Mobile Internet and Intra-Regional Trade Flows in West Africa

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ABSTRACT

Intra-regional trade within West Africa has attracted concerns over its flows and associated benefits. This paper examines the relationship between mobile internet and intra-regional trade flows for six West African countries due to their trade relation for the period 2000-2023. The countries include, Nigeria, Ghana, Coted'lvoire, Mali, Senegal and Benin. Trade data (exports and imports) was obtained from World Trade Integrated Solution. For other explanatory variables including GDP representing incomes in both exporting and importing, Distance, Proportion of individual using internet, inflation rate and population, data was obtained from the World Bank database. Export is employed as the dependent variable. While the theoretical framework relied on internetisation management theories, the gravity model estimation was employed in analysing the trade flows. The model is estimated using the Generalised Method of Moment because it utilises the moment conditions and instrumental variables to obtain consistent and efficient parameter estimates. Using sensitivity analysis, results show that incomes of both exporting and importing countries facilitated trade, distance retarded trade relation with inflation included. Mobile internet variable measured by the proportion of individual using internet facilitated exports flow in the region. It is important that West African governments further improve access to mobile internet with minimum costs. Road networks between countries should be put in good shape to facilitate easy mobility.

JEL Classification: F10, F18, M15

Keyword: Mobile Internet, Intra-regional trade, Gravity model

INTRODUCTION

Intra-regional trade in West Africa has attracted attention as a means weighing the potentials for trade among developing countries in meeting key macroeconomic and social objectives. Such intra-regional trade may be more impactful in fostering growth dimension compared to the world trade. Existing trade among developing countries such as West Africa can highly be significant following large export market, which enhances comparative advantage, possibility of smaller countries to achieve economies of scale; diversification of export markets and products as well developing alternative export markets within developing countries amidst sluggish economic growth and demand for import in developed countries. Increased trade within the developing countries including West Africa region is key among the objectives of regional groupings and so it is politically desirable. Besides, intra-regional trade has been in force as it enhances food security within the region. The role of digital technology in global trade relations, particularly intra-regional trade, cannot be overemphasised. Trade in goods that can be enhanced through digitisation have been transformed amidst advancement in internet and computer technologies. The online purchase and sales of goods and services by the business sector as a reflection of e-commerce is a major reference point. The effect of internet usage on trade has important implications, especially within the discussion of national policies concerning investment in IT infrastructure. One thing is for an increase in mobile internet usage to positively affect bilateral trade performance; another is for policy makers to structure the internet infrastructure to get to as many users as possible. Trade literature has demonstrated that information and communication infrastructure creates a larger impact on transaction than on transportation costs since it fosters

information and diffusion of knowledge, thus enhances trade (Celbis *et al*., 2014). Sub-Saharan counties are known for lower ICT adoption rates and underdeveloped nature, yet the potential for ICT as a trade facilitator is of great relevance. The advent of mobile technology diffusion is expected to intensely improve cross-border transactions and provide information on markets, product as well as suppliers (Aker & Mbiti, 2010; Souter *et al*., 2012). One of the features of intra-African trade is the nature of informal cross-border transactions, representing approximately 30-40 % of total intra-regional trade within some Regional Economic Communities (UNECA, 2010; IMF, 2019) and as such, mobile technology assists to resolve issues relating to information and knowledge at the borders (UNCTAD, 2019). This tends to affect trade logistics positively which happens to be the most significant barrier of intra-regional trade in Africa (IMF, 2019). While intra-regional trade amidst internet usage fosters achievement of key objectives of the regional groupings, a fundamental issue relates to improper documentation because a sizeable number of trade volumes are unrecorded by customs constituting smuggled, under invoiced and over invoiced goods. However, in West Africa, these results from the original state of production and marketing styles attributed to the region's most important traded commodities such as live cattle. Besides, weak administrative and statistical ability are a pointer to inadequate trade data. Thus, in most cases, there is usually a large discrepancy in trade data between exporters and importers and considered often as illegal trade. During the 1970-80, estimates of unrecorded trade only captured 10 out of the entire countries in West Africa, whereas these countries had accounted for 95% of recorded trade within the region. This problem has found its way to the present time and resulting in declining intra-regional trade in the region. Some countries such as Benin were characterised by high volumes of unrecorded trade. It accounted for almost 80% of unrecorded volume of exports. Besides, poor transportation and communication infrastructure hinder trade flows in terms of exchanging goods and services within the region. Burkina Faso and Mali known for the production and export of raw cotton are beset with logistic and industrial infrastructure. Despite the increasing penetration rate in terms of internet usage, access to electricity remains a major problem, which denies many from the use of mobile phones, especially the rural dwellers who have almost been technically excluded. Thus, the need to have better access to electricity to foster mobile phone usage for trade development is germane within West African region. Consequently, this study mainly examines the determinants of intra-regional trade in West African countries and specifically examining the role of mobile internet in trade flows.

