

Migrants' Remittances, Financial Development and Economic Growth in Nigeria: A Vector Error Correction Model Approach

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Abstract: Improvement in economic growth should take note of individual welfare in developing nations like Nigeria. Migrants' remittance inflow and financial development are both needed to influence such desired growth. This study therefore, examined the effect of migrants' remittances and financial development on economic growth in Nigeria from 1986-2019. The study obtained secondary data like real-GDP per capita, migrants' remittance, financial index, real exchange rate and trade openness from Central Bank of Nigeria Statistical Bulletin 2019 and World Bank Development Indicator, 2019. The Augmented Dickey Fuller (ADF) and Phillip Peron (PP) unit root tests employed confirmed that all the variable identified above were stationary at first level difference. Johansen Co-integration confirmed a long-run relationship among the variables. The lagged error correction (ECM) established that short-run and long-run dynamic was linked at an adjustment speed of 19.0% annually. Migrants' remittance and trade openness were significant and directly related to real-GDP per capita; while, real exchange rate indirectly related to it. Also, financial index was directly related to it, but non-significant. The study concluded that impact of remittances on economic growth depends on the degree of liberalization of the economy; while exchange rate appreciation depresses it. Therefore, recommended that Nigeria government should put in place policies such as low charges on migrants' remittance inflows in order to reduce inflow of such remittance through informal channel. Also, government must remove any trade barriers that could affect or reduce any form of free movement of remittance inflow.

Keywords: Real-GDP per capita, migrants' remittance, financial index, Vector Error Correction

I. INTRODUCTION

Migrants' remittances have become an important and growing source of foreign funds for several developing countries especially the sub-Saharan countries. According to World Bank (2017), remittances was US\$585.1 billion in 2016, of which US\$ 442 billion went to developing countries. It increased to US\$613 billion, indicating 7% in 2017 in which an estimated value of US\$450 billion was channel to developing countries. Also, that of 2018 was \$ 616 billion dollars. Nigeria as one of the developing countries received the sum of \$ 246.119 billion remittance inflow from 1977-2016 (Falade, 2019). In 2017, the country received the sum of \$22 billion, Senegal \$2.2 billion, Ghana \$2.2 billion, Kenya \$2.0 billion, Uganda \$1.4 billion, and Mali \$1.0 billion (World Bank, 2017).

The inflow of remittances passes through either formal or informal channels. The formal channel is known as the documented channel, while, the informal channel is known as the undocumented channel (Falade, 2019). In major sub-Saharan African countries remittances inflow pass through informal channel; therefore, reduce the effect of such funds or kinds on financial sector. According to World Bank (2010), more than 50% of the remittances inflow to developing countries passed through informal channels, which leads to under-estimation of total remittances received. In view of this, International Monetary Fund, IMF (2009) reveals that poor financial institution is responsible for usage of undocumented channel. In the word of Falade, Aladejana and Oluwalana (2018), Nigeria is characterized with poor financial services which is responsible for under-productive of real sector in the economy. The upsurge in remittances inflow through informal channel in developing countries reduce its significant effect on economic growth by 50% (IMF, 2015).

Meanwhile, the importance of remittances to financial development cannot be overemphasized, since money received by recipients through formal channel not only make funds available to banks, it also stimulates financial development and make funds available to government through charges on such loan. Given this, World Bank (2013) highlights the need to building effective institutions and promoting financial development in order to stimulate economic growth. Hammad (2016) established that financial development and remittances inflow influence economic growth through the process of making funds available to deficit side of the economy, which have multiplier effect on macro-economy indices. Also, economy needs funds and a well-developed financial institution to mobilize funds from the surplus side and channel such funds to the deficit side. According to Dabwor (2018), a growing economy places more responsibilities on the financial sector to mobilize the needed capital to facilitate production, generate employment and income. Also, Babatunde, Olayinka and Okwy (2011) supported the claims within Nigeria's context and confirmed that remittances influence financial development through the provision of credit to the private sector. In the realization of these facts. This present study examines the effect migrants' remittances and financial development on economic growth in Nigeria. To achieve this, the study is grouped into four sessions that include introduction, literature review,

methodology, result and discussions and conclusion and recommendations.

