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THE IMPACT OF CREDIT RISK AND INTEREST RATE VARIABILITY OF NIGERIA'S COMMERCIAL BANKS ON ECONOMIC GROWTH

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Abstract

This study examined the impact of credit risk and interest rate variability of Nigeria's commercial banks on economic growth of Nigeria, using data spanning (1999-2016). Secondary sources of data were collected from Central Bank of Nigeria. Loan Loss Provision (LLP) was used as proxy for Credit Risk, while Interest Rate (INTR) was used as proxy for Interest Rate Variability and Gross Domestic Product (GDP) represents Economic Growth. The augmented Dicky-Fuller Unit Root test results indicate that the data series achieved stationarity after second difference. The Johansen cointegration test results affirmed evidence of a long run equilibrium relationship among variables. The Ordinary Least Square (OLS) of multiple regression was analyzed based on economic, statistical and econometric criteria. The study reveals that, loan loss provision has a positive and significant effect on gross domestic product in Nigeria, while interest rate variability has a negative but significant effect on gross domestic product. The study recommends that Nigerian government should endeavour to bring down and stabilize the interest rate in Nigeria so as to curb its deteriorating effects on economic growth in Nigeria. This can be achieved through sound monetary and fiscal policies. The Central Bank of Nigeria (CBN) should mandate the commercial banks to further increase their loan loss provisions as evidence suggest that increasing it has the tendency of increasing Nigeria's economic growth.

Keywords: Credit Risk, Interest Rate Variability, Economic Growth, Commercial Banks

1. Introduction

Among the major interest earning asset of Nigeria's commercial banks is the banks loans and advances. The loan portfolio is the aggregated loans and advances availed to various commercial banks' customers within a given period.

Ezirim and Emmanuel (1998) posit that loan portfolio of banks is fraught with diverse kinds of risk, which among them and principally is the credit risk. The loan portfolios of banks are called risk assets owing to inherent risks associated with it. Risk assets greatly influence the success or failure of commercial banks. This is because the failure/success of a bank is influenced to a large

extent by the quality of credit decisions and thus the quality of the risk assets. Nzeotta (2004).

Therefore, credit risk has been viewed as relative changes in portfolio value due to failure of counter parties to meet their obligations or due to changes in the market perception of their ability to continue to do so, Wallace (2008).

Interest rate variability is the danger that changes in interest rates will create losses for the commercial banks. This, according to Nwankwo (1991) could negatively impact on loan portfolios of commercial banks when a rise in interest rate is uncontrollably. Both rising and falling interest rates can cause this damage to any bank that is unprepared, though, rising interest rates can cause more problems than falling interest rates. This derives from the fact that prices and yields in loans vary inversely with interest rate changes.

Commercial banks in Nigeria have continued to play important roles in the financial system by mobilizing financial resources and making same available for growth and developmental projects. They accounted for about 93.2% of total institutionalized savings as at last December 2016, Central Bank of Nigeria Economic Report (2016). They also provide and play a key role in the money transmission process, provide financial advice and services to individuals, corporate bodies, public sectors and participate in government schemes as well, such as the National Economic Reconstruction Fund, World Bank Small and Medium-Scale Enterprises (SMEs) loan scheme. Agriculture Credit Guarantee Scheme and host of other schemes.

Economic growth is an essential ingredient for sustainable development. Economic growth brings about a better standard of living of the people, and it emanates from the improvement in infrastructure, health, housing, education and agricultural productivity. Therefore, the multiplier effect of credit risk and interest rates variability cannot be over emphasized, as it negatively affect all factors of growth indices in the economy.

1.2 Statement of the Problem

The periodic reports in the financial statement of commercial banks in Nigeria indicating huge provision for bad and doubtful debts, has been a source of worry and also a wrong signals to the stakeholders, especially, local and potential foreign investors alike in Nigeria's commercial banks.

The current increase in doubtful loans of commercial banks could, if not well managed, will erode confidence, trigger bank run and affect economic growth of Nigeria.

Interest rate variability has over the years poses as a threat to commercial banks ability to manage their loan portfolio; it distorts income and thwarts efforts of commercial banks to stay afloat.