Following the introduction, this paper is structured as follows: section two reviews related theoretical and empirical literatures, while section two and three discuss the methodology, and results and discussion, respectively. The last section is the conclusion.

LITERATURE REVIEW

Researchers have explored the effect of Information Communication Technology (ICT) on trade considering the role of trade costs impact on trade flows (Krugman, 1985; Venables, 2001). Access to ICT and Internet use fosters information and knowledge relating to markets, products and agents through reduction in transport costs on distance and information and communication costs and particularly to new markets (Anderson & Van Wincoop ,2004; Fink, Mattoo, & Neagu, 2005). ICT tends to promote international trade. Several factors tend to influence the cost reduction linked to Internet use ranging from stage of the ICT process of diffusion, specialisation in trade together with other components associated with economic development (Allen, 2014; Clarke & Walsten, 2006; Demirkan et al., 2009; Vemuri & Siddiqi, 2009).

In discussing the international trade theories, it is important to understand the role IT plays in the micro level and as well as propagates at the aggregate level. Literature divides international trade theories into two categories- the supply-based and the demand –based theories.

The supply-based theories concern the producer/ supplier perspective and are hinged on the theories of mercantilism, absolute advantage and comparative advantage. The Mercantilist theory is of the belief that wealth resulted from possession of precious metals and that the loss of a nation is a gain to another (Asheghian,1995, p.23). Theories of absolute advantage and comparative advantage are related as they point to the idea that local production based on minimum cost in terms of capital and labour resources respectively would maximise the benefits of each country involved through trade interactions.

The demand aspect of international trade is connected to the indifference curves, Heckscher-Ohlin (H-O) theory and its extensions. Indifference curves are locus of commodity combinations that yield same satisfaction level.

While individual indifference curves relate to individual preferences, community indifference curves relate to a nation's preference (Asheghian, 1995, pp. 48-49) (see also Balassa, 1963).

H-O theory emphasises the factor endowment as the origin of international trade. Accordingly, each country in question exports commodities that utilise abundant factor most intensively. Thus, countries with abundant labour supply should export commodities produced with same labour, while ones with capital-abundance are to export commodities produced using same technology.

The H-O theory was provisionally maintained even though continuous tests of the theory showed that it did not follow any proof. Linder (1961) argued that domestic demand conditions are the primary force that could influence trade in manufactured products. Since international trade involves manufactured goods, domestic demand is a main determinant of the flow of products among countries (Asheghian, 1995, pp. 80-81). Kravis (1956) first noticed the inability of the theory to explain trade in manufacturing goods but underscored the empirical significance of technology in patterns of trade between countries. Since the H-O theory emphasises on a country exporting the commodity with abundant input factor most intensively, hence, a country with labour abundant feature and paying relatively low wages is expected to export labour-intensive commodities. A contradictory result of test of the H-O theory showed that in every country studied, the exporting countries were involved in paying labour highest wages. In explaining this, what suits a country willing to export a technically advanced product is its technological exposition compared to its competing trade partners. The position hers was followed by numerous other contributors in this area resulting in the technological gap theory (Asheghian, 1995, p. 81).

The connection between international trade theories can better be explained considering internetisation Management. Dana *et al.* (2002) proposes the internetisation and entails the dynamism through which the Internet-based firms evolve. The theory of mercantilism, which emanated from the supply-based theories, is connected to sustainable development through the positive intervention of the Internetisation management paradigm in the managerial operations of firms. Internetisation Management facilitates better flow of information among firms within trading nations thus enhancing knowledge and information accumulation. Similarly, the connection between Indifference curves' theories in the demand-based theories to sustainable development appears strong because demand creates new opportunities for businesses through Internetisation Management paradigm. As such, this facilitates opening up new channels of communication in terms of wide range of alternative products offer.

