
**Role of Financial Development on Remittance-Investment Nexus in Nigeria:
An Interactive Effect Approach**

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Abstract

Financial constraint has been identified as one of the main impediments that keep the poor from getting foothold on the development ladder. Financial development, measured by the amount of credit granted to the private sector by the bank sector helps in bridging the gap between the rich and the poor. The paper investigates the role of financial development on remittance-investment nexus in Nigeria. Annual secondary data covering the periods of 1981Q1 to 2020Q4, and were obtained from the World Development Indicators (WDI) published by the World Bank and Statistical Bulletin published by the Central Bank of Nigeria (CBN). Data collected were analyzed using Philips-Perron test unit root test, Augmented Dickey-Fuller unit root test, and Autoregressive Distributed lag model. Results obtained indicate that financial deepening dampens the effect of remittances on private domestic investment. The unit root test carried out revealed that only private domestic investment is integrated of order (0) while international remittances and financial deepening are integrated of order (1). The study recommends that government should implement policies that will encourage the flow of remittances into Nigeria, and adopt the agreement of World Remittance Index that the cost of remitting money in Sub-Saharan Africa should not be more than 5% of the amount.

Keywords: International remittances, Private investment, Financial development

1. Introduction

Investment is the employment of funds with the aim of getting return on it. In general terms, investment means the use of money in the hope of making more money. Investment is the commitment of funds which have been saved from current consumption with the hope that some benefits will be received in future. Investment refers to the concept of deferred consumption, which involves purchasing an asset, giving a loan or keeping funds in a bank account with the aim of generating future returns. Investment here means real gross private domestic capital formation. This is the measure of physical investment used in computing Gross Domestic Product (GDP) in the measurement of nation's economic activity. This is an important component of GDP because it provides an indicator of the future productive capacity of the economy. It includes replacement purchases plus net additions to capital assets plus investments in inventories. It also includes non-residential investment (such as tools, machinery, and

factories), residential investment, change in inventories. Private domestic investment is the finance money invested by companies, financial organizations, individuals or other investors rather than by a government. Investment is perhaps the most variable and volatile components of aggregate demand and fluctuations in its level are highly correlated with fluctuations in the Gross National product. This is because it is affected by the cyclical behaviour of the economy. Businesses are always wary of the changing expectations; it falls sharply during recessions and rises during booms.

Investment is financed from savings (domestic or foreign). While investment is financed from domestic saving in the advanced economies, foreign saving is often used to supplement domestic saving in the financing of investment in many developing countries. In many developing countries, the resources to finance the different business ideas are in short supply. This is because their economies are plagued with problems associated with low income, inadequate financial systems, low domestic savings; vicious level of poverty, low tax revenue, macroeconomic instability, political instability, unstable exchange rate, limited foreign exchange earnings, and availability of natural resources amongst others. As a result of these, developing countries inevitably resort to policy that will enhance the flow of international migrant remittances or foreign finance in order to bridge the gap between the resources available to them and what is required for their advancement (Joseph, 2017). International Organization for Migration (2006) broadly defined remittances as the financial flows associated with migration, in other words, personal cash transfers from a migrant worker or immigrant to a relative in the country of origin. Remittances are referred to as unrequited transfer sent by migrant workers back to relatives in their countries of origin (Juthathip, 2007).

The sum of financial remittances sent by International migrants back to their families in origin countries amounted to \$581.6 billion in 2015, according to World Bank estimates; almost 75 per cent were sent to developing countries (\$431.6 billion), representing more than three times the size of foreign aid received by such countries in the same year. Nigeria received \$21.1 billion from the said remittances that year (the highest in Africa) compared to all developing countries in the world. In addition, remittances are the largest source of foreign capital in developing countries even more than Foreign Direct Investment (FDI). In 2018, a total of \$25.08 billion was remitted by Nigerians in diaspora (PricewaterCoopers, 2019). This represents about 14% increase from 2017 and 83% of the federal government's 2018. This was about \$3 billion higher than the World Bank's previous estimates and placed Nigeria as the highest remittance recipient in Africa and fifth highest globally, behind the likes of India, china, Philippines and Mexico in that order. African countries, like many developing countries in other continents need a substantial inflow of international remittance inflows in order to make up for the savings and foreign exchange gaps associated with a rapid rate of capital accumulation (Okeke, Chinanuife and Mogbo, 2021).

