Does Trade in Medical Products Improve Health Outcomes in Nigeria? A Macro-Level Analysis

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Abstract

This study examined the relationship between trade in medical products and health outcomes in Nigeria. Annual time series data ranging from 1980 to 2016 was sourced from Business Monitor International (BMI, 2017), World Development Indicators (WDI, 2018) and National Bureau of Statistics (NBS, 2018) was used for the study. The study make used of Grossman health demand theory and health outcome was measured by three indicators which are infant mortality rate (less than one), infant mortality rate (less than five) and life expectancy. The independent variables used in the model include trade in medical product, health finance, growth rate of gross domestic product, sanitation facilities, urbanization, education and total fertility rate. From the estimated results of ECM, trade in medical product reduces both infant mortality rate less than one, infant mortality rate less than five and life expectancy but reduction in terms of infant mortality rate less than one and that of infant mortality rate less indicates that trade in medical product improve health outcomes while the reduction in terms of life expectancy shows that trade in medical product worsen health outcomes in Nigeria. Therefore, trade in medical product only improve infant mortality rate less than one and that of five but worsen life expectancy. Most of the medical product has their side effect at old age. Therefore, the study recommended that there should be more investment in trade in medical product in Nigeria in other for both infant mortality rate (less than one) and infant mortality rate (less than five) to be improve more significantly. The investment in trade in medical product should be on product that will also lead to increase in life expectancy and there should be a control on the number of children given birth to by individual household in Nigeria.

Keyword: Trade in Medical Products, Health Outcome, Grossman Health Demand Theory and Error Correction Model (ECM)

JEL Classification Codes: F00, F19, F43, I11, I12, I18

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1. Introduction

Many countries acknowledge a right to basic healthcare in their constitutions and set out official public health goals in which the provision of health services to the general population plays an essential role. As trade in health service is broadly defined the literature covers aspects of all sides of the 'triangle' of economic globalisation: trade, investment and migration (Mortensen, 2008). Trade in health services came into focus of international trade consideration and strong liberalization efforts have been undertaken since then. These two aspects - globalisation and tertiarisation - nowadays increasingly concern the health service sector as well. Though being viewed as typically non-tradable, health services trade becomes a phenomenon of present time (Waeger, 2007). There are two dominating views in terms of trade in health service which are 'trade' view and 'health system' view. The 'trade' view emphasizes the commercial potential for developing countries with limited or optimistic consideration of the impact on domestic health systems. Conversely, the 'health system' view sees adverse effects on health systems from trade in health services, while rejecting the idea of health services as tradable commodities on a global healthcare market (Waeger, 2007). In other words, developing countries are argued to face a 'trade off' between pursuing commercial opportunities and achieving public health goals (Herman, 2009).

Trade also affect health outcomes via a very diverse number of direct and indirect pathways (Stevens *et al*, 2013). Among them, income and its distribution, income inequality, economic insecurity, and unhealthy lifestyles link trade policy to social determinants of health and, often negative, health outcomes (Missoni, 2013). There are some bad medical products that are imported through the back door into the developing countries like Nigeria which can destroy the health of an individual. This has been the natural occurrence in Nigeria because of custom officers are corrupt when those importers of bad medical product settle then they will allow them to import the product into the country without considering the health of the majority (Swinburn *et al*, 2011).

However, the literature does not document much with respect to Nigeria on trade in medical products and health outcomes. The common denominator of most of these empirical studies was the use of cross-country panel data to investigate the nexus between trade in medical products and health outcomes (Fayissa and Gutema, 2008; Missoni, 2013; Stevens *et al*, 2013; Herzer, 2014 & Novignon and Atakorah, 2016). This trend has been criticized in the contemporary literature, particularly because of the observed heterogeneity among countries. Hence, any potential inference drawn from these cross-country studies provides only a general understanding of how the variables are broadly related, and thus offers little guidance for policy formulation in a specific country. Therefore, it is more advantageous to conduct studies of individual countries, since this approach allows one to take into account, country-specific characteristics, such as structural change, services sector policies, trade patterns and exogenous shocks that are peculiar to that country. Therefore, the study is set to examine whether trade in medical products improve health outcomes in Nigeria.