Theoretical literature has observed the trade effects of Information Communication Technology (ICT) with respect to their impact on trade costs. ICT improves exports performance through reducing shipping costs, costs of search and time expended and barriers to entry into new markets (James, 2002; Venables, 2001). Based on Helpman and Trajtenberg (1998), as a general-purpose technologies (GPT), ICT and internet use specifically facilitates the search for information and its acquisition, management, processing media including the analysis. As a result of this, ICT and the Internet specifically contribute to low frictions arising from information due to the effect of imperfect information on patterns of trade (Akerman, Leuven, & Mogstad, 2018; Allen, 2014; Rauch, 1999), thus allowing for access to information and the transmission of knowledge relating to markets, products and agents. Companies using the Internet tend to expand their communication quality through communicating faster and cheaper because using it improves communication that goes on between customers and suppliers; this obviously reduces the fixed costs linked with information and communication (Fink, 2005; Freund & Weinhold, 2002; Harris,1995). ICT reduces the costs of entering new markets (Adjasi & Hinson, 2009; Freund & Weinhold, 2004) through reduction in bargaining and management costs (Demirkan *et al*., 2009; Venables, 2001) and the coordination costs that arise in dispersed production process (Baldwin, 2016; Venables, 2001). Use of internet can equally affect costs of transport because technology arising from this are mostly linked with organisational changes affecting costs of shipping (Freund & Weinhold, 2002; Venables, 2001). Besides, ICT tends to enhance expansion and market diversification (Harris,1995; Petersen, Welch & Liesch, 2002) and as well as changing the geographical patterns within the internationalisation process (Akerman, Leuven, & Mogstad,2018; Allen,2014; Yushkova,2014). Technological diffusion is fostered use of internet facilitates, emergence of new products development and processes, new business models and new ways of cooperating within firms leading to increasing international interactions (Osorio-Urzua, 2008).

Theoretically, the absence of internet on market activities can be demonstrated for an imperfectly produced good.

While some producers sell directly to foreign markets, some others do not sell to some markets. Producers are willing to sell to neighbouring markets and to far-reaching markets. Due to fixed cost of entry, firms in a specific market tend to have significant market power and prices which vary across countries. To further buttress the case of trade with internet, ensures that world demand and supply markets are nonsegmented. Countries can now buy and sell at the international market. Importing countries make gain due to lowering price levels and exporting countries gain more due to access to new markets with little or no fixed cost. This summarily improves welfare as information asymmetries can now reduce and everyone is informed.

Increased competition follows because world prices are expected to fall and converge. Since all countries buy from world market, it is expected that prices must be similar; besides, with the absence of market-specific sunk cost, competition becomes more intense and thus prices must be lower. Firms identified to have an established trade links tend to lose because their monopoly power is eradicated. Thus, firms which exported previously to many countries tend to lose because of emerging lower prices resulting from effective Internet. The reverse occurs for importing firms as they gain more from consumer surplus due to relatively low-price level.

Generally, innovation through Internet has the potential to create large global markets for identified traded goods directly based on exchanges within buyers and sellers and indirectly through search engines. This effect is at variance with what obtains from recent innovations including telephone or the fax which are only effective for bilateral transactions. With this development, sunk costs linked with stablishing trade ties are reduced to the lowest level and information on market activities is now freely available. This subsequently has some relevant implications for the size and trade flows pattern among countries (Freund & Weinhold, 2000).

On the empirical evidence, researchers have estimated the relationship between internet use and trade flows focusing on bilateral trade data using gravity models. While in most studies, findings show a positive effect of some technologies on trade flows, considerable differences with respect to samples, time and geographical scope and issues relating to methodology are observed; however, a few studies research in bilateral flows between developed and developing countries.

Using quasi-bilateral trade data for 2001 and a sample of 52 developed with 46 developing countries, Clarke and Wallsten (2006) found that Internet hosts bring an increase in exports from developing countries; however, no effect was observed for bilateral trade flows from high-income countries. In studies that follow, scholars employed diverse variables ranging from an ICT index to internet users and found positive effects on exports. Márquez-Ramos and Martínez-Zarzoso (2005) in their study for the year 1999 found that technology represented by technological index, impact greatly on trade flows in exports for poor countries compared to rich ones and that the impact of technology is larger than the role geographical distance and is more important for poor than the rich countries. Demirkan *et al*. (2009) in 2005, found that the use of ICT impact more on trade among smaller economies than larger ones and that more distant trading partners facilitate more trade due to ICT than closer countries showing larger trade flows. Vemuri and Siddiqi (2009) compared trade before and after the expansion of the Internet for 64 developed and developing countries during 1985-2005 without differentiating the impacts based on developmental levels. Using panel data econometrics, findings show that a factor consisting of telephone lines, personal computers and Internet users positively affected trade.

