Impact of Dynamic Working Capital Management on Operational Efficiency: Empirical Evidence from Scandinavia

Abstract

Purpose: Consumer goods firms often tie up inventory and accounts receivable resources, creating cost and liquidity issues. Dynamic working capital management (DWCM) can mitigate these concerns and enhance operational profitability. The study investigates DWCM's impact on operational efficiency (OE).

Design/methodology/approach: The empirical estimation uses pooled Ordinary Least Squares, random effect, and system Generalized Method Moments regression analysis of consumer goods firms in Scandinavia from 2005 to 2022 to present the results.

Findings: The findings indicate that DWCM has an inverse relationship with operating cost while positively impacting operating profit. The final outcome demonstrates that DWCM enhances OE. Furthermore, the working capital ratio (WCR) consistently exceeds the cash conversion cycle (CCC) in all models, indicating that prudent management of cash in accounts receivable, inventory, and accounts payable leads to higher cost savings and superior performance.

Originality/Value: This paper adds to literature on how DWCM affects OE in the consumer goods sector. It also highlights the impact of time management and cash management of WCM on OE. Additionally, it analyzes how DWCM variables affect operating costs and profits, shedding light on their efficiency impact.

Practical implications: The results suggest that organizations that prioritize the management of the absolute cash committed to inventory, receivables, and payables as much as the CCC experience improved OE.

Keywords: Dynamic working capital management, operating cost, operating profit, operating efficiency, Scandinavian markets, GMM

1. Introduction

Managing the gap between the purchase of raw materials and the receipt of payment from the sale of the final product is essential to maximizing firm efficiency and profitability. Although the operating process is affected by several factors that need attention, the unique nature of working capital management (WCM) requires special consideration, as total assets comprise 61.7% of current assets (Rey-Ares *et al.*, 2021). Investments in inventory and accounts receivable take up a substantial slice of the total investment of many firms (Nwude *et al.*, 2021; Özkaya and Yaşar, 2023).

In this regard, WCM requires the maintenance of the proper levels of current assets against current liabilities. Its objective is maintaining sufficient cash flow to mitigate liquidity risks and promptly settle short-term obligations. Effective WCM involves the proper planning and control of short-term assets and liabilities in a manner that balances liquidity and profitability. It demands a dynamic approach that incorporates a holistic management perspective. As opposed to a static view of working capital (WC), such as current and quick ratios, dynamic working capital management (DWCM) requires total management of the whole operating cycle while keeping an eye on the individual parts (Moss and Stine, 1993).

This study focuses on the consumer goods sector from 2005 to 2022. To the best of our knowledge, few empirical studies pay particular attention to this sector, which deals with considerable volumes of inventory, accounts receivable, and accounts payable within the operating cycle. Moreover, an average of 77% of previous studies on WCM focus on the length of time attributable to the operating cycle measured by the cash conversion cycle (CCC) (Prasad *et al.*, 2019). Therefore, this study looks at DWCM in terms of the CCC and employs the working capital ratio (WCR). CCC manages the time involved in translating inventory and accounts receivable into cash (Deloof, 2003), while WCR accounts for the actual money involved in the operating cycle (Jaworski and Czerwonka, 2022).

Additionally, a substantial number of prior studies pay attention to the profit-generating potentials of WCM measured by return on assets (ROA), return on equity (ROE), and return on invested capital (ROIC), while approximately only 39% focuses on returns attributable to the operating activities such as gross margin, net margin, and operating margin (OM) (Prasad *et al.*, 2019). While the study uses OM, it also pays attention to the cost management potential of WCM by employing the operating expense ratio (OER). Few prior empirical works assess the cost or risk management potential of WCM (Aktas *et al.*, 2015; Le, 2019). Hence, this study focuses on complete operational efficiency (OE) in terms of cost and profitability. It aims to evaluate the impact of DWCM on OE with evidence from consumer goods firms from 2005 to 2022.

The novelty of the study lies in its comprehensive approach. First, the results are drawn from a broader view of efficiency as consisting not only of profitability but also of cost. Profitability is measured from the operational perspective measured by the OM rather than from the overall profitability viewpoint, such as the ROA. Rather than an overall cost perspective, the study looks at cost from an operational viewpoint by employing the OER. These perspectives are consistent with the purpose of WCM, that is, the management of the day-to-day operational activities of the firm. Second, the analysis of the results is based on a two-sided view of WCM. In addition to the time management view of WC proxied by the CCC, the study focuses on the absolute cash attributable to WC, presenting a more holistic view of WCM. Finally, the study arrives at its conclusions by employing three analytical approaches: pooled Ordinary Least Squares, Fixed Effect, and the two-step system Generalized Method Moments.

The study finds an inverse relationship between DWCM and operating cost, while DWCM impacts operating profit positively. DWCM therefore has the aggregate effect of enhancing OE. As a result, this study contributes to existing literature.

First, it adds to the growing literature on how DWCM impacts OE, with particular emphasis on consumer goods firms in the Scandinavian market. Second, it provides evidence to show the effect of both the length of time management and the actual cash management of WCM on OE. Third, it examines the influence of the DWCM variables on operating cost and operating profit to identify their impact on efficiency. Finally, it employs several analytical procedures to assess the impact of DWCM on OE and present its results.

WCM is of particular essence to firms in the consumer goods space. For instance, from the reports of XXL—a sportswear retail company with a presence in the Nordic region—79% and 78% of current assets are held in inventory and accounts receivable in 2021 and 2022, respectively. Account payables represent 23% and 32% of current liabilities during the same period (XXL ASA, 2022). Existing studies report different results on how WCM affects firm performance. Amponsah-

Kwatiah and Asiamah (2020) and Gonçalves *et al*. (2018) present a positive relationship between these variables. Conversely, Lyngstadås and Berg (2016) and Hassan *et al*. (2023) report an inverse relationship. The debate on the specific nature of the relationship between WCM and profitability is far from settled. Particularly, literature on how DWCM impacts OE is scarce.

Scandinavia is the setting for this study for diverse reasons. First, Scandinavian countries represent a region of political and economic stability on a global scale. Furthermore, these markets foster a supportive business environment, rendering them particularly favorable for commercial activities (Hassan *et al.*, 2023). Previous literature on the topic focuses on individual countries in Scandinavia (Denmark, Norway, and Sweden) (Bratland and Hornbrinck, 2013; Enqvist *et al.*, 2014; Lyngstadås and Berg, 2016; Yazdanfar and Öhman, 2014) and even fewer on the region combined (Hassan *et al.*, 2023). This study seeks to assess DWCM's impact on OE with evidence from the Scandinavian markets. Even though the evidence of the study is drawn from this region, the findings apply to other politically and economically stable economies with supportive business environments.

