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The effects of Working Capital Management on the Financial Performance of Commercial and Services Firms Listed at Nairobi Securities Exchange in Kenya

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Abstract: Working capital management (WCM) is critical because it affects a company's profitability, liquidity, and investment decisions, all of which have an impact on financial performance. As a result, effective and efficient working capital management is an essential component for commercial and service businesses. Given the importance of the commercial and services industries to the Kenyan economy, the goal of this research was to look into the impact of working capital management on the financial performance of these firms, particularly those listed on the Nairobi Securities Exchange (NSE), from 2003 to 2022. Working capital management was measured using the average age of inventory, average collection period, average payment period, and cash conversion cycle, whereas financial performance was measured using return on asset, return on equity, and net operating profit margin. Using panel regression analysis, the results showed that the average inventory age, average collection period, average payment period, and cash conversion cycle were all negatively related to financial performance for NSE-listed commercial and services firms. Based on the findings, it is recommended that Kenyan commercial and services firms adopt prudent optimal working capital management practices in order to improve firm financial performance and maximize shareholder wealth.

Keywords: commercial and services firms; financial performance; Nairobi Securities Exchange; net operating profit margin working capital management

1. Introduction

Working capital management (WCM), like capital structure, cost of capital, dividends, and capital budgeting, is a critical concept in finance management because it helps to support long-term financial decisions. WCM refers to the management of current liabilities and current assets and is extremely important because it affects a firm's profitability and decisions, which in turn influence its financial performance [1]. As a result, to maintain stability and competitiveness, commercial and service firms must strike a balance between current liabilities and current assets. Appropriate and efficient working capital management is an essential component of commercial and service firms because it allows them to operate efficiently and contribute to a country's economic development. For example, commercial and service firms create new jobs, increase economic flexibility, provide opportunities for upward social mobility, and contribute to the country's GDP. Kenya, for example, is dealing with a high unemployment rate, which is expected to reach 5.6% in 2023 and rise to 6.19% (1.64 million people) by the end of 2024 [2]. To achieve long-term growth and address the country's economic development challenges, successful commercial and service firms must improve their performance. As a result, there is a need to better understand the relationship between WCM and the performance of commercial and service firms.

CSFs are businesses that act as intermediaries, purchasing and selling goods and services in their area of expertise. They do not engage in the synthesis of raw materials from start to finish, as do manufacturing companies that transform raw materials, but rather in commercial transactions that connect the producer with the end consumer. These companies act as intermediaries, transferring,

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storing, distributing, and selling goods and services. Apart from Longhorn Publishers, which has been reporting good performance (profits) [3], the Capital Markets Authority reports that there has been a persistent downward trend in financial performance results posted by companies in the NSE, particularly CSFs, with the majority of these firms on the verge of collapsing between 2013 and 2017, namely Atlas Development, Deacons, Eveready, Express Limited, Hutchings Biemer, Kenya Airways, and Uchumi supermarkets. Kenya Airways, for example, reported the country's worst corporate results in history, totaling $258 million US dollars for 2015-2016 [4]. The central question is whether these firms experienced a challenge to manage their working capital.

Nonetheless, various researchers conducted research on the WCM and performance and reported mixed results, namely a positive relationship [5–8] and a negative relationship [1,9,10]. A study by [6] and [7] examined the impact of WCM on the profitability of South African industrial firms. Their findings indicate that if such businesses can reduce their investment in working capital, their profitability tends to rise. For the reasons stated earlier, the current study will focus solely on Kenyan CSFs. Second, there have been very few studies in Kenya that focus on WCM and firm performance in the commercial and services segments of NSE-listed Kenyan companies. Despite extensive research, there remains a gap due to a lack of factual evidence to justify the optimal level of working capital required by firms to influence their profitability. A lack of consensus persists regarding the optimal level of working capital and how it affects a company's profitability [11–14]. The empirical research suggests that the direction of the relationship between working capital management and financial performance that generates shareholder value is still debated. This study aims to fill a knowledge gap by investigating the relationship between WCM and financial performance of firms listed on Kenya's Nairobi Securities Exchange.

