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Research Article

Stock Market Integration and Corporate Investment in Nigeria: A Critical Analysis

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Abstract. Low level of corporate investment in Nigeria coupled with poor financial base of a single stock exchange market system bring the need for the study to critically examined the effect of stock market integration on corporate investment in Nigeria from 1986 to 2022. The study adopted Augmented Dickey Fuller (ADF) unit root test and Auto-regressive Distributed Lag (ARDL). The data used for this study were collected from the Central Bank of Nigeria, Statistical Bulletin (2022). The ADF showed that the real exchange rate, lending interest rate, and trade openness were all integrated of order zero ($\Delta = 0$); while, stock market integration and corporate investment were integrated of order one ($\Delta = 1$). The ADF result showed that stock market integration exhibited a non-stability trend over the years, real exchange rate showed a negative sign but non-significant at 5%; while, lending interest rate and trade openness was negative and significant. The study concluded that stock market integration was volatile over the years which limited the rate of impacting corporate investment in Nigeria; while, lesser interest rate and trade liberation promote corporate investment. The study recommended that in order to fast ease stock market integration, which is crucial for economic

progress, the Nigerian Exchange Group NGX should aim toward ensuring that each listed firm on the market have a strong market capitalization through encouraging different ownership structure to possess their respective stock value.

Keywords: stock market integration, corporate investment, Auto-regressive Distributed Lag

INTRODUCTION

Stock market integration is a situation in which two or more countries stock market are linked together to depict the same trend or co-movement in terms of price changes, risks involvement, as well as, benefit attached (Hillier and Loncan, 2019; Obadiaru *et al.*, 2020). Two markets have successfully integrated when investors may readily switch between two markets stock without paying extra costs in taking the action, as well as, provides the same level of opportunities stock prices on both markets for interested parties (Ozen and Tetik, 2019). Most stock markets in developing nations had weak financial bases prior to the liberation of many economies of the developing countries and advancement in information and technology known-how. For instance, the South African market capitalization was R5.2 billion in 1992; while that of Nigeria was ₦ 47.50 billion; Uganda (UGX 2 billion) and Cameroon (FCFA 3.2 billion) (Gail and Kapingura, 2015; Obadiaru *et al.*, 2020; Johannesburg Stock Exchange, 2022). The convention of such money to dollars indicate that in 1992 all the African countries' market capitalization was less than \$1 billion dollars. This figure posed a serious challenge to corporate investment, since this limit accessibility to funds which reduces the level of investment in the real sector of the economy and growth.

Through the supply of more financial instruments that may better suit their risk choices and liquidity demands, the stock market is anticipated to promote the mobilization of savings. However, across Africa, including Nigeria the desire for this is still considered low. For instance, data available indicate that the Nigerian stock market only contributed 0.6% to GDP in 2021; compared to South Africa's 1.2%; Uganda's 0.2% and Ghana's 0.3% (Kouki and Rezgui, 2017; Ezeanyeji and Ifeako, 2019; Johannesburg Stock Exchange, 2022). This may be attributed to low financial base in these countries when compared with New York Stock Exchange (NYSE) in USA with a largest stock worth \$26.2 trillion that contributed 13.5% to the country's GDP in 2021 (Grbić, 2020). According to Falade *et al.* (2021), who backed up the aforementioned claim, Nigeria's financial institutions are characterized by a weak financial foundation, which restrains both the growth of the stock market and overall output.

Nigeria is still lagging behind in terms of resources, notably funds, to attain the desired level of economic growth and development, when compared to industrialized nations like Europe, the USA, and other emerging countries. For instance, the New York Stock Exchange (NYSE), which has the largest stock worth \$26.2 trillion, NASDAQ (16.24 \$ trillion), Shanghai Stock Exchange, China (\$6.74 trillion), and Euronext, Europe (\$6.06 trillion) (Algaeed, 2020, Imade, 2021, Okafor *et al.*, 2021); are not in sub-Saharan African nations. Nigeria's largest stock is worth \$63 billion (Falade, 2021). The rate of business investments is decreased as a result of the stock market's low net worth. Nigeria as a nation lost investments totaling \$ 31.4