The following section discusses existing literature and hypotheses development for empirical testing, and section 3 discusses the method, data, variables, and estimation procedure. Section 4 reports the results of empirical analysis and implications, and conclusions are presented in section 5.

2. Previous Literature and Hypothesis Development

2.1 Dynamic Working Capital Management and Efficiency

The role of WCM as a key influencing factor on firm performance and risk has received considerable attention (Nwude *et al.*, 2021). For most businesses, cash goes into inventory and accounts receivable while they depend on accounts payable to fund their operations (Deloof, 2003). Therefore, the efficient management of these components of the operating processes is a significant task for managers and requires utmost discernment. The management of the components of WC in a harmonious fashion in order to derive the combined benefit is the objective of efficient WCM.

Moss and Stine (1993) distinguish between the static and dynamic views of WCM. The traditional liquidity measures, like the current and quick ratios, focus on static balance sheet values. Despite its value in assessing a firm's ability to fulfill financial obligations promptly, the static approach has limitations in evaluating its comprehensive cash management capabilities (Wichitsathian and Pestonji, 2019). The usefulness of the static liquidity measures is constrained by their inability to offer sufficient insights into the cash flow dynamics associated with the transformation process within a firm's WC position. Static liquidity indicators primarily emphasize a liquidation-oriented perspective rather than a going concern approach to the firm’s liquidity assessment (Richards and Laughlin, 1980).

DWCM enhances the firm's liquidity from an ongoing concern standpoint. The dynamic approach captures the net time interval between the actual cash expenditures made by a firm to acquire its productive resources and the subsequent cash receipts derived from sales of the products. It determines the duration required to convert each dollar of cash expenditures back into a corresponding cash inflow generated through the firm's regular business operations. A dynamic

approach to WCM effectively monitors receivable collections, payable settlements, and inventory movements. It is crucial in identifying the essential sources of liquidity, tracking and correcting trade collection discrepancies, as well as payable inefficiencies. With DWCM, the firm can adjust and optimize its trade credit policies and take advantage of its supplier's credit terms.

DWCM can be viewed from a time or actual cash management perspective. The CCC is the commonly used DWCM indicator. It recognizes the importance of time lag in the production, distribution, and collection inherent in the operating cycle (Malm and Sah, 2019). The CCC is an essential approach to determine how well a business handles its WC in terms of duration. It focuses on accounts receivable, accounts payable, and inventory. Hence, it is the number of days a company takes to sell its inventory, collect its debts, and pay off its suppliers and other payables (Baker *et al.*, 2017).

Boțoc and Anton (2017) argue that the length of time as measured by the CCC is relatively low in magnitude and fails to monitor the amount of money involved in the operating cycle. The CCC mainly deals with time-related aspects of a company's financial operations, often in days or weeks. While an important indicator, it might not comprehensively depict a business's complete financial scale or magnitude. Additionally, the CCC might not adequately capture the sheer monetary value attributable to the operating cycle. It emphasizes the duration of various processes within the cycle, such as inventory turnover, payables settlement, and receivable collection. However, it does not directly account for the volume of money moved through these processes. This phenomenon means that a company with a lower CCC might still have a substantial amount of money tied up in its operations. It can be a limitation, especially for larger enterprises or industries with significant capital investments.

A number of empirical works establish a positive connection between CCC and profitability. Abuzayed (2012) examines the listed firms on the Amman stock market from 2000 to 2008. The results indicate that CCC has a positive relationship with firm profitability. A study of a sample of 263 nonfinancial BSE 500 firms listed on the Bombay Stock Exchange (BSE) from 2000 to 2008 reports a positive impact of CCC on firm performance (Sharma and Kumar, 2011). This positive relationship between CCC and profitability is reported by several other studies (Amponsah-Kwatiah and Asiamah, 2020; Gonçalves *et al.*, 2018).

On the other hand, extant literature finds the WCM-profitability nexus to be negative. Using a seemingly unrelated regression model, Yazdanfar and Öhman (2014) examine cross-sectional panel data from 13,797 SMEs operating in four industries. According to the empirical findings, the CCC has a negative impact on firm profitability. Evidence to support a negative influence of CCC on profitability is also presented by Aldubhani *et al*. (2022). Using multiple regression techniques, they analyzed a sample of 10 manufacturing firms listed on the Qatar Stock Exchange from 2015 to 2019. The inverse relationship gains support from other prior studies (Lyngstadås and Berg, 2016; Özkaya and Yaşar, 2023). Alternative strands of literature report a nonlinear CCC-profitability relationship. A concave or inverted U-shape is identified to define the connection between these two variables. These findings indicate an optimal level of WC at which profitability is maximized (EL-Ansary and Al-Gazzar, 2021; Shakil *et al.*, 2019).

The WC cash management approach mitigates the weakness of the CCC. It considers the absolute amount of capital involved in the operating cycle. This approach employs the net WC-to-sales ratio or the WCR, and it is defined as ((Inventories + Account receivables) – (Account

Payables))/Sales. Anton *et al*. (2021) explore actual money management instead of the length of time by employing the WCR rather than the CCC mechanism to establish the relationship between WCM and profitability. The result establishes an inverted U-shape relationship between WCR and ROA of Polish firms. Using a panel dataset of high-growth firms from southeastern, eastern, and central Europe from 2005 to 2016, Boțoc and Anton (2017) report a nonlinear relationship between WCM measured by WCR and firm profitability. Jaworski and Czerwonka (2022) find that increasing WCR values causes profitability to rise at a slower rate. The study uses 326 public companies listed on the Warsaw stock market from 1998 to 2016.

Most previous studies focus on the profit-generating abilities of WCM measured by ROA, ROE, and ROIC. In contrast, few others focus on returns attributable to the operating activities, such as gross margin, net margin, and OM (Prasad *et al.*, 2019). The former measures evaluate the effectiveness of capital utilization and return generation. They relate to returns on different types of capital (total assets, shareholders' equity, and all invested capital) and consider the impact of financing and capital structure on returns. They are useful for comparing a company's performance against industry peers or across different periods.

The latter measures assess different levels of profitability based on varying expense considerations. They focus on different stages of revenue generation and associated costs and analyze specific aspects of revenue generation and cost management within the firm's core operations. These measures are useful for comparing the efficiency of revenue generation and cost management within a company. Moreover, Richards and Laughlin (1980) argue that CCC is inherently connected to the operating cycle, making it a suitable metric for evaluating its influence on operating profitability. Assessing the impact of the CCC on operating profitability is justified and rightly suited because it aligns with the core operating activities of the business and reflects the timing of cash flows within the operating cycle accurately.