Statement of the problem

At present the inflow of migrants' remittances serve as a growing source of foreign funds to many developing countries Nigeria inclusive. The inflows of such remittance received normally double the official recorded value, due to the persistence nature of informal channel in developing countries. Also studies such as Adela and Dietmar (2013), Koay and Choong (2013), Muhammad *et al.* (2012) and Iheke (2012) have confirmed that remittances positively impact economic growth. Also, studies in Nigeria that include Adeleye (2018), and Anyawu and Erhjikarpor (2009) arrived at the same conclusions. Furthermore, studies that include Ratha (2005) and Jongwanich (2008) confirmed that remittances stimulate financial development. However, one gap that seems obvious from the past studies is the used of real gross domestic product or gross domestic product as proxy for economic growth without considering growth that capture citizens' well-being. This study therefore, examined the effect of migrants' remittances and financial development on economic growth in Nigeria using gross domestic product per capita as proxy for economy from 1986-2019. This is importance because when measuring economic performance or growth, a country should also be concerned with standard of living to ascertain how far each sector has contributed to the growth of the country and the overall citizens' welfare.

II. LITERATURE REVIEW

Falade (2019) defined migrant's remittance inflow as movement of cash or kinds through formal or informal channels by migrant from the country of resident to country of his birth or origin. Englama (2009) defined migrants' remittance as the transfer of money by a foreign worker or migrant to his or her home country. International Monetary Fund (IMF) interprets and records remittances in three different sections of the balance of payments which include: compensation of employee's, workers' remittances and migrants' transfers.

According to Falade, Aladejana, Okewo and Oluwalana (2021), financial development contains the quality delivery by financial institutions in terms of efficiency in financial instruments, the payment system, and financial services. Financial development is indicator for measuring essential level of development and growth in any economy. Financial institution such as central bank, stock exchange market, banking, insurance firm, etc. are the core players in financial services development. Financial institutions maintain price stability and make funds available from surplus side to deficit side. A growing economy places more responsibilities on the financial sector to mobilize capital to facilitate production, generate employment and income. In this present 21st century, financial sector development has embraced technology input, therefore, serves as a central nerve for economic development

through the availability of funds and other financial services (Falade, *et al.* 2021)

Empirical Studies

Migrants' Remittances and Economic Growth

Iheke (2012) studied remittances and economic growth in Nigeria from 1980-2008 using OLS techniques. The OLS result showed that remittances, per capita income, investment and time were significant and had a direct effect on economic growth. Similar study by Elisa and Peluso (2011) used a pooled regression techniques and arrived at the same conclusion that a direct and significant effect occurred between remittance and economic growth. A study by Fayissa and Nsiah (2008) using 37 African countries confirmed that migrants' remittances directly influenced economic growth. A study on remittances and poverty reduction using the developing Asia-Pacific country was carried out by Jongwanich (2008). The finding indicated that migrants' remittance inflow received by household drastically reduce poverty through increasing income, smoothing consumption and easing capital constraints of the poor. In addition, Salahuddin and Jeff (2015) used Bangladesh, India, Pakistan and the Philippines as the case study from (1977-2012) using a panel data. The result established a direct and significant effect between migrant remittances and economic growth in the said countries. Also, Imai *et al.* (2014) established a direct link between the duo.

On a contrary note, Chami *et al.* (2003) used 113 countries and confirmed that a significant and indirect relationship exist between remittances and economic growth. While, Catrinescu *et al.* (2009) found non-significant relationship between the duo using 114 countries. Similar study with the same conclusion was conducted by Karagoz and Kadir (2009) in Turkey from 1970-2005.

Financial Development and Economic Growth

Shahzad and Raza (2014) carried out a study on remittances and financial development in five South Asian countries using a time frame period from 1989-2011 and panel pool technique. The result showed that a direct and significant relationship existed between the duo with remittance contributing 12.6% to financial development.

Giuliano, Paola, and Ruiz-Arranz (2005) studied remittances, financial development and Growth. This paper used data from 100 developing countries as the case study. The study discovered that remittances increase when the economic situation (and investment opportunities) in a country are more favourable. Also, Balde (2010) used OLS and instrumental variables (2SLS) estimation methods to investigate the macroeconomic impact of remittances on savings and investment in Sub-Saharan Africa (SSA). Specifically, the paper compared the effectiveness of remittances and foreign aid (official development assistance) in promoting savings and investment. The study found that remittances are more effective than foreign aid in promoting savings and

investment in SSA. The coefficients on the remittances variable were found to be 6 to 7 times higher than those on the foreign aid variable.