The remaining part of this study is divided into four sections. Sections 2 discusses the literature review, section 3 focuses on the research methodology and section 4 is on data analysis and interpretation and section 5 details the conclusion and policy recommendations.

2. Literature Review

International trade in health services has gained momentum – both in terms of increased trade and level of media, political and academic attention – over the past decade (Missoni, 2013). International organisations, non-governmental organisations (NGOs) and academics have all contributed to the literature on the subject covering a wide range of perspectives and conclusions. The nexus between the health sector and trade openness has been conceptualized in many ways. For instance, Waeger, (2007) deals with health economics as well as trade theory– trade in health services. The study provided a first insight in how trade in Health Services could help to overcome resource constraints in national health systems as well as allude to the potential risks of which sight shouldn't be lost. Lior, (2009) examined the magnitude, directions, patterns of specialisation, growth and other aspects related to international trade in healthcare services. The study found out that a great deal of variation exists within different segments of international trade in healthcare services. For the most part, international trade was conducted through the movement of foreign health professionals between countries, as well as the presence of foreign healthcare firms in local markets. International trade through cross-border activity, whereby healthcare services are provided and consumed in different territories, remains very low.

Furthermore, Karin, (2004) examined the effect of trade in health in developing countries. The study found out that liberalization of trade in health services can create opportunities, but may also exacerbate preexisting problems. Moreover, once liberalization is locked in under international trade agreements, reversing policies becomes difficult, especially for developing countries. Making undue commitments to liberalize health services under GATS may therefore result in the loss of policy space. Rupa, (2002) examined the ways in which health services can be traded, using the mode-wise characterization of trade defined in the General Agreement on Trade in Services. The trade modes include crossborder delivery of health services via physical and electronic means, and cross-border movement of consumers, professionals, and capital. The study found out that the potential costs and benefits of trade in health services are shaped by the underlying structural conditions and existing regulatory, policy, and infrastructure in the health sector. Thus, appropriate policies and safeguard measures are required to take advantage of globalization in health services.

In the same manner, Richard, (2004) seeks to provide the first comprehensive and systematic review of evidence concerning FDI and health services. The study found out that the extent to which a national health system is commercialized per se is of more significance than whether investment in it is foreign or domestic; the national regulatory environment and its 'strength' will significantly determine the economic and health impact of FDI, the effectiveness of safeguard measures, and the stability of GATS commitments; and any negotiations will depend upon parties having a common understanding of what is being negotiated, and the interpretation of key definitions is thus critical. Novignon and Atakorah, (2016) examined the linkages between international trade integration and economic performance. The findings of the study supported international trade integration across countries in SSA and emphasizes the need for countries to be conscious of gains from trade within sub-sectors of the economy.

Philip *et al*., (2013) examined the relationship between free trade and health, using a range of data relating to trade openness and human development. The study finds that free trade does in fact appear to be associated with better health outcomes, with the relationship particularly pronounced for lower-income countries. Rupa, (2017) focused on the impact of health services trade on the realization of sustainable development goals and the various modalities through which this impact may occur. The study concluded by indicating two broad directions for policy action at the national level. First is to address structural issues in the healthcare system, the key structural issues being standards, infrastructure, human resources and technology. The second area for policy action is to ensure synergies between health services trade and the rest of the healthcare system. In addition to national policies, multilateral and regional cooperation can also promote sustainable development in the context of health services trade. Swati, (2015) examined the relationship between international trade and health equity, benefits of medical tourism 'trickled down' to India's poor. The study concluded that with reiterating the importance of healthcare as intrinsic to 'health capabilities' imperative for enjoying a meaningful life.