Sousa (2018) examined the impact of the Internet of Things on Global Trade activities of multinational companies. Using interviews and online survey methodologies, findings show that the Internet of Things revolution changes all sector of the global economy including manufacturing, energy, agriculture, transportation among others.

Azmeh and Foster (2020) examined the political economy of the growing debates around digital trade in relation to rules as a regulation of national internet policies to support trade in digital goods and services. The paper agued beyond updating rules but highlighted the technological contingency of international rules and how technological shifts have through some channels enhance processes of fragmentation of the international trade regime.

Zhang *et al.* (2022) analysed the spatial spillover effect of the internet on trade performance with regard to vision of the public's sleep health in a group of European countries. The study applied the hierarchical modelling and revealed the effect of internet and sleep health on trade performance at fundamental and general levels, respectively. Results show that internet positively impact trade performance and likewise, good sleep health could be enhancing the spillover effect of internet on trade performance.

Within Africa, Portugal Perez and Wilson (2012) studied the relationship between physical and telecommunication infrastructure and trade facilitation measures. Findings show that physical infrastructure made the greatest impact on exports and that a large impact of ICT physical infrastructure on trade increases, the richer the country in question for a group of 101 countries during 2004-2007. For the case of Kenyan exports to other African countries, Chacha and Edwards (2019) found a firm-level evidence for the period 2004 -2013 with more importance given to control of corruption compared to political fragility.

Econometric Methodology and Model

Research design for this paper is strictly quantitative focusing on secondary data. Following this, the study considers the role Internet plays on export trade and as well as considering the trade effect of income levels. Theoretical underpinning is rooted from the Internetisation and international trade theories wherein the supply and demand-based theories of trade are connected with the internetisation management. The major intent here is the knowledge accumulation and information flow due to internetisation management theories to boost trade flows in both cases.

Following previous literature, a study of this kind usually adopts the gravity model of trade in line with econometric approaches in modelling trade flows, which aims at examining bilateral trade flows. For the conventional gravity model, the assumption is based on the fact that bilateral trade positively relates to country size and negatively related to the distance (Berthelon & Freund, 2008; Pöyhonen, 1963; Tinbergen, 1962). The augmented version considers additional variables relevant to trade models including population, institutional and economic factors that tend to explain bilateral trade relation.

Theoretically, gravity model is based on Newtonian physics wherein trade between two countries is dependent on their sizes and proximity. Essentially, the flow of goods between two points is a function of the peculiarity of the origin and of the destination and some measures of impedance between them. While the gravity model has been recognised due to its empirical robustness in analysing trade flows, it is known to lack basic theoretical foundation and limited reputation among economic researchers. Anderson (1979) first derived the theoretical foundation, assumptions of monopolistic competition; variation in factor endowments and production technologies demonstrates various interpretations and idea of the gravity model. Bergstrad (1985), Deardorff (1998) among others further initiated alternative theoretical foundations for the gravity model in question. Baier and Bergstrad (2007) among others can be visited for related reviews on the theoretical foundations.

This paper begins the procedure for specification by considering the flow of goods G_{ij}between two points i and j. G_{ij} is expressed as being dependent on the characteristics of the origin $(0_i)$and the destination (D_j) points including some measure of impedance between them (I_{ij}). Thus,

$$G_{ij} = f(0_i, D_j, I_{ij}) \quad (1)$$

Moving from the specific to general, therefore:

$$G_{ij} = \beta X + \mu, \mu \cong N(0, \sigma^2) \quad (2)$$

Where G represent the goods, X is a vector of explanatory variables indicating the sizes of both exporting and importing countries, the distance apart, other factors facilitating or retarding trade flows between them. Theoretical exposition is discussed in Anderson and Van Wincoop (2003). β is vector of parameters estimated and μ denotes error term which is identically and normally distributed.

Equation (2) describes the relation between trade flows which is bilateral imports or exports and the explanatory variables denoting the sizes of the trading partners' location, proximity and other relevant factors facilitating or impeding trade between them.

Following the theoretical underpinning, the relevance of this theory to the current study is clearly demonstrated through incorporating knowledge accumulation and information flow represented by ICT into the empirical specification in modelling trade relations. This is in line with other theoretical literature such as James, 2002; Venables, 2001, whose assertions were based on ICT-trade costs related issues. With this, knowledge individual

realises through internet usage was considered as a key determinant of trade among others. The study modified existing gravity model considering other notable traditional factors and augmented version such as country size, distance, Population, institutional and economic factors that accounted for the variation in bilateral trade.

