



IMPACT OF DISCRETIONARY PRODUCTION COST ON VALUE OF LISTED OIL AND GAS MARKETING COMPANIES IN NIGERIA

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Abstract

The study examined the impact of discretionary production cost on value of listed oil and gas marketing companies in Nigeria. The study used secondary panel data techniques for data analysis and interpretations in order to fully capture the objectives. The population of this study is made up of twelve oil and gas marketing companies listed NGX for a period of thirteen (13) years (2010-2022). Out of which eighty were used as sample size. The data was analyzed using descriptive and inferential statistical tools. Panel Regression technique was used to determining the impact of the explanatory variables on the dependent variable. The regression result shows that discretionary production cost has insignificant impact on value of listed oil and gas marketing companies in Nigeria. This implies that discretionary production decisions have secured balance with effective risk management and cost control, as the market may not strongly reward or penalize firms based solely on these decisions. Based on this conclusion, the study recommends that for purpose of investors, and policymakers, management of listed oil and gas marketing companies in Nigeria should assess the impact of discretionary production in conjunction with other critical factors influencing firm value. More son, strategic risk management and cost control practices should be emphasized to balance discretionary production decisions.

Keyword: discretionary production cost, value, listed oil and gas marketing companies, Nigeria

1. Introduction

Generally, investors invest for anticipated future returns, but those returns can rarely be predicted precisely as there will almost always be risk associated with investments. Actual or realized returns will almost always deviate from expected returns anticipated in the beginning of the investment period. Firm value is considered a primary and essential driver for investors when making investment decisions, so they are interested in the quality of the financial data in companies' annual reports related to firm value in an attempt by the owners to improve the company's image and raise its value. It is assumed that investors will prefer investments with the highest expected return suitable to their risk aversion (Bodie & Marcus, 2008). A company's success however is often linked with the company's value creation, i.e., the ability of the company to generate future returns in terms of invested capital. The value of a firm is driven by earnings and growth, which in turn are rooted in the firm's business strategy, unique assets, management, and strategic market position, among other things (Koller et al., 2013).

Firm value is a concept distinct from market price, which is "the price at which one can transact", while firm value is "the true underlying value" according to theoretical standards. The concept is most commonly invoked in inefficient markets or disequilibrium situations where prevailing market prices are not reflective of true underlying firm value. Firm's value is a subjective measure of



how well a firm can use its assets from its primary business to generate revenues. A company's value is a good indication of investors' perceptions of its business prospects. For market price to equal firm value, the market must be informational efficient and rational expectations must prevail (Asad & Usman, 2019). However, earnings are one of the most important items in financial statements. This is because; users of financial statements mostly focus on the company's earnings before looking at other variables.

Earnings represent the image of a company on the eyes of many investors and other financial statements' users for decision-making purposes. Earnings indicate the extent to which a company has engaged in value added activities. Thus, earnings management occurs during which financial reports are prepared using judgment in order to mislead the stakeholders about the underlying economic performance of the company, or to influence contractual outcomes that are based on the reported earnings. Earnings manipulation makes financial reporting to be of less quality and reduces the level of confidence of investors in their decision-making process (Shehu & Abubakar, 2012).

The issues of earnings management have been receiving a higher attention and focus concern from government, accounting professional bodies as well as the public, particularly after the high-profile corporate governance scandals such as Enron, WorldCom, Satyam Computers, Parmalat which were occur throughout the world. Most of these corporate governance scandals termed as major accounting scandals because underlying cause for the failure was materially misstate the financial statements to mask the true financial information of the firm by using earnings management practices due to lack of corporate governance specially a weaker board in the firms. Hence, most users of financial statement do not count accounting earnings as a major yardstick for performance evaluation as well as for decision-making (Idris, 2015).

Earnings management is used to distort the true performance of firms. One of the managers' incentives to carry out these unethical practices could be to increase corporate performance, which can only occur in the short term due to the fact that in the long term the market penalizes those manipulative companies and they enjoy lower corporate performance. Therefore, when the market regulators identify unethical practices, it penalizes manipulative companies with subsequent poor stock price performance, among others. This assertion is however, supported by the study of Jo and Kim (2007) who analyzed the link between earnings management and corporate performance and obtained evidence of how higher levels of earnings management are associated with lower future corporate value. Earnings management has two types which are accrual earnings management and real earnings management.