3. Research Methodology

The theoretical framework of this study is grounded on Grossman's theory of the demand for health care (1972). This theory was concerned with how individuals allocate their resources to produce health. The theory goes beyond traditional demand analysis and has been extremely influential in health economics. The theoretical health production function is stated as:

$$H_t = f(X_t) \qquad (1)$$

Where *H* is individual health output and *X* is vector of individual inputs to the health production function, *f*. The elements of the vector include nutrient intake, income, consumption of public goods, education, time devoted to health related procedures, initial health stock and the environment. The above model presents the micro (individual) health production analysis. To account for the macro level health production, Fayissa and Gutema (2008) presented a macro level specification of equation (3.1) by representing the elements of the vector X as per capita variables and then regrouped them into sub-sectors vectors of social, economic and environmental factors. The macro level health production function is represented in the equation (2)

$$h_t = f(Y_t, S_t \,\&\, V_t) \qquad (2)$$

Where *h* is the aggregate population health status outcome, *Y* is a vector of per capita economic variables, *S* is a vector of per capita social variables and *V* is also a vector of per capita environmental factors.

The model specification for the study was based on Grossman health demand theory and three indicators will be used for health outcome which are infant mortality rate less than one, infant mortality rate less than five and life expectancy and three models will be specified. The study will also adopt the model from the work of Novignon and Atakorah, (2016) but with some modification since this study will divided health outcome into three.

$$IMR1_t = f(TMP_t, HF_t, GDPG_t, S_t, URBN_t, EDU_t \,\&\, FR_t) \qquad (3)$$

$$IMR5_t = f(TMP_t, HF_t, GDPG_t, S_t, URBN_t, EDU_t \,\&\, FR_t) \qquad (4)$$

$$LE_t = f(TMP_t, HF_t, GDPG_t, S_t, URBN_t, EDU_t \,\&\, FR_t) \qquad (5)$$

The linear regression models is given below:

$$IMR1_t = \beta_0 + \beta_1 TMP_t + \beta_2 HF_t + \beta_3 GDPG_t + \beta_4 S_t + \beta_5 URBN_t + \beta_6 EDU_t + \beta_7 FR_t + \mathrm{e} \qquad (6)$$

$$IMR5_t = \beta_0 + \beta_1 TMP_t + \beta_2 HF_t + \beta_3 GDPG_t + \beta_4 S_t + \beta_5 URBN_t + \beta_6 EDU_t + \beta_7 FR_t + \mathrm{e} \qquad (7)$$

$$LE_t = \beta_0 + \beta_1 TMP_t + \beta_2 HF_t + \beta_3 GDPG_t + \beta_4 S_t + \beta_5 URBN_t + \beta_6 EDU_t + \beta_7 FR_t + \mathrm{e} \qquad (8)$$

Where *IMR1* is Infant Mortality Rate less than one, *IMR5* is Infant Mortality Rate less than five, *LE* is Life Expectancy, *TMP* is Trade in Medical Product, *HF* is Health Finance, *GDPG* is Gross Domestic Product Growth Rate, *S* is Sanitation Facilities, *UBN* is Urbanizatiion, *EDU* is Education, *FR* is Total Fertility Rate and *e* is Error Term

The study used error correction model (ECM) to estimate the short and long-run equilibrium which is an appropriate system of single equation. The error correction model tells us the degree to which the equilibrium behavior drives short run dynamics. Equilibrium relationship in turn have implications for a short run behavior, one or more series move to restore equilibrium. Theoretically, ECM should range between -1 and 0 with which you can interpret it as a percentage return to equilibrium of your variables or how much percentage is disequilibrium corrected.

The study make used of annual time series data ranging from 1980 to 2016. This period was chosen because the last data published by Business Monitor International (BMI) for trade in medical product in Nigeria was 2016 and as a result, the study is limited by this data. The data were sourced from sourced from Business Monitor International (BMI, 2017), World Development Indicators (WDI, 2018) and National Bureau of Statistics (NBS, 2018). The variables include infant mortality rate less than one, infant mortality rate less than five, life expectancy, trade in medical product; square of trade in medical product; health finance; gross domestic product growth rate; sanitation facilities; urbanization; education and total fertility rate.

4. Data Analysis and Interpretation

4.1 Preliminary Analysis

This subsection deals with preliminary analysis where summary statistics result, correlation analysis result, stationarity test, co-integration analysis are dealt with.