billion from 2015 to 2020 as a result of inconsistent Nigeria Exchange Group policies, poor financial institutions, political unrest, and insurgency (Onuoha, Okoye and Chika, 2021); in contrast, African countries as a whole lost investments totaling \$ 205.6 billion (2010–2020) (Owen, 2020). The inadequate financial foundation in each country's stock market, however, indicates that African is falling behind in terms of corporate investment. Also, some existing studies have shown that exchange rate instability, high lending interest rate, as well as, hostility measures on border closure policies worsen the stock market integration (Khetsi and Mongale, 2015; Oprea and Stoica, 2018). Aside from this, research has shown that corporate investments can reduce the high levels of poverty that are impacting developing countries negatively by making household engages in productive activities through provision of employment opportunities that put individual household in better position to afford basic needs of life (Okafor *et al.*, 2021; Umar, 2022). Given this, the present study critically appraises the effect of stock market integration on corporate investment in Nigeria from 1986–2022.

Objective of the study

Objectives of the study were to;

- i. Analyze the effect of exchange rate on corporate investment in Nigeria.
- ii. Investigate the effect of lending interest rate on corporate investment in Nigeria.
- iii. Ascertain the effect of economy liberation on corporate investment in Nigeria.

LITERATURE REVIEW

Stock Market Integration

Stock market integration is a process in which stock markets in two or more nations trend together, as well as, showing the same identical return on investment (Ozen and Tetik, 2019). Also, a process through which investors switch between two markets without paying extra costs and there are arbitration procedures available to guarantee that stock prices on both markets is said to be well integrated stock market (Obriki and Ese, 2022). In this study, stock market integration is defined as a market in which the stock markets of two or more countries are combined to exhibit the same trend or co-movement in terms of price charges, risks, and rewards reaped by individual investor. The existing available studies have shown that when stock markets of two nations are integrated, it affords them the advantages of market efficiency, comparative advantage, even competition amongst the existing firms, reduces the rate of price volatility and promote high financial base (Kouki and Rezgui, 2017; Hillier and Loncan, 2019; Obadiaru *et al.*, 2020); on a contrary view, studies have confirmed that stock market integration does not create value due to its rigidity in nature but rather destroy it (Gail and Kapingura, 2015; Algaeed, 2020).

Corporate Investment

A corporate investment is investment(s) that a corporate entity makes in addition to any existing investments (Hillier and Loncan, 2019; lheanacho, Okere and Onoh, 2023). Meanwhile, existing researches has demonstrated that a variety of

factors influence corporate investment, amongst include the interest rate, money supply, exchange rate policy, and firms' value (Oprea and Stoica, 2018; Ozen and Tetik, 2019; Owen, 2020). In this current study, a corporate investment is said to occur when individual's organization add to already exiting investment(s) for sole purpose of increasing firms' value and revenue realization or investing in others. Corporate firms that engage in corporate investment have one thing in common: they are entities with various forms of ownership and view the stock market as the lender of last resort for long-term investments. The ownership structure of a firm is made up of investors who are both insiders and outsiders who own ownerships in corporate enterprises.

THEORETICAL REVIEW

Capital Asset Pricing Model Theory and Signaling Theory

Capital asset pricing model (CAPM) was propounded by Sharpe (1964) and Lintner (1965) in their respectively study; while, Spence (1973) propounded the signaling theory. For capital asset pricing model, it deals with both risk and expected return to face by corporate investors when undertaking investment for either to increase existing firms' value or alternative investment; while, signaling theory seeks to lessen the informational imbalance between two parties on the particular investment to undertake. In the case of signaling theory, shareholders and other parties within a business corporation tend to have more information than the new investors. For instance, a local investor may have more up-to-date information than overseas investors on the stock market in his own country. Because it restricts the free flow of information, the scenario therefore encourages an imperfect market. It is in view of this, CAPM advocate undertaking less risky venture. However, risk is unavoidable in business; but, every position action must be taken to reduce it to lower minimum level.