In addition, there is a scarcity of previous empirical studies that assess the cost or risk management abilities associated with WCM (Aktas *et al.*, 2015; Le, 2019). This study uses OM, a profitability measure linked to the operating cycle, while also considering the cost management potential of DWCM by employing the OER. The primary focus of this research is to examine the impact of DWCM on the overall OE, encompassing both cost management and profitability aspects. This study hypothesizes that

H1: CCC negatively impacts OER

H2: WCR negatively impacts OER

H3: CCC positively impacts OM

H4: WCR positively impacts OM

3. Methodology

This study analyses the impact of DWCM on the OE with evidence from listed consumer goods firms. This section presents the data, sources, and variables employed. Finally, the estimation procedure and summary of variables are presented.

3.1 Data

This study uses financial and Environment, Social and Environment (ESG) data of listed consumer goods firms from three Scandinavian markets. The data are obtained from the Refinitiv Eikon database for eighteen years, from 2005 to 2022. Concerning data on sustainable practices, companies with at least a year of reported ESG scores within the study period are included.
Several filters are applied to improve the accuracy and consistency of the data. Firms with incomplete data are excluded from the analysis. Winsorization is applied to deal with the issue of outliers. The final sample has 61 consumer goods firms with 1098 firm-year observations after filtering.

3.2 Variables

Using profitability proxies such as ROA, ROE, ROIC, and Tobin's Q (Boțoc and Anton, 2017; Sawarni *et al.*, 2021) is common while analyzing the relationship between firm performance and various financial variables. The story is not different in the area of WCM. This study takes a different approach, specifically looking at operational efficiency rather than at overall firm profitability measures. Therefore, it focuses on both cost and returns in the operating cycle. This study uses two OE indicators to explain DWCM's impact on OE. First, a measure of efficiency in managing cost is proxied by OER, and a measure of efficiency in profit generation proxied is by OM.

Similarly, two variables are used to measure DWCM: a measure of the length of time to convert inventory and accounts receivable to cash in the operating cycle proxied by CCC (Deloof, 2003; Seth *et al.*, 2020) and WCR, an indicator of the absolute amount of money connected to the operating cycle (Boțoc and Anton, 2017). These two measures give a holistic view of both the time and cash management attributable to the operating cycle. To control for other possible influences on OE, account receivable days (ARD), account payable days (APD), ROA, gross domestic product (GDP), and firm size (FSa) are included in the analysis. The study also controls the influence of sustainable operations on OE by including ESG dummy variables.

Table I Summary of Variables

Variables	Notation	Formula
A. Dependent Variables		
Operating Expenses ratio	*OER*	Total Operating Expenses/Total Revenue
Operating Margin	*OM*	Operating Income/ Total Revenue
BI. Independent Variables		
Cash Conversion Cycle	*CCC*	ARD + InvD – APD where; ARD = Accounts Receivable Days InvD = Inventory Days APD = Accounts Payable Days
Working Capital ratio	*WCR*	(AR + Inv – AP)/TR where; AR = Accounts Receivable Inv = Inventory AP = Accounts Payable TR = Total Revenue
BII. Control Variables		
Account Receivable Days	*ARD*	Accounts Receivable* 365 COGS
Account Payable Days	*APD*	Accounts Payable* 365 COGS
Return on Assets	*ROA*	Net income/Total Assets
Firm size	*FSa*	Natural Log of Total Assets
Macroeconomic variable		
Gross Domestic Product	*GDP*	GPD growth rate
Sustainability Variable		
Economic Social Governance	*ESG*	ESG Dummy

Source(s): Authors' own creation

3.3 Estimation

This work employs the pooled OLS, panel regression, and dynamic panel data in GMM procedures to ensure the robustness of the results. Previous literature follows a similar process (Boțoc and Anton, 2017; Kafeel *et al.*, 2020). DWCM variables, firm control variables (FC), macroeconomic controls (MC), and sustainability dummy (ESG) are regressed against OE variables. The baseline regression is as follows:

$$OE = \beta_0 + \beta_1 WCM_{it} + \beta_2 FC_{it} + \beta_3 MC_{it} + \beta_4 ESG_{it} + \mathcal{E}_{it} \quad (1)$$

The estimation process begins with the use of the pooled OLS method. This model assumes that the relationships between the variables are constant over time and across individuals. Each WCM variable and the control variables are regressed against the OE variables.

$$Y = \beta_0 + \beta X + \mathcal{E} \quad (2)$$

$$OER = \beta_0 + \beta_1 CCC + \beta_2 ARD + \beta_3 APD + \beta_4 ROA + \beta_5 FSa + \beta_6 GDP + \beta_7 ESG + \mathcal{E} \quad (2a)$$

$$OER = \beta_0 + \beta_1 WCR + \beta_2 ARD + \beta_3 APD + \beta_4 ROA + \beta_5 FSa + \beta_6 GDP + \beta_7 ESG + \mathcal{E} \quad (2b)$$

$$OM = \beta_0 + \beta_1 CCC + \beta_2 ARD + \beta_3 APD + \beta_4 ROA + \beta_5 FSa + \beta_6 GDP + \beta_7 ESG + \mathcal{E} \quad (2c)$$

$$OM = \beta_0 + \beta_1 WCR + \beta_2 ARD + \beta_3 APD + \beta_4 ROA + \beta_5 FSa + \beta_6 GDP + \beta_7 ESG + \mathcal{E} \quad (2d)$$

OER measures the costs of operations, and OM measures the returns from operations. These variables are the dependent variables and indicate operational efficiency. The independent variables of interest, which are the indicators of DWCM, include CCC and WCR. CCC measures the number of days to convert inventory and accounts receivable to cash. WCR is a proxy for the

amount of cash committed to the operating cycle. The variables ARD, APD, ROA, and FSa are used as firm-level controls, while GDP is the control variable at the country level. The study introduces ESG, a dummy variable for firms with reported sustainable operations during the study period. It equals 1 for the period when ESG data availability for a particular firm and 0 otherwise. Ɛ represents the error term.