Unlike other sources of external finance, remittances tend to be more stable making them a reliable source of financing for developing countries (Biller, 2007). Remittances are often more effective than development aid since they are sent directly to the recipient thus making them less susceptible to bureaucratic bottlenecks and corruption. Moreover, because large share of

remittances are sent through informal channels; they are therefore not captured in official tabulations (Cherono, 2013).

In spite of the upward surge in the amount of remittances to Nigeria, there are number of factors that impede their flow. The first is transaction costs. Presently, the cost of sending money to Nigeria is very high. On the average, to send \$200 to and from a country in the region costs almost \$19 in the first quarter of 2018. In Africa, transaction cost as of the first quarter of 2018 is 11.18%. Sub-Saharan Africa's remittance price in the first quarter of 2017 is 9.81% as against South Asia's 5.40% which remains the cheapest receiving region. Intra-African transaction cost is about 15%. The high cost is mainly contributed by the exclusive arrangements between banks and international money transfer institutions as well as stringent regulations related to money laundering and terrorist financing (World Bank, 2011).

Poor access to formal financial institutions, and high interest rate spread plays a significant part in contributing to the low mobilization of diaspora remittances. Mundaca (2005) finds in a sample of selected Central America countries (e.g. Brazil and Mexico) that financial development tends to increase the responsiveness of growth to remittances. However, the works of Giuliano and Ruiz-Arranz (2009) and Fayissa and Nsiah (2008) suggest that remittances boost growth in countries with an underdeveloped financial sector. In other words, in countries where the financial sector is unable to extend credit to the private sector, remittance receipts are a vital source of capital relative to financially developed societies. Moreover, it can be argued that migrant transfers meant for investment purposes could be severely limited in the presence of acute political instability, corruption and go-slow bureaucracies. Hence, non-financial institutions and institutional qualities such as law and order, government stability, democratic accountability, e.t.c, affect the growth of remittances positively, which will then influence the level of investment (Okeke, Utomi and Ezenekwe, 2019).

Regrettably, the remittance transaction cost still remains high, which, inevitably, reduces the amounts beneficiaries actually receive. This will eventually undermine the impact of remittances on real gross private domestic investment. According to the Remittance Prices Worldwide database (RPW) of the World Bank, in the first quarter of 2017, the global average cost of sending money was 7.45% of the amount transferred, with the highest average cost, i.e. 9.81% of the amount transferred in Sub Saharan Africa. Also, perhaps surprisingly, the top ten most expensive corridors in Africa are intra-African, with a cost up to 19.35% of the amount. Many assertions have been made that the high transaction cost of international remittances to and within Africa is as a result of underdeveloped financial and payment infrastructures (underbankarization which is the low level of access and use of formal banking services).

Evidence from previous research shows that financial development tends to increase the responsiveness of growth to remittances while other researchers in less developed countries characterised by underdeveloped financial market suggest that remittances boost growth in countries with an underdeveloped financial sector. In other words, in countries where the financial sector is unable to extend credit to the private sector, remittance receipts are a vital source of capital relative to financially developed societies. These conflicting empirical findings

invite further research of the role of financial development on remittance-investment nexus in Nigeria.

This study, however, concentrates on the role of financial development on the impact of international remittances on private domestic investment in Nigeria.

2. Objective of the Study

The objective of this study is to examine the role of financial development on the impact of international remittances on private domestic investment in Nigeria.

3. Literature Review

3.1 Modern Portfolio Theory (MPT):

This theory was pioneered by Henry Markowitz in his paper “Portfolio Selection”, published in 1952 by the Journal of Finance. Modern Portfolio theory is a theory on how risk-averse investors can construct portfolios to optimize or maximize, emphasizing that risk is an inherent part of higher reward. MPT is formalization and extension of diversification in investing, the idea that owning different kinds of financial assets is less risky than owning only one type. Its key insight is that an asset’s risk and return should not be assessed by itself, but by how it contributes to a portfolio’s overall risk and return. It’s also called the Mean-Variance analysis. In this theory, remittances are viewed as a strategy by an emigrant worker to diversify his other savings. Accordingly, the decision to remit is based on the risk return differential of assets in both the host and recipient country. As such, the main determinants of the decision to remit include interest rate, and black-market exchange rate premium among others. Apart from these economic determinants, the desire to invest may also be driven by the desire of the emigrant worker to return back home with dignity in the event that the emigrant worker chooses to return home (OECD, 2006). Since the desire to remit is purely motivated by investment opportunities, the correlation between remittances and GDP tends to be positive.