Ojapinwa and Lateef (2013) investigated the link between remittances and fixed capital formation in Nigeria between 1977 - 2010 and employed the Dynamic Ordinary Least Squares model to study the subject. The study found a direct and significant effect between remittances and physical investment; while, a negative and significant correlation was confirmed between remittances and financial depth. Also, studies that include Ojapinwa (2015), Babatunde, Olayinka and Okwy (2011), Adenutsi (2010), Catrinescu (2009); Jongwanich (2007); Pradhan *et al.*, (2008) and Ratha (2005) had confirmed that remittances stimulate financial development.

III. METHODOLOGY

Theory of Altruism was adopted as the theoretical framework. According to this theory, the choice to remit is determined by the income needs of the relatives of the emigrant workers. Emigrant workers send money to their relatives in the country of origin in order to improve their welfare. There is no expectation of reciprocation on the part of the migrant worker. The migrant worker remits the money because his utility is derived from that of his family members (Chami *et al.*, 2003). In other words, the migrant worker gets satisfaction if the welfare of the family left back home improves, as a result of this, the motivation for the migrant worker to remit increases when the family is facing economic constraints. Remittances received by household are form of compensatory transfers to meet some certain needs of households thus enabling them smoothen their consumption. Therefore, migrants’ remittances received by household is countercyclical; thus, increasing during periods of economic downturns and decreasing during periods of robust economic growth. Therefore, according to this theory, remittances do not have a positive relationship with private investment since they are primarily spent on consumption activities.

Model

The model for this was built on Ekpeno (2015) model. Therefore, the basic model for Ekpeno (2015) is given below;

$$Growth = f(Income, X, Finance) \dots \dots \dots (i)$$

Where; Growth = Growth rate, income = The (logarithm) level of GDP per capita, X= Matrix of control variables and Finance = Financial development indicators.

Modifying the above model with little modification in line with the objective, the study have the following model;

$$RGDPC_t = f(REM_t, FD_t, REXCH_t, OPEN_t) \dots \dots \dots (ii)$$

Where; RGDPC = Real-GDP per capita (proxy for economy growth), REM = Migrants’ Remittances, FD= Financial Index (proxy for financial development), REXCH = Real exchange rate, OPEN= Trade Openness

In econometric form, equation (ii) becomes

$$RGDPC = \delta_1 + \delta_1 REM + \delta_2 FD + \delta_3 REXCH + \delta_4 OPEN + \mu_t \dots \dots \dots (iii)$$

The a-priori expectation is: $\delta_1 > 0, \delta_2 > 0, \delta_3 < 0$ and $0 > \delta_4 > 0$

Representing equation (ii) below in the VECM system equation using a reduced form of a matrix framework, we have:

$$\begin{bmatrix} RGDPC_t \\ REM_t \\ FD_t \\ REXCH_t \\ OPEN_t \end{bmatrix} = \begin{bmatrix} \alpha_1 \\ \alpha_2 \\ \alpha_3 \\ \alpha_4 \\ \alpha_5 \end{bmatrix} + \sum_{i=1}^p \begin{bmatrix} \pi_{11} & \pi_{12} & \pi_{13} & \pi_{14} \\ \pi_{21} & \pi_{22} & \pi_{23} & \pi_{24} \\ \pi_{31} & \pi_{32} & \pi_{33} & \pi_{34} \\ \pi_{41} & \pi_{42} & \pi_{43} & \pi_{44} \\ \pi_{51} & \pi_{52} & \pi_{53} & \pi_{54} \end{bmatrix} \times \begin{bmatrix} RGDPC_{t-i} \\ REM_{t-i} \\ FD_{t-i} \\ REXCH_{t-i} \\ OPEN_{t-i} \end{bmatrix} + \begin{bmatrix} \mu_{1,t} \\ \mu_{2,t} \\ \mu_{3,t} \\ \mu_{4,t} \\ \mu_{5,t} \end{bmatrix} \dots iv$$

Justification of the Variables in the Model

RGDPC was used as proxy variable for economic growth in the model and acted as the dependent variable to capture economic growth that is concerned with the citizens’ well-being. FD was included in the model based on the Ekpeno (2015) model adopted in the study as well as the objective of the study. REXCH was include because migrants’ remittances inflow is majorly in foreign currency and they are converted into local currency (Naira). REM was used as proxy variable for migrants’ remittances as well as to capture the stated objective of the study. OPEN was included in the model because of the neo-classical growth theory adopted that assumes free-trade.

