, Cross-Border, SEM, Researcher, Quality

Introduction

Informal trading activities are very common at the borders of developing economies, particularly where there are fewer government controls on migration. These informal border trading activities constitute a large contribution to the economic growth of border towns in these developing countries. A good example of this regard is the booming local economy of Oja-Odan border town between Nigeria and Benin Republic where large number of Nigerians transact informally with Beninuos on daily basis (Central Bank of Nigeria [CBN], 2016; Saka, 2023). However, most of the informal cross-border trades in Africa are not being recorded or documented by customs statistics and/or official trade records (Abayisenga, 2024; Economic Commission for Africa, 2023; Kahiya, 2025; World Bank, 2020). Up till now, no agreed method of reporting informal cross-border trade exists in Africa (Economic Commission for Africa [ECA], 2023). In fact, lack of adequate documentation of growing informal cross-border trading activities has been a long term statistical concern for Nigeria due to under-reporting of trade flow in her Balance of Payment statistics (CBN, 2016; International Monetary Fund, 2015).

Meanwhile, better information on the magnitude and pattern of informal cross-border trade would potentially increase the adequacy and quality of statistics on international trade merchandise. In other words, this paper extends the work of a baseline study by Saka (2023) to evaluate the likely impact of private researchers' involvement on improved quality of border trade data collection in developing countries. The focus of the current study, just like the baseline study, is informal cross-border trade activities at Oja-Odan, a cross-border town between Nigeria and the Benin Republic. However, the current study argues that the non-probability-based small sample employed in the baseline study, where 100 micro and small-scale enterprises were selected, could undermine the external validity of the study (Olsen, Orr, Bell, & Stuart, 2013; Faber & Fonseca, 2014; Tipton, Hallberg, Hedges, & Chan, 2015). Thus, generalisation of the study results among other developing countries becomes difficult.



Literature Review

Border trading refers to trading activities which national legislation recognises between residents of adjacent locations connecting countries (United Nations Conference on Trade and Development [UNCTAD], 2023). This official definition recognises formal border trade; however, informal trade exists outside such a definition. In the main, informal cross-border trade (ICBT) constitutes trades conducted by business firms that are not officially registered with the government (Abayisenga, 2024; Kahiya, 2025; Saka, 2023) and/or registered businesses that attempt to evade existing legislation and duties. In Africa, large proportions of ICBTs are micro and small-scale enterprises and are very prevalent (ECA, 2023). In many intra-African border economies, ICBTs serve as a reliable means of employment for a large number of residents in two different neighbouring countries (Kahiya, 2025). In the context of this current paper, the quality of border trade data is conceived as the extent to which trade data meet the needs and requirements of the end users.

This study is underpinned by total quality management (TQM) theory, which was developed by Edward Deming after World War II and during the reconstruction of Japan damaged infrastructure. TQM illustrates that an organisation can achieve long-term success if its mission is directed towards total customer satisfaction. In the current context, IMTS could achieve long-term efficiency in data compilation and dissemination of international merchandise trade, should there be incorporation or coverage of trade activities of informal cross-border micro and small-scale enterprises in developing countries. Empirically, research studies by ECA (2023) and the World Bank (2020) have documented in their respective findings that informal micro and small-scale trades are rarely captured by customs records or recorded in official international trade statistics.

More specifically and directly, the baseline study by Saka (2023) investigated the potential impact of private researchers' role in ensuring quality of border trade data collection in developing countries by focusing on informal trade activities in Oja-Odan town (a border area between Nigeria and the Benin Republic). In the baseline study, a more dynamic and sophisticated Structural Equation Modeling (SEM) approach was employed to analyse data drawn from 100 micro and small-scale operators. The study found that involving private researchers in the collection of data on micro and small-scale enterprises in border areas has significant and positive implications for improving international trade statistics in developing countries. However, the study suffers from a deficiency of a small sample, which tends to undermine the external validity of the study; hence, it limits generalisation of results among other developing countries (Olsen *et al.*, 2013; Faber & Fonseca, 2014; Tipton *et al.*, 2015). Against this backdrop, the current study aimed to examine the same

objective in the baseline study within the SEM framework but increased the sample size through a more scientific process.

