THE IMPACT OF FOREIGN EXCHANGE DEMAND ON SELECTED NIGERIA'S MACROECONOMIC VARIABLES

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Abstract

This paper analyzed the extent to which foreign exchange demand affects migration, economic growth, and inflation utilizing quarterly data from the Central Bank of Nigeria's Statistical Bulletin. Autoregressive Distributed Lag (ARDL) technique was used to analyze the data. The study showed that migration rate had significant postive relationship with demand for foreign currency (t=0.196342 and p=0.0450<0.05). Negative significant relationship was also observed between economic output product (GDP) and foreign exchange demand (t=-0.274375, p=0.0047<0.05). There was also insignificant positive relationship between the rate of inflation and foreign exchange demand (t=-0.110176, p=0.09126<0.05). The conclusion of testing the autoregressive distributive lag model (ARDL) hypothesis is that migration rate has a positive substantial influence on Nigeria's demand for foreign currency both in the short run and the long run. This result corroborated the Japa syndrome that is currently ravaging the less developed countries, particularly in Nigeria. The study recommended for policies that would mitigate the effect currency depreciation and curb inflation, accelerate economic growth thereby reducing migration rate and ensure that foreign exchange demand channeled towards economic activities.

Keywords: *Foreign Exchange Demand, Migration, Gross Domestic Product, Inflation.*

1. Introduction

The diversified differences of currencies across countries and nations globally amplifies the issues of foreign exchange. Financial transactions are carried out among countries with different currencies, and these transactions can only be successfully carried out through foreign exchange. Foreign exchange, which is the conversion of one currency into another, is frequently needed for tourism purposes, commercial and business activities. The value of currencies and the real return of investors are both significantly influenced by the foreign exchange rate, a key element in international trade. Countries like Germany uses euro, United State of America, dollar; United Kingdom, GBP; Switzerland, CHF; and Japan uses Japanese Yen (JPY) to trade globally, with each country having its own exchange rates. Investors and Operators prefer stable exchange rates, as high volatility in an economy increases risk (Chowdhury & Hossain, 2014). Chowdhury & Hossain (2014) and Bouraoui & Archavin (2015) emphasized that understanding the determinants that drive currency fluctuations is essential for investors to make informed decisions. Amsterdam had the first actual FX market almost 500 years ago.

The exchange allowed for free currency transfers, which supported the preservation of exchange rates. Governments were not allowed to print money that was more than the value of their gold reserves after the implementation of the gold standard in 1875. Gold was the ideal metal because of its scarcity,

malleability, resistance to corrosion, and difficulty in procuring (Akhilesh, 2023). International issues like barter system, gold coin standard, the Bretton Woods Monetary Conference, and the floating technique

have significantly changed the business scenes globally. Macroeconomic statistics, capital markets, and international trade numbers significantly impact forex markets, with the impact on business and organizational transactions being a crucial aspect (Lioudis, 2022). Foreign exchange rate volatility in Nigeria significantly impacts economic activities, trade relations, competitiveness, and overall growth.

Foreign currency trading is become a common way to make money in Nigeria. Business opportunities are being created by people through FOREX, especially among young individuals. According to Barbara (2015), 62% of the 8 million foreign exchange trading accounts were established by individuals under the age of 35.

However, inflation exerts a major impact on a country's foreign exchange rate and currency value. Investopedia (2022) asserts inflation as a strong factor among other variables which influences exchange rates. Favorable exchange rates are not guaranteed by a low inflation rate, but an exceptionally high inflation rate does. negatively impacts a country's exchange rates with other nations (The Investopedia, 2022).

Migration also impacts foreign exchange through remittances, trade balance changes, economic growth, labor market dynamics, inflation, political and social factors, as well as capital flows. Effects vary based on each country’s circumstances, making it essential to monitor economic indicators and policies for predicting foreign exchange market impacts accurately.

Over the years, it’s become very hard to keep track of exchange rates in Nigeria, because the price keeps rising every day and every hour which has been affecting the economy through inflation and many other economic terms. Nigeria's foreign currency rates throughout the past 20 years have been volatile, which has led to economic uncertainty; as a result, potential foreign investors are unavoidably exposed to exchange risks. Therefore, for international firms, investors, and practitioners, knowing the influence of economic factors impacting the Nigerian foreign currency policy is extremely important.