Altruism hypothesis

Altruistic behaviour has been suggested in the literature in the attempt to explain the motivation that underlies a migrant’s decision to remit. Altruism is an ethical doctrine which was coined by the French philosopher, Auguste Comte (1852), as a description of the ethical doctrine he favoured. Proponents of altruism hypothesis suggest that individual family members are obligated to help each other and that this explains migrant remittance decisions (Becker 1981, 1991; Stark and Lucas, 1988; Stark 1995; Rapport and Docquier, 2006). The doctrine suggests that migrants will be willing to transmit resources to make up for the income shortfall of family members for either their consumption or investment. Altruism hypothesis suggests that a migrant will willingly sacrifice his or her own well-being or interest for the sake of the welfare of relations due to the love and concern they may have for their relation’s welfare. It was Comte’s belief that individuals are morally obligated to renounce self-interest and live for others. Pure altruism suggests that one must be benevolent and must sacrifice or forego something for the benefit of another person or persons without expecting anything in return. This sacrifice could be in the form of physical resources, time or energy. An altruistic giver does not expect to be

compensated either directly or indirectly for her/his act. However, the migrant remittance decision theory of altruism in the literature has been derived from utility theory (Becker, 1981; Lucas and Stark, 1985; Stark, 1995; Osili, 2007) which suggests that by remitting, the migrant maximizes her/his expected utility.

According to this theory, the decision to remit is based on the income needs of the relatives of the emigrant worker. Emigrant workers send money to their relatives in the country of origin in order to improve 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, the motivation for the migrant worker to remit increases when his family is facing economic constraints. Remittances are therefore a form of compensatory transfers which compensate households faced by economic disruptions thus enabling them smoothen their consumption. As such remittances tend to be countercyclical; 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.

3.2 Empirical Literature Review

Onyeisi, Odo, and Anoke (2018) examined remittances and domestic credit to private sector: The Nigerian Experience. Variables employed in the model include domestic credit to Private sector, growth rate of international remittance inflow, exchange rate, inflation, Real GDP, and official development assistance. The study used co-integration, vector error correction mechanism for estimation of specified models, and in the short run, remittance inflows was found to have positive but insignificant link with domestic credit to private sector while development assistance indicated a negative relationship with domestic credit to private sector.

Ogboi and Ezike (2017) evaluated Household Inward Remittances and banking sector development in Nigeria. They employed both descriptive statistics in the form of graph and Generalized Method of moments' instrumental variables (GMM-IV) estimator to examine the remittances – banking sector development nexus in Nigeria. Variables employed include private sector credit, remittances, trade openness, lending rate, and inflation. The study revealed that household remittances made positive impact on banking sector development in Nigeria, though the impact is negligible considering the huge amount of remittance inflows into the Nigerian economy. Asogwa and Okeke (2013) in their study of the crowding out effect of budget deficits on private investments in Nigeria observed that budget deficits crowds out private investments in Nigeria.

Ojapinwa and Oladipo (2014) examined the impact of workers' remittances on financial development in 32 Sub-Saharan African countries. They employed dynamic panel Generalized Method of Moments (GMM) to study the potential effect of remittances on financial development with emphasis on financial intermediation. The study discovered that worker's remittances affect financial development in a positive and significant way. This positive relationship suggests that remittances complements financial intermediation in SSA countries as

exemplified by “endogenous growth” literature and the canonical financial intermediating model with the insights that remittance-savings behaviour will generally influence equilibrium financial growth rates. Okeke (2021) investigated the impact of international remittances on unemployment in Nigeria using the two-stage least squares (2SLS) and discovered that international remittances affect unemployment negatively.