Following the above discussion, the baseline model specification in an extended form is presented below:

$$InEXP_i = \alpha_0 + \alpha_1 InGDP_{i,j} + \alpha_2 InGDP_{j,i} + \alpha_3 InDIS_{ij} + \alpha_4 InITU_{ij} + \alpha_5 InINF_{ij} + \alpha_6 InPOP_{ij} + \varphi + \nu + \varepsilon \quad (3)$$

Where EXP_i is exports from exporting country$_i$, GDP_i is income of exporting country *i,* GDP_j is income of importing country *j* , DIS_{ij} denotes distance between the trading partners, ITU_{ij} which is the key variable, denotes proportion of individual using internet, INF_{ij} represents inflation rate and captures macroeconomic instability, and POP_{ij} is population in the trading countries. 'ln' is natural logarithmic transformation. The log of inflation was taken due to its large values which may make it deviate from normality. φ_i and ν_j indicate exporting and importing countries fixed to control for each country's peculiarity while ε is the error term.

Equation (3), the base line equation is estimated using the Generalised Method of Moment (GMM) because it utilises the moment conditions and instrumental variables to obtain consistent and efficient parameter estimates. Thus, it is an alternative to empirical research method where theoretical ideas are fundamental. Besides, it controls for heteroscedasticity and autocorrelation in estimation models particularly for the baseline equation. It is expected that income, proportion of individual using internet and population directly impact trade flows.

Six countries' intra-regional trade performance amidst is examined. These countries include Nigeria, Ghana, Coted'lvoire, Mali, Senegal and Benin. Trade data (exports and imports) was obtained from World Trade Integrated Solution for the period 2000 to 2023. For other explanatory variables including *GDP* representing incomes in both exporting and importing, Distance, Proportion of individual using internet, inflation rate and population, data was obtained from the World Bank database. The period is chosen on the belief that most technological innovations that support mobile internet system were gradually growing particularly to foster trade flows. The paper employed exports as the dependent variable because they essentially serve as injection to the economy. However, some variables are not included due to their missing values. Challenges encountered in data gathering remains fundamental in Africa.

RESULTS AND DISCUSSION

Table 1: Descriptive Statistics of gravity model variables

VARIABLE	*MEAN*	*MEDIAN*	*STD− DEV*	*J − B*	*OBS*
EXP_i	10.35	12.54	3.84	0.05	110
GDP_i	24.94	24.82	1.24	0.49	72
GDP_j	23.59	23.58	0.82	0.30	120
$DIST_{ij}$	12.74	12.34	0.86	0.00	134
INF_{ij}	1.34	1.43	1.29	0.04	131
ITU_{ij}	1.84	1.89	1.38	0.03	133
POP_{ij}	17.00	16.78	0.94	0.00	144

*J-B: Jaque-Bera, STD-DEV: Standard Deviation, OBS: Observation

Source: Author's computation using EViews

Descriptive statistics in table 1 shows the trend in exports, income of exporting countries, income of importing countries, distance between the exporting and importing, inflation rate in the trading countries, proportion of individual using internet and population.

Income of the exporting countries represented by GDP_i has the highest mean value compared to other variables. This essentially implies that exporting countries take advantage of exporting being an injection to necessarily increase their income. The lowest mean value is shown by the proportion of individual using internet. In terms of spread, exports have the greatest spread as shown by the standard deviation of log of exports (3.84) still maintaining the fact that exports are an injection to the economy. However, income of the importing countries comes with the lowest spread in log form (0.82). This is not unlikely because imports are seen as a withdrawal from the economy.

Table 2 shows the results of the unit root test. In testing the stationarity conditions or the variables employed, the study adopted the panel unit root utilising all the test methods under "summary". These include Levin, Lin & Chut*, lm, Pesaran and Shin W-stat, ADF-Fisher Chi-square and PP-Fisher Chisquare. Results show a mixture of order of integration. Income of the exporting and importing countries, population, and inflation are integrated in levels while exports and proportion of individuals using internet are integrated in their first differences. However, the distance variable is non-stationary in its level.