Table 1: Summary Statistics Result

	IMR1	IMR2	LE	TMP	HF	GDPG	S	UBN	EDU	FR
Mean	4.675	5.179	47.731	10.614	8.654	1.098	34.121	16.327	13.041	6.273
Median	4.787	5.305	46.324	9.987	8.464	1.510	34.800	16.400	12.942	6.224
Maximum	4.862	5.387	52.754	24.628	12.354	30.300	38.100	17.200	14.347	6.783
Minimum	4.239	4.689	45.177	4.548	3.721	-15.500	29.000	15.100	10.964	5.650
Std. Dev.	0.1976	0.222	2.346	4.437	3.039	7.277	2.928	0.657	1.1632	0.360
Skewness	-0.917	-0.926	1.022	0.945	-0.2474	1.161	-0.352	-0.299	-0.172	0.041
Kurtosis	2.389	2.404	2.474	4.075	1.508	8.984	1.674	1.964	1.423	1.691
Jarque-Bera	5.756	5.838	6.863	7.285	3.808	63.527	3.475	2.207	4.015	2.654
Probability	0.056	0.054	0.032	0.026	0.149	0.000	0.176	0.332	0.134	0.265
Sum	172.96	191.61	1766.06	392.73	320.22	40.64	1262.48	604.10	482.52	232.11
Sum Sq. Dev.	1.405	1.773	198.178	708.709	332.42	1906.48	308.67	15.55	48.71	4.68

Source: Author's Estimation from E-view 9

Table 1 explains the summary statistics output of the dependent and independent variables used in the study. As shown in the tables all the series exhibit positive average values and consequently, urbanization has the highest yearly mean value while GDP growth rate has the lowest yearly mean value. Given the standard deviation values of the ten series under consideration, GDP growth rate seems to be more volatile while infant mortality rate less than one appears to be least volatile. This by implication suggests that the series are relatively not stable for the model. This finding is however, in agreement with the statistical properties of the series. With respect to the statistical distribution of the variables, all the series have both positive and negative skewness. Two of the series are leptokurtic (> 3) while others are playkurtic (< 3).

Table 2: Correlation Analysis Output

	IMR1	IMR2	LE	TMP	HF	GDPG	S	UBN	EDU	FR
IMR1	1									
IMR2	0.199	1								
LE	-0.388	-0.588	1							
TMP	-0.270	-0.273	0.319	1						
HF	-0.736	-0.034	0.786	0.120	1					
GDPG	-0.300	-0.299	0.262	0.077	0.447	1				
S	0.690	0.059	-0.392	0.103	-0.293	-0.348	1			
UBN	0.740	0.044	-0.672	0.572	-0.304	-0.062	0.592	1		
EDU	-0.789	-0.088	0.577	0.132	0.095	0.405	-0.473	-0.271	1	
FR	0.392	0.091	-0.447	-0.061	-0.473	-0.408	0.447	0.374	-0.199	1

Source: Author's Estimation from E-view 9

The degree and direction of association among the variables are shown in Table 2. Correlation analysis is use for two purpose which is to know the degree of linear association among variables and to see whether there is no multicollinearity among variables. A number of the signs tend to conform to a priori expectation. No serious problem of multicollinearity exists, as the Pairwise correlation coefficient for any of the variables does not exceed 0.80 (Gujarati, 2003).

Table 3: Augmented Dickey-Fuller (ADF) Unit Root Test

Variables		Unit Root Tests ADF t-statistics	Conclusion
IMR1	Level	-0.012256	I(1)
	First Difference	-2.438338*	
IMR2	Level	-0.029620	I(1)
	First Difference	-2.128470*	
LE	Level	-0.014289	I(1)
	First Difference	-1.985407*	
TMP	Level	-0.018681	I(1)
	First Difference	-2.776289*	
HF	Level	-0.035456	I(1)
	First Difference	-2.692156*	
GDPG	Level	-0.105277	I(1)
	First Difference	-1.978874*	
S	Level	-0.105277	I(1)
	First Difference	-3.658874*	
UBN	Level	-0.001099	I(1)
	First Difference	-5.015830*	
EDU	Level	-0.105277	I(1)
	First Difference	-2.658874*	
FR	Level	-0.001099	I(1)
	First Difference	-3.015830*	