Earnings are one of the most important items in financial statements. This is because; users of financial statements mostly focus on the company's earnings before looking at other variables. Earnings represent the image of a company on the eyes of many investors and other financial statements' users for decision-making purposes. Earnings indicate the extent to which a company has engaged in value added activities. Thus, earnings management occurs during which financial reports are prepared using judgment in order to mislead the stakeholders about the underlying economic performance of the company, or to influence contractual outcomes that are based on the reported earnings. Earnings manipulation makes financial reporting to be of less quality and reduces the level of confidence of investors in their decision-making process (Shehu & Abubakar, 2012). In essence, sudden collapse of some companies that once appears viable and futuristic through its financial report has been an issue that calls for serious attention.



The oil and gas sector of Nigeria is a formidable sector which has contributed immensely to enhance economic activities in Nigeria. More so, since the oil and gas sector contribute significantly to the development of the Nigerian economy, this study is intended to expand the body of knowledge in respect of the earnings management that may be existing in sector especially in a developing economy like Nigeria that earns over 80% of her foreign exchange from oil and particularly, as the Federal Government is putting in place policies and strategies to improve the oil sector's contributions to the Nigeria economy (Garuba 2006).

Numerous research studies have been explored influence real earnings management on firm value in both advanced and developing nations. Some notable studies include those of Al-Shouha et al. (2024) in Jordan, Uchegbu et al. (2023) and Ahmed and Ali (2022) in Nigeria, Hernawati et al. (2021) in Indonesia, Olaoye and Akinleye (2020) in Nigeria, Abbas and Ayub (2019) in Pakistani, Agus and Fuad (2018) in Indonesia, Kurnia (2017) in Indonesia, Moshi (2016) in Tanzania, Muhammad (2014) in Indonesia, and Gill et al. (2013) in India. Based on the above literature reviewed the current study identified that there is disagreement in the literature on the impact of *discretionary production cost as one of measurement for earnings management on firm value*.

Some studies found positive impact, some negative and other studies found mixed result. Example, Al-Shouha et al. (2024), Uchegbu et al. (2023), Hernawati et al. (2021), Olaoye and Akinleye (2020), Ubesie et al. Mbah (2019), Suprianto and Setiawan (2018) and Kurnia (2017) found positive effect. Ahmed and Ali (2022), Abbas and Ayub (2019) and Sayari (2018) found negative effect. Agus and Fuad (2018) and Omimi et al. (2016) found mixed results. More so, previous theoretical studies have shown that earnings management is effectively controlled by the corporate governance system and performance. In addition, the results of previous studies found empirical evidence that there is a positive relationship between earnings management and firm value. Hence, these disagreements on the impact of earnings management on firm value motivate this current work. Most of the studies reviewed have been conducted in European and Asian countries limited studies have been carried out in Africa particularly in Nigeria. Therefore, this study intends to examine the impact of *discretionary production cost* on firm value of oil and gas listed on the Nigerian Exchange Group (NGX).

2. Literature Review And Hypotheses Development

This section reviews the empirical literature on the previous studies on the variable under investigation. Al-Shouha et al. (2024) examined the relationship between ownership structure and firm value through the mediating role of accrual earnings management. Panel data were extracted from the financial reports of 88 non-financial companies listed on the Amman Stock Exchange for 11 years (2009–2019). The Barron and Kenny, Sobel, and other test approaches were applied to investigate the mediation effect and mediating relationships. The result shows that accrual earnings management has positive and significant impact on firm value of listed non-financial companies on the Amman Stock Exchange for the period under study.

Ahmed and Ali (2022) examined the effect of earnings management on the firm value of the listed Nigerian oil and gas companies. This research is based on the data collected for a period of 13 years, that is, 2008-2020. Using the annual reports and accounts of listed oil and gas firms, data were collected through secondary sources. As of December 2020, all thirteen (13) listed oil and gas companies on the NSE made up the study population. A panel data approach was used with random and fixed effect regression. The results confirmed that earnings management has a significant negative effect on firm value. This suggests that investors do recognize earnings manipulation and, as a result, it discounts the firm's value. This usually leads to a low firm value. Also, Abbas and Ayub (2019)



investigated the behavior of earnings management for Pakistani nonfinancial listed firms for the period of 15 years 2003-2017 using OLS. The study found a positive relation between real earnings management and firm value.