Nigeria is now a hot topic when it comes to foreign exchange because of the significant depreciation and devaluation of the local currency. Late 2015 through 2023 saw the beginning of the Naira's decline, it breached at ₦776.35/US Dollar in the CBN official rate and over ₦866.75/US Dollar in the black markets. These does not only have an impact on consumer spending daily but also on Nigeria's economy. The link between macroeconomic factors and foreign exchange rates has been well explored. For instance, Odior (2019) examined at how macroeconomic variables affect the volatility of foreign exchange rates in Nigeria. Whereas Jim (2021) analyzed the macroeconomic impact of foreign exchange intervention. However, the link between the selected macroeconomic variables (migration, economic growth and inflation) and exchange rate demand has not been well captured by the researchers most especially in Nigeria in addition, few or no studies have researched on the recent happenings of foreign exchange demand from Nigerian perspectives as it relates to selected variables. Because foreign exchange is a daily affair which fluctuates daily. Thus, this study is set to address these research questions: What is the relationship between foreign exchange rates and selected macroeconomic indicators in Nigeria? To what extent has the foreign exchange demand rate affected migration, economic output product, and inflation rate?

Furthermore, the general objective of this research is to examine the impact of the heavy foreign exchange demand rate on macroeconomics variables, while the specific objectives are to examine the relationship

among the foreign exchange demand rate and the selected macroeconomic variables. Also, to determine the impact of foreign exchange demand rate on migration, economic growth and inflation rate in Nigeria.

2. Literature Review

2.1 Conceptual Clarifications

Foreign Exchange Demand

Foreign exchange, sometimes known as FX, is the process of exchanging one currency for another. In a market economy, the value of a currency is determined by supply and demand. The value of foreign money in a free economy where supply and demand determine the value of a country's currency is emphasized by Lioudis (2022). It is possible to describe the foreign exchange rate, which compares one country's currency to another's, directly or indirectly. In the contemporary period, nations choose their foreign currency rates based on established norms and market forces. Before World War I, most currencies were set in gold; following that conflict, most are based on the USD (Bashir et al., 2014; Ernest, 2019).

In any economy, the exchange rate has an influence on domestic price levels, the profitability of traded goods and services, resource allocation, and investment choices. It may also be defined as the ratio of a unit of one currency to another currency at a specific period (Segun and Adebayo, 2018: Babalola, 2021). According to Retimr (2020) foreign exchange is determined by factors like inflation, balance of payment, terms of trade, government debt, interest rate, political stability, recession, speculations/buyer, etc.

Migration

Migration is the act of relocating from one location to another with the purpose of residing there long-term or permanently (Esses, 2018). People migrate for various reasons, including economic opportunities, better living conditions, education, family unification, or to escape conflict, persecution, or environmental disaster (*European Parliament*, 2023). There are two main types of migration: internal and international. Internal migration involves crossing national borders. Government and international organizations have implemented various policies and programs to regulate and manage migration, including visa requirements, border control, and refugee resettlement programs (Morley, 2024). Migration is a complex issue, and it continues to be a significant topic of discussion and debate in politics, economics, and social spheres around the world.

Inflation

Inflation is the rate of increase in prices over a given period of time. Inflation is typically a broad measure, such as the overall increase in prices or the increase in the cost of living in a country. For some goods, like food, or for some services, like a haircut, it may also be calculated more accurately (Reed, 2023). Regardless of the environment, inflation evaluates how much more expensive a certain set of goods and/or services has become over a specified period, most typically a year. (Oner, n.d).

Economic Growth

The market values of all finished goods and services produced inside a nation's boundaries over a specific period are added up to form the GDP (Bondarenko, 2024). It acts as a comprehensive evaluation of the state of a nation's economy and a broad indication of all domestic production. (Fernando, 2023)

Even while GDP estimates are often made on an annual basis, they may also be computed quarterly. For instance, the US government estimates the annualized GDP for the entire year as well as each fiscal quarter. Each set of data in this report is presented in real terms, which implies that it has been corrected for price changes and is thus net of inflation. (Jason, 2023).