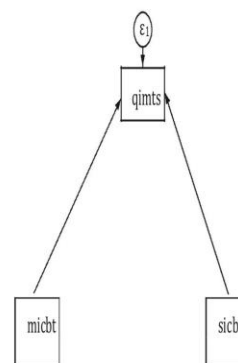
Methodology

The current study adopts a similar survey research design employed in the baseline study by Saka (2023); however, an objective method is used to determine an appropriate sample size while employing Krejcie and Morgan's (1970) sample size determination formula. The formula is provided as:

$$S = \frac{X^2 NP(1-P)}{d^2 (N-1) + X^2 P(1-P)}$$

Where s = sample size, X^2 = table value of chi-square at 1 degree of freedom for desired confidence level (0.95); N = population size (500). This population figure was used in the baseline study through head-counting of MSEs in the study area. P = population proportion (0.5). The result yields a sample size of 217 MSEs' owners and managers. A simple random sampling technique was then used to systematically select every 5th visited micro or small-scale enterprise visited at Ojan-odan border town for interviews through administered questionnaire instruments. The interviews were conducted by the investigators and two Research Assistants from August 4, 2025, to September 5, 2025 (approximately 1 month). This study considers the accuracy of border trade data collection as the dimension of data quality in international trade merchandise statistics, while private researchers' involvement is viewed within the data collection framework from micro and small-scale enterprises at the sampled border town. According to International Merchandise Trade Statistics (IMTS, 2023) and Saka (2023), the accuracy of trade statistics means how close a disseminated statistics is to the original or true features of the trade flows. The SEM diagram in Figure 1 depicts a potential relationship between private researchers' involvement and the quality of border trade data collection in developing countries.

Figure 1: Structural Equation Modeling of Impact of Private Researchers' Involvement on Quality of Border Trade Data Collection in Developing Countries



Note: micht = micro informal cross-border trade; sicht = small-scale informal cross-border trade; qimts = quality international merchandise trade statistics
 Source: STATA 12.1 Outputs (2023)



Table 1: SEM Estimation of Impact of Private Researchers' Involvement on Quality of Border Trade Data Collection in Developing Countries

Structural equation model	Number of obs	=	204
Estimation method	= ml		
Log likelihood	= -693.34063		
Cronbach alpha	= 0.84		

	Coef.	OIM Std. Err.	z P> z [95% Conf. Interval]
-----+-----			
Structural			
qimts <-			
micbt	.1598941	.0603087	2.65 0.008 .0416913 .278097
sicbt	.4109975	.0628723	6.54 0.000 .2877701 .534225
_cons	.7823118	.1441557	5.43 0.000 .4997718 1.064852
-----+-----			
Variance			
e.qimts	.4655956	.0461008	.3834664 .5653148

LR test of model vs. saturated:	chi2(0)	= 0.739,	Prob > chi2 = 0.2984
.			
Post-Estimation Diagnostics			

Fit statistic	Value	Description	
-----+-----			
Likelihood ratio			
chi2_ms(0)	6.328	model vs. saturated	
p > chi2	.592		
chi2_bs(2)	54.281	baseline vs. saturated	
p > chi2	0.251		

Source: STATA 12.1 Outputs (2025)

Interpretation and Discussion of Results

The information in Table 1 indicates that 204 data points (observations) entered the final analysis. The final data as treated by the system represents 98.08% of the total 208 retrieved questionnaires from the respondents, which were correctly filled. In the main, the final data analysed is approximately 94% of the study sample; hence, this indicates high reliability of the result, which is even confirmed by a Cronbach's alpha value of 0.84 revealed in Table 1. From Table 1, SEM estimation results show that the collection of data on micro-informal cross-border trade by private researchers has a potential positive and significant impact (*micbt*: coefficient = .16; *p*-value = 0.008) on the quality of international trade statistics in developing countries.

Similarly, potential involvement of private researchers in data collection on small-scale informal cross-border trade in developing countries will positively and significantly (*sicbt*: coefficient = 0.41; *p*-value = 0.000) increase the quality of foreign trade statistics by 0.43 per cent. The non-significant probability values of chi-square likelihood ratios indicate the overall fitness of the study economic model. Interestingly, the results obtained in this study align with earlier findings by Saka (2023) and further reinforce the notion that private researchers play a crucial role in the collection and dissemination of international trade statistics. Again, the results obtained in this study also corroborate analytical evidence provided by CBN (2016) that accurate reporting of ICBT between Nigeria and her neighbouring countries can boost employment opportunities at the country border areas and ensure food sustainability in Nigeria.



Conclusion and Future Work

This paper concludes that involving private researchers in the collection and dissemination of trade data on informal cross-border trade activities in developing countries at their border towns has potential positive and significant implications to increase the quality of international merchandise trade statistics. Thus, this paper recommends that UNCTAD, UNSD, ECA, World Bank, national statistical offices (like the Central Bank of Nigeria and the National Bureau of Statistics) and other agencies responsible for collection, compilation and dissemination of international merchandise trade in developing countries should involve private researchers in the process. Nevertheless, future research is required to cover border areas connecting three or more developing countries in Sub-Saharan Africa, where substantial quantities of informal trading take place.

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