The second level of analysis employs the panel regression model following previous studies (Hassan *et al.*, 2023; Sawarni *et al.*, 2021). Panel data analysis allows for the estimation of individual-specific effects, time-specific effects, and the relationships between variables that may vary across individuals and over time. The fixed and random effect techniques are analyzed, and suitable models for the data are selected. The random effect technique is appropriate based on the Hausman test. Previous investigations arrive at similar decisions using the random effect technique (Boțoc and Anton, 2017).

$$Y_{it} = \alpha + \beta X_{it} + \gamma D + \mu_{it} \quad (3)$$

$$OER_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 ARD_{it} + \beta_3 APD_{it} + \beta_4 ROA_{it} + \beta_5 FSa_{it} + \beta_6 GDP_{it} + \beta_7 ESG_{it} + \gamma D_i + \mu_{it} \quad (3a)$$

$$OER_{it} = \beta_0 + \beta_1 WCR_{it} + \beta_2 ARD_{it} + \beta_3 APD_{it} + \beta_4 ROA_{it} + \beta_5 FSa_{it} + \beta_6 GDP_{it} + \beta_7 ESG_{it} + \gamma D_i + \mu_{it} \quad (3b)$$

$$OM_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 ARD_{it} + \beta_3 APD_{it} + \beta_4 ROA_{it} + \beta_5 FSa_{it} + \beta_6 GDP_{it} + \beta_7 ESG_{it} + \gamma D_i + \mu_{it} \quad (3c)$$

$$OM_{it} = \beta_0 + \beta_1 WCR_{it} + \beta_2 ARD_{it} + \beta_3 APD_{it} + \beta_4 ROA_{it} + \beta_5 FSa_{it} + \beta_6 GDP_{it} + \beta_7 ESG_{it} + \gamma D_i + \mu_{it} \quad (3d)$$

The panel regression model introduces individual firm i at time t effect for all the variables. γD represents the fixed effect and μ is the error term.

The final level of estimation uses the two-step system generalized method of moments (SYS-GMM) technique proposed by Arellano-bond, similar to prior studies (Baños-Caballero *et al.*, 2016). The panel system GMM estimation method aims to address endogeneity and control individual-specific heterogeneity and account for potential dynamic panel bias. Utilizing lagged-dependent and instrumental variables provides consistent and efficient estimates for panel data models with endogenous variables (Arellano and Bover, 1995; Blundell and Bond, 1998).

$$Y_{it} = \alpha + \lambda Y_{it-1} + \beta X_{it} + \gamma Z_{it} + \mu_i + \mathcal{E}_{it} \quad (4)$$

$$OER_{it} = \beta_0 + \lambda OER_{it-1} + \beta_1 CCC_{it} + \beta_2 ARD_{it} + \beta_3 APD_{it} + \beta_4 ROA_{it} + \beta_5 FSa_{it} + \beta_6 GDP_{it} + \beta_7 ESG_{it} + \gamma Z_{it} + \mu_i + \nu_{it} \quad (4a)$$

$$OER_{it} = \beta_0 + \lambda OER_{it-1} + \beta_1 WCR_{it} + \beta_2 ARD_{it} + \beta_3 APD_{it} + \beta_4 ROA_{it} + \beta_5 FSa_{it} + \beta_6 GDP_{it} + \beta_7 ESG_{it} + \gamma Z_{it} + \mu_i + \nu_{it} \quad (4b)$$

$$OM_{it} = \beta_0 + \lambda OM_{it-1} + \beta_1 CCC_{it} + \beta_2 ARD_{it} + \beta_3 APD_{it} + \beta_4 ROA_{it} + \beta_5 FSa_{it} + \beta_6 GDP_{it} + \beta_7 ESG_{it} + \gamma Z_{it} + \mu_i + \nu_{it} \quad (4c)$$

$$OM_{it} = \beta_0 + \lambda OM_{it-1} + \beta_1 WCR_{it} + \beta_2 ARD_{it} + \beta_3 APD_{it} + \beta_4 ROA_{it} + \beta_5 FSa_{it} + \beta_6 GDP_{it} + \beta_7 ESG_{it} + \gamma Z_{it} + \mu_i + \nu_{it} \quad (4d)$$

The GMM incorporates λY_{it-1}, the lag of the dependent variables, and γZ_{it} as instrumental variables with μ_i and ν_{it} capturing firm-specific time-invariant effects and independent and identically distributed error term across firms.

4. Findings

This section provides the results of the empirical analysis to evaluate the impact of DWCM on OE. It includes a descriptive overview of the variables, correlation matrix, OLS, RE, and GMM panel regression analyses.

4.1 Descriptive Statistics

This subsection presents the summary statistics of the variables. It is based on the variables combined, and country and subsector category. The correlation matrix is as follows.

Table II Descriptive statistics

Variables	Obs	Mean	Median	S D	Min	Max
A. Operating Efficiency Measures						
OER	1098	0.926	0.927	0.094	0.732	1.112
OM	1098	0.071	0.072	0.090	-0.108	0.261
B. Dynamic Working Capital Management						
CCC	1098	87.363	84.400	72.425	-94.069	277.700
WCR	1098	0.183	0.172	0.144	-0.174	0.511
C. Firm Control						
ARD	1098	55.904	52.800	28.721	1.900	226.100
APD	1098	63.798	54.900	36.814	3.100	143.463
ROA	1098	0.050	0.053	0.075	-0.098	0.205
FSa	1098	7.549	7.406	2.140	1.905	12.112
D. Macroeconomic control						
GDP	54	1.833	2.100	2.328	-4.900	6.000
E. Sustainability						
ESG	1098	0.338	0.000	0.473	0.000	1.000

Note: Table 2 reports the descriptive statistics based on the number of observations, mean, median, standard deviation, minimum and maximum values of all variables including OER, OM, CCC, WCR, ARD, APD, ROA, FSa, GDP, and ESG dummy. The sample period is 2005-2022.

Source(s): Authors' own creation

Table II presents the descriptive statistics for all variables used in the study. The table classifies the variables into OE, WCM, firm control, macroeconomic control, and sustainability measures.

Under OE, the OER indicates that on average, consumer goods firms in the Scandinavian market spend approximately 92.6% of their revenue on operating expenses. OM shows an average profit margin of 7.1%.

Under DWCM, the CCC indicates that these firms, on average, require 87.4 days to convert inventory and accounts receivable into cash and collect payables. This result is consistent with the reports of Hassan *et al.* (2023) for the Nordic region (average 60–104 days). The results show that firms hold 18.3% of their total assets in WC, according to the WCR.

For firm control variables, the ARD shows that the firms collect accounts receivable within approximately 56 days. Firms settle their accounts payable within approximately 64 days, as the APD indicates. ROA has a mean value of 0.050, indicating an average return on assets of 5%. The FSa has a mean value of 7.549. At the macroeconomic level, GDP suggests a 1.833 average economic growth rate. Sustainability includes ESG score, which is a dummy variable.