2.1 Empirical Studies

Jin et al. (2021) conducted foreign exchange intervention (FXI) is successful in stabilizing nominal exchange rates in the near run, but it has less of an impact on real exchange rates, according to VAR analysis of 26 countries. They discovered that nations with more overall and asset price volatility are more inclined to react to external shocks by intervening more vehemently. China's macroeconomic responses to external shocks frequently mirror those of the intervening nations. However, the straightforward methodology used in this study has limitations and encourages future structural research on FXI's macroeconomic effects.

Fakiyesi (2003) analyzed the Central Bank of Nigeria's struggle in managing its exchange market and foreign assets. Since 1986, various foreign currency policies have been developed to increase supply, decrease demand, and maintain international reserves. The error correction framework was used to identify variables affecting Nigeria's foreign currency demand. The findings showed that the demand for foreign exchange in Nigeria is stable based on historical demand, liquidity, lagged real exchange rate values, autonomous and parallel exchange roles, foreign transaction volume, domestic inflation impact, and real rates for Nigerian treasury bills.

Using annual data from 1981 to 2012, Bakhshi and Ebrahimi (2019) investigated the relationship between the exchange rate and unemployment in Iran. The study used an autoregressive econometric model with distributed lag and focused on the unemployment rate, exchange rate, export, import, and gross domestic product. The findings showed a negative correlation between exchange rates and unemployment while showing a significant and favorable impact of economic growth on unemployment.

Okorontah's (2020) research examines the impact of macroeconomic factors on Nigeria's exchange rate performance. The study uses data from 1985-2018, using OLS, unit root tests, Johansson co-integration tests, and ECM. Results show that unemployment significantly influences the naira's value. Strengthening Nigeria's international competition capacity through domestic production and export diversification can lower unemployment and support the naira's value.

2.2 Theoretical Review

PPP involves an economic theory that compares different countries' currencies through a "basket of goods" approach. That is, PPP is the exchange rate at which one nation's currency would be converted into another to purchase the same and same amounts of a large group of products (The Investopedia team, 2023). The basis for PPP is the "law of one price". In the absence of transportation and other transaction

costs, competitive markets will equalize the price of an identical good in two countries when the prices are expressed in the same currency. For example, a particular TV set that sells for 750 Canadian Dollars [CAD] in Vancouver should cost 500 US Dollars [USD] in Seattle when the exchange rate between Canada and

the US is 1.50 CAD/USD. If the price of the TV in Vancouver was only 700 CAD, consumers in Seattle would prefer buying the TV set in Vancouver.

This is the theory of foreign exchange rate determination known as purchasing power parity. power parity.

3. Research Methods

To demonstrate the connection between foreign exchange demand and macro-economic variables performance, this research adopts the model of Okorontah (2020).

The model in its Functional form is as specified in equation (1):
EXD =Σ (GDP, IFR, INR, MR) …… (1)
Where:
EXD= Foreign Exchange Demand (which measures the rate of purchase of Currency by the public-Cashflow)
EOP= Economic Output Product (proxy of gross domestic product – GDP)
IFR= Inflation Rate (this measures changes in the general price level of goods and services)
MR= Migration Rate (examines the amount of foreign exchange spent on traveling expenses)
Σ= Functional notations
This is specified in econometric form in equation (2)

$$\boldsymbol{Y}t = \beta 0 + \beta 1\boldsymbol{X}1,t + \beta 2X2,t + \beta 3\boldsymbol{X}3,t + \alpha 0Yt\text{-}1 + \varepsilon t \ldots\ldots\ldots (2)$$

$\boldsymbol{Y}t$ is the dependent variable at time *t.*
$\boldsymbol{X}1,t$, $X2,t$, and $\boldsymbol{X}3,t$ are the three independent variables at time *t.*
$\beta 0$ is the intercept term.
$\beta 1$, $\beta 2$, and $\beta 3$ are the coefficients for the three independent variables.
$\alpha 0$ is the coefficient for the dependent variable lagged by one period, Yt-1.
εt represents the error term at time *t.*

4. Data Analysis and Interpretation of Results

In this section the trend of foreign exchange demand. Migration rate, economic growth and inflation in Nigeria between 2004 and 2021were appraised. The other section shows the extent of how the foreign exchange demand affects, migration, economic growth and inflation in Nigeria.