2. Literature Review

Theoretical Review

Several theories have been proposed to explain WCM and firm financial performance, including the *Financing Advantage Theory, Cash Conversion Cycle (CCC) Theory, Transaction Cost Theory*, and *Stakeholder Theory*. According to [15], the *Financing Advantage Theory* postulates that managers who have a financial advantage develop an efficient receivables management strategy. This theory outlines a variety of receivables management practices, including assessing consumer credit worth, encouraging credit reimbursement in the event of nonpayment, and tracking reimbursements. The current study finds that the theory of financial advantages applies to CSFs when it comes to managing their account receivables. [16] introduced *CCC Theory*, which states that rapid cash conversion leads to proficient operating revenue management, which increases liquidity, profitability, and business value. However, the "cash conversion process" refers to the period during which real money is held in various accounts, such as receivables and inventory. Thus, a longer CCC lowers the firm's value and reduces profitability, causing a lag in the company's development. Firms with rising long-term expectations may fail and go bankrupt unless their liquidity is properly managed. This was one of the issues that contributed to Uchumi supermarket's poor financial performance in Kenya. This theory promotes the use of cash management to ensure that CSFs' financial performance improves.

According to [17], the *Transaction Cost Theory* states that good payables management can reduce the transaction costs of paying bills by accumulating bills and making scheduled payments for all of them, as opposed to piecemeal payments, which increase the organization's costs. However, when linking account payable to financial performance, the theory fails to take into account the type, size, and mode of business operation. According to the theory, management should devise a strategy for regulating and managing various companies' inventories and payables, as well as their impact on the organization's financial performance (Deloof, 2003). This theory is based on managing and regulating payables expenditure in order to maximize expected revenue, which translates into profit. If the firm does not manage and regulate its payables expenditure well, it may fail to settle payables on time, reducing the cash available for running the business and, as a result, affecting revenue generated from sales levels and profit [14].

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Stakeholder Theory is a view of capitalism that emphasizes the interconnected relationships between a company and its customers, suppliers, employees, investors, communities, and other stakeholders [18]. The theory contends that a company should generate value for all stakeholders, not just shareholders. Before the variable allocation is made between investors, the state, shareholders, and employees, the value typically emerges from the wealth generated by the adequate utilization of the company's supplies. Since the 1980s, scholars all over the world have questioned the viability of focusing on shareholders' wealth as the most fundamental goal of business. This theory lends support to the argument that improved financial performance (as measured by net profit margin) can be used to increase equity for stakeholders.

Empirical Review

Previous research has filtered the importance of WCM through various dimensions, such as the best approach to managing accounts receivable to maximize returns and the importance of optimal inventory management, among others. Although numerous studies have been conducted on the relationship between WCM and financial performance in both developed and developing countries, research on the impact of working capital management on firm profitability in Kenya is extremely limited. This is supported by existing literature [19,20] and a few student theses on the subject, some of which have been highly cited [21,22], as well as a few works published in predator journals. Furthermore, few studies have been conducted on the relationship between working capital and its impact on a firm's financial performance, particularly in Kenyan CSFs. Several studies that investigated the link between WCM and profitability yielded conflicting results. The mixed findings necessitate additional research, particularly to determine the consistency of results before making recommendations or policy recommendations.

Studies conducted by [5–8] found a positive relationship between WCM and profitability, whereas [7,9,10] reported a negative relationship. For example, [5] looked at how WCM affects the size and profitability of companies in the Czech Republic's manufacturing, wholesale, and retail sectors. From 2009 to 2019, the data sample included 3645 manufacturing firms and 5257 retail and wholesale firms. Using the GMM and comparison approach, the results showed a statistically significant relationship between WCM and company profitability and size. The findings revealed that CCC, working capital ratio, current liabilities ratio, and current assets ratio all have a positive impact on the profitability and size of all firms studied. [7] investigated the effect of WC efficiency (WCE) on the composite financial performance (CFP) of 796 non-financial listed Indian companies between 2015/16 and 2021/22. They used fixed effect logistic regression models to estimate the effect of CCC (accounts payable days, inventory days, and accounts receivable days) on CFP score while controlling for four variables (age, firm size, growth, and leverage). Their findings show that CCC is inversely associated with CFPS, implying that the firms' WCE leads to superior financial performance on a composite basis.