Agus and Fuad (2018) examined whether earnings management (EM) proxy by the practice of accrual management (AM) and real activity manipulations (RM) is related to the increase of firm value (FV) in the manufacturing industry in the IDX in the period 2010–2014. Subsequently, based on the normative and formal testing, the fixed effect model was selected as the appropriate model. The results indicated that an abnormal production cost based on real activity manipulations (RM) practice tends to increase firm value (FV) and abnormal discretionary expenses based real activity manipulations (RM) do not exhibit the same evidence. In the same vein, Arar et al. (2018) examined the relationship between earnings management and the stock price liquidity for a selected sample of (49) Jordanian Service Companies listed on Amman stock market for the period of (2010-2015). Using the Jones Modified Model (1995), the outcomes of this study indicated a non-significant relationship between the Earning's Management and the Stock Price Liquidity in the Jordanian service companies.

Sayari (2018) examined the effect of earnings management on stocks liquidity using two modified earnings management measurement models: modified model of Jones (1995) and model of Kothari et al. (2005). Using a panel data qualitative approach, the obtained results point to a positive relationship between discretionary accruals and Tunisian firms ask-bid spread (as estimated by the two measurement models). This indicates that discretionary accruals allow Tunisian investors to optimally construct their stocks portfolios. The collected results also highlighted a negative and a significant impact of transaction size and volume on firm's ask-bid spread. Indeed, earnings management allows for increasing stocks liquidity when discretionary accruals are negative and reducing their liquidity when these accruals are positive.

Sunardi (2018) examined the effect of earnings management on firm value before and when IFRS implementation. The study population was 127 manufacturing companies for the period of 2010-2016. The sample consists of 192 firms, and the data was source from the completed financial report year 2010-2016, financial report year 2010-2011 (96 observation) was to explain before applying of IFRS while financial report (96 observation) year 2012-2016 explained when application of IFRS. The research results, before the implementation of IFRS earnings management did not impact on firm value, then when the implementation of IFRS earnings management affected positively and significantly firm value. While the moderate variables of percentage of sales growth and age of firm strengthen the influence of earnings management on firm value before implementation of IFRS, but variable of capital expenditure weaken. On the other hand, the percentage variable of sales growth, capital expenditure value and age of firm strengthens the influence of earnings management on company value during company implementation.

Kurnia (2017) examined the influence of accrual earnings management and real earnings management on firm value. The study used sample of 162 non-financial companies listed in Indonesia Stock Exchange during the research period 2012 to 2015. Sample selection method used was purposive sampling. Data were analyzed using multiple regression method. The empirical evidence of the research indicated that accrual earnings management has positive and significantly influence to firm value. While, real earnings management has negative and significantly influence to firm value.

In the same vein, Suffian et al. (2015) examined the relationship between real earnings management (REM) activities and firm value. A sample of 6,216 firms was used as sampled size and data were extracted from annual and accounts of the sampled firms for a period of eighty years (2004-2011). Linear regression was used to analysis the data generated from the sampled firms to determine



the relationship of each REM activity of the sample firms with the firm value. The result shows that REM activity has positive and significant impact on and firm value. Similarly, Muhammad (2014) examined the influence of the earnings management on firm value of real estate and properties companies listed in Indonesian Stock Exchange. The earnings management was measured using discretionary accrual by modified Jones model while firm value was measures using Tobin's Q. The study used purposive sampling method to sample 12 companies for the period 2012-2014. Descriptive statistic and multiple regression method are used to analyze the data. The result showed that earning management proxy by *discretionary production cost* has influence on firm value.

The claim by Zhang et al. (2006) on earnings management was unwarranted and could be questioned because it needs proper monitoring for the serious interest. Subsequently, to posit with the findings of the reviewed literature indicating earnings management and firm value had a negative effect, it implies that successive engagement in earnings manipulation by management could lead to a significant drop in stock price which could trigger investors' lawsuits as observed by Francis (2011). Hence, the need to also curb aggressive earnings management behaviour is important. The hypothesis of the study was stated as follows:

H_{01} : Discretionary production cost has no significant effect on value of listed oil and gas companies in Nigeria.

