

Evaluating the Role of Green Logistics Practices on Financial Sustainability in Fast-Moving Customer Goods Firm in Lagos State, Nigeria



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SHORT ABSTRACT: Companies now prioritise sustainability, especially FMCG firms, have efficiency and environmental responsibility goals. This study examined financial sustainability and green logistics practices of selected FMCG companies in Lagos State, Nigeria. Survey data was collected using verified questionnaires. The survey included 13,782 managers from eight listed FMCG companies. Taro Yamane formula was used to calculate 519 samples. The response rate was 96.7%. Descriptive and inferential (multiple and hierarchical regression) was applied. This study demonstrated that green logistics practices did not affect the financial sustainability of selected FMCG companies in Lagos State. To improve long-term sustainability, these firms should use green logistical methods.

ABSTRACT: Today's organisations value sustainability more. Thus, organisations, particularly those in the fast-moving consumer goods (FMCG) business, have aligned goals to focus on efficiency and environmental responsibility. FMCG firms suffer from non-sustainability because of mismanaged green logistics operations such as green production, procurement, transportation, packaging, and reverse logistics. Many current studies focus more on industrialised countries than developing nations and non-FMCG businesses. This research examined Lagos State, Nigeria FMCG businesses' financial sustainability and green logistical practices. The study was survey-based. The survey included 13,782 managerial staff from eight listed FMCG corporations in Lagos State, Nigeria. Taro Yamane formula was used to calculate 519 sample size. Simple random sampling was used. Structured and validated questionnaires data was collected. Cronbach's alpha reliability coefficient ranged from 0.78 to 0.94. The response rate was 96.7%. Descriptive and inferential statistics, including multiple and hierarchical regression, were employed. The results indicated that the implementation of green logistics methods did not have a statistically significant impact on the financial sustainability of the chosen FMCG companies in Lagos State, Nigeria. ($Adj.R^2 = 0.001$, $F(5, 496) = 1.11$, $p > 0.05$). The study concluded that green logistics practices promote firm sustainability of selected FMCG firms in Lagos State, Nigeria. This study recommended that the management of FMCG firms in Lagos State, Nigeria should embrace a comprehensive strategy towards sustainability, integrating green logistics practices into their broader sustainability strategy to enhance their long-term sustainability.

KEYWORDS: Financial sustainability, Green logistics practices, Green production, Green transportation, Green packaging, Green packaging, Reverse Logistics

1. INTRODUCTION

The importance of sustainability in today's organisations is growing. As a result, organisations, particularly those in the fast-moving consumer products industry have started to make sure to concentrate on elements that enhance the efficacy of their performance and include eco-friendly considerations in the system for managing the supply chain (Soyege, Makinde & Akinlabi, 2023, p. 3). Despite this, it has been noticed, particularly by fast-moving customer goods (FMCG) companies that the quality of the results falls short of expectations. This is because of inadequate management of green logistics practices, which makes it difficult for these companies to achieve a significant level of firm sustainability (Prataviera, Creazza & perotti, 2024, p. 87). This has produced fantastic chances for companies to go green by providing the required environmentally friendly goods and services and appealing to customers whose purchasing decisions are impacted by the environment (Zhang & Dong, 2020, p. 6607).

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The FMCG industry is the dominant manufacturing market in the United Kingdom, constituting 14% of the total value of products produced in the nation, which amounts to around £110bn. The sector has a workforce of more than 400,000 persons across 7,000 enterprises (Alsaifi et al., 2020, p. 126; Mariani & Wamba, 2020, p. 342). Nevertheless, the industry has seen a growing number of smaller, specialized firms, venturing into healthy and vegan goods segment. Also, besides the solid track record, UK manufacturing firms have encountered unprecedented obstacles in the form of an uncertain business climate and a lack of strategic focus, resulting in decreased sustainability among FMCG firms (Gong et al., 2020, p. 125).

