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Transmission Effect of the Interaction between Parallel and Official Foreign Exchange Markets in Nigeria

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Abstract: This study investigates whether there is any interaction existent between the exchange rate movements in the official and parallel foreign exchange markets and whether or not the official exchange rate manipulation can serve as an instrument for controlling the parallel market rate. The study utilizes annual data series for official foreign exchange rate and parallel foreign exchange rate in Nigeria for the periods 1980-2012. We employed the unit root test, Q-test, BDS and ARCH test to evaluate the linear dependence and volatility in the series while the Bivariate GARCH was used to test for transmission existent between the official and the parallel foreign exchange markets. The unit root test results report that all the variables prove to be stationary at first difference, the Q-test shows evidence of no linear dependence in the series thereby suggesting that the series are not linearly correlated and that both the official and parallel exchange rates are random in nature. The BDS test revealed the existence of linear dependence meaning that there is serial correlation existent between the items in the series and also suggesting that both the official exchange rate and the parallel exchange rate can be predicted. The ARCH test results indicate that there is the influx of volatility in the two markets and that the series are volatile in nature. The Bivariate GARCH test for transmission existent between the two markets reveals that volatility does not transmit from the official foreign exchange market to the parallel foreign exchange market. This negates the exchange rate pass-through theory but supports the theory of exchange rate disconnect. The study therefore posits that changes in the official exchange rates are not important in explaining or influencing changes in the parallel exchange market in Nigeria. Thus, policy makers may not be able to use the manipulations of the official foreign exchange rate as a tool for controlling the activities of the parallel foreign exchange market in Nigeria. The study recommends that the managers of the Nigeria economy should ensure influxive design and implementation of policies and strategies that will ensure a more favourable official exchange rate regime in Nigeria so as to eliminate the wide premium existent between the two markets.

Keywords: Parallel market; Official market; Transmission influx; Exchange rate pass-through.

1. Introduction

Scholars in international finance seem to agree that official and black or parallel foreign exchange markets are tending to be an unavoidable component of economies of many developing countries. Parallel Market refer to an illegal form of market where foreign money or goods are bought and sold while official market is a legal and recognized form of market where foreign currencies and/or goods are bought and sold. Barro and Lee (1993) reported that this dual (black and official) foreign exchange market system was unwittingly created by Government restrictions on free trading of foreign currencies. It created an avenue for diverting export and import revenues from the official to the parallel or black market. This adversely affects the servicing of external debt obligation and economic policy implementation. Available evidence from finance literature supports this view. The report of Barro and Lee (1993) shows that black markets with substantial parallel premiums, measured by the spread existent between black and official rates has a reasonable potential to substantially reduce economic control and growth influx. This can also be seen in the work of Bhagwati (1978) which support the argument that the emergent situation provides incentives for illegal transactions such as smuggling.

Parallel foreign exchange market or black market as it is popularly called, has been in existence for a while now and has become a common phenomenon in most developing countries inclusive of Nigeria. Official Foreign exchange market embraces the conversion of the purchasing power from one currency into another bank deposits of foreign currency, the extension of credit denominated in a foreign currency, foreign trade financing, trading in

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foreign currency, options and futures contract and currency swaps (Eun and Resnick, 2004). Ilesanmi (2000) however, defined foreign exchange market as a market for the sale or purchase of foreign currencies. Parallel foreign exchange market (black market) is a second foreign exchange market that exists outside the government regulate, recognized official foreign exchange market. It is typically used as a way to evade exchange controls.

In Nigeria the market is free and open for all individuals, corporate bodies and even the government to carry out genuine business but with some restrictions imposed by the government on the exchange and convertibility of currencies. This has led many individuals and even some corporate bodies to turn to some alternative market. Inconsistencies in handling and shortages in supply of foreign currencies not excluding monopolies by some persons act as a catalyst for the parallel market to thrive. In the aftermath of the oil boom, coming with huge salary increases, tariff and excise policies aimed at subsidizing people's purchasing power engender excess demand for tradable goods. This led to a real appreciation of the exchange rate in the official market. At the onset of the oil crisis in the late 70s, the option open to the government was to offset the pressure on the balance of payments by currency devaluation quantitative control to sustain the official market. This was implemented in 1978. Subsequent policy responses in 1982 and 1984 were all geared toward reducing the quantity of imports than raising the price (the exchange rate). These emergent policies consequently however, gave room for the growth of the parallel foreign exchange market (the Black market) in Nigeria.

Today, the parallel market has grown in it length and girth especially in Nigeria. It has become a major and ready source of foreign exchange to most individuals, some corporate bodies and to some other economic agents, since the exchange rate in the market usually deviates and is depreciated than the official exchange rate. As the parallel market for foreign exchange expands and people depend more on it for their transactions, government loss control over the economy as more of the official transactions are diverted to the parallel market.

Due to the negative influxes of the parallel foreign exchange market on the official market, economic control and resource allocation, many countries have resorted to some damage control approach by either giving the parallel market some degree of legality or simply tolerating its operation. This is done either by creating a legal or semi-lega1 parallel market and allowing it to operate alongside the official market. Under this parallel market regime, current account transactions are settled at the government-controlled official rate and the parallel rate is used for capital account transactions (Agenor and Ucer, 1990).

An important advantage of the existence of a parallel market however, is that it may allow policymakers to view it as a medium to unify both the official and parallel markets. This might be particularly true for reforming countries that are eager to eliminate exchange controls on current account transactions and introduce the convertibleness of domestic currencies. The report of Kiguel and O'Connel (1995) shows that Asia, South Africa and Latin America introduced the parallel markets (semi-legal and legal) for this purpose.

In an attempt to unify both the official and the parallel foreign exchange markets so as to control the parallel exchange rate using the official market rate, there is the need to investigate whether there is some level of interaction existent between the two markets. As such, the activities of the official market are expected to be transmitted to the parallel market. In such situation, exchange rate pass- through will be said to occur and the interaction will be said to follow the exchange rate pass-through theory. Exchange rate pass-through means that the exchange rate changes in the official market is allowed or transmitted to register its full influx on the exchange rate in the parallel foreign exchange market. In this case, movement or volatility in the official market exchange rate will be correlated with movement or volatility in the parallel foreign exchange rate. Where this did not occur, then the interaction will be said to follow the theory of exchange rate disconnect. Our worry in this study therefore, is to investigate the nature and magnitude of interaction existent between the movements in the official exchange rate and the parallel exchange rate of foreign exchange markets representing the official and parallel foreign exchange market activities respectively in Nigeria.

A key question this study intends to answer in this regard is whether or not policy makers or the managers of the Nigerian economy can successfully use the official exchange rate as a policy tool to control the parallel market exchange rate transactions influxively?. However, the main aim of this study is to critically investigate the influx of parallel foreign exchange market on the official market in Nigeria.