As a factor, commercial banks are keen in monitoring the fluctuation in interest rate. The risk and challenges in realizing the real objectives in commercial banks' loan portfolio, has culminated to, and as evidence for numerous bank failure in Nigeria, a decline in attaining micro and macroeconomic goals.

This scenario in Nigerian's commercial banks and the industry in general has led to short term planning as opposed to long term one, which tends to hamper the commercial banks' forecast and projections into the future activities and earnings.

The banking industry in Nigeria has been strained by the deteriorating quality of its risk assets as a result of the significant dip in equity market indices, global oil prices and sudden depreciation of the Naira against global currencies.

According to BGL Banking Report (2010), the poor quality of the commercial banks' loan assets hindered banks to extend more credit to the domestic economy, thereby adversely affecting economic performance and growth. This prompted the Asserts Management Corporation of Nigeria (AMCON) in July, 2010 to provide a palliative measure to the recurring problems of non-performing loans that bedeviled Nigeria banks

1.3 Objectives of the Study

This study mainly seeks to examine the impact of credit risk and interest rate variability of Nigeria's commercial banks on economic growth of Nigeria from 1999 – 2016.

The specific objectives are:

(1) To examine the impact of credit risk on economic growth of Nigeria.

(2) To examine the impact of interest rate variability on economic growth of Nigeria.

(3) To ascertain a long run relationship between credit risk, interest rate variability and economic growth of Nigeria.

2.0 Review of Related Literature

Credit risk has always been a primary concern for Nigeria's commercial banks. The world economic meltdown of 2007 exposed the weakness of existing risk management systems among Nigeria's commercial banks which led to some mergers and other takeovers in the country's financial services industry.

Though the banking industry especially commercial banks in Nigeria has, irrespective of all the challenges, achieved greater prominence in the economic landscape of the country, as it has been playing a predominant roles in granting credit facilities and other financial intermediation processes to enhancing growth and investments. The biggest credit risk facing commercial banks in Nigeria is the risk of counter-party defaults.

This according to Nigerian Deposit Insurance Corporation (NDIC) has posed as one of the major challenges confronting commercial banks in Nigeria.

According to NDIC (2015) reports, non performing loans (NPLs) of commercial banks and other Deposit Money Banks (DMBs) in Nigeria increased to ₦648.89 billions, even as two lenders' Capital Adequacy Ratio (CAR) fell below the prescribed threshold of 10 percent as at 2014.

Highlight of the report obtained showed that commercial and other banks had loans increased by 82.87 percent in 2015 compared to the previous year's figure, which the corporation, in its 2014 annual report had put at ₦354.84 billion.

According to the report, the banking industry's total assets grew marginally by 1.36 percent, total loans and advances rose by 5.56 per cent, shareholders' funds unimpaired by losses, increased by 14.02 per cent while capital adequacy ratio stood at 17.66 per cent. Unaudited profits decreased by 2.02 percent, while non-performing loans increased by 82.87 percent in 2015.

Also, it was observed that non-performing loans to total loans ratio for the industry increased from 2.81 percent in 2014 to 4.87 percent in 2015. The report however disclosed that the banking industry's capital base remained strong pointing out that the Capital Adequacy Ratio (CAR) was 17.66 per cent in 2015 compared with 15.92 per cent in 2014, but exceeding the minimum threshold of 10 per cent and 15 per cent for national and International banks respectively.

Similarly, loan recovery in the industry increased tremendously during the year under review. For 2015, NDIC put the amount of cumulative loan recovery at ₦27.41 billion as at 31st December 2015, compared with ₦26.75 billion as at 31st December 2014.

In the same vein, cumulative risk assets recovered from closed Micro Finance Banks amounts to ₦125.61 million as at 31st December 2014, while the debt recoveries from debtors of Primary Mortgage Banks in liquidation amount to ₦24.73 million as at 31st December, 2015.

Credit creation is the main income generating activity for banks, but this activity involves huge risks to both lenders and borrowers.

Credit risk and interest rate variability are the two most important risks faced by commercial banks. As Jarrow and Turnbull (2000) posit that, market and credit risk are intrinsically related to each other and not separable.

Sabato (2010) opined that, commercial bank's credit risk is the possibility that an adverse outcome which results in a loss of earning or leads to some constraints on a banks' capacity to achieve set goals.