Table 1 Definition and Measurement of Variable

Variables	Measurement	Source
RGDPC	Real gross domestic product divided by total population	CBN Statistical Bulletin 2019
REM	Total value of transfer money by a foreign worker to an individual in their home country % of GDP	World Bank Development Indicator, 2019
FD	Percentage of the value of credit to the private sector divided by GDP in constant prices % GDP	CBN Statistical Bulletin 2019
REXCH	Nominal exchange rate multiply by domestic price (₦)/foreign price (\$)	CBN Statistical Bulletin 2019
OPEN	The sum of imports and exports of goods and services divided by GDP in constant prices	CBN Statistical Bulletin 2019

Researcher’s compilation, 2021

IV. RESULT AND DISCUSSIONS

Table 2: Descriptive Statistics

	RGDPC	REM	FD	REXCH	OPEN
Mean	4.504845	3.148877	1.024947	3.391998	0.181212
Median	4.461764	3.195900	0.916718	2.911322	0.130000
Std. Dev.	0.229925	1.289806	0.191739	1.803298	0.155156
Jarque-Bera	3.249732	4.684831	4.387950	2.130775	2.903281
Probability	0.196938	0.096095	0.111473	0.344594	0.234186
Observations	34	34	34	34	34

Source: Researcher’s Compilation from E-view-9, (2021)

The descriptive statistics in Table 2 for the mean value shows that within the study period, the average growth rate of real-GDP per capita had the highest rate of positive respond to other macro-economic variables identified in the model followed by real exchange rate, migrants’ remittance, financial development index and trade openness. The findings for standard deviation showed that real exchange rate had the

highest dispersion among the variable, follow by migrants’ remittance, real-GDP per capita, financial index, and trade openness. Also, the *Jarque-Bera* probability value confirmed that real-GDP per capita, migrants’ remittance, financial index, real exchange rate and trade openness were normal distributed. Since their estimated p-values were greater than 5%.

Table 3: Unit Root Test Analysis

Augmented Dickey Fuller (ADF) Unit root					Phillip Peron (PP) unit root test			
Variable	Test Statistic	5% critical value	Level	Remark	Test Statistic	5% critical value	Level	S/NS
RGDPC	/3.182060/	/2.960411/	I(1)	S	/3.182060/	/2.960411/	I(1)	S
REM	/5.069652/	/2.960411/	I (1)	S	/5.132461/	/2.960411/	I(1)	S
FD	/6.589511/	/2.960411/	I (1)	S	/6.488589/	/2.960411/	I(1)	S
REXCH	/3.203998/	/2.960411/	I(1)	S	/6.410882/	/2.960411/	I(1)	S
OPEN	/6.563847/	/2.960411/	I (1)	S	/8.096554/	/2.960411/	I(1)	S

Where; S indicates Stationary

Source: Researcher’s compilation from E-view-9

Real-GDP per capita, migrants’ remittances, financial index, real exchange rate, and trade openness were all stationary (S) at first level difference, i. e I(1).

Table 4: Johansen Co-Integration Test

H ₀	Trace Max-Eingen Statistics			Max-Eingen Statistics		
	Trace Statistics	Critical value at 5% level	Prob	Max-Eingen Statistics	Critical value at 5% level	Prob
r = 0	217.5653	95.75366	0.0000* *	101.3480	40.07757	0.0000 **
r = 1	116.2173	69.81889	0.0000* *	73.81587	33.87687	0.0000 **
r = 2	42.40143	47.85613	0.1478	17.31207	27.58434	0.5532
r = 3	25.08936	29.79707	0.1583	13.21328	21.13162	0.4328
r = 4	11.87608	15.49471	0.1630	11.84864	14.26460	0.1165

Source: Researcher’s Compilation from E-view-9

As indicated in table 4 above, the t -statistic associated to the co-integration analysis of both Trace and Max-Eingen statistics at r= 0 and r=1 were greater than critical value at 5% significance level. The implication of this result was that there was evidence of co-integration or a long-run linear relationship among the variables.