Given the co-existence of the official and the parallel market for foreign exchange and the damaging consequences of the operations of the parallel market on the economy as well as the intention of the managers of the economy to control the parallel exchange rate using the manipulations of the activities of the official market, the following questions seek to excavate the problems of this study. Do the official and the parallel market activities correlate? Can policy makers use the official foreign exchange rate as a tool to control the parallel market rate? If there is any interaction existent between the two markets, does it follow the theory of exchange rate pass-through or that of exchange rate disconnect?

This study set out to investigate whether there is any interaction existent between the exchange rate movements in the two markets and whether or not the official exchange rate manipulation can serve as an instrument for controlling the parallel rate. In addition to examining the transmission mechanism, the study intends to reveal the nature of the connectivity, if there exist any. This objective is broken down into the following specifics:

i) To investigate the nature of relationship existent between the official foreign exchange rate and the parallel foreign exchange rate in Nigeria.

ii) To determine whether changes in the official foreign exchange rates are important in explaining changes in the parallel foreign exchange rates in Nigeria.

iii) To investigate whether the correlation existent between the official foreign exchange rates and the parallel foreign exchange rates in Nigeria follow the theory of exchange rate pass-through or exchange rate disconnect.

This study is expected to be useful to policy makers in their effort to fashion out dynamic and reliable policy measures in unifying the two markets. It will also be useful to researchers and help resolve the controversy as to whether the interaction existent between the official foreign exchange rate and the parallel market rate follow the theory of exchange rate pass-through or that of exchange rate disconnect in Nigeria.

Structurally, this work is organized into five sections. Section one introduce the study. Section two detailed the review of relevant literature, including theories and empirical review of past works. Section three describes the research methodology. Section four presents the data and give detailed analysis of the empirical results and findings of the study while section five discusses the concluding remarks.

2. Theoretical Postulates

The theoretical basis for this study is provided by these theories.

2.1. Theories of Exchange Rate Volatility

The explanations of exchange-rate fluctuation are subject to constraints imposed by the realities of available financial economic restrictions arising from international financial market conditions. The conditions determine the behavior of exchange rate and they include sticky prices, varying elasticities of import demand and export supply, and jumps in currency supplies or demands occasioned by stock adjustment and fluctuations in fund flow.

The Sticky-Price Theory: This theory presupposes that, purchasing power parity condition holds for the overall price level of baskets containing internationally traded goods but not for goods that are not traded internationally, and that the prices of non-traded goods are sticky, meaning that, their prices adjust toward or approaches the new equilibrium slowly after a disturbance or distortion. Under these condition, when the exchange rate falls in proportion to the percentage increase in a country's money supply, there remains an excess supply of money in circulation. This will lead to an increase in the traded goods prices in proportion to the supply of money because they move directly with exchange rate. As such, the price level in the economy will increase at a reduced rate than the money supply, making the demand for money lower than the supply of money. The excess supply of money will cause increased spending on goods and bonds(financial assets) (Levi, 1996).

This theory of exchange rate volatility focus on the influx of the increased spending on bonds and other financial assets, arguing that this lead to higher bond prices and lower interest rates. The low interest rate will result in capital flight or out flow of funds from the country until the country's currency appreciates by the extent to which the interest rates are below that of the other countries. However, the exchange rate must overshoot in order for the value of the currency to appreciate. So, if prices are sticky, exchange rate may overshoot their equilibrium, resulting in fluctuations (Levi, 1996).

Varying Elasticities Postulate : When the demand for imports is inelastic in the short run, the depreciation in the value of the domestic currency can increase the value of import because import prices will increase by more than the quantity of import declines. This implies that the quantity of a country's currency supplied can increase with a depreciation in the value of its currency. However, when the demand for the domestic currency does not increase in the same proportion as the supply possibly due to the fact that the demand for export is always very inelastic in the short run, currency depreciation will cause an excess supply of the currency. This excess supply will lead to further depreciation. So, when inelasticities persist there will be depreciation of the currency and excess supply of foreign exchange. Eventually. When elasticities of import demand and export supply increase, speculators may stabilize exchange rate in the market through appropriate prediction. Therefore, it is possible for exchange rate to fluctuate, overshoot or be volatile (Levi, 1996).

Stock Adjustment and Flow Fluctuations: Whenever accumulated investment portfolios of international investors are being readjusted in response to current realities in the investment environments, the demand for foreign currency is always high and this can cause the value of the foreign currency to increase or overshoot. The major reason is that accumulated portfolios are large relative to additions to portfolios, hence, stocks are large relative to flows. The large shift in portfolio might be occasioned by the fact that some form of money do not pay interest. Notably, interest rates increase to make up for expected depreciations in the value of the currency, so that international investors do not switch assets to foreign countries because they anticipate a depreciation in the value of domestic currency. When interest are not paid on money, the compensation is not possible and large portfolio adjustments existent between different countries' monies can occur, leading to large flow demands and exchange rate overshooting, rise or fluctuation (Levi, 1996).

2.2. Theories of Exchange Rate

(a) The Asset Approach

Current exchange rate models underline budgetary resource markets. As opposed to the customary perspective of trade and currency exchange rates conforming to equilibrate global exchange merchandise, the conversion standard is seen as changing in accordance with equilibrate universal exchange money related resources. Since products costs alter gradually in respect to money related resource costs and budgetary resources are exchanged persistently every business day, the move in accentuation from merchandise markets to resource markets has critical

ramifications. Trade rates will change each day or even each moment as provisions of and requests for money related resources of various countries changes. A ramifications of the benefit approach is that trade rates turns out to be a great deal more factor than merchandise costs.

(b) Real Trade Model

Taking after the early partial-equilibrum investigations as carried out by Boulding (1947) and Michaely (1954) of a business opportunity for utilization product subject to value control and apportioning, genuine exchange models of the assurance of the parallel-advertise premium concentration exclusively on the parallel market itself and disregard its collaborations with whatever remains of the economy. In particular, the parallel market for remote trade is demonstrated as mirroring the interest for outside cash to buy illicit imports and the supply of outside money got from unlawful sources. Martin and Panagariya (1984), McDermott (1989), Sheikh (1974), and Pitt (1981) underscore the part of carrying and under-invoicing of fares as the primary wellsprings of supply, though Culbertson (1975) stresses the resale of formally apportioned outside trade. This class of models accentuates the influx of high exchange charges on carrying exercises and illicit money exchanges. As appeared by De Macedo (1987) and Branson and Jorge (1989), a shipper will have a tendency to carry if the duty is high to the point that it pays to buy outside trade at a premium in the Parallel market, even after the likelihood of getting got by the traditions requirement office is high.