Theoretical Review

Several theories have been put forward which seeks to provide insight into the underlying relationship between discretionary production costs on value some of which is transaction cost theory. Burgstahler and Dichev (1997) explicate that, based on transaction and information costs, investors derive economic decisions on heuristics or reference points such as zero level or earnings changes, as well on the 'surprises' that zero earnings generate. In this way, a loss, or decrease in earnings may send a negative signal to outsiders, particularly credit ratters and stock analysts who are assessing the firm. This signal in turn negatively affects a firm's credit ratings and the costs of the debt, according to Dechow et al. (2000). However, outsiders may attach different weights to such a signal, depending on the firm's previous signals. Burgstahler and Dichev (1997) suggest that transaction cost theory could underlie the reason why companies report profit to avoid decreases in earnings. Two assumptions underpin this theory: first, Information about earnings affects the terms of transactions between the firm and its stakeholders and, more specifically, terms of transactions are generally more favourable for firms with higher, rather than lower, earnings. Second, the costs of storing, retrieving, and processing information are sufficiently high that at least some stakeholders determine the terms of transactions with the firm based on heuristic cut-offs at zero levels or zero changes in earnings.

3. Methodology

The current study used secondary panel data techniques for data analysis and interpretations in order to fully capture the objectives. The population of this study is made up of the twelve (12) listed oil and gas firms in Nigeria as at the December 31st 2022. Hence, for a company to qualify as a sample for the study, the following criteria were to be met: (i) the companies must be listed on the NGX market for the entire period of the study (2010-2022), (ii) none of them would have been delisted during the period 2010-2022; and (iii) the companies must have the requisite or complete set of data covering the study period. The essence of these filters is for the purpose of getting complete set of data for the period covered in the study. Thus, following the filters eighty (8) firms were qualified to be part of samples size as shown in Table 1.



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Table 1

Population of the study

S/N	Name of Company	Year of Listing	Sample Size
1	11 Plc.	1991	1
2	Anino International Plc.	1990	Removed
3	ArdovaPlc (Forte Oil)	2014	4
4	Capital Oil Plc.	1990	Removed
5	Conoil Plc.	1989	2
6	Eterna Plc.	1998	3
7	Japaul Oil & Maritime Services Plc.	2005	5
8	MRS Oil Nigeria Plc.	1978	6
9	Oando Plc.	1992	7
10	Rak Unity Pet. Comp. Plc.	1989	Removed
11	Seplat Petroleum Development Company Plc.	2014	Removed
12	Total Nigeria Plc.	1956	8

Source: NGX daily listing as at 2022 (www.ngx.com.ng)

The data was analysed using descriptive and inferential statistical tools. Panel regression technique was used to determining the impact of the explanatory variables on the dependent variable. The relationship is expressed as an equation that predicts a response of variable from a function of regress or and parameters. For the purpose of this study fixed effect, random effect and pooled OLS was used. Hausman test was carry out to choose the most appropriate technique among the models. The justification of using these techniques is that the data of this study contained i and t dimension i.e., time and individuals' companies.

Model Specification

The model used in this study was adapted from Al-Shouha et al. (2024), Uchegbu et al. (2023), Ahmed and Ali (2022),Hernawati et al. (2021) and Olaoye and Akinleye (2020)with some modifications. In order to determining the effect of *discretionary production cost* on value of listed oil and gas companies in Nigeria, the model captures contribution of explanatory variables on firm value. The functional and econometric forms of the model are stated as:

$$\text{TOBINSQ} = f(\text{PROD}, \text{FSIZE} \text{ and } \text{LEV}) \dots\dots\dots (1)$$

The following is the regression model that was used in this study:

$$\text{TOBINSQ}_{it} = \beta_{0_{it}} + \beta_1 \text{PROD}_{it} + \beta_2 \text{FSIZE}_{it} + \beta_3 \text{LEV}_{it} + e_{it} \dots\dots\dots (2)$$

Where: TOBINSQ_{it} = Firm value for company i at time t; $\beta_{0_{it}}$ = Regression intercept for company i at time t; PROD = Discretionary production for company i at time t; FSIZE = Firm size for company i at time t; LEV = Leverage for company i at time t; $\beta_1 - \beta_3$ = Regression coefficient of the independent variables for company i at time t. e = an error term.