Table III Descriptive Statistics (Market)

	Obs	Mean	Median	SD	Min	Max
Denmark						
OER	270	0.939	0.934	0.093	0.732	1.112
OM	270	0.061	0.066	0.092	-0.108	0.261
CCC	270	39.790	45.388	62.574	-94.069	249.350
WCR	270	0.102	0.083	0.128	-0.174	0.511
ARD	270	56.556	51.400	25.562	11.700	122.975
APD	270	70.059	61.100	39.168	11.300	143.462
ROA	270	0.033	0.038	0.069	-0.098	0.205
FSa	270	7.126	7.000	1.820	3.367	11.944
GDP	270	1.439	1.750	2.210	-4.900	4.900
ESG	270	0.215	0.000	0.411	0.000	1.000
Norway						
OER	198	0.902	0.916	0.088	0.732	1.112
OM	198	0.098	0.084	0.087	-0.108	0.261
CCC	198	113.787	115.500	86.311	-87.862	274.600
WCR	198	0.253	0.214	0.163	-0.174	0.511
ARD	198	54.424	52.900	20.803	12.700	122.975
APD	198	80.611	68.450	33.472	37.500	143.462
ROA	198	0.050	0.039	0.060	-0.098	0.205
FSa	198	8.594	8.426	1.528	4.828	11.561
GDP	198	1.539	1.550	1.462	-1.900	3.900
ESG	198	0.439	0.000	0.498	0.000	1.000
Sweden						
OER	630	0.929	0.928	0.095	0.732	1.112
OM	630	0.067	0.072	0.088	-0.108	0.261
CCC	630	99.447	92.900	61.668	-9.670	277.700
WCR	630	0.196	0.195	0.129	-0.174	0.511
ARD	630	56.091	54.100	31.982	1.900	226.100
APD	630	55.831	49.700	34.457	3.100	143.462
ROA	630	0.058	0.064	0.080	-0.098	0.205
FSa	630	7.401	7.430	2.324	1.905	12.112
GDP	630	2.094	2.600	2.555	-4.300	6.000
ESG	630	0.359	0.000	0.480	0.000	1.000

Note: Table 3 reports the descriptive statistics of the studied countries based on the number of observations, mean, median, standard deviation, minimum and maximum values of all variables including OER, OM, CCC, WCR, ARD, APD, ROA, FSa, GDP, and ESG dummy. The sample period is 2005-2022.

Source(s): Authors' own creation

Table III presents descriptive statistics for key variables in the three Scandinavian markets from 2005 to 2022.

Denmark exhibits the highest OER, suggesting that Danish companies allocate an average of 93.9% of their revenue to operating expenses. On the other hand, Norway has the lowest of 90.2%, indicating comparatively lower operating expenses. It has the highest average OM of 9.8%, suggesting relatively efficient profit generation relative to Denmark and Sweden.

Further, Norway exhibits the highest average CCC (113.8 days), indicating that Norwegian firms take longer to convert their investments into cash than Danish firms (39.8 days). The WCR measures a company's short-term financial health by comparing the cash held in inventory, accounts receivable, and accounts payable to total revenue. Denmark holds the least cash, representing 0.102, while Norway has the highest cash in the operating cycle (0.253).

Denmark has the highest average ARD (56.6 days), indicating the longest accounts receivable duration within Danish companies compared to the other two countries. Norway fares better with 54.424 days. Norway has the highest mean APD (80.6 days), indicating an efficient credit payment period, while Sweden shows collection inefficiency (55.8 days). Swedish firms exhibit the highest mean ROA (0.058), suggesting better asset utilization compared to Denmark and Sweden. Danish companies record a 3.3% average. Norway has the highest mean FSa (8.594), indicating larger-sized firms on average. Sweden has the highest average GDP (2.094), reflecting its relatively more robust economic performance relative to Denmark and Norway. Norway exhibits the highest mean ESG value (0.439), indicating a stronger focus on sustainability initiatives in Norwegian firms.

Table IV Descriptive Statistics: (Sub-Sector)

	Obs	Mean	Median	SD	Min	Max
Apparel & Accessories						
OER	126	0.934	0.922	0.094	0.732	1.112
OM	126	0.066	0.078	0.093	-0.108	0.261
CCC	126	115.045	99.150	63.973	-8.462	277.600
WCR	126	0.214	0.182	0.142	-0.074	0.511
ARD	126	43.297	47.150	26.721	3.100	122.975
APD	126	56.134	47.850	32.400	17.500	143.462
ROA	126	0.066	0.075	0.097	-0.098	0.205
FSa	126	6.660	6.209	2.442	1.905	12.112
GDP	126	2.001	2.600	2.527	-4.900	6.000
ESG	126	0.262	0.000	0.441	0.000	1.000
Automotive						
OER	108	0.927	0.930	0.078	0.732	1.112
OM	108	0.072	0.070	0.076	-0.108	0.261
CCC	108	84.688	77.600	48.685	-31.962	274.275
WCR	108	0.195	0.184	0.100	-0.174	0.511
ARD	108	59.734	62.950	26.425	15.300	122.975
APD	108	59.700	56.450	28.422	21.200	143.462
ROA	108	0.066	0.063	0.069	-0.098	0.205
FSa	108	7.350	7.394	1.697	3.336	9.904
GDP	108	2.002	2.600	2.426	-4.300	6.000
ESG	108	0.324	0.000	0.470	0.000	1.000
Entertainment & Leisure						
OER	198	0.938	0.937	0.123	0.732	1.112
OM	198	0.062	0.062	0.121	-0.108	0.261
CCC	198	41.453	32.569	67.350	-94.069	249.350
WCR	198	0.074	0.036	0.133	-0.174	0.511
ARD	198	55.311	46.150	31.930	10.393	127.200
APD	198	74.311	54.350	51.713	3.100	143.462

ROA	198	0.023	0.023	0.085	-0.098	0.205
FSa	198	5.952	5.919	1.387	3.025	8.984
GDP	198	1.737	2.000	2.399	-4.900	6.000
ESG	198	0.076	0.000	0.265	0.000	1.000
Food & Beverages						
OER	288	0.903	0.920	0.077	0.732	1.112
OM	288	0.096	0.080	0.076	-0.108	0.261
CCC	288	101.749	94.400	76.847	-53.662	274.600
WCR	288	0.230	0.214	0.161	-0.159	0.511
ARD	288	54.944	52.900	21.451	7.500	122.975
APD	288	64.253	58.550	29.178	11.100	143.462
ROA	288	0.061	0.059	0.055	-0.098	0.205
FSa	288	8.665	8.837	1.705	4.622	11.944
GDP	288	1.688	2.000	2.068	-4.900	6.000
ESG	288	0.403	0.000	0.491	0.000	1.000
Home & Lifestyle						
OER	216	0.920	0.923	0.055	0.771	1.112
OM	216	0.080	0.077	0.055	-0.108	0.229
CCC	216	95.720	92.300	60.913	-3.000	277.700
WCR	216	0.209	0.201	0.126	0.012	0.511
ARD	216	52.464	50.150	24.961	1.900	122.975
APD	216	59.561	50.950	30.403	12.600	143.462
ROA	216	0.068	0.066	0.052	-0.098	0.205
FSa	216	8.410	8.131	1.979	3.109	11.948
GDP	216	1.939	2.300	2.445	-4.900	6.000
ESG	216	0.597	1.000	0.492	0.000	1.000
Miscellaneous						
OER	162	0.954	0.960	0.120	0.732	1.112
OM	162	0.029	0.040	0.093	-0.108	0.261
CCC	162	87.011	94.790	79.340	-87.862	253.750
WCR	162	0.170	0.166	0.100	-0.174	0.508
ARD	162	70.178	67.700	36.682	12.700	226.100
APD	162	64.483	55.950	40.499	3.100	143.462
ROA	162	0.019	0.024	0.083	-0.098	0.205
FSa	162	7.191	7.033	2.183	1.905	11.070
GDP	162	1.825	2.100	2.302	-4.900	6.000
ESG	162	0.265	0.000	0.443	0.000	1.000

Note: Table 4 reports the sub-sectoral descriptive statistics based on the number of observations, mean, median, standard deviation, minimum and maximum values of all variables including OER, OM, CCC, WCR, ARD, APD, ROA, FSa, GDP, and ESG dummy. The sample period is 2005-2022.