In this system arranged carried imports give the stream request to outside cash in the parallel market while influxively pirated sends out give the stream supply. The long-run parallel-advertise premium is then dictated by the harmony conditions for legitimate and unlawful exchange. Over the long haul balance, where legitimate fares rise to lawful imports and influxively snuck sends out pay for arranged carried imports, the premium can be communicated as a weighted normal of the carrying proportion occasioned by the structure of levy obstructions.

Genuine exchange models give a sufficient system to dissecting the influx of exchange limitations (as unmistakable from trade controls) on the parallel-showcase rate. The essential confinement of their approach is that, in light of the fact that the main motivation to bargain in remote cash is to purchase imported merchandise, the sole reason need advertise movement is to empower sneaking to occur. This accept away the portfolio thought process that has been recognized as a basic supporter to the interest for remote money. In addition, despite the fact that this approach gives a valuable investigation of the long-run determinants of the exceptional, it contains no system that acceptably clarifies the short-run conduct of the top notch, which is taken as given by exporters and merchants in many models.

(c) Portfolio Balance Approach

Consideration has as of late centered around the portfolio-adjust approach, created by (De Macedo, 1985;1987) and Dornbusch *et al.* (1983), which focuses on the part of benefit organization in the assurance of the parallel-advertise rate. Portfolio expansion has without a doubt been distinguished as a basic segment of the informal interest for outside coin in many creating nations.

The general perception basic this class of models is that remote trade is a money related resource. Loss of trust in the residential money, fears about expansion and expanding tax collection, and low genuine local loan fees offer ascent to an interest for outside coin, both as a fence and asylum for assets and as a method for gaining and accumulating imports in portfolio models, desires assume a key part in deciding transient moves in free market activity and in representing the instability of parallel-market rates. An expected future change in the residential cash stock will start to apply its belongings quickly after declaration, for example or when specialists get to be distinctly mindful that the strategy change will occur and will create portfolio rearrangements and in addition attendant changes in the parallel-showcase rate, in order to accomplish the wanted organization of private operators' portfolios.

In spite of the fact that the fractional harmony detailing of Dornbusch *et al.* (1983) accept the presence of local and outside enthusiasm bearing resources, the fundamental components of the approach are best caught by models in which household specialists hold in their portfolios just non enthusiasm bearing local and remote cash. These models depend on the coin substitution speculation, whereby cash equalizations named in outside coin are expected to speak to a substitute for household cash as a store of substantial worth, unit of record, and medium of trade. They give substantial knowledge into the short-and long-run conduct of parallel-market trade rates.

In every one of these models, yield is exogenous, and the craved extent amongst household and remote coinage is given by a liquidity inclination work (Calve and Carlos, 1977) that relies on upon the normal and under immaculate prescience, genuine rate of deterioration of the parallel-showcase conversion standard. Private capital exchanges through the official market are generally disregarded, so that the reported current-account adjust is equivalent to the adjustment in national bank saves, which together with an exogenously decided rate of development of residential credit, decide the adjustments in the local cash stock. The unreported current-account adjust decides the adjustment in the supply of remote cash held in private operators' portfolios. The stream supply of remote trade in the parallel market more often than not gets from under-invoicing of fares. The inclination to under-receipt, when endogenous, is expected to depend decidedly on the level of the premium. The likelihood of identification is additionally accepted to ascend as deceitful exchanges increment, and this converts into a rising yet at a reducing rate-minor under-invoicing offer

Portfolio adjust infers that the residential cash estimation of the load of remote resources is equivalent at every moment to a fancied extent of private riches. In the short run, the parallel-showcase rate moves to set the portfolio interest for outside resources equivalent to the current load of remote coin, inferring that stream request and supply may separate at any given minute. The assurance of the parallel conversion scale at any minute is along these lines made utilizing the portfolio-adjust condition, with the load of outside coin thought to be settled. Over the long haul, the parallel rate and private-division possessions of outside cash are resolved mutually by the prerequisites of both portfolio and current-account harmony.

Despite the fact that there stay essential contrasts existent between individual definitions, some broad conclusions can be gotten from this class of models. Under a settled rate administration, an expansionary financial and credit strategy produces a deterioration of the parallel conversion standard, an ascent in costs, a genuine valuation for the official swapping scale, and a decrease in the costs of merchandise for such fare continues are surrendered through the official market in respect to the parallel market. As an outcome, the extent of fare continues repatriated at the official conversion standard falls, and authority saves decrease. In the end, the national bank will come up short on stores and an adjust of-installments emergency will result. Now, the irregularity existent between expansionary macroeconomic approaches and a pegged official conversion scale will get to be distinctly unsustainable, and restorative measures should be executed as an equality change, for instance. The procedure prompting to a cheapening emergency has been all around recorded by Edwards (1989) and Edwards and Montiel (1989).

2.3. The Concept of Parallel Foreign Exchange Market

The presence of a parallel market in outside coinage has essential welfare suggestions. To break down these essential ramifications we will first recognize the welfare influxs of trade and exchange controls and after that assess the minimal welfare influx of parallel market exercises rising up out of the presence of these controls. Dornbusch (1986) reported that trade and exchange limitations in creating nations like Nigeria have regularly been acquainted in an endeavor with shield a generally exaggerated settled conversion standard, to force adjust of-installments conformity in economies confronted with restricted remote stores and an outer obtaining requirement (and, in this manner, constrained capacity to safeguard the proclaimed equality), and to protect business exchanges from the 'troublesome" influxs of passing budgetary stuns.

With a specific end goal to guard support of conversion scale, different methods of reasoning accentuating short-to long haul objectives have been advanced by policymakers. Recently free nations have frequently seen an exaggerated conversion scale as an image of financial autonomy, with little worry about the monetary expenses of such a decision. In different cases, overvaluation has been seen as a modest approach to give shabby imports to household makers and buyers outstandingly imports of capital merchandise, strong products, and moderate data sources not created locally. Cheap access to such imports has been seen as fundamental in advancing financial development in medium and long haul run. In a few nations, an exaggerated swapping scale has been seen as a fleeting hostile to swelling gadget; by keeping down the residential cost of imported products, an exaggerated rate was accepted to point of confinement go through influxs of changes in world market costs on local expansion. Another method of reasoning frequently given to holding fast to an exaggerated conversion scale identifies with the discernment that such a rate is equipped for encouraging the redistribution of salary and monetary movement from the tradable-products division to the non tradable-merchandise area. Such a rationale has regularly been a fundamental component of 'internal situated" exchange systems of populist governments worried about the centralization of riches in the tradable-merchandise segment. At last, trade controls have been forced in nations, where transient capital streams were seen to be sporadic and thought to prompt to unfavorable developments in the genuine conversion scale (with negative results for the present record) or to deliver repetitive theoretical assaults that would debilitate the powers' supply of remote holds and hamper financing of exchange exchanges.