The FMCG business in Kenya has shown rapid expansion in recent decades. The industry's expansion has led to the entrance of several enterprises, both domestic and international, aiming to capture a portion of the market (Gitonga, 2017, para. 3). Kenya has several FMCG manufacturing businesses located in Nairobi. These companies produce a wide range of fast-moving consumer products that are distributed both domestically and globally. Bidco is widely recognised as the dominant player in the FMCG industry in Kenya, with a market share of around 24% in the Oil and Fat products segment (Jepherson et al., 2021, p. 52). Kapa Oil Refineries have a market share of around 12% in this section of the FMCG industry, placing them in second position. Unilever Kenya ranks third with a market share of 9%, based on their production capacity (Muhalia et al., 2021, p. 9). Like other nations, some previous Kenyan fast moving consumer goods companies are experiencing difficulties because of heightened rivalry and technology improvements that have made some of their products outdated. For example, Eveready East Africa, a once prominent player in the FMCG industry in Kenya, collapsed and withdrew from the market as a result of exorbitant expenses and inadequate financial sustainability (Jepherson et al., 2021, p. 58).

The objective of this research is to ascertain the impact of green logistics on financial sustainability. In a 2016 study conducted by Jackson, Gopalakrishna-Remani, Mishra and Napier (2016), the researchers examined the association between green practices and the economic success of organisations. The results demonstrated that using environmentally friendly methods in the distribution chain not only enhanced enterprises' profitability but also contributed to the development of a favourable brand identity (p. 147). Similarly, Khan and Quanli (2017) discovered that the utilisation of renewable energy sources and the adoption of eco-friendly measures resulted in an improvement in the financial performance of companies (p. 16841). Green logistics processes refer to specific activities or actions that aim to mitigate the ecological footprint of industrial tasks, while yet ensuring high quality, competitiveness, and cost-effectiveness (Golcic & Smith, 2013, p. 83). Implementing green logistics practices can have both positive and negative effects on an organisation's finances. While it may strain the financial resources of the organisation, it can also improve its corporate reputation and market share. If properly managed, these improvements can lead to long-term financial sustainability. Implementing green logistics methods leads to reduced costs and higher profitability for organisations, making them more competitive and enabling them to gain long-term strategic benefits (Vanalle et al., 2017 p. 1951). Several scholars have observed that having high corporate profits and material well-being is not beneficial if it leads to significant harm to the ecosystem, resulting in detrimental impacts on both people and the environment (Ejoh et al., 2014, p. 199). The elements that promote financial sustainability sometimes serve as indirect catalysts for its antithesis (Gardini & Grossi, 2018, p. 965). Due to the divergent results, this study hypothesises that:

H₀: Green logistics practices have no significant effect on financial sustainability.

2. METHODOLOGY

This study adopted a positivist philosophy (Sestu & Majocchi, 2020, p. 220). The positivist paradigm is a scientific approach to research that focuses on observable and measurable phenomena. This paradigm is based on the belief that knowledge is derived from empirical evidence and that scientific theories can be verified through experimentation (Zyphur & Pierides, 2020, p. 55). The positivist paradigm is a perspective within the social sciences that emphasizes the need to study social phenomena through empirical observation and measurement (Bonell et al., 2018, p. 7). This perspective is also concerned with developing theories that can be verified through scientific testing. The justification for the positivist paradigm is based on the belief that the natural world is knowable.

The survey design utilised in this study enabled the researcher to describe the situations in detail about the focus group as they exist. The design also helped in the extraction of attitudes and opinions from a sizable sample of respondents so as to make generalized conclusions. This design was adopted by similar studies which resulted in obtaining of desired results (Islam et al., 2021, p. 142; Sajid et al., 2021, p. 39; Zhang et al., 2019, p. 39). A total of 13,782 management employees from the following companies made up the study's population: Unilever Nigeria Plc, PZ Cussons Nigeria Plc, Dangote Sugar Refinery Plc, Honeywell Flour Mill Plc, Cadbury Nigeria Plc, and Flour Mills Nigeria Plc. The stated FMCG businesses, manufacture food and personal hygiene items, and are listed on the Nigerian Stock Exchange, and are all based in Lagos State, Nigeria. Due to their engagement in reverse logistics, waste management, packaging, transportation, warehousing, procurement, manufacturing, and sustainability,

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the companies were taken into consideration for the study (Okunuga et al., 2022, p. 17; Ogunlela, 2018, p. 116). Lagos State was chosen in this investigation because it is Nigeria's commercial hub, an industrial area, and a cosmopolitan city (Ukah et al., 2019, p. 299). A total of 502, out of the 519 questionnaires that were issued to respondents were properly completed, retrieved, and utilised in the study. This indicates a rate of response of roughly 96.7% out of the population used in this study, which was deemed an optimum response rate.