Soludo (2006) in his assertion classified bank risks into financial risks, which include the following risks, credit, liquidity, interest rate, foreign exchange, market prices and solvency risks, while operations risks are mainly risks exposed to banks in the area of managing personnel and the quality of personnel as well as processes involved in the day-to-day operations of the banks. In addition to measuring and controlling credit risk, firms also try mitigating their credit risk, some of the popular ways of achieving that, according to Capgemini (2011), are

- **Risk-Based Pricing:** This is a tool which firms use to calculate the interest rates on loans given, based on the probability of default or the risk on the loan.
- **Covenants:** Firms incorporate very strict covenants in their deal contracts. Such covenants generally require capital level, or prohibit him from carrying out certain actions.
- **Credit Insurance:** Credit insurance covers any losses that may result from unpaid receivables. It also covers bankruptcy as well as late payments.
- **Credit Derivatives:** These derivative instruments provide protection against the credit risk of the underlying assets of the derivative.
- **Collaterals:** The counterparty bearing the credit risk in a deal asks the opposite counterparty for collateral, which the party at risk holds till the deal, is complete.

Other credit risk management strategies according to lindergreen (1987) are but not limited to the following:

(i) **Compliance to Basel Accord**: The Basel Accord are international principles and regulations guiding the operations of banks to ensure soundness and stability. The

Accord was introduced in 1988 in Switzerland. Compliance with the Accord means being able to identify, generate, track and report on risk-related data in an integrated manner, with full auditability and transparency and creates opportunity to improve the risk management processes of banks to adopt sound internal credit risk management practices to access their capital adequacy requirements.

(ii) **Credit Bureau:** This is an institution which compiles information and sells this information to banks as regards the lending profile of a borrower. The bureau awards credit score called statistical odd to the borrower which makes it easy for banks to make instantaneous lending decision. An example of Credit Bureau is the Credit Risk Management System (CRMS) of the Central Bank of Nigeria (CBN).

(iii) **Adoption of a Sound Internal Lending Policy:** The lending policy guides banks in disbursing loans to customers. Strict adherence to the lending policy is by far the cheapest and easiest method of credit risk management. Kithinji (2010) highlighted some of the factors considered in designing a lending policy and which should be in line with the overall bank strategy, they include the existing credit policy, industry norms, general economic condition of the country and the prevailing economic climate.

Interest rate seems to be a strong determinant of credit risk because; it influences the debt burden of borrowers. Arewa, Nwachukwu and Owoputi (2013). This means that the trade-off between interest rate variability and credit risk is expected to be positive. In fact, a rise in debt burden caused by an upward increase in interest rates could lead to a higher rate of classified loans. Nkusu (2011) and Aver (2008).

Interest rate is an important variable to watch out for. This is because; interest rate movements affect commercial banks' earning and commercial banks explicitly acknowledge the impact of interest rate on their assets and liability management operations.

Berger, and Bouwman, (2009) suggest that the interest rates charged by a Credit Institution serve a double function of sorting potential borrowers (leading to adverse selection) and also, affecting the action of borrowers (leading to the incentive effect). Interest rate, in no doubt exact significant influence on credit position of commercial banks Eids (2011).

Formal empirical evidence on the relationship between interest rates and credit risk is recent and still scarce. Loannidou, ongena and Peydro (2009), Jimenoz, Onzena, Reydro and Sauvina (2013) and Maddaloni and Peydro (2011) provide evidence that reductions in interest rates are followed by deterioration of bank lending standards, an increase in lending volumes and with some additional lag, abnormally high default rates among the granted loans.

On the other hand, Havon (2004) asserts that interest rate levels and volatility are used to assess the impact of financial liberalization on economic growth. According to the economic theory, the base is the interest rate set by banks to determine the interest rate.

In a nutshell, Huizinga (1999) opined that the interest rate fluctuates reflecting the substitution between debt and equity financing. As the equity market expands offering competitive returns, commercial banks increase the deposit rate to compete for funds from the public and also increase the volume of loans and advances.