Whatever the reason for the burden of trade controls, nonetheless, there are welfare costs connected with the limitations. Some of these expenses have been very much reported in the writing on global exchange. A basic outcome, underscored by Bhagwati (1978) and Greenwood and Kimbrough (1987), is that trade controls put a quantity on imports, subsequently raising their residential relative costs similarly as duty would. To the degree that trade controls prompt to the development of a parallel coin advertise, notwithstanding, they additionally influence private specialists' financial choices prominently the choice to avoid limitations by buying outside money illicitly in the parallel market. The extra welfare influxs are mind boggling, in light of the fact that they fluctuate as per the class of operators considered, and they have not yet been completely analyzed in the writing.

The increases and misfortunes connected with parallel markets rely on upon various components, specifically the punishment structure. On the off chance that the normal expenses of utilizing these business sectors are low for private transactors, venders and in addition purchasers, welfare is probably going to be higher than if on1y official channels are utilized. For example, laborers abroad dispatching stores and outside visitors offering dollars will get more units of household cash at the parallel rate than at the official rate. Bhagwati and Bent (1973) in their work clarified that if punishments (fines, jail terms, and so on.) are upheld to some degree, the normal expenses might be very high. It is impractical, when all is said in done, to evaluate the correct extent of additions and misfortunes, yet it can be demonstrated that, on account of carrying, misfortunes to runners' can exceed increases to shoppers. This happens when sneaking operations are liable to increasing costs due to punishments, so that illicit imports supplant official imports without bringing down the cost of imports to household buyers. This outcome require not persist to

different types of swindling, in any case, for example, fake invoicing and redirection of settlements. On the off chance that is not exorbitant to control solicitations, welfare grains to exporters will likely exceed potential misfortunes (Gupta, 1987).

From the perspective of the powers, parallel markets have some conspicuous antagonistic influxs. To start with, there is a cost of authorization to neutralize unlawful exercises and rebuff guilty parties. Second, there is lost duty income as an afterinflux of carrying and under-invoicing, lost wage expenses and household circuitous charges, and a diminished stream of outside trade to the national bank, which brings down the administration's ability to import. Third, parallel markets empower lease looking for exercises (defilement of government authorities, for Instance), which prompt to a problematic distribution of rare assets. Fourth, the presence of a parallel market encourages the change from residential money advantages for outside coin resources (remote cash equalizations held locally or enthusiasm bearing resources held abroad) and may diminish the seignior-age income gathering to the administration.

Regardless of these costs, parallel markets are generally endured in creating nations. The common contention used to legitimize them is that administrations understand that, the length of there is request apportioning in the official market for remote trade, there will undoubtedly be an optional market, which can be disposed of just at restrictive cost. Seen along these lines, a parallel market in remote coin is taken to be socially alluring despite the fact that the powers' definitive objective is to evacuate oppressive practices and stress lawfulness in monetary exercises, in light of the fact that the parallel market takes care of the requests of administrators proportioned in the official market.

McDermott (1989) advances another intriguing contention that may disclose why powers have a tendency to oblige as opposed to face parallel markets. He proposes that the presence of a parallel money market may yield two sorts of advantages. To begin with, it builds work by raising the household accessibility of imported sources of info. Second, it might really expand the stream of remote coin to the national bank. This last mentioned, to some degree incomprehensible, influx may emerge when the expanded accessibility of imported data sources permits add up to fares to extend and to grow so much that remote money receipts increment through both lawful and unlawful channels. There is, be that as it may, minimal observational proof to bolster this view. In general, the welfare influxs of trade controls within the sight of parallel markets are to a great extent equivocal at the total level.

2.4. Unification of Foreign Exchange Markets

The unification of remote trade markets, whereby the premium is brought down and the official and parallel rates are steadily conveyed nearer in order to in the end deliver an extraordinary swapping scale, remains a key approach issue for some creating nations. These nations should likewise choose whether the brought together rate ought to glide or be pegged. At the point when a parallel market is a huge wellspring of import financing, the motivation behind unification is to ingest and legitimize it, rendering official the accepted import advancement managed by access to the parallel market and taking out the wasteful aspects and market discontinuity connected with it. Unification endeavors may go for embracing a uniform gliding conversion standard, or a uniform settled or creeping official rate. In the primary case, the official conversion scale clears the outside trade showcase; in the second, changes in the keeping money framework's remote stores serve to compare the free market activity for outside coin.

Consider, to start with, the strategy of embracing a coasting swapping scale. With regards to the hypothetical system depicted above, such an arrangement move influxesly affects the short-and long-run conduct of the conversion scale and the swelling rate. Over the long haul, the influx depends critically on the financial influx of the conversion scale change. On the off chance that the double game plan gives benefits to the compelling voices in, for instance the type of expense incomes from coin operations, the rate of devaluation of the swapping scale and the swelling rate can be relied upon to rise, in light of the fact that the powers are well-suited to adjust for a fall in income by an expansion in fiscal financing; on the other hand, if the framework causes misfortunes, the rate of deterioration and the swelling rate can be required to fall.

In the short run, the conduct of the gliding conversion scale after unification will rely on upon various components, specifically the conduct of assumptions in regards to the change procedure. At the point when the unification endeavor is foreseen, operators trying to keep away from capital misfortunes and to acknowledge capital additions will move instantly into remote money resources if the uniform drifting conversion scale is required to devalue relative existing parallel rate. They will move into household cash resources if the rate is required to acknowledge with respect to the parallel market rate. As an afterinflux of these portfolio conformities, the parallel-advertise rate will move instantly when desires are shaped toward the level resource holders expect the post-unification drifting rate to reach. In the constraining case in which private operators foresee consummately the development of the post-unification swapping scale, the parallel-showcase rate will bounce at first and afterward devalue relentlessly toward that level as the season of real unification approaches (Agenor and Flood, 1992; Kiguel and Uzondo, 1990; Lizondo, 1987).

Consider now the case in which the powers endeavor to bring together the official and parallel markets by embracing a creeping peg, conceivably taking after a one-shot debasement of the official rate. Over the long haul, the rate of creep must be predictable with adjust of-installments harmony, and such a rate must equivalent the rate of deterioration that would win over the long haul under a uniform skimming administration (Lizondo, 1987). In the short run, the conduct of the parallel rate after unification will depend, at the end of the day, on the conduct of

desires. In the event that operators envision the unification endeavor, the portfolio changes depicted above will be started, and the parallel-advertise rate will move toward the normal level of the post-unification official rate. This represents the trouble in utilizing the parallel-showcase rate as a pointer for the underlying level of the official rate under a slithering peg administration. In the event that private operators foresee the unification endeavor, the parallel rate will move promptly, before the change is executed, around the level at which the powers are relied upon to set the official slithering rate. Setting the underlying, present change rate break even with on the parallel rate at the season of unification will in this way be reliable with adjust of-installments harmony just if desires are right

What proof is accessible concerning the conduct of trade rates taking after a unification endeavor? Few creating nations have endeavored to bind together their outside trade advertises by receiving a slithering peg. Moreover, as contended over, a for the last time downgrading can't without anyone else's input prompt to changeless reunification of the trade markets. Subsequently, a sensible approach is to analyze unification endeavors that have appeared as skimming the residential cash.