Simple random sampling technique was used for sample selection in this study. The justification for using simple random sampling technique is that it is one of the most effective methods to reduce bias in research studies. It guarantees that every individual in the population has an equitable opportunity of been chosen, thereby eliminating bias by the researcher. (Abanyam & Uwameiye, 2019, p. 20).

Table 3.1 Proportion of samples

S/N	Organization	Population	Sample Size	Proportion
1	Bua Foods Plc	1,890	519	71
2	Cadbury Nigeria Plc.	489	519	18
3	Dangote Sugar Refinery Plc	2,850	519	107
4	Flour Mills Nig. Plc.	5,083	519	191
5	Honeywell Flour Mill Plc	832	519	31
6	Nascon Allied Industries Plc	581	519	22
7	P Z Cussons Nigeria Plc.	1,302	519	49
8	Unilever Nigeria Plc	755	519	28
	TOTAL	13,782		

A tailored questionnaire was utilized as the tool for the collection of data. The research used a questionnaire that was separated into three pieces. Section A focused on gathering information on the respondents' biodata, including their Marital Status, Gender, Educational Qualification, Age, Nature of business, and Years of Experience. Sections B and C address the responses of the respondents in providing answers to the study questions pertaining to the independent and dependent variables, respectively. A six-point Likert scale with modified endpoints ranging from Very High (6) to Very Low (1) was used. Construct validity was assessed using Confirmatory Factor Analysis (CFA). The Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity were used to assess the adequacy of the sample, while the Average Variance Extracted (AVE) was utilised to assess the construct validity.

Table 3.2: Validity Results

Variables	No of Items	KMO	Bartlett's Test	Sig	Average Variance Extracted	Remark
Green Procurement	5	0.870	185.195	0.000	0.627	Valid
Green Production	5	0.823	120.721	0.000	0.688	Valid
Green Transportation	5	0.768	67.582	0.000	0.647	Valid
Green Packaging	5	0.793	171.539	0.000	0.746	Valid
Reverse Logistics	5	0.800	104.496	0.000	0.635	Valid
Financial Sustainability	5	0.768	175.402	0.000	0.710	Valid

The study instrument underwent validity testing to assure its accuracy. Construct validity was assessed with average variance extract (AVE), while the Sampling Adequacy was evaluated using the KMO and Bartlett sphericity test. The KMO findings above 0.5, indicating that the questions effectively assessed the variables in the sample. The Bartlett test of Sphericity yielded a score of 0.000, indicating a statistically significant link between the variables being analysed. The KMO variable test result in this study was above 5%, indicating that the statements used to measure each in the testing instruments were consistent with expectations.

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Similarly, the Bartlett test of Sphericity had a value below 5%, further supporting the notion that the variables were appropriately measured. All variables in the study instrument were considered to have construct validity if their Average Variance Extracted (AVE) values exceeded 0.5. The AVE values provide empirical support for the convergent validity of the measures.

Table 3.3: Reliability Result

Variables	No of Items	Cronbach's Alpha	Composite Reliability	Remark
Green Procurement	5	0.933	0.894	Reliable
Green Production	5	0.886	0.917	Reliable
Green Transportation	5	0.787	0.856	Reliable
Green Packaging	5	0.911	0.936	Reliable
Reverse Logistics	5	0.850	0.895	Reliable
Financial Sustainability	5	0.891	0.924	Reliable

Cronbach's alpha of 0.7 is the criterion for a credible research instrument (Kaplan, 2004). As additional evidence, the Cronbach alpha coefficient for internal consistency and the Composite reliability value were obtained. This test was performed to determine whether the questionnaire could remain consistent across different studies and contexts. The linearity test was performed to identify the study's independent and dependent variables. Data collected through structured questionnaire was analysed through Statistical Package for Social Science (SPSS). Descriptive statistics such as frequency distribution, mean and standard deviation were used to analyse the responses from the employee.