Kolapo, Ayeni, Oke, (20120 investigated the quantitative effect of credit risk on the performance

Of commercial banks in Nigeria over the period of 11 years. Five commercial banking firms were selected on a cross sections basis. The traditional profit theory was employed to formulate profit, measured by reform on Asset (ROA), as a ratio of non-performing loans to loan and advances (NDL/LA), ratio of Total Loan & Advances to Total Deposit (LA/TD) and the ratio of loan loss provisions to classified loans (LCP/CL) as a measure of credit risk. Their results showed that the effect of credit risk on bank performance measured by the Return on Assets of banks is cross-sectional invariant. That is effect is similar across banks in Nigeria.

3.0 Methodology

3.1 Research Design

The research design for this study is ex-post facto method. This is because; the data used for the study already exist and are not subject to variation prior to analysis. This method is quite suitable for the study because data on the variables are available in the Central bank of Nigeria, (CBN), Nigerian Deposit Insurance Corporation and Debt Management Office.

3.2 Nature and Sources of Data

The information for the research work was based on the historical data. The study employed data that are secondary in nature. The annual time series data was obtained from Central Bank of Nigeria Statistical Bulletin and Debt Management Office from 1999-2016. The estimation techniques include; Ordinary Least Sequence method of multiple regression, Augmented Dickey-fuller (ADF) Unit Root Test, and Johansen cointegration test.

3.3 Description Of Research Variables

The variables applied in the course of this work are grouped into;

3.3.1 Dependent Variable

Economic growth constitutes the dependent variable used for this study. The proxy for economic growth here is Gross Domestic product (GDP). The choice of this proxy is that it captures the totals in value of goods and service produced in Nigeria in monetary terms during a particular year and within the country's borders.

3.3.2 Independent Variables

Interest rate variability and credit risk constitute the variables used for this study.

The proxy for credit risk here is loan loss provisions. Loan loss provisions are relied upon to realize loan losses for a substantial number of years. This assertion is in consonance with the stipulation of Lehman and Manz (2006).

3.3 Model Specification

The aim of the study is to examine the impact of credit risk and interest rate variability of Nigerians commercial banks on economic growth of Nigerian using multiple regression model spanning from 1999-2016, considering the functional notations of this study or the model to

capture the impact of credit risk and interest rate variability on growth of Nigerian economy were specified and modeled as follows:

GDP = ∫ (LLP, INTR) …… (1)

GDP = $ß_0 + ß_1$LLP + $ß_2$ INTR + µ…….(2)

Where

GDP = Gross Domestic Product. (Proxy for Economic Growth)

LLp = Loan Loss Provision (Proxy for Credit Risk)

INTR = Interest Rate (Proxy for Interest Rate Variability)

N = Error Term

$ß_0$ = Constant Term

$ß_1$ and $ß_2$ = Coefficient parameter of the explanatory variables

Transforms eqn (2) into its logarithms form to bring the variables to a common base, the model is specified as:

GDP = $ß_0 + ß_1$ LOGLLP + $ß_2$ INTR µ ……. (3)

By a priori, $ß_0 > 0$, $ß_1 > 0$ and $ß_2 < 0$.

4.0 Data Presentation and Analysis

4.1 Data Analysis

Table 1a: ADF unit root test result at level

Variables	ADF test statistic	Test critical value at 5%	Remark
LOGGDP	-1.629130 (0.4427)	-3.098896	Not stationary
LOGLLP	-2.493764 (0.1373)	-3.098896	Not Stationary
LOGINTR	-1.697347 (0.4111)	-3.098896	Not stationary

Source: Author's computation using E-views 8.0 software

Note: The optimal lag for ADF test is selected based on the Akaike Info Criteria (AIC), p-values are in parentheses where (*) denote significance at 5 %.

Time series data by nature are non-stationary and any attempt to use them in that unstable form leads to spurious result. To test for stationarity or otherwise of the variables, the study adopted the Augmented Dickey-Fuller (ADF) unit root test. From table 1a, the ADF result shows that when the unit root test was done at level, none of the variables was stationary. This is because at

level, the ADF value (in absolute terms) of gross domestic product (GDP), loan loss provision (LLP) and interest rate (INTR) which were 1.629130, 2.493764 and 1.697347 respectively were less than the critical value (3.098896) at five percent level of significance. Hence, there was a need to further difference the series in order to obtain overall stationarity for all the variables.