Source(s): Authors' own creation

Table IV presents descriptive statistics for the sub-sectors within the consumer goods industry, specifically Apparel and Accessories, Automotive, Entertainment and Leisure, Food and Beverages, Home and Lifestyle, and Miscellaneous, from 2005 to 2022.

The Miscellaneous sub-sector exhibits the highest mean OER (0.954), indicating that companies in this category allocate 95.4 % of their revenue to operating expenses. The Food and Beverages sub-sector demonstrates the highest mean OM (0.096), suggesting better profitability of 9.6% compared to the others.

The Apparel and Accessories sub-sector exhibits the highest mean CCC (115.045 days), indicating that firms in this category take longer to recover WC compared to those in other sub-sectors. The Food and Beverage sub-sector displays the highest mean WCR (0.230), indicating that companies in this category maintain a relatively higher balance of inventory and accounts receivable than accounts payable. The Miscellaneous sub-sector has the highest mean ARD (70.2 days), suggesting the longest accounts receivable duration within firms in this sub-sector compared to others. The Entertainment and Leisure sub-sector has the highest mean APD (74.311), indicating comparative inefficiency in trade credit settlement within this sub-sector. The Home and Lifestyle sub-sector has the highest average ROA (0.068), implying relatively better asset utilization within this category. The Food and Beverages sub-sector exhibits the highest mean FSa (8.665), indicating larger-sized firms on average. The Home and Lifestyle sub-sector demonstrates the highest mean ESG value (0.597), signifying a stronger focus on sustainability initiatives in firms within this sub-sector.

Table V Pearson correlations matrix

Variables	OER	OM	CCC	WCR	ARD	APD	ROA	FSa	GDP	ESG
OER	1.000									
OM	-0.976	1.000								
CCC	-0.145	0.142	1.000							
WCR	-0.188	0.182	0.844	1.000						
ARD	0.136	-0.153	0.337	0.345	1.000					
APD	0.126	-0.116	-0.312	-0.276	0.129	1.000				
ROA	-0.766	0.774	0.096	0.150	-0.198	-0.227	1.000			
FSa	-0.365	0.347	0.017	0.083	-0.211	-0.027	0.239	1.000		
GDP	-0.099	0.101	-0.016	0.006	-0.040	-0.031	0.142	-0.009	1.000	
ESG	-0.192	0.209	-0.046	0.005	-0.128	0.038	0.148	0.621	0.015	1.000
Multicollinearity Diagnostics										
(VIF)			3.690	3.650	1.760	1.640	1.360	1.230	1.030	1.170
(Mean VIF)						1.940				

Note: Table 5 reports the results of Pearson's correlation test for the variables used in the study including: OER, OM, CCC, WCR, ARD, APD, ROA, FSa, GDP, and ESG dummy.

Source(s): Authors' own creation

Table V presents Pearson's correlation test result, showing no multicollinearity issues in the data. The highly correlated variables of OER and OM and CCC and WCR do not pose an issue in the model, as each variable is run separately. Thus, the impact of each variable is observed independently. The variance inflation factor (VIF), a standard means to check for multicollinearity, is carried out to further check for potential multicollinearity issues. The results confirm the absence of multicollinearity issues. Each of the individual variables' results is below the threshold of 5. Again, the mean VIF of 1.94 falls below the threshold, confirming the absence of multicollinearity issues. Prior studies present similar results (Amponsah-Kwatiah and Asiamah, 2020; Hassan *et al.*, 2023).

4.2 Regression result

This subsection presents the results of the regression analyses conducted to examine the association between DWCM and OE. The study uses OLS—columns 1 and 2, RE—columns 3 and 4, and SYS-GMM—columns 5 and 6. Including country and sub-sector fixed effects in the models did not significantly impact the dependent variables.

Table VI Result of the impact of DWCM on operating cost - OER

	(1)	(2)	(3)	(4)	(5)	(6)
	Pooled-OLS		RE		SYS-GMM	
CCC	-1.2×10^{-4}***		-5×10^{-5}**		-8×10^{-4}***	
	(3×10^{-5})		(2×10^{-5})		(1.8×10^{-4})	
WCR		-4.8×10^{-2}***		-2.2×10^{-2}*		-2.4×10^{-1}***
		(1.4×10^{-2})		(1.3×10^{-2})		(4.2×10^{-2})
ARD	-3×10^{-5}	-5×10^{-5}	1×10^{-5}	-1×10^{-5}	7×10^{-4}***	3.8×10^{-4}***
	(7×10^{-5})	(7×10^{-5})	(6×10^{-5})	(6×10^{-5})	(2.3×10^{-4})	(1.3×10^{-4})
APD	-1.9×10^{4}***	-1.7×10^{-4}***	-1.4×10^{-4}***	-1.3×10^{-4}***	-7.8×10^{-4}***	-5.4×10^{-4}***
	(5×10^{-5})	(5×10^{-5})	(5×10^{-5})	(5×10^{-5})	(1.6×10^{-4})	(9×10^{-5})
ROA	-9.2×10^{1}***	-9.2×10^{-1}***	-7×10^{-1}***	-7×10^{-1}***	-8.3×10^{-1}***	-8.2×10^{-1}***
	(2.5×10^{-2})	(2.510^{-2})	(2.5×10^{-2})	(2.5×10^{-2})	(3×10^{-2})	(2.6×10^{-2})
FSa	-1×10^{-2}***	-9.9×10^{-3}***	-5×10^{-3}***	-5×10^{-3}***	-1.9×10^{-2}***	-1.3×10^{-2}***
	(1.1×10^{-3})	(1.1×10^{-3})	(1×10^{-3})	(1×10^{-3})	(4.1×10^{-3})	(2.3×10^{-3})
GDP	-9×10^{-5}	-2×10^{-5}	-9.8×10^{-4}	-9.5×10^{-4}	-3.2×10^{-4}	-6.9×10^{-4}
	(7.5×10^{-4})	(7.5×10^{-4})	(6.6×10^{-4})	(6.6×10^{-4})	(8.3×10^{-4})	(7×10^{-4})
ESG	1.1×10^{-2}**	1.1×10^{-2}**	7.5×10^{-3}*	7.6×10^{-3}*	8.6×10^{-2}***	6.6×10^{-2}***
	(4.7×10^{-3})	(4.7×10^{-3})	(4.2×10^{-3})	(4.2×10^{-3})	(2.2×10^{-2})	(1.6×10^{-2})
_cons	1.07×10^{0}***	1.07×10^{0}***	6.6×10^{-1}***	6.6×10^{-1}***	1.05×10^{0}***	9.7×10^{-1}***
	(9.3×10^{-3})	(9.3×10^{-3})	(2.4×10^{-2})	(2.4×10^{-2})	(3.2×10^{-2})	(2.1×10^{-2})
Observations	1098	1098	1037	1037	1037	1037
Adj R^2	0.63	0.63	0.72	0.72		
Prob. > F	0.000	0.000	0.000	0.000	0.000	0.000
Group (Inst)					61(57)	61(57)
AR (1)					0.000	0.000
AR (2)					0.214	0.125
Sargan test					0.653	0.098
Hansen J test					0.504	0.432
Year dummy			yes	yes	yes	yes