4.1 Foreign Exchange Demand, Migration, Economic Growth and Inflation

Nigeria witnessed notable developments in inflation, migration, economic growth, and foreign exchange demand between 2004 and 2019. Numerous factors, such as net exports, foreign investment flows, inflation, and government spending, had an impact on these patterns. The price at which one national currency might be exchanged for another was determined in large part by the exchange rate, and the government also took different steps to combat inflation and enhance the economic prospects of the nation

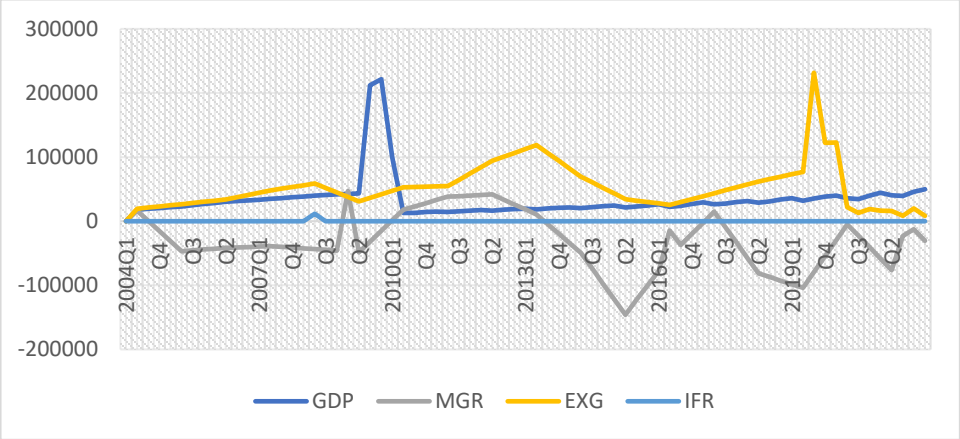

Fig 1. Trends of Foreign Exchange Demand, Migration, Economic Growth and Inflation

Source: Authors Computation

Fig 4.1 shows the trend of foreign exchange demand, migration rate, gross domestic product (GDP) and inflation rate from quarter 1 in 2004 and to quarter 4 in 2019 which shows that the foreign exchange demand has remain unstable throughout the period of study. The inflation rate showed noticeable shocks between 2008 and remains relatively stable till 2021. Meanwhile the economic growth displayed a trend of increase over the period of study particularly from quarter four of 2007 up till 2010.

4.2 Effect of Migration, Economic Growth and Inflation on Foreign Exchange Demand

4.2.1 Unit Root Test

The properties of the series were examined using Augmented Dickey Fuller unit root test. This is shown in table 4.1.

Table 4.1.1 Augmented Dickey Fuller Unit Root Test

Variables	ADF statistics	1% level	5% level	10% level	Prob	Order of Integration
EXD	-3.279760	-3.525618	-2.902953	-2.588902	0.0195	I(0)
MR	-2.589227	-3.527045	-2.903566	-2.588902	0.0000	I(1)
GDP	-3.373359	-3.528515	-2.904198	-2.589562	0.0153	I(1)
IFR	-8.427880	-3.252879	-2.902953	-2.588902	0.0000	I(0)

Source: Authors Computation

The result shows that variables like foreign exchange demand, and inflation rate were stationary at their level I(0) while, other variables including migration rate, economic product output (GDP), and were stationary at its first difference I(1). Since ADF-statistics are greater than the critical value at 1% 5% and

10% level of significant in absolute term, we therefore conclude that the level of foreign exchange demand, and inflation rate at their level have different order of integration which are I(1) and I(0), employs ARDL technique to estimate the model. To do this we have to select the lag order which is shown in table 4.2.

Table 4.2 Optimal Lag Length

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-3112.293	NA	5.47e+33	89.03695	89.16543	89.08798
1	-3019.002	173.2555	6.02e+32	86.82862	87.47105	87.08380
2	-3002.059	29.52878	5.89e+32*	86.80168*	87.95805	87.26101

Source: Authors Computation

Table 4.2 revealed that the selected lag order is indicated by an asterisk sign which is distributed mostly on lag2. The rule of thumb is to select criterion with the lowest value which is LR at 29.52878* this is because the lower the value, the better the model. The study therefore concluded that the lag length for the model is 2 and the best criteria to adopt for the model is LR.