Giuliano and Ruiz-Arranz (2005) used a Generalized Method of Moments (GMM) approach to investigate whether remittances could bridge the gap caused by the lack of access to credit. In particular, the paper examined the relationship between remittances and economic growth focusing on how the interaction between remittances and financial development can influence a country’s capacity to utilize remittances as well as the effectiveness of remittances. Data comprised of cross-country data of 73 developing countries receiving remittances in the period between 1975 and 2002. The empirical results suggest that remittances can promote investment and thus economic growth in countries with underdeveloped financial markets.

Hanson and Woodruff (2003) investigated the causal relationship between remittances and microcredit in rural Mexico and find that remittances are associated with higher education attainment in rural Mexico; in particular among 10-15-year-old girls whose mother has low educational levels. For the case of El Salvador, Cox-Edwards and Uretha (2003) studied remittances and investment in education in transnational Mexican communities using the propensity score matching, their results show that children from remittance recipient households are less likely to drop out from school, which they attribute to the relaxation of budget constraints affecting poor recipient households.

Paulson and Townsend (2000) posit that entrepreneurs in many developing countries suffer from lack of access to credit since many developing countries suffer from underdeveloped financial systems and therefore face liquidity constraints. In the absence of credit, entrepreneurs will not be able to pursue profitable opportunities. Remittance inflows can therefore alleviate such credit constraints in economies where there is limited access to credit. Dustmann and Kirchamp (2001) argue that relaxation of credit constraints would lead to higher levels of investment and thus economic growth.

Okeke, Utomi, and Ezenekwe (2019) investigated the impact of international remittances on private investment in Nigeria. Ordinary least square was used to analyze time series data sourced from World Development indicators. The result revealed that remittances increase the rate of private investment in Nigeria and that previous investment is a determinant of current investment. Okeke, Chinanufe, and Mogbo (2021) in their study of the causal relationship between international remittances and private domestic investment using Toda and Yamamoto Causality approach observed that there is a unidirectional causal relationship between remittances and private investments in Nigeria.

3. Model Specification

Even though the Autoregressive Distributed Lag model was employed in this study, an important technique that allows for non-linearity in an econometric model is the use of interaction terms—the product of explanatory variables. In order to achieve the objective of this study, the study

interacted remittances and private sector, interacted remittances with financial deepening. The interaction provides the channel through which remittances impacts on private investment in Nigeria, since remittances saved in financial institutions serves as loanable funds that is usually lent out to private investors as capital needed for investment.

The functional form of the model is stated as:

$$PDI = f(IMR * FIND, INF, OER, RIR, POLSTAB, GOVEFF) \text{ --- (1)}$$

The econometric form of equation (1) is stated as:

$$\begin{aligned} \Delta \ln PDI_t = & \beta_0 + \beta_1 \sum_{i=1}^q \Delta \ln PDI_{t-i} + \beta_2 \sum_{i=0}^q \Delta \ln IMR_{t-i} * \Delta \ln FIND_{t-i} + \beta_3 \sum_{i=0}^q \Delta \ln INF_{t-i} \\ & + \beta_4 \sum_{i=0}^q \Delta \ln OER_{t-i} + \beta_5 \sum_{i=0}^q \Delta RIR_{t-i} + \beta_6 \sum_{i=0}^q \Delta POLSTAB_{t-i} \\ & + \beta_7 \sum_{i=0}^q \Delta GOVEFF_{t-i} + \gamma_1 \ln IMR_t * \ln FIND_t + \gamma_2 \ln INF_t + \gamma_3 \ln OER_t \\ & + \gamma_4 RIR_t + \gamma_5 POLSTAB_t + \gamma_6 GOVEFF_t + \mu_t \text{ --- (2)} \end{aligned}$$

Where:

FIND = Financial deepening (proxy by the ratio of private sector credit to GDP).