Late proof focuses to more prominent adaptability in the trade courses of action of some creating economies, with a few nations embracing market-arranged trade frameworks. Roberts (1989) has concentrated the experience of African nations with market-based swapping scale game plans in the mid-1980s, particularly with outside trade closeouts and gliding rates. These changes regularly had as an express objective the ingestion of the parallel market and a diminishment or end of the premium. Table 1 condenses the outcomes.

The rates of ostensible depreciations that took after the presentation of unloading or drifting were enormous in Nigeria, Sierra Leone, Somalia, Uganda, Zaire, and Zambia. The table shows obviously that the disappointments of sell-offs and buoys are connected with lost control over fiscal arrangement (for instance. In Zambia and Ghana), though the triumphs are connected with an adjustment, if not a diminishment, of liquidity development (for instance, in Gambia). Curiously enough, the post-unification conversion scale is normally near the expert change parallel rate, giving occasion to feel qualms about the contention that the "balance" swapping scale is a normal of the official and parallel rates. This ought not amaze when the resale of outside trade happens on a vast scale (as in Nigeria) and when it is recalled that costs are resolved at the edge. A moment misguided judgment, brought up by Pinto (1989), is that the expansive one-shot devaluation of the official conversion scale commonly connected with unification must be inflationary. This has not been the situation in nations where cash development was at first monitored (Nigeria, Zaire), in light of the fact that the more devalued parallel rate is now reflected in local costs. Expansion after unification appears to rely on upon the monetary ramifications of unification and consequent or corresponding changes in macroeconomic arrangements.

Table-1. Changes in exchange rates, money supply and prices in nine African countries (in rates to dollars and percentages).

Country	Start of float or auction	Rate before depreciation		Rate immediately after depreciation	Initial nominal depreciation of official rate (%)	Additional nominal depreciation over 1st year of float (%)	Broad money growth in 1st year (%)	Inflation in rental prices in 1st year (%)
		Official	Parallel					
Cambia	1/86	3.5	7.0	6.8	49.0	10.0	7.0	54.2
Ghana	9/86	90.0	150.0	120.0	25.0	30.0	65.0	45.0
Guinea	1/86	270.0	420.0	340.0	20.0	15.0	75.0	71.0
Nigeria	9/86	1.6	4.0	4.8	66.0	-12.5	15.0	5.0
Sierra Leone	7/86	5.0	15.0	12.0	58.0	78.0	126.0	320.0
Somalia	1/85	26.0	90.0	90.0	71.0	22.0	81.0	38.0
Uganda	8/82	100.0	360.0	300.0	7.0	-2.8	42.0	40.0
Zaire	9/83	5.8	66.0	30.1	80.0	26.0	35.0	50.0
Zambia	9/85	2.2	3.9	5.0	56.0	29.0	70.0	55.0

Source: Roberts, 1989

Fiscal components can for sure record for a considerable ascent in the expansion rate taking after a unification endeavor. Table 1 demonstrates that swelling rose generously in Sierra Leone in the main year taking after the endeavor to bring together markets by' coasting. A clarification for the regularly watched inflationary burst identified with unification has been given by (Pinto, 1989;1991). In creating nations, the legislature is commonly a net purchaser of outside trade from the private part. Since the parallel-showcase premium is a vital verifiable assessment, there is an exchange off existent between the exceptional (duty on fares) and swelling (charge on household cash property) in financing the spending shortfall. Joining official and parallel trade rates can in this manner raise expansion substantially and for all time if the level of government spending stays steady in genuine terms. The misfortune in incomes from fares is supplanted by an expansion in money related financing of the spending deficiency and a higher expense on local money parities.

Two noteworthy lessons can be drawn from the late experience of African nations with swapping scale change. To start with, unification of the official and parallel markets by conversion standard strategy alone can't prevail

without monetary teach. Second, entire disposal of the premium requires the expulsion of all confinements on capital and business exchanges. The joined influx of measures intended to unwind import-authorizing plans and authoritative portions of remote trade is to make import exchanges showcase decided, subject just to the bends owing to levy. In Ghana, for instance, the trade and exchange framework was slowly changed from 1986 to 1989, simultaneously with the procedure of swapping scale change. The import-authorizing plan was initially streamlined, then changed, lastly abrogated in mid 1989, and other current exchanges were continuously made qualified for financing through the outside trade closeout. As an afterinflux of these measures, just a couple of confinements on current exchanges, relating basically to undetectable exchanges, stayed as a result by mid-1989. By complexity, in alternate nations already considered-quite Nigeria and Zaire-the cash was drifted just for business exchanges, with capital controls held for outward streams. The support of limitations on capital streams, combined with the nonattendance of sufficient money related and financial strategies kept a substantial fall of the parallel-showcase premium in these nations.

The examination proposes, subsequently, that the "best" way to deal with unification may be to unwind remote trade proportioning slowly in the official market, beginning with business exchanges and going with the advancement with discrete downgrades the pace of change being set by the speed and believability of financial alteration (Pinto, 1989). Financial arrangement and liquidity controls are critical to the procedure for settling desires, costs, and parallel trade rates. Desires of swelling and further devaluation now and again of expansionary credit approaches, ordinarily brought on by the adaptation of financial shortfalls, may apply a destabilizing influx on the value level. In this sense, unification is an intricate procedure, maybe requiring Institutional changes and also behavioral alterations with respect to market members.

2.5. The Nigerian Foreign Exchange Market

Foreign Exchange market (For Ex for short) is the financial related exchange where cash estimation of one nation is exchanged into different nations. The entire procedure completes by a system of different money related organizations like banks, speculators and government. Our substantial discourse here focuses on the inclusion of government utilizing Nigeria as a contextual analysis. Reasonably, a swapping scale constitutes the cost of one money as far as another. In the Nigeria circumstance for example, it is the units of naira expected to buy one unit of another nation's cash. That is, the estimation of the naira as far as the dollar or pounds sterling on account of the United States (U.S.) or United Kingdom (U.K) separately.