Variables of the Study and their Measurements

The means by which the various variables adopted in this study are measured or computed are shown in Table 2.



Table 2

Summary of variables and their Measurements

Variables	Proxies	Measurement	Source
Firm Value	Tobin's Q	Market value of equity plus Total debts/Total assets.	Al-Shouha et al. (2024), Uchegbu et al. (2023), Ahmed and Ali (2022) and ArdiandMurwaningsari (2018).
Discretionary Production Cost	PROD	Measured by one divided by lag of total assets plus sales divided by lag of total assets plus change in sales divided by lag of total assets plus lag of sales divided by lag of total assets.	Uchegbu et al. (2023), Ahmed and Ali (2022), Abbas and Ayub (2019), Olaoye and Akinleye (2020) and Olatunji (2020).
Control Variables	FSIZE	Measured as log of total assets	Uchegbu et al. (2023), Ahmed and Ali (2022), Olatunji (2020) and Agus and Fuad (2018).
	LEV	Measured as total debt divided by total asset	Al-Shouha et al. (2024), Olaoye and Akinleye (2020), Olatunji (2020) and Abbas and Ayub (2019).

Source: Compiled by the Author (2024).

4. Result and Discussion

Descriptive Statistics Result

Table 3 provides summary of statistics for the variables of the study. The summary statistics include measures of central tendency, such as mean, measures of dispersion (the spread of the distribution) such as the standard deviation, minimum and maximum of both the dependent variable and explanatory variables. The table shows the summary statistics of the dependent and independent variables in order to effectively appreciate the nature of the results.

Table 3

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
TOBINSQ	104	0.7339	0.4897	0.1325	3.3742
PROD	104	0.1127	0.0874	0.0011	0.5398
FSIZE	104	7.8600	0.5832	6.9475	11.0382
LEV	104	0.1954	0.1632	0.000	0.8132

Source: Computed by the Researcher using STATA Version 14.

The Table 3 shows that the mean value of Tobins'Q is 0.7339, standard deviation of 0.4897 and minimum and maximum values of 0.1325 and 3.3742 respectively. This suggests that the on average the market values the firm's assets down due to the value not exceeding one. However, the maximum indicated that there is a firm with high value within the period of the study. The standard deviation of Tobins'Q suggests that there is a significant amount of variation from the mean across



the firms in the sample. The minimum and maximum values of Tobins'Q suggests that there are some firms in the sample that have very high Tobin's Qs and/or engage in real earnings management to a significant extent.

Similarly, Discretionary Production Cost (PROD) shows a mean value of 0.1127, standard deviation value of 0.0874, and minimum and maximum values of 0.0011 and 0.5398 respectively. Productivity is a measure of the output produced per unit of input. A high level of productivity could indicate that a firm is more efficient and profitable, which would lead to a higher firm value. Therefore, the mean value indicates that eleven percent (11%) productivity was realized signifying less efficiency and profitability within the sampled firms.

More so, firm size is a measure of the firm's total assets. The table shows that on average 7.8600, standard deviation of 0.5832, minimum and maximum of 6.9475 and 11.0382 respectively. Larger firms are generally more stable and less risky than smaller firms, which could lead to a higher firm value. Leverage is a measure of the firm's debt-to-equity ratio. The table shows that it has a mean value of 0.1954, standard deviation of 0.1632, minimum and maximum values of 0 and 0.8132 respectively. High levels of leverage can increase the risk of bankruptcy, which could lead to a lower firm value. According to the average value of leverage, the firms have lower leverage and may not likely engage in real earnings management.

Correlation Analysis

The correlation matrix shows the correlation coefficients between the explanatory variables and dependent variables. The correlation coefficient is a measure of the linear relationship between two variables. It can range from -1 to 1, with a value of -1 indicating a perfect negative correlation, a value of 1 indicating a perfect positive correlation, and a value of 0 indicating no correlation.

Table 4

Correlation Matrix

VARIABLE	TOBINSQ	PROD	FSIZE	LEV	VIF
TOBINSQ	1.0000				
PROD	0.0873	1.0000			1.04
FSIZE	0.0693	-0.0451	1.0000		1.17
LEV	0.0686	0.0842	0.3652	1.0000	1.26

Source: Computed by the Researcher Using STATA Version 14.