Note: Table 6 reports the regression analysis results for assessing the impact of DWCM on OE in terms of cost. The results are based on the OLS, RE, and SYS-GMM estimation techniques. The study period is 2005-2022. Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Source(s): Authors' own creation

From Table VI, the dependent variable, OER, is measured against two independent variables related to DWCM: time duration management measured by the CCC and cash management indicated by the WCR and other control variables.

First, the results show that the coefficients for CCC are negative and significant with OER for all models. It confirms the first hypothesis. This outcome means a unit increase in the CCC by the firms, all other things being equal, reduces the firm's operating expenditure by 0.012%, 0.005%, and 0.08%, respectively, across the model. Second, the results reveal a significant inverse impact of WCR on OER in the region of 4.8%, 2.2%, and 24%. This outcome agrees with the second hypothesis.

Concerning the other control variables, the coefficients of ARD in columns 5 and 6 show a significant positive effect on OER for the third model. According to the findings, a one-unit

increase in ARD is associated with a corresponding increase in the company's operating expenses if all other factors remain constant. This result implies that when a firm increases its accounts receivable as part of its WCM strategy, its operating cost increases.

Additionally, the analysis shows that the APD coefficients negatively impact OER across all models. This result means that an increase in the duration of APD results in lower operating costs, thereby improving OE. This phenomenon suggests that extending payment periods for accounts payable allows these businesses to manage their cash flow and WC better. It allows potential investments for other operational needs that would otherwise necessitate costly external funding. This extended payment period effectively functions as an interest-free loan.

Furthermore, the ROA coefficients negatively impact OER in all models. This outcome suggests that a decrease in OER is seen for every unit increase in ROA. It implies that companies that generate higher asset returns tend to reduce operating expenses, demonstrating higher cost efficiency in allocating and utilizing resources.

Moreover, the coefficients of FSa exhibit a significant adverse effect on OER in all models considered. This observation implies that an expansion in the size of a company is associated with a fall in operating expenses. Consequently, it can be inferred that larger firms, as denoted by higher levels of assets, tend to handle their operating costs better.

The coefficients for ESG show a statistically positive impact on OER for all models. This result implies that sustainable operations are associated with increased operating costs. It also shows that substantial cost pressures may be associated with incorporating sustainable practices into the operations of the studied companies in the Scandinavian market, thereby affecting OE.

Table VII Result of the impact of DWCM on operating profit - OM

	(1)	(2)	(3)	(4)	(5)	(6)
	Pooled-OLS		RE		SYS-GMM	
CCC	6×10^{-5}***		6×10^{-5}***		9.6×10^{-4}***	
	(2×10^{-5})		(2×10^{-5})		(1.9×10^{-4})	
WCR		2.6×10^{-2}**		2.6×10^{-2}**		2.7×10^{-1}***
		(1.2×10^{-2})		(1.2×10^{-2})		(4.4×10^{-2})
ARD	-5×10^{-5}	-4×10^{-5}	-5×10^{-5}	-4×10^{-5}	-9.1×10^{-4}***	-4.9×10^{-4}***
	(6×10^{-5})	(6×10^{-5})	(6×10^{-5})	(6×10^{-5})	(2.4×10^{-4})	(1.5×10^{-4})
APD	1.6×10^{-4}***	1.5×10^{-4}***	1.6×10^{-4}***	1.5×10^{-4}***	9.3×10^{-4}***	6.1×10^{-4}***
	(5×10^{-5})	(4×10^{-5})	(5×10^{-5})	(4×10^{-5})	(1.6×10^{-4})	(9×10^{-5})
ROA	6.9×10^{-1}***	6.9×10^{-1}***	6.9×10^{-1}***	6.9×10^{-1}***	8.1×10^{-1}***	8×10^{-1}***
	(2.5×10^{-2})	(2.5×10^{-2})	(2.5×10^{-2})	(2.5×10^{-2})	(3.5×10^{-2})	(2.7×10^{-2})
FSa	3.69×10^{-3}***	3.6×10^{-3}***	3.7×10^{-3}***	3.6×10^{-3}***	1.9×10^{-2}***	1.3×10^{-2}***
	(9.5×10^{-4})	(9.6×10^{-4})	(9.5×10^{-4})	(9.6×10^{-4})	(4.8×10^{-3})	(2.6×10^{-3})
GDP	9.3×10^{-4}	9×10^{-4}	9.3×10^{-4}	9×10^{-4}	1.3×10^{-4}	4.5×10^{-4}
	(6.4×10^{-4})	(6.4×10^{-4})	(6.4×10^{-4})	(6.4×10^{-4})	(8.8×10^{-4})	(7.2×10^{-4})
ESG	-2.03×10^{-3}	-2.2×10^{-3}	-2.03×10^{-3}	-2.2×10^{-3}	-1×10^{-1}***	-7.6×10^{-2}***
	(4.01×10^{-3})	(4.02×10^{-3})	(4.01×10^{-3})	(4.02×10^{-3})	(2.5×10^{-2})	(1.7×10^{-2})
_cons	-3×10^{-2}***	-2.9×10^{-2}***	-3×10^{-2}***	-2.9×10^{-2}***	-1.6×10^{-1}***	-9.3×10^{-2}***
	(8.2×10^{-3})	(8.1×10^{-3})	(8.2×10^{-3})	(8.1×10^{-3})	(2.8×10^{-2})	(1.5×10^{-2})
Observations	1037	1037	1037	1037	1037	1037
Adj R^2	0.71	0.71	0.72	0.71		
Prob. > F	0.000	0.000	0.000	0.000	0.000	0.000
Group (Inst)					61(57)	61(57)
AR (1)					0.000	0.000
AR (2)					0.183	0.115

Sargan test			0.757	0.087
Hansen J test			0.547	0.390
Year dummy	yes	yes	yes	yes

Note: Table 7 reports the regression analysis results for assessing the relationship between DWCM and OE in terms of profit. The results are based on the OLS, RE, and SYS-GMM estimation techniques. The study period is 2005-2022. Standard errors are in parentheses. *** p<0.01, ** p<0.05

Source(s): Authors' own creation

Table VII shows the regression results of the variable OM and two measures of DWCM—CCC and WCR—and other control variables.