INF = Inflation (proxy by consumer price index)

OER = Official exchange rate (exchange rate announced by the Central Bank of Nigeria)

RIR = Real interest rate (this is the real cost of borrowing for investment)

POLSTAB = Political stability (this captured business environment)

GOEFF = Government effectiveness (this captured business environment)

4. Data Analysis and Interpretation of Results

The study tested the stationarity of the variables using the Augmented Dickey and Fuller. The result of this test is presented in table 5.1

Table 5.1: Augmented Dickey-Fuller Test Result

Variable	Level ADF Statistic	5 Percent Critical Value	First Difference ADF Statistic	ADF Critical Value at 5%	Level of Integration
lnPDI	-0.692044	-2.882910	-3.893119	-2.882910	I(1)
lnIMR	-2.437842	-2.882433	-3.165743	-2.882433	I(1)
lnFIND	-1.562295	2.881260	-9.668795	2.881260	I(1)
lnOER	-2.968477	-2.881260			I(0)
POLSTAB	-1.933626	-2.881260	-3.211107	-2.881260	I(1)
RIR	-2.540479	-2.882433	-4.386224	-2.882433	I(1)

Source: Authors' compilation from the result of ADF test, 2021

Table 5.1 shows the result of unit root test of the variables in the model. It could be observed that variables such as the log of private domestic investment (lnPDI), log of international remittances

inflow (LnIMR), log of financial development (LnFIND), political stability (POLSTAB) and real interest rate (RIR) were observed to be stationary after first difference, hence integrated of order one while the log of official exchange rate (LnOER) was stationary in its level form and are integrated of order zero. Thus, the study has a combination of I(0) and I(1). Bound test approach was adopted and the study found that there exists long run association among the variables in the model. The result of the cointegrating and long run form of the model for remittance-investment nexus is presented in table 5.2.

Table 5.2: Financial development and Remittance-Investment Nexus
 Dependent Variable: Private Domestic Investment
 Method: ARDL

Table 5.2a: Short run result Dependent variable: D (LNPDPI)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNPDPI(-1))	2.170493*	0.355455	6.106222	0.0000
D(LNPDPI(-2))	-1.842111*	0.235413	-7.825010	0.0000
D(LNPDPI(-3))	0.574386*	0.058416	9.832681	0.0000
D(LNFIND)	0.010503*	0.003158	3.326254	0.0012
D(LNFIND(-1))	-0.001587	0.001015	-1.563736	0.1206
D(LNFIND(-2))	0.001316	0.001018	1.292754	0.1987
D(LNFIND(-3))	0.000975	0.001005	0.970386	0.3339
D(LNFIND(-4))	0.000379	0.001000	0.379007	0.7054
D(LNFIND(-5))	-0.002025*	0.000694	-2.917977	0.0042
D(LNIMR)	0.000796	0.001352	0.588967	0.5570
D(LNIMR(-1))	0.002663	0.002207	1.206958	0.2299
D(LNIMR(-2))	-0.000673	0.002189	-0.307415	0.7591
D(LNIMR(-3))	-0.001237	0.002166	-0.571202	0.5690
D(LNIMR(-4))	0.002627*	0.001310	2.006052	0.0472
D(LNFIND * LNIMR)	-0.000423*	0.000134	-3.152511	0.0021
D(LNOER)	-0.004046	0.004482	-0.902682	0.3686
D(LNOER(-1))	0.012850*	0.004317	2.976836	0.0036
D(POLSTAB)	-0.000850	0.000650	-1.307641	0.1936
D(POLSTAB(-1))	0.000664	0.001416	0.468813	0.6401
D(POLSTAB(-2))	-0.001136	0.000721	-1.575676	0.1178
D(RIR)	-0.000021	0.000025	-0.834162	0.4059
CointEq(-1)	-0.019323	0.003596	-5.373260	0.0000

Where * denotes significant at 5 percent level.

Source: Authors' compilation from the result of ARDL cointegrating form, 2021

The cointegrating equation of the model in Equation (4.2) is given as

$$Cointeq = LNPDPI - (0.5738LNFINDD + 0.0035LNIMR - 0.0219LNIMR * LNFINDD - 0.3167LNOER + 0.0109POLSTAB - 0.0011RIR + 4.2702)$$

Table 5.2b: Long run result Dependent variable: LNPD

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNFIN	0.573763*	0.112299	5.109249	0.0000
LNIMR	0.003535	0.015575	0.226946	0.8209
LNFIN*LNIMR	-0.021891*	0.004946	-4.425644	0.0000
LNOER	-0.316698*	0.037017	-8.555534	0.0000
POLSTAB	0.010869*	0.002172	5.003677	0.0000
RIR	-0.001079	0.001215	-0.887494	0.3767
C	4.270156	0.211310	20.207983	0.0000

Where * denotes significant at 5 percent level.