Empirical Review

A study was carried out by Polanco-Martinez *et al.* (2018) with a special reference to EU stock market using wavelet transform and a nonlinear causality technique from 2004 to 2011. The areas of study include Portugal, Italy, Spain, Greece and Ireland. It was discovered that from 2004-2007, the stock market integration among the selected countries showed high level of co-movement in the country and significant at 5% significant level. This suggests that a direct link existed between stock market integration and corporate investment with 12.3% increase in it on the average. In addition, there was no co-movement in the country stock market integration from 2008-2011 due to high level of crisis caused by recession that occurred in 2008. Lastly, the nonlinear causality test established bi-directional causalities in the crisis period than in the preceding period. On a contrary note, a similar study conducted by Ahmad *et al.* (2018) from 1997 to 2016 used Brazil, Russia, India, China, South Africa as a case study. The results showed that Russia and South Africa are net transmitters of volatility to other BRICS markets, while India and China showed a low level of connectivity with the others. This implies that Russia and South Africa witnessed high level of corporate investment in both countries; while that of

other was lesser. In addition, exchange rate and interest rate were confirmed significant with an indirect impact on corporate investment. The disparity in finding may be attributed to methodology; time frame and many other. A similar study using the same BRIC countries from 2007 to 2017 was carried out by Ozen and Tetik (2019) using Vector Error Correction Model (VECM). It was discovered that no co-movement in stock market integration in the countries. Therefore, concluded that developed markets responded differently from the developing markets to the US market.

On stock market integration, Aluko and Kolapo (2020) was concerned with the twelve selected Sub-Saharan countries using a feasible generalised least squares (FGLS) estimator from 2000–2015. The result obtained showed that there was co-movement among stock market integration in the selected countries with the responds of Nigeria's stock market moving to other regions countries, as well as, income, trade openness, financial openness, macroeconomic instability, financial intermediary development, savings, and corporate investment positively influence stock market development. It was concluded that there was a high level of stock market integration amongst the selected countries that moved from Nigeria to other countries. Using some selected countries in Southern African Development Community (SADC); Mamvura, *et al.* (2020) conducted a study using a time frame of 2000–2015 and a dynamic panel vector error correction model (P-VECM). From the results obtained, it was established that foreign portfolio investment was significant with a direct effect on stock market performance at 5% significant level; while, financial deepening proved significant with a direct effect on stock market performance. In addition, testing for a causality between the variable of interest, it was proven that a bi-directional relationship existed between financial deepening and stock market performance. A similar study in Zimbabwe by Dube and Shoko (2020) from 1990 to 2018 using autoregressive distributed lag model (ARDL) proved that a long-run and statistical relationship existed between corporate investment and stock market integration; as well as, between an inverse relationship between interest rate and stock market integration.

A study by Mazikana (2022) was concerned with a stock market development using a literature review approach, from the result, it was discovered that majority of studies reviewed established that a direct link was confirmed between corporate investment and stock market integration. Also, theory used showed that stock market integration promotes corporate investment, as well as, economic growth. A similar study conducted in African by Kingstone and Yudhvir (2022) between 2011 and 2021 using a panel pool approach. It was discovered that stock market integration in African directly proportional to level of corporate investment at 5% significant level.

METHODOLOGY

Under this, epistemological research philosophy was employed in this investigation. Epistemological research is primarily concerned with a research base through which knowledge is applied in terms of data collection, analysis, and interpretation (Leedy and Ormord, 2005; Wilson, 2016); while, under this approach, positivism as a method to epistemological inquiry was adopted in the current

investigation. Because this research will utilize a logical method, positivism is seen as a suitable paradigm. Due to the study's data acquisition from secondary sources, its analysis used a deductive research strategy. Also, qualitative research methodology served as its foundation owing to the collecting of data from secondary sources; while, an ex post facto research design was adopted. Furthermore, secondary sources were employed; as such, five variables were employed; four of them; exchange rate, loan interest, trade openness, and stock market integration were considered independent variables, while the fifth, corporate investment was considered a dependent variable. The stock market integration was proxied as foreign ownership and sourced from the monthly report of Nigerian Exchange Group (NGX), while the other four variables were sourced from the Central Bank of Nigeria, Statistical Bulletin (2022). The model for this is provided below and was created using both the aim of the current study objective and the remaining three sub-objectives of the study.