3. RESULTS

Table 4.1: Descriptive Statistics on Financial Sustainability

	VH	H	MH	ML	L	VL	missing	Total	
	%	%	%	%	%	%	%	Mean	Standard Deviation
Growth in gross profit in the last 5 years.	21.31	27.29	37.05	13.15	1.00	.20	0.0	4.54	1.01
Growth in sales in the last 5 years.	9.56	27.69	35.66	24.50	2.59	.00	0.0	4.17	.99
Growth in net profit margin in the last 5 years.	37.05	32.87	24.30	5.18	.60	.00	0.0	5.01	.94
Growth in return on investment in the last 5 years.	6.57	27.29	47.81	15.54	2.79	.00	0.0	4.19	.88
Growth in return on assets in the last 5 years.	12.35	14.34	26.49	40.04	5.78	1.00	0.0	3.84	1.16
Grand Average								4.35	1.00

Table 4.1 displays the findings of the descriptive statistics on financial sustainability. According to the results of the analysis, 21.31% of the respondents indicated very high on use of growth in gross profit in the last 5 years, 27.29% indicated high, 37.05% of the respondents indicated moderately high, while 13.15% of respondents indicated moderately low, 1.00% low and 0.20% very low. The respondents, on average, reported that the response on growth in gross profit in the last 5 years is high with a standard deviation showing convergence around the mean (mean = 4.54, STD = 1.01). Furthermore, the result from the table above showed that with regards to growth in sales in the last 5 years, 9.56% of the respondents rated very high, 27.69% indicated high and 35.66% indicated moderately high, while 24.50% suggested moderately low and 2.59% suggested low.

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On average, the respondents indicated that the response rate on growth in sales in the last 5 years is high (mean = 4.17, STD = 0.99). On the growth in net profit margin in the last 5 years, 37.05% of the participants expressed very high, 32.87% suggested high and 24.30% expressed moderately high, while 5.18% indicated moderately low and 0.60% indicated low. On average, the respondents indicated that growth in net profit margin in the last 5 years is very high with a standard deviation showing convergence around the mean. (mean = 5.01, STD = 0.88).

The result of the descriptive analysis also showed that 6.57% of the participants suggested very high growth in return on investment in the last 5 years, 27.29% indicated high, 47.81% indicated moderately high, 15.54% moderately low and 2.79% implied low. On average, the respondents rated moderately high on growth in return on investment in the last 5 years with a standard deviation showing convergence around the mean (mean = 4.19, STD = 0.88). Lastly, with regards to growth in return on assets in the last 5 years, 12.35% indicated very high, 14.34% suggested high and 26.49% implied moderately high, while 40.04% implied moderately low, 5.78% indicated low and 1.00% of the respondents indicated very low. On average, the respondents indicated that growth in return on assets in the last 5 years is moderately low with a standard deviation showing convergence to the mean (mean = 3.84, STD = 1.88).

The grand mean of the financial sustainability is 4.35 with a standard deviation of 1.00 which illustrates that on average the responses of the respondents on green logistics practices converge around high for financial sustainability of selected FMCG firms in Lagos State, Nigeria.

The tables revealed that the pattern of responses is similar as both green logistics practices and financial sustainability tend towards moderately high. Thus, we can conclude that the components of green logistics practices tend to affect the financial sustainability of selected FMCG firms in Lagos State, Nigeria.

Table 4.2: Summary of multiple Regression of green logistics practices and financial sustainability of selected fast-moving consumer goods firms in Lagos State, Nigeria.

N	Model	B	Sig.	T	ANOVA (Sig.)	R	Adjusted R ²	F (5,496)
502	(Constant)	3.561	.000	6.386	0.350 ^b	0.106 ^a	0.001	1.117
	Green production	-0.083	.641	.467				
	Green procurement	0.006	.938	.078				
	Green transportation	0.159	.123	1.543				
	Green packaging	0.005	.949	.064				
	Reverse logistics	0.058	.095	1.675				
Predictors: (Constant), Green Production, Green Procurement, Green Transportation, Green Packaging, Reverse Logistics.								
Dependent Variable: Financial Sustainability								