Table 5: Vector Error Correction Estimates

CointEq1:	-0.189875 (0.100010) [1.898560] {0.0621}*	$R^2 : 0.971851$		
		Adjusted R-squared =0.966438		
		F-statistic: 1.940546		
		Prob(F-statistic) : 0.030157		
$\Delta(RGDPC(-1))$	$\Delta(REM(-1))$	$\Delta(FD(-1))$	$\Delta(REXCH(-1))$	$\Delta(OPEN(-1))$
0.595535 (0.368456) [1.616299] {0.1021}	0.143954 (0.079830) [1.803266*] {0.0601}*	-0.464066 (0.414790) [- 1.118799] {0.2010}	-0.000840 (0.000189) [-4.450096] {0.0001}**	0.404350 (0.131736) [3.069402] {0.0050}**
Standard errors in (), t-statistics in [], & p-value in { }, t-value (t _{0.05} = 2.042, & t _{0.1} = 1.697				
** & * indicate statistically significant at the 0.05 and 0.1 level				

Source: Researcher’s Compilation from E-view, 2021

The lagged error correction ECM (-1) was statistically significant at 10% conventional significant level with an inverse relation judging from t-value (t_{0,1}= 1.697) that was less than the absolute t-statistic (1.898560). This finding implies that the short-run and long-run dynamic was linked at an adjustment speed of 19.0% annually. In economics terms, the finding implies that the disequilibrium that occurred from short-run to long-run was corrected at an annual rate of 19.0%.

The results for real-GDP per capita of immediate past year was non-significant with a direct effect. The t-statistic (1.616299) was less than the t-value (t_{0.05 & 0.1} = 2.042 & 1.697) at 5% and 10% significance level. In economic term, this implies that prosperity in terms of economic output per person and increase in gross domestic product in previous year has infinitesimal influenced on current year.

The estimated coefficient of immediate past year of migrants’ remittances in table 5 was 0.143954 and statistically significant, implying that migrants’ remittances was a robust instrument that affected real-GDP per capita in Nigeria. Specifically, the result showed that a direct relationship existed between migrants’ remittances and real-GDP per capita in Nigeria. The positive sign of the migrant remittances was consistent with the *a priori* expectation. The implication of this finding on economy growth is that more inflow of migrants’ remittance into the country improve the prosperity of the citizens in terms of economic output per person, as well as the overall gross domestic product through increase in the demand for goods and services produced by industries, individual recipients or household. The significant nature of migrants’ remittances has been attributed to many factors. For instance, Falade (2019) discovered that remittance inflow reduced poverty among the recipients; thus, impact economic growth positively. Also, studies that include Adeleye (2018), Iheke (2012), Elisa and Peluso (2011) and Fayissa and Nsiah (2008) confirmed that remittances directly impact economic

growth. On the contrary, studies that include Falade, *et al.* (2021) and Catrinescu *et al.* (2009) established an indirect and significant relationship between the duo. The disparity in the finding could be attributed to the methodology, time frame, and level of financial development.

The VECM result showed an inverse and non-significant relationship between immediate past year of financial index and real-GDP per capita. This finding implies that over the years financial development has infinitesimal effect on economic growth in Nigeria. Since there was a negative relationship between financial development and economic growth but non-significance, this may be due to low levels of financial development in developing countries, Nigeria inclusive. Also, Babatunde *et al.* (2011) revealed that Nigeria’s financial sector that is part of financial development is characterized with shortage of fund, therefore reduce their credit to private sector. This finding was in line with the study of Ekpeno (2015) that discovered insignificant relationship between financial development and economic growth in less developed countries and sub-Sahara African countries. The non-significance of financial index in Nigeria might be attributed to mono-economy, low levels of financial development and lack of banking cultural among informal sector players.