Table 4.3: Estimation ARDL Model for Short Run Error Correction Model

Variable	Coefficient	Std. Error	t-Statistics	Prob.
C	18189.65	7715.905	2.357423	0.0216
EXD(-)*	-0.310498	0.097456	-3.186016	0.0023
MR**	0.013189	0.067176	0.196342	0.0450
GDP**	-0.024170	0.088091	-0.274375	0.0047
IFR**	0.234025	2.124104	0.110176	0.9126
D(EXD(-1))	-0.049693	0.130129	-0.381875	0.7039
D(EXD(-2))	0.299648	0.122198	2.452146	0.0170

Source: Authors Computation

Table 4.3 shows the result of ARDL model for the short run relationship between foreign exchange demand and migration rate, economic output product (GDP), and inflation rate, for the period of 2004 to 2021. The result shows that at lag 1, migration rate has an significant postive short run relationship between migration rate and foreign exchange demand using 5 percent significant (t=0.196342 and p=0.0450). The model shows (t=-0.274375 and p=0.0047) which shows negative significant short run relationship between economic output product(GDP) and foreign exchange demand using 5 percent significant. Inflation rate shows a insignificant positive short run relationship between inflation rate and foreign exchange demand (t=-0.110176 and p=0.09126) using 0.05 significant level.

4.4 ARDL Co-integration Test (Pesearan F-Bounds Test)

Since the unit root test shows that all the variables are stationary at levels and first difference3 and none of the variable is stationary at second difference, one of the conditions for ARDL is satisfied, we proceed by testing for long run relationship among the variables. Table 4.4 displayed the ARDL co-integration test result. The table displays bound F-statistics of 2.0505093 for testing the joint hypothesis that there is no long-term association between the variables under consideration, which were observed to be less than the 5% bound of the critical value (4.66) of the Pesaran table

Table 4.4: ARDL Bound Test

Test Statistics	Value	Signif.	I(0)	I(1)
		Asymptotic: n=1000		
F-statistic	2.050509	10%	2.37	3.2
K	3	5%	2.79	3.67
		2.5%	3.15	4.08
		1%	3.65	4.66

Source: Authors Computation

Therefore, for the period under study, the ARDL bound test in Table 4.4 shows the F-statistics shows 2.050509 and it appears to be non-stationary from 1%, 2.5%, 5% 10% with the value 3.65, 3.15, 2.79, and 2.37 respectively. While I(1), appears to be non-stationary as well with the value; 4.66, 4.08, 3.67, 3.2 respectively. Showing the evidence of a long-term relationship between the variables of foreign exchange demand (EXD), migration rate (MR), economic output product (GDP), and inflation rate (IFR). Since there was evidence of long run relationships among the variables, we presented the ARDL long run model as shown in Table 4.5 below.

Table 4.5 Estimation of Result of Standard ARDL Model for Long Run

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MR	0.042479	0.215271	0.197326	0.0442
GDP	-0.077843	0.280886	-0.277134	0.0226
IFR	0.753710	6.845499	0.110103	0.9127
C	58582.28	15222.34	3.848439	0.0003

Source: Authors Computation

Table 4.5 ARDL Bound test results for long-term relationships are shown. LR was chosen as the best criteria since it has the least value, and 2 was thought of as the maximum ideal lag length for the different variables in the model. According to the table, migration rate and foreign exchange demand have a long-term positive relationship (r=0.197326, p=0.0442). The fact that there is a demand for foreign exchange whenever people migrate to foreign nations may account for the positive association between foreign exchange demand and migration rate. Foreign currency demand and economic output product (GDP) have a long-term, substantial negative association (r=-0.277134, p=0.0226). The table also showed a long-term positive but minor association between the demand for foreign exchange.