Source: Author's Estimation from E-view 9

*Note: *, ** and *** represent 1%, 5% and 10% level of significance respectively*

The Augument Dickey Fuller (ADF) tests was used to test for the time series properties of the study variables. The study test for unit roots on infant mortality rate less than one, infant mortality rate less than five, life expectancy, trade in medical product, health finance, gross domestic product growth rate, sanitation facilities, urbanizatiion, education and total fertility rate using ADF because ADF procedure is mostly commonly used test, it nevertheless required homoscedastcity and uncorrelated errors in the underlying structure. The unit root will guarantee that the inference regarding the important issue of stationarity is unlikely driven by the choice of testing procedures used. The results, showed a strong evidence(s) that all the variables were integrated of order one that is, I(1). That is short-run relationship exist between the variables.

Table 4: Johansen Co-integration Rank Test

Hypothesized	Trace	0.05	Max-Eigen	0.05
No. of CE(s)	Statistic	Critical Value	Statistic	Critical Value
None *	615.2115**	239.2354	161.6269**	64.50472
At most 1 *	453.5847**	197.3709	100.6225**	58.43354
At most 2 *	352.9621**	159.5297	91.43702**	52.36261
At most 3 *	261.5251**	125.6154	70.91941**	46.23142
At most 4 *	190.6057**	95.75366	60.78198**	40.07757
At most 5 *	129.8237**	69.81889	39.00159**	33.87687
At most 6 *	90.82213**	47.85613	33.77234**	27.58434
At most 7 *	57.04978**	29.79707	30.81624**	21.13162
At most 8 *	26.23354**	15.49471	21.82145**	14.26460
At most 9 *	4.412089**	3.841466	4.412089**	3.841466

Source: Author's Estimation from E-view 9

*Note: ** represent 5% level of significance respectively*

The next step is to test for the presence of long-run relation among the variables, that is, co-integrating relationships. The test result which was obtained using the Johansen Co-integration Technique is reported in the tables 4. The results of the Johansen co-integration test showed that there was long-run co-movement among the variables. This was evidenced from the Trace statistic and Max-Eigen statistic which showed that the Johansen co-integration had ten co-integrating equations emanated from each statistic. Thus, this result showed there was a convergence relationship among the variables in the long-run.

4.2 Empirical Analysis and Discussion

Having established the long-run relationship and co-movement among the variables, there was a need to examine the speed of adjustment that took all the variables to converge in the long-run. This test was done using error correction mechanism (ECM). In eview-9, the error correction model (ECM) is not directly estimated but this will be achieve through estimation of short-run autoregressive distributed lag (ARDL) approach.

Table 5: Error Correction Mechanism (ECM) Regression Result

Dependent Variable is Health Outcomes			
	IMR1	IMR2	LE
Regressor	Coefficient with P-Value	Coefficient with P-Value	Coefficient with P-Value
TMP	-0.0034 [0.001]*	-0.0037 [0.001]*	-0.0588 [0.029]**
HF	0.0054 [0.347]	0.0065 [0.325]	-0.1430 [0.348]
GDPG	0.001 [0.304]	0.001 [0.298]	-0.0111 [0.424]
S	0.008 [0.258]	0.008 [0.304]	-0.1745 [0.341]
UBN	0.115 [0.000]*	0.131 [0.000]*	-1.3328 [0.000]*
EDU	-0.025 [0.008]*	-0.026 [0.030]**	0.2114 [0.012]**
FR	0.387 [0.406]	0.441 [0.000]*	-3.9434 [0.006]*
_CONS	.078 [0.831]	-0.027 [0.949]	99.305 [0.000]*
ECM(-)	-0.954 [0.002]*	-0.167 [0.000]*	-0.108 [0.001]*
R-Squared	0.992	0.992	0.961
Adjusted R-Squared	0.990	0.989	0.951
F-Stat[Prob]	522.0844 [0.000]*	505.708 [0.000]*	101.4135 [0.000]*
Durbin-Watson Stat	1.9291	1.9184	1.5533
Breusch-Godfrey Serial Correlation LM Test	1.851 (0.182)	0.972 (0.391)	2.568 (0.946)
ARCH Test	0.864 (0.359)	0.826 (0.447)	0.310 (0.736)
Heteroskedasticity Test	1.010 (0.468)	0.715 (0.641)	0.457 (0.834)
Ramsey RESET Test	0.552 (0.584)	1.447 (0.723)	0.259 (0.997)