The results reveal a significant positive effect of the coefficients of CCC on OM across all three models, confirming the third hypothesis. The result implies that while holding other factors constant, an increase in the CCC leads to an increase in OM by 0.0006%, 0.0006%, and 0.096% across models. Similarly, the research results reveal a significant positive effect of DWCM to cash management, as measured by the WCR on OM by 2.6%, 2.6%, and 27%, which supports the fourth hypothesis.

Concerning the other variables, the coefficients of ARD show a statistically significant negative impact of OM for the third model in columns 5 and 6. The findings indicate that assuming all other variables remain constant, a unit increase in ARD corresponds to a reduction in the firm's operating income. This observation implies a negative impact of accounts receivable on OM, suggesting that an increase in accounts receivable as part of the WCM strategy decreases OM. This result implies that operating performance results favor maintaining a low number of days and amount of accounts receivable. It also gains support from previous studies (Pais and Gama, 2015).

Similarly, the coefficients of APD show a significant positive effect of OM across all models. It implies that an increase in APD, all else being equal, leads to a higher OE for the firms. This observation signifies that extending the payment period for accounts payable allows consumer goods firms in the Nordic region to better manage their cash flow and WC. By delaying payments to suppliers, these firms can hold onto their cash for a more extended period, which may be invested in or used for other operational needs.

The ROA coefficients positively impact OM in all models significantly. The result means an increase in OM for every unit leads to an increase in ROA. This finding implies that companies with higher asset returns tend to generate higher operating income, indicating greater profitability and efficiency in resource utilization.

The coefficients for FSa show significant and positive associations with OM for all models. This implies that an increase in the company's size is associated with a projected increase in OE in terms of returns. This finding suggests that larger firms tend to generate higher operating returns.

Similarly, the results from Table VII show that ESG relates to OM negatively. The outcome is valid for the third model, which illustrates statistical significance. It suggests that organizations that prioritize ESG performance may experience a decrease in their operating profit margin. This outcome also suggests that the benefits derived from ESG initiatives may not fully offset the increased operating costs incurred.

5. Discussion

5.1 Impact of DWCM on Operating Cost

The negative effect of CCC on OER suggests that organizations that efficiently convert their inventory and receivables into cash and settle payables as timely as possible experience cost savings. By reducing the time it takes to convert these components into cash, companies can streamline operations, optimize cash flow, and potentially reduce costs associated with inventory holding, credit management, and collection activities. Additionally, effective operating cash management can lead to reduced operating costs. By minimizing excess cash held up in the operating cycle, organizations can potentially avoid costs related to illiquidity, opportunity costs, and financing charges. Efficient cash management helps ensure that financial resources are utilized effectively to enhance cost efficiency.

Generally, the firm's ability to manage its operating cycle more dynamically, such as having a good handle on its CCC and WCR, offers a significant cut on its operating cost. Additionally, the coefficient for the WCR is larger for all models compared to CCC. It is evident from the results that paying more attention to the actual cash committed to the operating cycle offers a more efficient approach to managing WC. This result is consistent with the work of Le (2019), who finds a strong, significant negative relationship between net WC and stock-return volatility, and Aktas *et al*. (2015), who assert that additional investment in WC reduces firm risk.

5.2 Impact of DWCM on Operating Profit

The findings indicate that dynamism in time duration management, as the CCC reflects, is associated with higher operating profit. It suggests that organizations that efficiently convert their inventory and receivables into cash while receiving early payments experience increased profitability. By reducing the duration to convert these components into cash, companies can improve their cash flow position, enhance liquidity, and potentially boost profitability by reducing costs associated with WC. Moreover, effective cash management and better control over WC levels can increase operating profits. By optimizing cash management practices, organizations can free up resources and allocate them more efficiently, leading to improved profitability. Efficient cash management helps minimize excess WC and reduce costs associated with idle cash, financing charges, and opportunity costs.

Furthermore, the coefficient for WCR is consistently larger than that for the CCC across all models. The result suggests that a greater emphasis on cash management within the operating cycle offers a more efficient approach to DWCM. These findings align with prior research conducted by Amponsah-Kwatiah and Asiamah (2020), who highlight a strong and significant positive association between CCC and both ROA and ROE, as well as Ailemen *et al*. (2021), who assert that liquidity ratio and the capital adequacy ratio affect asset return significantly and positively.

5.3 Implications

The research findings presented in this study have important implications for financial managers, policymakers, owners, and other investors. The academic community may derive insight from the study's conclusions. The results highlight the significance of actively managing WC components to impact OE positively. Companies can reduce costs and unlock profitability gains by improving the CCC and WCR. Particular attention should be placed on the absolute cash committed to inventory and accounts receivable while prioritizing accounts payable optimization. The negative impact of DWCM on operating expenses suggests that effective cost-reduction strategies are

crucial for profitability. Efficiency requires a holistic cost–income management approach. By implementing strategies that optimize these processes, businesses can enhance cash flow, improve liquidity, and ultimately drive higher operating profit.

6. Conclusion and Further Research

This study investigates the impact of DWCM on OE within the context of public consumer goods firms in the three Scandinavian markets spanning 18 years. The empirical analysis employs OLS, RE, and GMM models, drawing from a dataset comprising 1098 firm-year observations.

It presents evidence to show that better management of the actual cash held up in inventory, accounts receivable, and accounts payable has better cost reduction and profit enhancement effects. Moreover, the finding demonstrates that efficiency depends not only on income generation but also on cost and risk reduction. The study addresses one of the WC-intensive sectors in markets with interesting political, macroeconomic, and sustainability dynamics.

The study draws its conclusions from the consumer goods sector data of the Scandinavian market. Further research may consider a comparative study across different industries or regions for a broader understanding of the impact of DWCM on OE. However, the focus of this study is limited to the impact of DWCM on OE. Static WCM variables such as current and quick ratios may be explored to examine their impact on OE. Future research can concentrate on an in-depth assessment of the impact of the individual environment, social, and governance pillars on OE.

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