Table 4.2 displays the results of the multiple regression analysis conducted on the financial sustainability of selected FMCG companies in Lagos State, Nigeria, specifically focusing on the components of green logistics practices. The results showed that green procurement ($\beta = 0.006$, $t = 0.78$, $p > 0.05$), green transportation ($\beta = 0.159$, $t = 1.543$, $p > 0.05$), green packaging ($\beta = 0.005$, $t = 0.064$, $p > 0.05$) and reverse logistics ($\beta = 0.058$, $t = 1.675$, $p > 0.05$) all have positive and insignificant impact on financial sustainability of the chosen FMCG firms in Lagos State, Nigeria while green production ($\beta = -0.083$, $t = 0.467$, $p > 0.05$) showed a negative and insignificant effect on financial sustainability. Therefore, it may be inferred that fast-moving consumer goods corporations do not consider green practices as significant contributors to their financial sustainability.

The R-value of 0.106 confirms this finding and suggests that the components of green logistics practices have a modest positive association with the financial sustainability of selected FMCG firms in Lagos State, Nigeria. The coefficient of multiple determination, Adj R² = 0.001, suggests that only 0.1% of the variation in financial sustainability among chosen FMCG firms can be explained by green logistics practices. The remaining 99.9% of modification are attributed to additional variables that were not included in the model. The predictive multiple regression models are stated accordingly:

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$$FS = 3.561 + -0.083GP + 0.006RL + 0.159GProc + 0.005GT + 0.058GPkg + U_i \text{---Eqn (i) (Predictive Model)}$$

Where:

FS= Financial sustainability

GP = Green Production

GProc = Green Procurement

GT = Green Transportation

GPkg=Green Packaging

RL = Reverse Logistics

Based on the regression model, when green logistics practices are held at zero, the financial sustainability score is 3.561, indicating a favourable outcome. The predictive model reveals that all factors are deemed negligible. Consequently, the company's management may diminish the importance of these variables, hence why they have been excluded from the prescriptive model. The results of the multiple regression analysis in the prescriptive model show that improving each of the variables of green logistic practices by one unit leads to corresponding increases in financial sustainability of 0.006, 0.159, 0.005, and 0.058, respectively. The same holds true for decreases in these variables. Therefore, implementing green practices will result in improved financial sustainability for selected FMCG companies in Lagos State, Nigeria.

The F-statistics (df = 5, 496) = 560.928 at p = 0.000 (p>0.05) suggests that the overall model is not significant in telling the impact of green logistics practices on the financial sustainability of selected FMCG businesses in Lagos State, Nigeria. The findings indicate, it would be advantageous for fast-moving consumer products companies to de-emphasize the factors. Thus, the null hypothesis (H₀) stating that green logistics methods do not have a substantial impact on the financial sustainability of chosen FMCG businesses in Lagos State, Nigeria was not rejected.

4. DISCUSSION

The results of the multiple regression analysis for the hypothesis indicate that the implementation of green logistics practices, including green procurement, green transportation, green production, reverse logistics, and green packaging, have a positive but statistically insignificant impact on the financial sustainability of selected fast moving consumer goods firms in Lagos State, Nigeria. The adjusted R-squared value is 0.106, indicating a weak relationship between the variables. The F-statistic is 560.928 with 1 and 117 degrees of freedom, and the p-value is more than 0.05. Therefore, the collective influence of the several sub factors was not significant in predicting the financial stability of chosen FMCG companies in Lagos State, Nigeria.

The study's results aligned with the research conducted by Khan and Qianli (2017), which examined the impact of implementing a green supply chain on the economic and environmental performance of manufacturing companies in emerging Asian countries, including Pakistan (p. 16839). The study revealed that engaging in green shopping had a detrimental impact on a company's profits. In the study conducted by Agyabeng-Mensah et al., (2020), it was shown that green warehousing and logistics optimisation have a negative impact on economic performance, but they enhance economic performance by promoting supply chain sustainability (p. 37). Research has shown that social values and ethics have a beneficial role in enhancing both the sustainability of supply chains and economic performance.