Source: Author's Estimation from E-view 9

*Note: *, ** and *** represent 1%, 5% and 10% level of significance respectively*

The above result on infant mortality rate less than one shows that the R^2 is approximately 0.99, which indicates that about 99 per cent of the variations in infant mortality rate less than one is explained by the regressors in the model. The adjusted R^2 (which correct the over prediction of the R^2 in explaining the variation in the dependent variable by independent variables) is approximately 0.99 which measures the actual variation of 99 per cent in infant mortality rate less than one by the regressors. It is clear that the seven independent variables explained 99 percent of the systematic total variations in infant mortality rate less than one during the period under consideration. The Durbin Watson test of serial correlation indicates absence of first order serial correlation as indicated by a DW statistic of 1.9291. From the seven regressors, only three are statistically significant in determine infant mortality rate less than one at 1% level of significant but urbanization has a positive relationship with infant mortality rate less than one while trade in medical product and education has a negative relationship with infant mortality rate less than one. Therefore, any improvement in our trade in medical product will reduce infant mortality rate less than one in Nigeria and this is an indication that trade in medical product improve our health outcomes. Specifically, a percentage increase in trade in medical product will bring about a reduction of 0.0034% in infant mortality rate less than one. Also, education attainment decrease infant mortality rate less than one because with a better education, there will be an improvement in health sector which will lead to decrement in the number of infancy that are dying. Therefore, a percentage increase in the educational level of the people in the country will bring about 0.025% decrease in infant mortality rate less than one but urbanization gives rise to infant mortality rate less than one. This is because what will call urbanization is not what is supposed to be, there are lot of people who are expose to health dangers in the sole call urban city in Nigeria than the rural area. If the yardstick for appropriate urbanization are not put in place, there will be more infant mortality rate less than one in the urban city.

Based on the regression on infant mortality rate less than five, the R^2 is approximately 0.99, which indicates that about 99 per cent of the variations in infant mortality rate less than five is explained by the regressors in the model. The adjusted R^2 (which correct the over prediction of the R^2 in explaining the variation in the dependent variable by independent variables) is approximately 0.99 which measures the actual variation of 99 per cent in infant mortality rate less than five by the regressors. It is clear that the seven independent variables explained 99 percent of the systematic total variations in infant mortality rate less than five during the period under consideration. The Durbin Watson test of serial correlation indicates absence of first order serial correlation as indicated by a DW statistic of 1.9184. From the seven regressors, only four are statistically significant in determine infant mortality rate less than five at 1% and 5% level of significant which are trade in medical product, urbanizatiion, education and total fertility rate but urbanization and total fertility rate has a positive relationship with infant mortality rate less than five while trade in medical product and education has a negative relationship with infant mortality rate less than five. Trade in medical product bring about 0.0037% decrease in infant mortality rate less than five and this suggest that increase in trade in medical product will decrease the rate at which the child less than five years of age are dying. In the same vein, education attainment decrease infant mortality rate less than five because with a better education, there will be an improvement in health sector which will lead to decrement in the number of infancy that are dying. Therefore, a percentage increase in the educational level of the people in the country will bring about 0.026% decrease in infant mortality rate less than five. Furthermore, urbanization and fertility rate exert a positive significant impact on infant mortality rate less than five. Any increase in the rate of urbanization in Nigeria will worsen the rate of infant mortality less than five by 0.131% and also, if total fertility rate increase since our health sector are not capable of handling such a huge rate, there will be an increase of 0.441% in infant mortality rate less than five