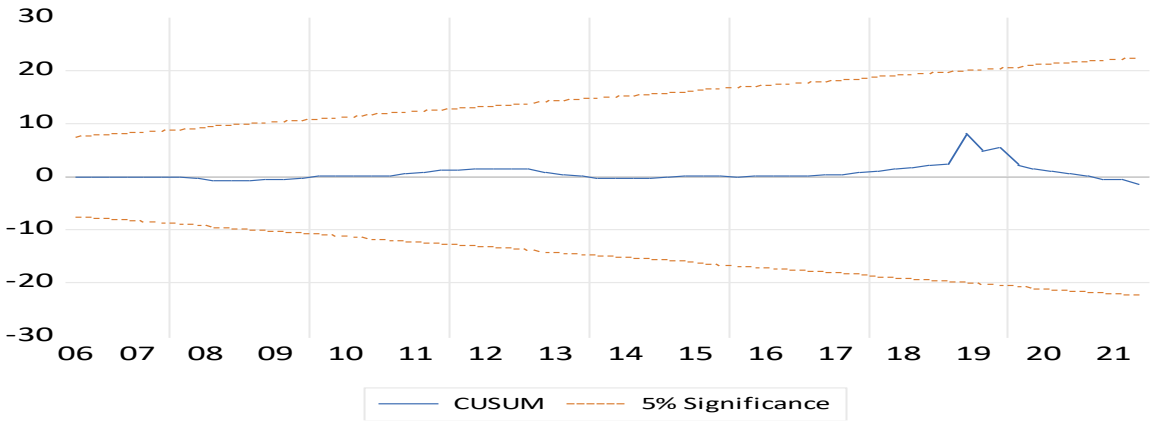

Figure 4.2.1 Plot of CUSUM Test of Recursive Residual

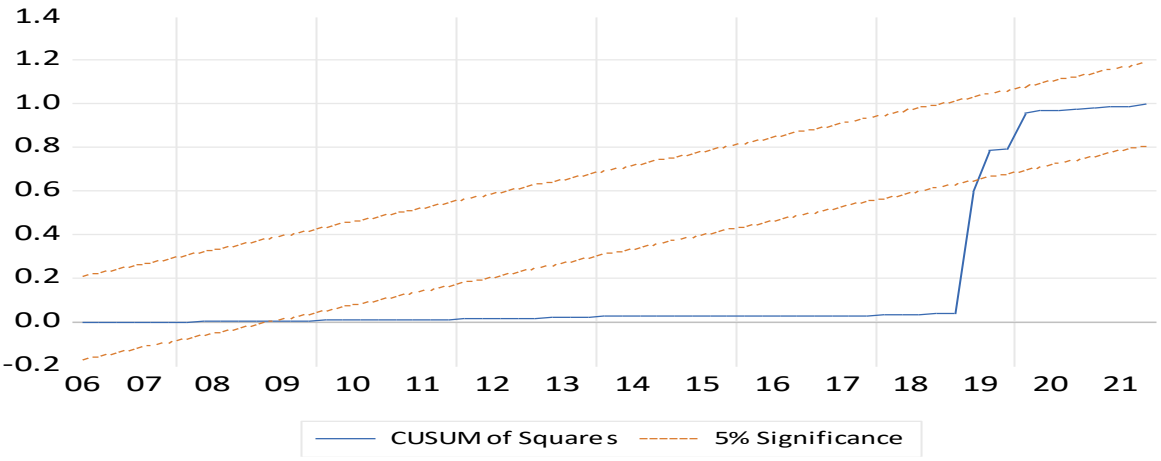

Fig 4.2.2 Plot of CUSUM Test(squares) of Recursive Residual

The CUSUM test shows that the plot of residual remains within 5 percent critical bounds, therefore the model is stable.

5. Conclusions

The analysis of the effects of foreign exchange demand on the macroeconomic variables in Nigeria, including migration rate, economic output product (GDP), and inflation rate demonstrates the extent of the relationships among the variables. The conclusion of testing the autoregressive distributive lag model (ARDL) hypothesis is that migration rate has a positive substantial influence on Nigeria's demand for foreign currency both in the short run and the long run. This result corroborated the Japa syndrome that is currently ravaging the less developed countries, particularly in Nigeria. We also found a positive relationship between inflation and foreign exchange demand. Perhaps, the devaluation of currency that is ravaging Nigerian economy might have accounted for this fact.

The results also revealed that in the short run and in the long run gross domestic product (GDP) demonstrated a significant negative performance in foreign exchange demand, and a positive insignificant performance on foreign exchange demand. The study recommended policies on proper economic planning to boost economic growth to attract investors and enhance economic development. This may reduce the level of inflation rate, migration and the demand for foreign exchange.

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