Table 2: Panel Unit Root Test

VARIABLE	*TEST – EQUATION*	*TEST – METHOD*	*PROB*	*O – I*	*DECISION*
EXP_i	Individual intercept	Summary	0.00	I(1)	Stationary
GDP_i	Individual intercept	Levin, Lin & Chut* PP-Fisher Chi-sq Others	0.00 0.00 >5%	I(0) I(0)	Stationary Stationary
GDP_j	Individual intercept	Levin, Lin & Chut Levin, Lin & Chut	0.00 >5%	I(0)	Stationary Non-Stationary
$DIST_{ij}$	Individual intercept	Summary	0.00	I(0)	Stationary
INF_{ij}	Individual intercept	Summary	0.00	I(0)	Stationary
ITU_{ij}	Individual intercept	Summary	0.00	I(1)	Stationary
POP_{ij}	Individual intercept	Summary	0.00	I(0)	Stationary

*I-O: Order of Integration, PROB: Probability
Source: Author's computation using EViews

Table 3: Panel GMM Estimation with Sensitivity Analysis

VARIABLE	*COEFF*	*STD ERR–*	*PROB*	*COEFF*	*STD ERR–*	*PROB*
C	-16.03	12.54	0.21	-18.92	11.19	0.10
GDP_i	1.48	0.54	0.01	1.37	0.43	0.00
GDP_j	0.08	0.57	0.89	0.14	0.45	0.76
$DIST_{ij}$	6.65	8.87	0.46	-0.37	0.70	0.60

INF_{ij}	------	------	-----	-0.30	0.36	0.40
ITU_{ij}	0.004	0.03	0.90	-0.64	0.31	0.05
POP_{ij}	-5.43	7.18	0.45	-------	--------	--------

Source: Author's computation using EViews

The GMM estimates the relationship between exports and the conventional and extended gravity model variables. The incomes of the exporting (1.48) and importing (0.08) countries positively impact exports indicating that the economic size is fundamental in boosting intra-trade between countries. However, effect of exporting countries' income on exports apart from being significant is more pronounced compared to that of importing countries. This essentially is an indication that income generated from exporting countries can have more trade driven effect. The positive effect of economic size as demonstrated on export follows expectation in trade literature.

The distance variable is shown to have a positive effect on trade. This is contrary to expectation of the gravity model estimation carried out in most research papers. A possible explanation to this is that irrespective of distance, trading could take place through other means like mobile phone trading, internet trading and other ICT channels especially on intangible goods. By implication, other trading channels such as mobile phone, internet, among others are insensitive to large distance between trading countries since trading in this case does not need traveling and making physical contacts.

The key variable, proportion of individual using internet impact positively on exports and is significant at the 10% level. This is expected as trade is more promoted through effective internet services. Besides, internet ensures rapid and effective communication link among market players. Thus, this interaction between internet usage and exports flow as obtained is absolutely in line with studies in trade related areas such as Zhang *et al.* (2022), Vemuri and Siddiqi (2009) among others.

Population variable, however, impacts negatively on trade. Population has often been referred to as the market size and is expected to be positively related to exports. The perceived reasons for this could be the incorporation of population and income in the model as there seems to be some inter-correlations between them. However, an economy with lower skills population may essentially retard trade growth.

The paper through sensitivity analysis replaces population for inflation within the explanatory variables. As before, results show positive effect of income in both exporting and importing countries on exports while the distance variable this time negatively (-0.37) impact on exports trade showing the theoretical expectation is met in this case. This is obviously in line with (Berthelon & Freund, 2008; Pöyhonen, 1963; Tinbergen, 1962).

For the two regression models, the explanatory variables have high explanatory power as on the average about 78.5% of the variation in export trade is explained by the standard gravity model variables. The Durbin-Watson statistic values show that the degree of autocorrelation in the models is minimal.

CONCLUSION

This paper examined the relationship between mobile internet and intra-regional trade flows within West Africa considering five key countries in trade relation spanning the period 2000 to 2023. Various reviews on trade in the literature have identified major trade determining factors promoting trade including exchange rate, interest rate, and inflation rate among others. While the theoretical framework relied on internetisation management theories, the gravity model estimation was employed in analysing the trade flows between the selected countries in West Africa. Using sensitivity analysis, results show that incomes of both exporting and importing countries facilitated trade, distance retarded trade relation with inflation included. The key variable represented by the proportion of individual using internet facilitated exports flow in the region. This could be connected to easy access to information and communication. It is important that West African governments and in particular ECOWAS, should further improve access to efficient network system accompanied by minimum costs. Trade involving road linkages between countries should be put in good shape to facilitate easy mobility. Trade agreements mission

should begin to manifest through reducing bureaucratic bottlenecks, trading difficulties among others in ECOWAS region to further enhance trade facilitation.

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