Ref. [10] examined the relationship between returns and WCM by selecting 43 scientific papers from 2003 to 2018, which covered nearly 62,000 enterprises in 35 countries. Using meta-analysis and meta-regression methods, the findings show that returns and the CCC have a common, negative relationship. There was a statistically significant and negative relationship discovered between profitability and the average collection period, inventory turnover cycle, and accounts payable period. [10] investigated how WCM affects the returns of 56 listed halal food and beverage companies in Malaysia, Indonesia, Pakistan, Saudi Arabia, and the United Arab Emirates. Unbalanced panel data from 2008 to 2021 were obtained from the Bloomberg database and analyzed using the two-step system generalized method of moments (GMM) technique, with the robustness of the results tested using generalized least square regression (FGLS).

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3. Materials and Methods

Study Population and Sample Size

The Nairobi Securities Exchange (NSE) has 59 listed companies, 13 of which are in the commercial and services segment. As a result, the study's population consisted of all CSFs listed consecutively on the NSE between 2003 and 2022. The final sample consisted of six CSFs with 20 years of operation, yielding a panel data of 120 observations.

Data Collection

The required data for the study was gathered from audited financial statements and other relevant annual reports available on the respective CSFs' websites from 2003 to 2022. These data included the nature of the company, its size, total asset value, period of existence, county, firm background, and financial performance parameters (profitability ratios).

Variable Description

The financial performance of the firms was assessed using profitability ratios as the dependent variable. To assess the efficiency of the CSFs in generating profits, the dependent variables were measured using return on equity (ROE), return on asset (ROA), and net operating profit margin (NOPM). The WCM was represented by four variables (CCC, ACP, AAI, and APP) that served as independent variables in the study. The study's control variables included firm size, leverage, and current ratio. The variables are defined in **Table 1**.

Table 1. Description of variables.

Variables	Symbol	Description	Measurement
Return on assets	ROA	ROA is a profitability ratio that provides how much profit a company can generate from its assets	$\frac{\text{Net income}}{\text{total assets}}$
Return on equity	ROE	ROE is the measure of a company's annual return (net income) divided by the value of its total shareholders' equity, expressed as a percentage	$\frac{\text{Net income}}{\text{total equity}}$
Net operating profit margin	$NOPM$	$NOPM$ is a ratio of earnings before interest and tax divided by total revenue.	$\frac{\text{EBIT}}{\text{Total revenue}}$
Average age of inventory (AAI)	λ	The AAI is the average number of days it takes for a firm to sell off inventory.	$\left[\frac{\text{Cost of goods}}{\text{sold inventory}}\right] \times$ 365 days
Average collection period (ACP)	ψ	ACP refers to the amount of time it takes for a business to receive	$\left[\frac{\text{Accounts receivable}}{\text{Net sales}}\right] \times$ 365 days

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		payments owed by its clients in terms of accounts receivable.	
Average payment period (APP)	δ	The APP is the average time period taken by a company to pay off their dues against the purchases made on a credit basis from the supplier.	$AAI + ACP = APP$
Cash conversion cycle (CCC)	ϖ	CCC is the average time difference between paying suppliers and recouping the amount invested in inventory and debtors.	$\left[\frac{\text{Accounts payable}}{\text{Cost of sales}}\right] \times$ 365 days
Firm size (SIZE)	ϑ	Firm size is the logarithm of the total assets of any given firm. It is assumed that as the company grows, its sales also increase.	Logarithm of total assets
Current ratio (CR)	θ	Current ratio is a liquidity measure that indicates whether a firm has current assets to cover for its short-term financial obligations. It's a ratio current asset to current liabilities.	$\frac{\text{Current assets}}{\text{current liabilities}}$
Leverage (LEV)	η	Leverage is considered as a firm's risk and it measured as the amount of debt a firm uses to finance assets.	$1 - \left[\frac{\text{Equity}}{\text{Total assets}}\right]$

Source: Authors' compilation.