Correlation coefficient indicates a positive correlation between TOBINSQ and PROD with the value 0.0873, but the correlation is weak. This means as the PROD increases firm value also increases. Table 4 further shows that there are a number of other interesting relationships between the variables. For example, firm size (FSIZE) is positively correlated with firm value (Tobins'Q), with a correlation coefficient of 0.0693. This suggests that larger firms tend to have higher firm values. This is likely due to the fact that larger firms are generally more stable and less risky than smaller firms. This suggests that firms with higher levels of debt tend to have lower firm values. This is likely due to the fact that leverage increases the risk of bankruptcy, which can make firms less attractive to investors.

Table 5 presents the result of the analysis on the impact of discretionary production as proxy to real earnings management on firm value of listed oil and gas firms in Nigeria. According to the Hausman specification test, Random Effect (RE) model is the appropriate.



Table 5
Random Effect Model

Tobins'Q	Coef.	Std. Err.	Z	P> z
Constant	1.1184	0.8405	1.33	0.183
PROD	0.4111	0.6261	0.66	0.511
FSIZE	-0.0685	0.1077	-0.64	0.525
LEV	0.5506	0.3636	1.51	0.130
Prob > F	0.2946			
R – Squared	0.0665			
Within	0.2042			
Between	0.0064			
Overall	0.0788			
Hausman	0.0001			
LM test	3.71			
Wald chi2 (3)				

Source: Computed by the Researcher using STATA Version 14 .

Table 5 shows that estimated intercept is 1.1184 with a standard error of 0.8405. The t-statistic is 1.33, and the associated p-value ($P > t$) is 0.183, suggesting that the constant is not statistically different from zero. The coefficient for the variable PROD is 0.4111, with a standard error of 0.6261. The t-statistic is 0.66, and the p-value is 0.511. This suggests that the variable PROD is statistically insignificant at conventional significance levels (e.g., 0.05). The positive coefficient indicates that as PROD increases by one unit, the firm value represented by Tobin's Q increases by approximately 0.4111 units but without any influence. The coefficient for the variable FSIZE is -0.0685, with a standard error of 0.1077. The t-statistic is -0.64, and the p-value is 0.525. The variable FSIZE is not statistically significant at a conventional significance level of 0.05. The coefficient for the variable LEV is 0.5506, with a standard error of 0.3636. The t-statistic is 1.51, and the p-value is 0.130. The variable LEV is statistically insignificant at a conventional significance level of 0.05.

Table 5 also shows the model fitness where p-value associated with the F-statistic for overall model fit is 0.2946, indicating that the overall model is statistically not significant. The R-squared value is within, between and overall is 0.0665, 0.2042 and 0.0064 respectively. All representing the proportion of variance in the dependent variable (Tobin's Q) explained by the independent variables in the model. The R-square of between had further confirmed coefficient determination of 0.2042 indicating that the independent variable impacted on the dependent variable at 20% holding other variables constant and 80% was captured by the residuals. Tests for assumptions and model specification include Hausman test which shows the p-value associated with the Hausman test is 0.0788, suggesting that there is a statistically significant difference between the fixed effects and random effects models where it led to the Lagrange Multiplier Effect test. The LM test (0.0001) further indicates that Random Effect Model is appropriate to present.

5. Conclusions and Recommendations

The variables influencing firm value have been the subject of several researches in both developing and developed countries. Hence, this study was carried out to examine the effect of



discretionary production cost has no significant effect on value of listed oil and gas companies in Nigeria. The result of the regression analysis shows that discretionary production cost does not influence value of listed oil and gas companies in Nigeria. In line with the major findings of the study, the following conclusions and recommendation are drawn: Discretionary production decisions have secured balance with effective risk management and cost control, as the market may not strongly reward or penalize firms based solely on these decisions. The study also concludes that potential influence of information asymmetry on investor perceptions of discretionary production impact is bound to occur.

Based on the conclusions of the study, some recommendations for investors, managers, and policymakers include the following: the management of listed oil and gas companies in Nigeria should assess the impact of discretionary production in conjunction with other critical factors influencing firm value. Strategic risk management and cost control practices should be emphasized to balance discretionary production decisions.

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