Source: Authors' compilation from the result of ARDL long run form, 2021

Table 5.2a shows the result of short run

Financial deepening and International remittances are positively related to Private domestic investment in the short run which is in line with apriori expectation. By implication, a unit increase in financial deepening and remittances will result in 15 and 0.7% increases in private domestic investment. However, official exchange rate and Political stability are negatively related to Private domestic investment in the short run. By implication, a unit increase in exchange rate and government stability will result in 4% and 0.8% decrease in private domestic investment but they are insignificant at 5% level. Real interest rate is negatively related to the level of private domestic investment, and coefficient of interest rate is not statistically significantly different from zero at 5% level of significance. The error correction term is as expected, negatively signed and is not statistically significantly even at less than 1 percent level. This is a further indication of the existence of long run relationship between the dependent variable and the regressors. The absolute value of the coefficient lies between zero (0) and one (1), and it indicates that about 1% of the short run deviation from the equilibrium (long run) position is corrected annually to maintain the equilibrium. This shows high speed of adjustment to equilibrium.

In the long run result, Financial deepening and International remittances are positively related to Private domestic investment in the short run which is in line with apriori expectation, though remittance is not statistically significantly different from zero. A unit increase in financial deepening and remittances will result in 50% and 0.3% increases in private domestic investment. However, the interactive effect of remittance-investment nexus and financial deepening shows that financial development affects remittance-investment nexus negatively which is contrary to a priori expectation. A unit increase in the multiplicative effect of remittance and financial deepening would bring about 2% decreases in private domestic investment in Nigeria and it is statistically significantly different from zero. On the contrary, the real interest rate is negative which is in line with a priori expectation. A unit decrease in the real interest rate would bring about less than 1% increase in private domestic investment in Nigeria, but it is statistically insignificant.

4. Discussion of Findings

The coefficient estimates of the interactive effect of remittances and financial deepening show that financial development dampens the effect of remittances on private investment in Nigeria. It indicates that the impact of remittances on investment varies inversely with the level of private sector credit available to the populace. This suggests that the credit market is malfunctioning. In addition, it indicates that remittance inflows are neither channeled through the financial intermediaries nor leveraged (i.e. use as collaterals) for investment purposes. This might be due to underdeveloped financial and payment infrastructures (underbankarization which is the low level of access and use of formal banking services); hence making transaction cost of international remittances to and within Africa to be high. On the contrary, the estimates of financial deepening show that financial development enhances private domestic investment in Nigeria through provision of financial services and better access to credit. Given the positive role of financial development in providing enabling environment for identification and marshalling of the needed financial resources to exploit such investment opportunities, entrepreneurs could raise external funds under a sound financial framework.

6. Conclusion and Recommendation

Households receiving remittances are not necessarily the best entrepreneurs in town. In countries where the financial market is fairly developed, such households could conveniently put aside some of their remittance receipts in the banks. Thus, a portion of purely altruistic motivated remittances can in this fashion find its way through financial intermediation into the business sector. Furthermore, migrants can remit to their home country in search of fair returns by taking advantage of the intermediation provided by financial institutions (Bjuggren, Dzansi and Shukur, 2010).

This paper has sought to discuss in a consistent and comprehensible form the role of financial development on remittance-investment nexus in Nigeria using interactive function of Autoregressive distributed lag model. The empirical results show that financial deepening dampens the effect of remittances on private domestic investments in Nigeria. Hence, it is recommended that the government should do the following;

- Policies that will encourage the flow of remittances into Nigeria be implemented. Nigeria should adopt the agreement of World Remittance Index that the cost of remitting money in Sub-Saharan Africa should not be more than 5% of the amount.
- Monetary authorities should offer premium exchange rates to migrant workers that will allow them to sell their foreign exchange earnings to importers through daily auctions held by domestic banks. Sequel to this, importers are able to use the foreign exchange they have purchased to import certain commodities regulated by the Nigerian Customs Authority.
- The government should make policies that will encourage domestic financial institutions to actively engage in the money transfer market so as to increase the availability of external funds required for investment.

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