Diagnostic Tests

Diagnostic tests were performed to ensure that the estimated models were robust and well specified, including unit root tests, Hausman specification tests, Variance Inflation Factor (VIF) tests for multicollinearity, and the Breusch-Pagan Lagrange multiplier (LM) test. The unit root test indicated that the data was stationary at the first difference; the Hausman specification test indicated that the fixed-effect estimator was superior to the random-effect estimator; the VIF factor indicated that there was no multicollinearity in the dataset; and the Breusch-Pagan Lagrange multiplier (LM)

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test revealed that there was no serial correlation in the data. To avoid digression and focus on the study's objective, diagnostic tests are not included in this paper but are available upon request.

Model Specification

The relationship between WCM and financial performance was estimated using a panel regression model. Given the three dependent variables (return on assets, return on equity, and net operating profit margin), the estimation models are as follows:

$$Model\ 1: ROE = \alpha_o + \lambda_1\alpha_1 + \psi_1\alpha_2 + \delta_1\alpha_3 + \eta_1\alpha_4 + \vartheta_1\alpha_5 + \theta_1\alpha_6 + \varpi_1\alpha_7 + \varepsilon_{it} \quad (1)$$

$$Model\ 2: ROA = \beta_o + \lambda_2\beta_1 + \psi_2\beta_2 + \delta_2\beta_3 + \eta_2\beta_4 + \vartheta_2\beta_5 + \theta_2\beta_6 + +\varpi_2\beta_7\varepsilon_{it} \quad (2)$$

$$Model\ 3: NOPM = \phi_o + \lambda_1\phi_1 + \psi_2\phi_2 + \delta_2\phi_3 + \eta_2\phi_4 + \vartheta_2\phi_5 + \theta_2\phi_6 + +\varpi_2\phi_7\varepsilon_{it} \quad (3)$$

where ROA is Return on assets, ROE is return on equity and $NOPM$ is net operating profit margins. In addition, λ is average age of inventory; ψ is average collection period; δ is average payment period; η is leverage; ϑ is firm size; θ is current ratio; ϖ is cash conversion cycle; and ε_i is error term. The regression coefficients are as follows: $\alpha_o, \alpha_1, \alpha_2, \ldots \alpha_6$ for Model 1; $\beta_1, \beta_2, \ldots \beta_6$ for Model 2; and $\phi_1, \phi_2, \ldots \phi_6$ for Model 3. α_o is constant for Model 1, β_o for Model 2 and ϕ_o for Model 3.

4. Results and Discussions

Descriptive Statistics

Table 2 summarizes the descriptive statistics for the study variables, including the minimum and maximum values, median, mean, and standard deviation.

Table 2. Summary of descriptive statistics.

Variable	Mean	Median	Standard Deviation	Minimum	Maximum
Return on assets	0.092	0.095	0.428	-0.510	0.432
Return on equity	0.284	0.260	0.872	-1.358	2.264
Net operating profit margin	0.073	0.051	0.750	-0.816	620
Average collection period	78.26	40.85	1.946	5	571.00
Average age of inventory	35.92	42.69	1.361	0	105.47
Cash conversion cycle	70.71	30.52	15.675	-62.47	598.00
Average payment period	30.64	29.79	0.592	3	101.00
Current ratio	2.02	1.05	1.38	0.51	5.94
Leverage	0.549	0.527	0.947	0.084	0.842

Source: Authors' Computation.

The average return on assets for Kenyan commercial and service firms listed on the NSE was 9.20 percent, implying that every shilling invested in assets produced KShs. 9.20 in earnings. The commercial and services firms averaged a return on equity of 28.40%, demonstrating efficient use of shareholders' capital. Furthermore, the commercial and service firms in this study averaged a net operating profit margin of 7.30%. According to these findings, commercial and service firms achieved a higher return on equity than both the return on assets and the net operating profit margin, which are profitability measures. This suggests that management in commercial and service firms used

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shareholders' equity to generate income in an effective and resourceful manner. This result supports stakeholders' theory that firms exist to maximize shareholder wealth. The *Stakeholders' Theory* supports the argument that improved financial performance (measured by net profit margin) can be used to increase stakeholder equity. The findings revealed that commercial and service firms took 78.26 days on average to collect payment from debtors. This means that commercial and service firms had to wait more than a month on average to collect payment for credit sales. The average inventory age, which measured how long it took to sell the goods recorded by commercial and service firms, was 35.92 days, with no minimum days and a maximum of 105.47 days.