Moreover, the result of regression analysis on life expectancy revealed that the R^2 is approximately 0.96, which indicates that about 96 per cent of the variations in life expectancy is explained by the regressors in the model. The adjusted R^2 (which correct the over prediction of the R^2 in explaining the variation in the dependent variable by independent variables) is approximately 0.95 which measures the actual variation of 95 per cent in life expectancy by the regressors. It is clear that the seven independent variables explained 95 percent of the systematic total variations in life expectancy during the period under consideration. The Durbin Watson test of serial correlation indicates absence of first order serial correlation as indicated by a DW statistic of 1.5533. From the seven regressors, only four are statistically significant in determine life expectancy at 1% and 5% level of significant which are trade in medical product, urbanizatiion, education and total fertility rate but urbanization and level of education has a positive relationship with life expectancy while trade in medical product, urbanization and total fertility rate has a negative relationship with life expectancy. Trade in medical product bring about 0.0588% decrease in life expectancy and by implication, an increase in trade in medical product does not improve life expectancy. Furthermore, urbanization bring about 1.3328% decrease in life expectancy and this is due to more stress associated with urbanization in Nigeria and also fertility rate decreases life expectancy by 3.9434%. This so because among women that go into labour, the is tendency that they will lose some energy and blood which can prolong life and also, among men that are just supplying sperm without replacement they are subject to short life but with level of education one can still leave long by yielding to medical instruction.

It could be observed that the findings of this study was in line with Fayissa and Gutema, (2008); Missoni, (2013); Stevens *et al*, (2013); Herzer, (2014) & Novignon and Atakorah, (2016), they find out that trade in medical product improve health outcomes. This study also confirm the same when infant mortality rate less than one and less than five were used for health outcomes but trade in medical product does not improve health outcomes when life expectancy was used in this study as a measure of health outcomes which is total different from the results of the past studies in this area.

Lastly, the diagnostic tests for the three regression models confirm the correctness of the estimated model. The Breusch-Godfrey LM test statistics rejected the existence of serial correlation, while the ARCH test and Breusch-Pagan-Godfrey confirms that the residuals are homoscedastic. Also, the Ramsey RESET test suggests that the specified functional form is adequate.

5 Conclusion and Policy Recommendations

There are vest amount of studies on trade in medical products and health outcomes but the literature does not document much with respect to Nigeria on this topic. The common denominator of most of these empirical studies was the use of cross-country panel data to investigate the nexus between trade in medical products and health outcomes (Fayissa and Gutema, 2008; Missoni, 2013; Stevens *et al*, 2013; Herzer, 2014 & Novignon and Atakorah, 2016). This trend has been criticized in the contemporary literature, particularly because of the observed heterogeneity among countries. Hence, any potential inference drawn from these cross-country studies provides only a general understanding of how the variables are broadly related, and thus offers little guidance for policy formulation in a specific country. Therefore, it is more advantageous to conduct studies of individual countries, since this approach allows one to take into account, country-specific characteristics, such as structural change, services sector policies, trade patterns and exogenous shocks that are peculiar to that country. Unlike previous studies, this paper examine whether trade in medical products improve health outcomes in Nigeria. The whole study centers on country specific study using Nigeria. Three indicators were used for health outcomes which are infant mortality rate less than one, infant mortality rate less than five and life expectancy in order to make the research paper unique while the independent variables are trade in medical product, health finance, gross domestic product growth rate, sanitation facilities, urbanizatiion, education and total fertility rate. Before applying error correction model (ECM) approach, the paper examine the unit root of the series which shows I(1) series and Johansen co-integration test shows there are at least ten co-integrating equations. From the estimated results of ECM, trade in medical product reduces both infant mortality rate less than one, infant mortality rate less than five and life expectancy but reduction in terms of infant mortality rate less than one and that of infant mortality rate less indicates that trade in medical product improve health outcomes while the reduction in terms of life expectancy shows that trade in medical product worsen health outcomes in Nigeria. Therefore, trade in medical product only improve infant mortality rate less than one and that of five but worsen life expectancy. Most of the medical product has their side effect at old age.

What are the policy implications to be derived from these findings? Study recommended the following policies: (i) there should be more investment in trade in medical product in Nigeria in order for both infant mortality rate less than one and infant mortality rate less than five to be improve, (ii) the investment in trade in medical product should be on product that will also lead to increase in life expectancy and; (iii) there should be control on the number of children given birth to by individual household in Nigeria.

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