Table 1b: ADF unit test result at 1st difference

Variables	ADF test statistic	Test critical value at 5%	Remark
LOGGDP	-2.472041 (0.1434)	-3.119910	Not Stationary
LOGLLP	-4.670694 (0.0036)*	-3.119910	Stationary
LOGINTR	-3.498892 (0.0262)*	-3.119910	Stationary

Source: Author's computation using E-views 8.0 software

Note: The optimal lag for ADF test is selected based on the Akaike Info Criteria (AIC), p-values are in parentheses where (*) denote significance at 5 %.

At first difference, only gross domestic product (GDP) was not stationary at five percent level of significance as shown in table 1b. This is because the ADF value of GDP (in absolute term) 2.472041 was less than the critical value 3.119910. However, both loan loss provision (LLP) and interest rate (INTR) were stationary as their ADF values 4.670694 and 3.498892 were greater than the critical value 3.119910 at five percent level of significance. Hence, there was still need to difference the variables one more time to see whether an overall stationarity shall be obtained.

Table 1c: ADF unit test result at 2nd difference

Variables	ADF test statistic	Test critical value at 5%	Remark
LOGGDP	-4.318479 (0.0073)*	-3.144920	Stationary
LOGLLP	-8.671381 (0.0000)*	-3.144920	Stationary
LOGINTR	-4.608593 (0.0054)*	-3.175352	Stationary

Source: Author's computation using E-views 8.0 software

Note: The optimal lag for ADF test is selected based on the Akaike Info Criteria (AIC), p-values are in parentheses where (*) denote significance at 5 %.

At second difference, all the variables became stationary as their ADF values (in absolute terms) 4.318479, 8.671381 and 4.608593 for gross domestic product (GDP), loan loss provisions (LLP) and interest rate (INTR) were greater than the critical values 3.144920, 3.144920 and 3.175352 respectively. Since, all the variables are now stationary and integrated of the same order (i.e. order 2), cointegration analysis is justified.

Table 2: Johansen Cointegration test result

Hypothesized No. of CE(s)	Trace Statistic	5 percent Critical value	Max-Eigen Statistic	5 percent Critical value
None*	33.91245	29.79707	23.94645	21.13162
At Most 1	9.966005	15.49471	5.833910	14.26460
At Most 2*	4.132095	3.841466	4.132095	3.841466
* denotes significant Trace statistic *denotes significant Max-Eigen statistic Note: Trace statistic indicates 2 cointegrating equations at 0.05 level Max-Eigen statistic indicates 2 cointegrating equation at 0.05 level				

Source: Author's computation using E-views 8.0 software

Based on the cointegration test result in table 2 above, the Trace statistic indicates that there exist two cointegration equations at five percent level of significance. According to the result, Trace statistic of 33.91245 and 4.132095are greater than the critical values of 29.79707 and 3.841466 respectively. More so, the Max-Eigen statistic of 23.94645 and 4.13209 exceed the critical values of 21.13162 and 3.841466 respectively. Thus, we affirm that the variables of the model are related in the long run and with the evidence of a long run equilibrium relationship amongst the variables, the variables are suitable for the regression analysis.

Table 3: Ordinary Least Squares (OLS) result for the model
Dependent Variable: LOGGDP
Method: Least Squares
Date: 04/26/17 Time: 02:55
Sample: 1999 2013
Included observations: 15

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.535735	0.297245	15.25924	0.0000
LOGLLP	0.147647	0.041769	3.534814	0.0041
LOGINTR	-0.570558	0.163221	-3.495624	0.0044

R-squared	0.752333	Mean dependent var	4.592009
Adjusted R-squared	0.711055	S.D. dependent var	0.149824
S.E. of regression	0.080536	Akaike info criterion	-2.023379
Sum squared resid	0.077832	Schwarz criterion	-1.881769
Log likelihood	18.17534	Hannan-Quinn criter.	-2.024888
F-statistic	18.22609	Durbin-Watson stat	1.887422
Prob(F-statistic)	0.000231		

Critical values:

(a) t-statistic, $t_{0.05} = 1.761$

(b) F-statistic, $F_{0.05}(2, 12) = 3.89$

Source: Author's computation using E-views 8.0 software

The Ordinary Least Squares (OLS) result above was analyzed based on economic, statistical and econometric criteria. First, the result reveals that loan loss provision (proxy for credit risk) has a positive and significant relationship with gross domestic product (proxy for economic growth) in Nigeria. This result conforms to economic a priori expectation because the higher the amount of money the banks keep aside to cover uncollected loans, the more liquid the banks are and ultimately the more capable they are in meeting their customers' demand. From the result, one percent increase in loan loss provisions leads to 0.15 percent increase in gross domestic product in Nigeria. The computed t-statistic (2.16) exceeds the tabulated (critical) t-statistic (1.76) at five percent level of significance. As a confirmation, the probability value of loan loss provision (0.0041) is less than the significant test level (i.e. $P < 0.05$). Hence, we conclude that credit risk (proxied by loan loss provision) has a significant impact on economic growth in Nigeria. This finding contradicts Kolapo, Ayeni and Oke (2012) which argued in favour of a negative and significant relationship between loan loss provision and banks' performance (and I dare add economic growth) in Nigeria. Perhaps, this finding may be attributed to the fact that since the banks cannot be barred from giving out loans; enough buffers ought to be created through increasing the loan loss provision in order to mitigate the ugly implication of non-performing loans. This is against the backdrop that the loan loss provision ensures that the banks remain liquid even in the face of mounting unrecovered loans. Being liquid makes the banks capable of meeting up with their customers' demand for cash which ensures that business activities are not hampered. As business activities are carried out, productivity increases thereby leading to an increase in economic growth in Nigeria.

Second, the result reveals that there exists a negative and significant relationship between interest rate variability (proxied by interest rate) and gross domestic product (proxy for economic growth) in Nigeria. From the result, one percent increase in interest rate leads to 0.57percent decrease in gross domestic product in Nigeria. The computed t-statistic for interest rate in absolute term (3.50) exceeds the tabulated (critical) t-statistic (1.76) at five percent level of significance. As a confirmation, the probability value of interest rate (0.0044) is less than the test significant level (i.e. $P < 0.05$). Hence, we conclude that interest rate variability has a significant effect on economic growth in Nigeria. This finding is similar to that done by Babalola, Danladi, Akomolafe and Ajiboye (2015) which argued that interest rate has a negative relationship with economic growth in Nigeria. However, the finding of this study differs from Babalola et al (2015) in terms of magnitude as their study found that interest rate had an insignificant effect on economic growth while this study established a significant impact of interest rate on economic growth in Nigeria. This finding may be attributed to the destabilizing effect of interest rate on the cost of borrowing. A high and fluctuating interest rate imposes high cost to borrowing and makes business decisions highly impossible and this leads to a reduction in productivity. As productivity declines, economic growth is adversely affected.

The coefficient of determination shows that 75 percent of the variations in economic growth (proxied by gross domestic product) are caused by variations in loan loss provision and interest rate in Nigeria. Thus, the remaining 25 percent of the variations in economic growth are due to other factors not included in the model. The computed F-statistic (18.23) is greater than the critical F-statistic (3.89) and this indicates that the model is significant as well as reliable. Finally, the Durbin-Watson statistic (1.89) lies within the acceptable region and indicates that there is no presence of autocorrelation being that $2 \leq DW < 4$ and this shows that the regression result is not spurious.

5. Conclusion

The study investigated the relationship between credit risk, interest rate variability and economic growth in Nigeria. In order to achieve this huge task, the study specifically investigated the effect of loan loss provision (proxy for credit risk) and interest rate (proxy for interest rate variability) on gross domestic product (proxy for economic growth) in Nigeria. Hence, both loan loss provision and interest rate served as the explanatory variables while gross domestic product served as the dependent variable. From the empirical evidences, the study revealed that loan loss provision has a positive and significant effect on gross domestic product in Nigeria while interest rate variability (proxied by interest rate) has a negative but significant effect on gross domestic product (proxy for economic growth).

5.1 Recommendations

Based on the outcome of the study, the following recommendations are made:

(i) Nigerian government should endeavor to bring down and stabilize the interest rate in Nigeria so as to curb its deteriorating effect on economic growth in Nigeria. This can be achieved through sound monetary and fiscal policies.

(ii) The Central Bank of Nigeria (CBN) should mandate the commercial banks to further increase their loan loss provisions as evidence suggest that increasing it has the tendency of increasing Nigeria's economic growth.

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