On average, commercial and services firms had a cash conversion cycle of 150.71 days, with minimum and maximum values ranging from -62.47 days to 598 days. This implies that the cash conversion cycle was highly variable, possibly due to differences in credit policies between commercial and service firms. This five-month CCC is extremely long on average, and according to *Cash Conversion Cycle Theory*, it reduces the firm's value and profitability, causing a lag in the company's development. As previously stated, this was one of the issues that contributed to Uchumi supermarket's poor financial performance in Kenya. Commercial and service firms reported an average payment period of 30.64 days, with a median value of 29.79 days. What stands out is that the mean and median values were nearly identical, indicating a symmetric data distribution. The average payment period recorded by commercial and service firms was 3 days at its lowest, while it reached its highest of 101 days.

Empirical Findings

Table 3 shows the summary results of the panel regression model analysis for the three dependent variables.

Table 3. Panel regression results for the three models.

		Dependent Variables							
		Constant	AAI	ACP	APP	CCC	LEV	SIZE	CR
Model 1	Pooled-OLS ROA	-0.413* (-1.24)	-0.018** -(3.19)	-0.148*** (-0.35)	-0.019* (-4.08)	-0.317* (-0.06)	-0.059 (-8.63)	0.033*** (-7.31)	-0.745*** (-5.62)
	Random-Effects ROA	-0.554 (-1.93)	--0.007** (-2.36)	-0.147** (-0.42)	-0.022** (-1.62)	-0.310** (-5.09)	0.053 (-5.94)	0.030* (-1.09)	-0.745* (-4.02)
	Fixed-Effects ROA	0.449 (-0.84)	-0.018** (-6.17)	-0.148** (-4.21)	-0.021** (-2.72)	-0.316** (-4.11)	0.156 (-8.37)	0.032 (-5.53)	0.789 (-2.46)
Model 2	Pooled-OLS ROE	-0.352*** (-3.58)	-0.014** (-1.64)	-0.077** (-4.18)	-0.028** (-4.28)	-0.173** (-1.06)	0.418 (-4.08)	0.996*** (-4.28)	0.122 (-5.08)
	Random-Effects ROE	-0.345 (-2.11)	-0.004** (-0.67)	-0.072** (-0.67)	-0.025** (-2.09)	-0.174** (-7.26)	-0.417 (-1.34)	0.996** (-1.87)	0.121 (-1.36)
	Fixed-Effects	-0.351 (-5.14)	-0.005*** (-3.86)	-0.077*** (-1.56)	-0.028** (-1.82)	-0.173** (-3.17)	-0.417 (-3.60)	0.995 (-2.48)	0.122 (-1.41)

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	ROE								
Model 3	Pooled-OLS NOPM	-0.274 (-1.24)	−0.115*** (−6.24)	−0.108*** (−4.03)	−0.103** (−1.35)	−0.825** (−4.59)	−0.184 (−0.44)	0.351** (-2.42)	-0.189 (-3.37)
	Random-Effects NOPM	-0.178 (-0.59)	−0.114*** (−6.37)	−0.106*** (−4.71)	−0.102** (−1.27)	−0.812** (−1.44)	0.179 (-2.08)	0.356 (-1.08)	-0.195 (-2.42)
	Fixed-Effects NOPM	0.269 (-1.09)	−0.115*** (−6.21)	−0.106*** (−4.80)	−0.102** (−1.25)	−0.825** (−2.63)	0.183 (-2.45)	0.354 (-0.93)	0.188 (-1.36)

Source: Results estimates.