Model I

$$COI = f(STOCKI, EXCH, INT, OPEN) \dots \dots \dots (i)$$

Putting equation (i) in econometric form, we have

$$COI = \beta_0 + \beta_1 STOCKI + \beta_2 EXCH + \beta_3 INT + \beta_4 OPEN + \mu$$

Where; COI = Corporate investment, STOCKI = Stock market integration, EXCH = Real exchange rate, INT = Lending interest rate, OPEN = Trade openness, β_0 and β_4 = Parameters and μ = Error terms

RESULT

Table 1: Descriptive Statistics (1986-2022)

Statistics	COI	STOCK	EXCH	INT	OPEN
Mean	0.265994	2.956290	2.011410	0.570706	1.981088
Median	0.283301	3.257314	2.002166	0.755112	2.257398
Std. Dev.	0.412507	1.143522	0.172692	0.477900	0.769499
Jarque-Bera	0.142267	3.476388	4.861511	4.300285	7.494590
Probability	0.931337	0.175838	0.087970	0.116468	0.023581
Sum	9.841788	109.3827	74.42216	21.11612	73.30024
Sum Sq. Dev.	6.125840	47.07515	1.073611	8.221999	21.31666
Observations	37	37	37	37	37

Source: Econometric-view result (2023)

The descriptive result indicates that, on average, less risk investment and price stability encourage corporate investment, although other factors like the lending interest rate (INT) and trade openness (OPEN) also had an impact but infinitesimal. The median result demonstrates that the amount of corporate investment was determined by the co-movement of stock market integration within Nigeria stock market. Additionally, the majority of the selected variables were found to be normally distributed at 5% according to the *Jarque-Bera* test statistics for determining if the series is normally distributed.

Unit Root Test

Table 2 : Augmented Dickey Fuller (ADF) Unit Root Test (1986-2022)

Test at Level				Test at first level difference			
VARIABLES	Test Statistic	5% critical value	Decision	Test Statistic	5% critical value	Decision	
COI	/2.132373/	/2.951125/	I(0)	/5.847362/	/2.951125/	I(1)	
STOCK	/2.079759/	/2.945842/	I(0)	/4.618357/	/2.951125/	I(1)	
EXCH	/3.515059/	/2.945842/	I(0)	--	--	--	
INT	/4.270022/	/2.945842/	I(0)	--	--	--	
OPEN	/3.777526/	/2.945842/	I(0)	--	--	--	

Source: Econometric-view result (2023)

The ADF findings showed that the real exchange rate (EXCH), lending interest rate (INT), and trade openness (OPEN) were all integrated of order zero ($\Delta = 0$); While stock market integration (STOCK) and corporate investment (COI) were integrated of order one ($\Delta = 1$). In other words, they remained stationary at the first level difference.

Bound Test Result

Table 3: ARDL Bounds Test (1986-2022)

Test Statistic	Value	k
F-statistic	4.024278	4
Critical Value Bounds		
Significance	Io Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Source: Econometric-view result (2023)

The bound test indicates a long-term relationship between corporate investment (COI), stock market integration (STOCK), real exchange rate (EXCH), lending interest rate (INT), and trade openness (OPEN). This is because the F-statistic value was higher than the critical upper bound value at the 5% significance level.

Table 4: Short-run Result (1986-2022)

$R^2 = 0.874140$; Adjusted $R^2 = 0.821699$; Prob.(F-statistic)= 0.000011; Durbin-Watson stat=2.322067

Variable	Coefficient	Std. Error	t-Statistic	Prob. *
COI(-1)	0.877382	0.131863	6.653752	0.0000**
COI(-2)	-0.605487	0.136347	-4.440774	0.0002**
STOCK	-0.469721	0.320971	-1.463440	0.1563
STOCK(-1)	1.693612	0.423690	3.997286	0.0005**
STOCK(-2)	-0.773403	0.268627	-2.879101	0.0083**
EXCH	-0.019571	0.185733	-0.105373	0.9170
INT	-0.334032	0.073854	-4.522861	0.0001**

OPEN	0.092238	0.269485	0.342275	0.7351
OPEN(-1)	-0.706210	0.286357	-2.466190	0.0212**
OPEN(-2)	0.277097	0.227088	1.220215	0.2342
Constant	-0.224148	0.371422	-0.603485	0.5518

** indicate statistically significant at the 0.05

Source: Econometric-view result (2023)

The short-run ARDL result is displayed in Table 4. The outcome demonstrated that the corporate investment (COI) short-run coefficients for lagged one and two as the dependent variable of itself were significant at 5% with a direct influence for lagged one and an indirect effect for lagged two. The results suggest that corporate investment (COI) was low in the nation over the previous two years, with an improvement shown over the previous year.