The advancement of ForEx in Nigeria up to its present state was influxed by various variables, for example, the changing example of worldwide exchange, institutional changes in the economy and auxiliary moves underway. National Bank Bulletin (2002) reported that before the foundation of the Central Bank of Nigeria (CBN) in 1958 and the institution of the Exchange Control Act of 1962, outside trade was earned exclusively by the private segment and held in parities abroad by business banks which went about as operators for neighborhood exporters. Amid this period, horticultural fares contributed the heft of outside trade receipts. This additional to the way that the Nigerian pound was fixing at standard to the British pound sterling; with simple convertibility it postponed the improvement of a dynamic ForEx. In any case, with the foundation of the CBN and the consequent centralization of outside trade power on it, the need to build up a neighborhood ForEx got to be distinctly clear and objective. At that point came the jump in unrefined petroleum send out income in the mid 1970s, coming about because of the sharp ascent in raw petroleum costs, subsequently improved authority outside trade receipts. The Nigeria's ForEx accordingly encountered a blast amid this period and the administration of remote trade assets got to be distinctly important to guarantee that deficiencies did not emerge. (CBN, 2002).

Be that as it may, with incidental decrease in raw petroleum values and consequently, its profit, outside trade emergency started to emit driving government to apply firm trade control measures in mid 1982 and amidst an enduring increment in the interest for remote exchange. (CBN, 2002). A similar work demonstrated that the expanding interest for outside trade when the supply was contracting energized the improvement of a parallel market for remote trade that subsequently prospered over the authority ForEx. The trade control framework was not able develop a fitting system for outside trade designation in consonance with the objective of inner adjust. This prompted to the presentation of the Second-level Foreign Exchange Market (S-tForEx) in September, 1986. Under S-tForEx, the assurance of the Naira swapping scale and allotment of remote trade were just in view of market powers. To expand the extension, in 1989 the Foreign Exchange Market Bureau de Change (ForEx MBdeC) was acquainted with manage secretly sourced outside trade. As a consequence of the instability in rates, additionally changes were presented in the ForEx in 1994. These incorporated the formal pegging of the naira conversion scale, the centralization of outside trade in the CBN, the limitation of Bureau de Change to purchase remote trade as operators of the CBN, the reaffirmation of the lawlessness of the parallel market and the stopping of open records and bills for accumulation as method for installments segments. The 1995 the market was changed with the presentation of Autonomous Foreign Exchange Market (AFEM) for the offer of outside trade to end-clients by the CBN through chose approved merchants at market decided conversion standard. Department de Change was yet again concurred the status of approved purchasers and venders of remote trade. The ForEx was further changed in October, 1999 with the presentation of an Inter-bank Foreign Exchange Market (I-BFEM).

2.6. Structure of Nigeria's Foreign Exchange Market

The Nigerian ForEex has seen colossal change appropriate from the 60s. The trade Control act was presented and ordered in 1962 with the reason for concocting control instruments that will suit the economy, however it bombed in its obligations, this brought about the presentation of the Second-level Foreign Exchange Market (S-tForEx) in September, 1986. Department de change was acquainted in 1989 with broaden the operations of the remote trade advertise in order to meet the requests of those sourcing for private outside trade and to give little clients access to the market.

Nigeria High Commission (2006) characterizes authority de change as a casual outlet for purchasing and offering of outside trade .it went further to depict it as a cash shop without bureaucratic bottleneck connected with traditional banks, it keeps away from exercise in futility and different challenges .this can likewise be found in the work of Lawal and Abdulkadir (2010). The brought together authority market was presented in 1987, Autonomous Foreign Exchange Market (AForEx) in 1995, and the Inter - bank Foreign Exchange Market (I-BForEx) in 1999.

In July 2002, the Dutch sale framework was acquainted with supplant the I-BForEx and it helped in lessening the premium existent between the official rates and the parallel rates .In this framework, trade rates were resolved in view of the offers of the remote trade. Like different frameworks this too had its own pitfalls. Aminu-Kano and Marguba (2002) as cited in Wahab and Rihanat (2010) reported that the substantial imperfection of this framework was that of interest of outside trade surpassing supply which has prompted to a nonstop devaluation of the naira. In 2006 Wholesale Dutch closeout framework was presented with the banks as essential players and the CBN as an administrative body, Bureau de Change go about as specialists who purchase and offer outside trade. Trade rates in the Bureau de Change are along these lines, advertise decided.

3. Empirical Review

Degefa (2001) investigated the changes of the parallel premium in relation to the movement of the macroeconomic variables such as price index. The study utilized annual longitudinal data for the period 1966-1996. The data was sourced from the Ethiopian Ministry of Planning and Economic Cooperation and from issues of world tables of the World Bank yearbook. The analytical technique employed was the Ordinary Least Square (OLS) to investigate the influx of the fall in the parallel premium on the movement in macroeconomic variables. The Augmented Dickey-Fuller unit root test was used to test for stationarity of the variables which indicated that most variables are non-stationary at levels, except percentage change of parallel exchange rate and inflation rate. Hendry one-step methodology was also used to test for co-integration. The study revealed that the parallel premium has substantial negative influx on merchandise exports in both long and short terms, which imply that parallel premium influx on the export sector, real money balance exchange rate and foreign aid, which are in turn the main determinants of the parallel premium in Ethiopia. It was therefore recommended that for the functioning of the Ethiopian official foreign exchange market. Constraints need to be eliminated through further liberalization so as to avoid the repercussions of the parallel premium on macroeconomic variables that will initiate further reactions.

Nkurunziza (2002), regressed parallel premium for the period 1970-1998, a longitudinal analysis with data sourced from International financial statistics database. The augmented Dickey-Fuller and Phillips-Perron tests technique was employed. Based on the empirical results, the study discovered that the premium is determined by the expected rate of devaluation, trade policy variable and Gross Domestic Product (GDP) growth and that the persistent influx of the premium is strong which suggests that parallel market has gone beyond being tolerated by the government to becoming a stable institution despite the fact that it is still officially illegal. It was recommended that for a successful destabilization of the parallel foreign exchange market, long term measures that are strong and sustainable enough will be required.

Lemma (2004) regressed data sourced from annual report of the National bank of Ethiopia to factor out the main determinants of the parallel market covering a period of 33 years. The regression results showed that foreign exchange availability, money supply depreciation due to the official exchange rate; export rate and intensification of exchange control are the main determinants of the parallel foreign exchange market. He recommended based on the findings that government has to pursue policies that boost foreign exchange earnings and enhance efficient allocation of scarce resources by diverting the resources from the parallel market to the official market through aggressive means.

Caporale and Cerrato (2005) in testing for the existence of a long-run relationship existent between the parallel and official exchange rates applied the longitudinal techniques and heterogeneous panel methods to monthly data on the parallel and official market rates for 6 emerging market economies; namely Iran, India, Indonesia, Korea, Pakistan and Thailand in the period from1973-1998. The data was sourced from the peak world currency year book. The regression revealed that the black market and official exchange rate are linked in the long run and also confirms the positive substantial influx of the official exchange rate on the parallel market exchange rate. This implies that exchange rate risk cannot be eliminated altogether.