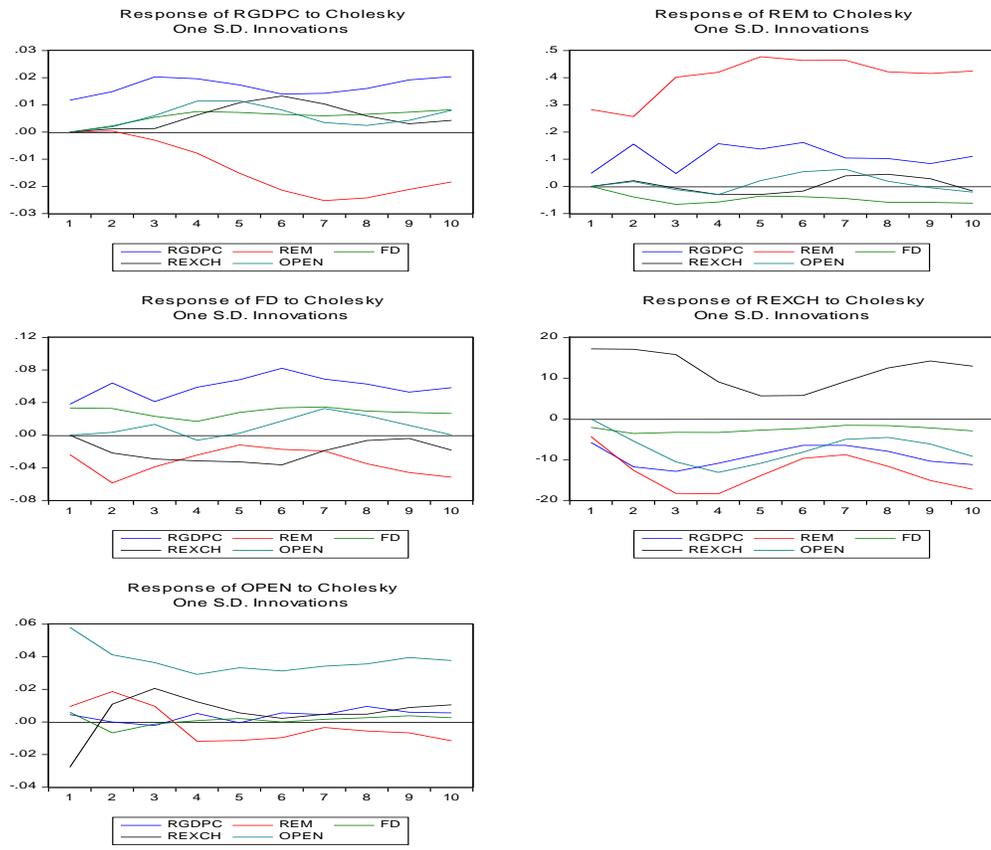
The estimated coefficient of real exchange rate for immediate past year was -0.000840 and very low, implying that exchange rate affected economic growth in Nigeria. Specifically, the result showed that a 1% increase in exchange rate brought

about 0.08% real-GDP per capita, provided other factors are kept constant. Although, exchange rate proved to be a significant factor that stimulated growth judging from the absolute t-value of 4.450096, The magnitude and negative signs of the co-efficient of the exchange rate was in line with the *a priori* expectation formulated in the model. The economic implication of this finding is that exchange rate appreciation discourages local consumption good; therefore, discourage many migrants to invest their savings in small businesses. In additional exchange rate appreciation discourage migrants to send money to their home countries.

The result indicated that a direct relationship existed between trade openness and real-GDP per capita at 5% p-value and statistically significant. Implying that trade openness had a direct effect on economy growth in the system. However, the establishment of a direct influence of trade openness on growth conformed to economic theory. The argument here was that more inflow of remittance, financial aids, foreign earning and free trade jointly boost economic growth. This finding was in consistent with the study of Hamma (2016) and Ojapinwa (2014) that discovered a direct link and significant relationship between trade openness and economic growth.

Impulse Response Result

Impulse response result for the VECM result is shown below using Cholesky –dof adjusted method for a period of 10 years.



The impulse response result table shows that the response of real-GDP per capita, migrants' remittance, financial index, real exchange rate and trade openness for the period of ten (10) exhibited both negative and positive signs. Therefore, implies that all the identified variables have the tendency to cause improvement or decline in economic growth in the future (provided that all other variables affecting it are held constant).

V. CONCLUSION AND RECOMMENDATIONS

The study concludes that impact of remittances on economic growth depends on the degree of liberalization of the economy; while exchange rate appreciation depresses it. Therefore, recommends that Nigeria government should put in place policies such as low charges on migrants' remittance inflows in order to reduce inflow of such remittance through informal channel. Also, government must remove any trade barriers that could affect or reduce any form of free movement of remittance inflow. The financial authorities and financial institutions present in the country should start creating awareness among people especially among informal sector players on the need to cultivate banking culture. Doing this, would enable the financial institutions such as banks to mobilize funds from the surplus side and channel such to deficit side. Also, the determination of exchange rate by market force should be maintained in order to encourage more of migrants' remittance inflow and economic growth.

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