According to the estimated p-value of the result, which was less than 0.05 and 0.1 level, the current stock market integration (STOCK) was not statistically significant at the 5% conventional level; however, that of the lagged one and lagged two periods was, with both exhibiting a positive and negative sign, respectively. This suggests that stock market interconnections with other countries are absent in Nigeria.

When other factors were held constant, the real exchange rate coefficient (EXCH) exhibited a negative sign but was non-significant at the 5% and 10% significant levels. The size and negative signs of the exchange rate co-efficient were consistent with the model's a priori expectation. In the instance of the exchange rate, it suggests that the increase in the exchange rate had no impact on corporate investment (COI) over the years under study.

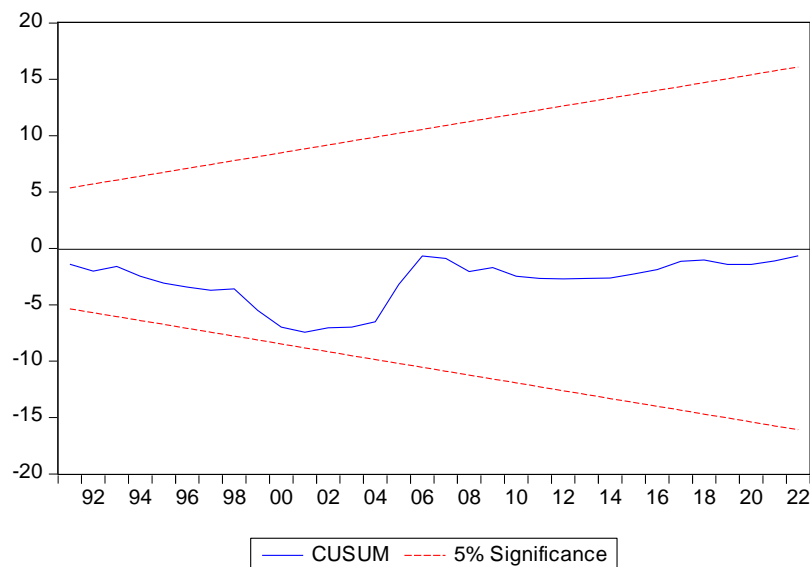
The loan interest rate's absolute coefficient (INT), which was 33.4%, was similarly negative. This indicates that a 1% rise in loan rates resulted in a 33.4 decline in corporate investment (COI). The interest rate's negative sign was consistent with a priori expectations. Economically speaking, an increase in loan rates would result in less demand for funds for corporate investment (COI), which would lower productivity in the industry.

Also, trade openness (OPEN) was negative and significant at the 5% level of significance, as demonstrated in the ARDL result. Suggesting that non-fully implementation of trade liberation in Nigeria limited the rate of stock market integration within the country that inversely affected the level of corporate investment in the country.

Diagnostic Test

Stability Test

The CUSUM chart is displayed in Figure 4.1 (see appendices) and within the 5% significance range is the CUSUM chart. This demonstrated the model's stability. Since the model line did not go beyond the red-line, the model estimated was adjudged right.



DISCUSSION OF FINDINGS

The ARDL result showed that the present stock market integration (STOCK) was not statistically significant at the 5% conventional level, but did exhibit a positive sign, but the lagged one and lagged two periods were significant and did, respectively, exhibit a positive and negative sign. Three economic implications can be obtained from the findings as related to corporate investment. First, in the last two years, there was absence of stock market integration in Nigeria; therefore, worsen the level of corporate investment in the country by 77.3%. Second, there was a partial level of stock market integration in the country last year which had a multiplier effect on aggregate level of different investment undertook by private investors. On the third reason, there is presently zero level of stock market integration in Nigeria when compared with other African country, which has infinitesimal impact on level of investment. However, a critical appraisal of this three years showed that Nigeria fared well in last two years in term of integrating with other African countries' stock market to generate high level of investment of 77.3% in totality. The results for the previous two years were consistent with those of Polanco-Martinez *et al.* (2018) and Mamvura, *et al.* (2020), who found that stock market integration had a high level of co-movement in the nation and was significant at a 5% significant level in their respective studies. On the other hand, Ozen and Tetik (2019) found no evidence of stock market integration in the chosen nations using the Vector Error Correction Model (VECM). However, other researches have indicated that stock market integration is not very high in emerging nations (Ahmad, 2018; Mazikana, 2022). This research's main conclusion is that, due to the stock market's volatility, Nigeria's stock market integration position is not stable. However, the country's mono-economy, which places a heavy emphasis on crude oil earnings, is the cause of Nigeria's current poor stock market integration trend. Additionally, it should be noted that stock market integration in Nigeria and other African nations has not been as successful as it has been in European Union nations, which have well-recognized currencies like the Euro and US dollars.