Akpan (2008), focused on the implications of exchange rate movement on economic growth, using the Nigerian foreign exchange market period of 1970-2003 as a case study. The OLS technique was adopted using longitudinal data to regress exchange rate movement with other variables like labour force, gross domestic investment and technology. From the analysis it was revealed that there is a positive relationship existent between exchange rate and economic growth. He recommended that gross domestic investment should be sustained since it leads to substantial economic development.

4. Method of the Study

The study is designed to be in line with the deductive econometric procedure in conjunction with the quasi-experimental research design involving the specification of the relevant model used in measuring the subject of interest, estimation of the parameters, checking for model adequacy, testing the nominated hypotheses and examining the global utility of the estimated model for policy purposes (Gujarati, 2006). The study sampled the official and the parallel foreign exchange market rates and their connectivity with one another in Nigeria from 1980-2012. The target sample of this study are all the official foreign exchange rate and the parallel foreign exchange rate used for trading on the foreign exchange markets from 1980-2012 and their actions as it affect market unification.

4.1. The Data

The study utilizes annual data series for official foreign exchange rate and parallel foreign exchange rate in Nigeria for the periods 1980-2012. The data was collected from the statistical bulletin of the Central Bank of Nigeria. The data were used in their absolute values since the rate of change data did not give any superior result.

4.2. The Variables

For our purpose, the variables are Official Foreign Exchange Rate and Parallel Foreign Exchange Rate. Official exchange rate measures the average strength of the Naira in the official market and is the rate at which the deals are transacted in the official market. Parallel exchange rate measures the average strength of the Naira in the black market.

4.3. The Model

In line with the research objective and following the theoretical underpinning of the study, we can hypothesize in the null form that:

H_{o1}: There is no substantial relationship existent between official foreign exchange rates and parallel foreign exchange rates in Nigeria.

H_{o2}: Changes in the official foreign exchange rates are not important in explaining changes in the parallel foreign exchange rate in Nigeria.

4.3.1. The VAR Model

In attempt to test the hypotheses this study, after examining the behaviour or property of the data using the Augmented Dicky Fuller Unit Root test, the researcher developed a bivariate GARCH model which is rooted in the modified structural VAR mechanism. According to Adrangi *et al.* (2011), the VAR system is stated as follows with little modification:

$$X_{o(t)} = \mu_o + \sum_{i=1}^{n} \mu_i X_{o\ (t-i)} + \sum_{j=1}^{p} \mu_j X_{p\ (t-j)} + z_t \quad \text{.....3.1}$$

$$X_{p(t)} = \lambda_0 + \sum_{i=1}^{n} \lambda_i X_{p\ (t-i)} + \sum_{j=1}^{p} \lambda_i X_o + w_t \quad \text{.....3.2}$$

$$i = 1, 2, \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots n$$

$$j = 1, 2, \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots p$$

where: $X_{o(t)}$ is the official exchange rate at time (t)

$X_{p(t)}$ is the parallel exchange rate time (t)

In order to estimate whether the transmission in official exchange rate could "pass through" to parallel exchange rate, the researcher develop bivariate GARCH model as shown below:

$\delta^2_{a(t)} = c_0 + c_1\delta^2_{a(t-1)} + c_2z^2_{(t-1)} + c_3w^2_{(t\ 1)}$.....3.3

$\delta^2_{b(t)} = d_0 + d_1\delta^2_{b(t-1)} + d_2w^2_{(t-1)} + d_3z^2_{(t-1)}$.....3.4

Where: δ^2_a is the volatility generated from 3.1

δ^2_b is the volatility generated from 3.2

z^2 is the squared standardized residuals from 3.1

w^2 is the squared standardized residuals from 3.2

3.3.2. Tests for Linear Dependency

Generally, in testing for bivariate GARCH there is need to test for autocorrelation and linear dependency in the longitudinal data that are employed (see Adrangi *et al.* (2011)). In response to this underlying fact, the researcher develops the following non-parametric and parametric models.

4.3.2.1. The Q-test of Ljung and Box

This test was introduced by Ljung and Box (1978) as a joint test for autocorrelation and partial autocorrelation at different lag lengths and as such it is called a portmataus test. This test expression can be stated as:

$$Q^*_T = T^2\sum^M_{J=1}(A_i)^2_{T-j}\ \ t\text{-}X^2_M \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.5$$

Where: Q^* is the Ljung and Box Q-statistic

(A_i) is the ith sample autocorrelation

M is the optimum lag length which may be selected by the Akaike information criterion or any other information criteria.

T is the sample number of observation

$$j = 1, 2 \ldots m$$

Note that.

$$\overline{A_i} = 1/T\sum^{T-i}_{t=1}(x_t - x)\,(x_{t+i} - x), \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.6$$

Where: x is the sample mean

X_t is the longitudinal.

4.3.2.2. The BDS test

The BDS test for chaotic structure is credited to Brock *et al.* (1987) and later popularized by Brock *et al.* (1996) as the most compressive test for non-linearity. The BDS statistic according to these authors can be specified as:

$$Z_{m,e} = (T)^{1/2}[C_{m,e} - C^m_{1,e}]\,(st_{m,e})^{-1} \qquad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 3.7$$

Where:

$Z_{m,e}$ is the BDS statistic

$C_{m,e}$ is the embedding dimension

$St_{m,e}$ is the standard deviation of $(T)^{1/2}\,(C_{m,e} - C^m_{1,e})$

Note that the BDS statistic is IID complaint that is $Z_{m,e} \sim N(0,1)$

5. Data Presentation and Empirical Analyses

In this section, we present and analyze our data and discuss our results. Thus, we present and analyze the data based on the outcome of the empirical results. These results provide the basis for conclusions on the findings. Relevant econometric tools (as earlier stated) were used to analyze the data and test the hypotheses postulated.

5.1. Data Presentation

The data presented below shows the annual values of official foreign exchange rate and annual values of parallel foreign exchange rate for the periods of 1980 and 2012.

Table-5.1. Data on annual values of official foreign exchange rate and parallel foreign exchange rate for the periods of 1980- 2012.