Table 3 shows the panel regression results for the three models; return on asset (ROA) is the dependent variable for Model 1, return on equity (ROE) is the dependent variable for Model 2, and net operating profit margin (NOPM) is the dependent variable in Model 3.The test results for Model 1 show that return on asset is negatively correlated with all four working capital management variables: average age of inventory (AAI), average collection period (ACP), average payment period (APP), and cash conversion cycle. According to the FE estimator, a 1% increase in average inventory age, average collection period, average payment period, and cash conversion cycle resulted in a 0.02%, 0.15%, 0.02%, and 0.32% decrease in NOPM, respectively, all of which were statistically significant at the 5% level. The findings are consistent with [9,10] and [23], but not with [5,6] and [12]. For example, [23] discovered a negative relationship between average payables period and return on assets, indicating that longer payables periods had the potential to reduce a firm's earnings if the cost of financing purchases was greater than the benefits

The test results for Model 2 show that return on equity is negatively related to all four working capital management variables: average age of inventory, average collection period, average payment period, and cash conversion cycle. The results show that the relationship between return on equity and average inventory age, as well as return on equity and average collection period, is statistically significant at the 1% level. Furthermore, the results show that the relationship between return on equity and average payment period, as well as return on equity and cash conversion cycle, is statistically significant at the 5% level. This finding is consistent with [7–9,12] and [24]. For example, [12] discovered that return on equity has a negative relationship with the cash conversion cycle (CCC), a negative, statistically significant relationship with the average collection period (ACP), and a negative, statistically significant relationship with the accounts payable period (APP). These findings were consistent with *Cash Conversion Cycle (CCC) Theory*, which advocates for efficient account payable management to reduce the risk of bankruptcy and financial distress, thereby increasing a firm's value.

The test results for Model 3 show a negative relationship between net operating profit margin and average inventory age, which is statistically significant at the 1% level. Similarly, the results show a negative relationship between net operating profit margin and average collection period, which is statistically significant at the 1% level. Net operating profit margin is also negatively related to both average payment period and cash conversion cycle, and the FE estimator shows that a 1% increase in average payment period and cash conversion cycle resulted in a 0.10% and 0.83% decrease in net operating profit margin, respectively, all of which are statistically significant at the 5% level of significance. This finding supports the findings of [9], who discovered a significant negative relationship between average collection period and net operating profit margin. This implies that early collection from customers boosts a company's performance by providing cash flow to support both operational and financing activities.

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The findings of this study revealed that: (i) the average age of inventory was negatively related to working capital management; (ii) the average collection period was negatively related to working capital management; (iii) the average payment period was negatively related to working capital management; and (iv) the cash conversion cycle was negatively related to working capital management. The findings of this study also show that the relationship between working capital management and financial performance is statistically significant at the 5% level.

This result is consistent with [1,9,10]. [9] used a fixed-effects estimator to investigate the relationship between financial performance and WCM retail firms listed on South Africa's JSE, and the findings were fourfold: (i) There is a negative relationship between average collection period and financial performance; (ii) There is a negative relationship between average inventory age and financial performance measures (ROA and NOPM); (iii) The average payment period was found to be negatively related to return on equity; and (iii) The cash conversion cycle and net operating profit margin variables were found to be negative. [10] discovered a statistically significant and negative correlation between profitability and cash conversion cycle, profitability and average collection period, and profitability and accounts payable period.

5. Conclusions

This paper looked at how working capital management affects the financial performance of commercial and service firms listed on Kenya's Nairobi Securities Exchange. The study's population included all 13 commercial and services firms that were listed consecutively on the NSE between 2003 and 2022, resulting in a final sample of 6 commercial and services firms. Using panel regression analysis, the results revealed that: (i) the average age of inventory was negatively related to working capital management; (ii) the average collection period was negatively related to working capital management; (iii) the average payment period was negatively related to working capital management; and (iv) the cash conversion cycle was negatively related. As a result, it was determined that working capital management is negatively correlated with financial performance for commercial and service firms listed on the Nairobi Securities Exchange. The study's practical implications are that firm decision makers should consider the importance of working capital management strategies in order to improve firm performance and financial sustainability. This study has a limited scope. Future research could look into all of the firms listed on the Nairobi Securities Exchange, as well as commercial and service firms listed on all East African stock exchanges.

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Data availability: Data will be made available on reasonable request.

Use of artificial intelligence: The authors confirm that they did not use artificial intelligence technologies when creating the current work.

Conflicts of Interest: The authors declare that there is no conflict of interest in relation to this paper, as well as the published research results, including the financial aspects of conducting the research, obtaining and using its results, as well as any non-financial personal relationships.

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