Real exchange rate (EXCH) data for the years under examination showed a negative sign, although it was not significant at the 5% or 10% significant level. The obtained negative sign, however, was consistent with the model's *a priori* assumption. The implication of the exchange rate situation is that corporate investors give the exchange level virtually little thought before making an investment. As a result, research by Hillier and Loncan (2019) and Owen (2020) as well as others reached a similar conclusion about the existence of an indirect relationship between real exchange rate and corporate investment (COI). Nigeria's real exchange rate is not taken into consideration because it is known that developing nations are characterized by exchange rate volatility. Regarding the nation, research by Liu (2016) and Mamvura, *et al.* (2020), in their respective studies, revealed that real exchange rate was significant and directly related to corporate investment, particularly on foreign portfolio, with a conclusion that exchange rate is a determining consideration when investing in a nation. The mono-economy, the weak financial institution basis, and the excessive reliance on the primary mode of production are a few of the factors that contributed to this (Oprea and Stoica, 2018; Ozen and Tetik, 2019).

The ARDL result demonstrated a negative and significant relationship between corporate investment (COI) and the lending interest rate (INT) at a 5% significant level. This demonstrates that reduced borrowing costs encourage company investment by 33.4%. In the instance of interest rates, the economic conclusion is that keeping lending rates low would raise demand for corporate investment funds (COI), which would raise sector productivity. This is feasible in that investing is made possible by the availability of funds. As a result, research by Hillier and Loncan (2019), Algaeed (2020), and Aluko and Kolapo (2020) all reached the same conclusion in their separately conducted studies, concluding that there is an inverse relationship between lending interest rates and corporate investment, and that lower interest rates encourage investment. However, several researches have indicated that excessive borrowing in developing nations prevents the reality of reduced interest rates from being seen there (Grbi, 2020; Imade, 2021).

The coefficient of trade openness (OPEN) (70.65) was negative and significant at the 5% level of significance, as demonstrated in the ARDL result. The conclusion of these funds is that the pace of stock market integration inside the country was constrained due to the non-adoption of trade emancipation among African nations, which had an adverse impact on the amount of business investment in the country. Due to their separate international trade policies' rigidity, African countries have lower levels of integration that may readily promote investments in both people and physical capital. On this point, Ozen and Tetik (2019) observe that many of them received government development assistance that guaranteed trade liberty amongst them.

CONCLUSION

This study critically examined the effect of stock market integration on corporate investment in Nigeria from 1986 to 2022 using Auto-regressive Distributed Lag (ARDL). The result showed that stock market integration (STOCK) exhibited a non-stability trend over the years, real exchange rate (EXCH) showed a negative sign

but non-significant at 5%; while, lending interest rate (INT) and trade openness was negative and significant. The study concluded that stock market integration was volatile over the years which limited the rate of impacting corporate investment in Nigeria; while, lesser interest rate and trade liberalization promote corporate investment.

Recommendations

- i. In order to fast ease stock market integration, which is crucial for economic progress, the Nigerian Exchange Group NGX should aim toward ensuring that each listed firm on the market have a strong market capitalization through encouraging different ownership structures to possess their respective share stock .
- ii. The country's top financial institution should make sure that the market is regulated by supply and demand rather than being overly dependent on crude oil to maintain a steady exchange rate.
- iii. The central bank should maintain an interest rate of one percent to prevent it from becoming too high and discouraging private investors from making investments.
- iv. Economic policy should be liberated, especially for investment purposes, by removing all obstacles to open access for both domestic and international investors.

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