Year	Official market rate (omr)	Parallel market rate (pmr)
1980	0.55	0.9
1981	0.62	0.93
1982	0.67	1.14
1983	0.72	1.82
1984	0.77	3.25
1985	0.89	3.79
1986	1.75	4.17
1987	4.02	5.55
1988	4.54	6.05
1989	7.36	10.55
1990	8.04	9.61
1991	9.91	13.4
1992	17.3	20.3
1993	22.07	36.2
1994	22	99.95
1995	21.9	83.7
1996	21.88	83.1
1997	21.88	85
1998	21.89	87.9
1999	92.34	99.3

2000	101.7	111.1
2001	111.23	133
2002	120.58	136.9
2003	129.3	141.4
2004	133.5	150.2
2005	132.15	149.21
2006	128.65	142.15
2007	125.83	140.25
2008	118.57	132.13
2009	148.9	152.65
2010	150.31	155.4
2011	154.18	159.35
2012	155.75	162.66

Source: Central Bank of Nigeria (CBN)'s Statistical Bulletin various issues

5.2. Empirical Results and Analyses

5.2.1. Unit Root Tests

Unit root tests which investigate the integration properties of the variables are necessary before further estimation. The Augmented Dicker-Fuller (ADF) unit root tests was used to investigate the order of integration of the variables. The results of the tests are presented in the table 5.2.

Table-5.2. ADF unit root test results

Variables	ADF-statistic	Test Critical Values	Order of Integration
OMR	-5.289410	1% level = -3.661661 5% level = -2.960411 10% level = -2.619160	1(1)
PMP	-5.595900	1% level = -3.661661 5% level = -2.960411 10% level = -2.619160	1(1)

Authors' Computation

The results of the Augmented Dickey-Fuller (ADF) unit root test (Table 5.2) show that all the variables were stationary at first difference (integrated of order one). As such, we proceeded to test for linear dependency.

5.2.2. Results of the Test for Linear Dependency and Volatility

This test is carried out specifically to investigate the linear dependency and volatility influx of the longitudinal variables – that is the official exchange rate and the parallel exchange rate using batteries of sophisticated techniques. The results are summarized in table 5.3.

Table-5.3. The Results of the tests of Linear Dependency and volatility Influx

Variable	Q(1)	BDS(2)	ARCH(1)
Office exchange rate	31.40(0.00)	0.17(0.00)	1.99(0.00)
Parallel exchange rate	31.60(0.00)	0.19(0.00)	1.53(0.02)

Note: the figures in parenthesis are the probability values
Source: Computed by the Researcher using E-view Window 7

Table 5.3 reports the results of the tests of autocorrelation, linear dependency, randomity and volatility conducted in the series of official exchange rate and parallel exchange rate. the Q-test is employed to test the assumption that there is no serial autocorrelation in the specified series. Since the probability value is less than 1 percent, this assumption or hypothesis can be rejected. Also, the BDS test the assertion that there is no linear dependency exhibited in the underlying series. This is rejected because the probability value for the BDS statistic is less than 1 percent. Thus, the series of official and parallel exchange rates are auto-correlated and linearly dependent. The coefficient of the ARCH is substantially different from zero since the probability value is less than 1 percent. In a nutshell, it means that there is ARCH influx in each of the series. But whether this influx could be transmitted (pass through) from the official market to parallel market is the nub of this study. The researcher builds the bivariates GARCH to take care of this quanding. The estimated results are presented in table 5.4.

5.2.3. Results of the Transmission (Pass-Through) Influx Using Bivariate GARCH Test

Table-5.4. The Results of the Bivariate GARCH Model

coefficient	c_1	c_2	c_3	d_1	d_2
Office exchange rate	0.19 0.54	-0.16	0.93	0.05	0.31
Parallel exchange rate	(20.76)* (0.37)	(-0.13)	(21.19)*	(0.96)	(0.23)

Note: the figures in parenthesis are the t-statistics while * implies substantial @ 1% level of significance.
Source: Computed from E-view Window 7.

The coefficients of GARCH terms (c_1 & d_1) are 0.91 and 0.93 respectively. The corresponding t-values are 20.76 and 21.19. Given that the critical t-value is 1.70 at 5 percent substantial level, the null hypothesis that there is GARCH influx can be refuted. The clustering or transmission of this influx depends on the significance of the coefficient (d_3). As indicated in table 5.4, t-value of d_3 is less than the critical t-statistic. This simply means that volatility does not transmit from official market to parallel market. However, since the coefficient +(d_3) is positive, we can deduce that a rise in the volatility in official market rate will lead to an increase in volatility in the parallel market rate, But this is very weak. Therefore, there is no transmission existent between the two markets negating the exchange rate pass through theory in support of exchange rate disconnect.

6. Concluding Remarks

This study sets out to investigate the issues relating to the magnitude, nature and the transmission mechanism of relationship existent between official foreign exchange market and parallel foreign exchange market and the response of the parallel market indicator to manipulations in the official market proxy in Nigeria. The unit root test was applied to ascertain the behaviour of the data for stationary purpose. As a result, all the variables prove to be stationary at first difference, lending continuity in the modeling process in our study. In addition, the study employed the Q-test, BDS and ARCH test to evaluate the linear dependency and volatility in the series while the Bivariate GARCH was used to test for transmission or pass-through existent between the official and the parallel exchange rate.

The results of the Q-test shows evidence for no linear dependency in the series thereby suggesting the absence of serial correlation, that is, the series are not linearly correlated and that both the official and parallel exchange rates are random in nature and no relationship can be predicted in these series. The BDS test revealed the existence of linear dependency meaning that there is serial correlation existent between the items in the series, and also suggesting that both the official exchange rate and the parallel exchange rate can be predicted, as such, the managers of the economy can control the official exchange rate using appropriate policy tools. The ARCH test results indicate that there is the influx of volatility in the two markets and that the series are volatile or stochastic in nature (they cannot be predicted) but whether the volatility influx is transmitted from the official market to the parallel market was not ascertained.

Using the Bivariate GARCH test to test for transmission existent between the two markets, our finding reveal that, volatility does not transmit from the official foreign exchange market to the parallel foreign exchange market. These negate the exchange rate pass-through theory but support the theory of exchange rate disconnect. The result suggests that changes in the official exchange rates (official market) are not important in explaining or influencing changes in the parallel exchange rate (parallel market) in Nigeria. As such, policy makers may not be able to use the manipulations of the official foreign exchange rate as a tool for controlling the activities of the parallel foreign exchange market in Nigeria.

From the fore going, we hereby conclude that there is a very weak relationship existent between the official foreign exchange market and the parallel foreign exchange market in Nigeria. Also changes in the official foreign exchange rates are not important or adequate in explaining changes in the parallel foreign exchange rates in Nigeria. We noted that the correlation existent between the official foreign exchange rates and the parallel foreign exchange rates in Nigeria does not follow the theory of exchange rate pass-through but is in line with the theory of exchange rate disconnect.

Policy makers or the managers of the Nigerian economy may not successfully use the official exchange rate as a policy tool to control the parallel market exchange rate transactions influxively.

The study recommends that the managers of the Nigeria economy should ensure influxive design and implementation of policies and strategies that will ensure a more favourable official exchange rate regime in Nigeria so as to discourage the massive transactions in the black market as well as enforce policy measure that can help reduce the activities of current parallel foreign exchange market in Nigeria.

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