Chou et al., (2017) discovered a negative correlation between the cost of community development and the financial success of companies (p. 822). Similarly, Zaid et al., (2018) found a negative link between green supply chain practices and financial success in China and Pakistan, respectively (p. 970). As stated by Green et al., (2019), implementing green practices helps enterprises build a positive reputation among environmentally conscious consumers (p. 120). This, in turn, leads to increased market value and sales, resulting in greater financial performance.

In contrast, the research conducted by Baah et al., (2021) revealed that sustainable logistics techniques had significantly impacted both environmental reputation and financial performance (p. 51). In relation to mediation, the environmental reputation did not act as a mediator in the connection between waste handling and financial performance. Nevertheless, it only partially acted as a mediator in the connections between sustainable transportation, sustainable information sharing, and financial performance. Furthermore, it completely facilitated the connections between reverse logistics, environmentally friendly packaging and distribution, green tracking and assessment, and financial performance. In addition, Osman et al., (2022) discovered that there exists a growing demand from consumers for eco-friendly transportation, with customers being willing to pay somewhat higher rates for such options (p. 15). In research conducted by Zhang et al., (2017), the correlation between sustainable logistics and economic growth and expansion, was investigated within the framework of developed nations (p. 1223). The results indicate that the logistics sector is of vital importance in enhancing and promoting the economic progression of nations. Afum et al., (2021) discovered that search engine optimisation (SEO) has a direct and noteworthy beneficial influence on environmental and social

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performance, but it does not affect financial performance (p. 259). Nevertheless, implementing sustainable supply chain management has a substantial influence on all aspects of sustainability performance.

In their study, Sroufe and Gopalakrishna-Remani (2018) discovered that implementing green supply chain practices can enhance a firm's financial performance by increasing its access to international market, resulting in higher revenue and market share (p. 12155). Additionally, green practices in the supply chain can lead to an increase in market share, improve brand image, draw in prospective clients, and ultimately boost net income while minimising sales costs (Laari et al., 2018, p. 1311). Aldakhil et al., (2018) performed panel research to examine the determinants that impact the adoption of green logistics techniques in BRICS member nations (p. 866). The outcomes indicated a favourable correlation between the use of environmentally friendly techniques in logistics operations and the achievement of sustainable economic and environmental development. In their study, Khan et al., in 2018 performed empirical studies on industrialised Europe nations to investigate the influence of logistics performance on macroeconomic and environmental variables (p. 273). The findings indicated that a strong performance in logistics positively influences the economic development of a country, but it has adverse consequences on environmental sustainability, particularly in terms of pollution, and global warming.

In their study, Khan and Qianli (2017) investigated the effects of implementing environmentally friendly practices in logistics and supply chain operations on the environmental and economic performance of companies (p. 16840). The findings suggest that implementing green practices leads to improved economic performance, characterised by higher levels of customer satisfaction and trust, increased efficiency in operations, and enhanced environmental sustainability, including reductions in greenhouse gas emissions and non-biodegradable garbage. Feng et al., (2017, p. 1271) and Zaid et al., (2018, p. 974) found an inverse connection between green supply chain practices and financial success in China and Pakistan, respectively. According to Green et al., (2019), implementing green practices enables companies to build a positive reputation among environmentally conscious consumers (p. 119). This, in turn, results in increased market worth and earnings, resulting in enhanced financial performance.

5. CONCLUSIONS AND RECOMMENDATION

It can be inferred from this study that the implementation of green logistics practices does not have significant effects on the financial sustainability of the chosen FMCG firms in Lagos State, Nigeria. While this research has not found any statistically significant impact of green logistics practices on financial management, it is important for the management of these organisations to recognise the potential long-term financial advantages of implementing green logistics practices. For example, implementing sustainable transportation methods can result in cost savings by decreasing fuel use, improving vehicle maintenance, and decreasing carbon emissions. In addition, investing in sustainable product design and packaging can enhance brand reputation and increase customer loyalty, leading to improved financial performance in the long run. Nevertheless, it is crucial to acknowledge that the research was carried out inside a particular setting (Lagos State, Nigeria) and concentrated on a certain sector (FMCG) posing a limitation. Therefore, the results may not be applicable to different sectors or situations. Future studies have the potential to reproduce this study in other settings or businesses in order to ascertain the generalizability of the results.

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