

**Effects of working capital management on the profitability of small and medium fisheries:
Evidence from quantitative research for a low-income country**

Abstract

As perceived in the current situation shaped by the COVID-19 pandemic, the enforcement of credit constraints underscores the importance of effective working capital management (WCM) as a key factor affecting the profitability of small and medium-sized enterprises (SMEs). This research examines the impact of WCM practices on the profitability of small and medium Moroccan fisheries. Morocco has the leading position in Africa as both the primary producer and exporter of fishery products, with the fishing industry playing a crucial role in the country's economy. In order to evaluate the association between WCM and profitability, this research applied dynamic panel data regression using the generalised method of moments (GMM) to avoid heteroskedasticity, endogeneity, and unbiasedness. Annual data of 100 small and medium fisheries are used for 2015-2020. The dependent variable is expressed as return on assets (ROA); independent variables are cash conversion cycle (CCC), days inventory outstanding (DIO), days sales outstanding (DSO), and days payable outstanding (DPO), and control variables are firm size (FIRM_SIZE), financial leverage (DEBT_RAT), and working capital requirement (WCREQ). Findings reveal a significant relationship between four WCM components (CCC, DPO, DIO and DSO) and profitability (ROA). The study should provide valuable insights for small owner-managers in the fishing sector. It will enhance SMEs' understanding of improving their firm's performance and aid practitioners in forecasting operating cash flows by effectively managing working capital components.

Keywords: small and medium enterprises, working capital management, profitability, cash conversion cycle, days sales outstanding, days inventory outstanding, days payable outstanding, general Method of Moment

Track: Financial Management

Word Count: (5006 without abstract and references)

1. Introduction

The COVID-19 pandemic has precipitated an unexpected worldwide economic downturn, causing substantial disruptions in supply chains and triggering one of the most severe stock market downturns in history, resulting in a loss of nearly 20% in value (PwC, 2022). The problem has been exacerbated by the Ukraine conflict and extended supply chain disruptions, resulting in a significant increase in energy costs and inflation (Cui et al., 2023). These shocks have negatively impacted companies in many sectors and economies via numerous channels, such as the downturn in financial markets, domestic consumption, and corporate sales (Demirguc-Kunt et al., 2021). The decrease in sales has had a substantial impact on the operational liquidity of enterprises, resulting in elevated levels of inventories and outstanding trade receivables. In addition, the fall in purchases of commodities has led to a reduction in trade payables, which has increased the probability of default (Ferriani and Gazzani, 2023). The economic disruptions have led to a drop in the value of enterprises' assets, affecting their immediate capital needs and hindering their ability to manage working capital (WC) effectively (PwC, 2022). Managing working capital has been more complicated for small and medium enterprises (SMEs) due to their vulnerability to significant fluctuations and uncertainties in procurement processes (Sensini and Vazquez, 2021).

The aforementioned circumstances highlight the significance of effective working capital management (WCM) as a key factor influencing the success of SMEs, particularly when they face limitations in accessing finance. Effective WCM is crucial for companies to mitigate the risk of failure and enhance profitability amidst dynamic business environments and interruptions in global supply networks. WCM involves managing the business's short-term finance or current assets and liabilities (Sensini and Vazquez, 2021), which affects liquidity, solvency, and profitability. Effectively managing working capital entails optimising cash levels, extending credit strategically, monitoring inventory, ensuring timely conversion of accounts receivable and inventory into cash, making prompt payments to accounts payable, securing a connection with financial levels, and investing in easily convertible assets, and renegotiating long-term liabilities (Frankel et al., 2017). To achieve sustained development in the competitive business landscape, firms must continually implement effective working capital strategies. This involves determining the ideal amount of net working capital, which leads to cost optimisation in managing and maintaining financial liquidity (Sensini and Vazquez, 2021). This research paper aims to analyse the effects of WCM components on the profitability of SMEs in emerging economies, with a particular focus on Morocco's fishing industry.

Prior research in corporate finance has shown that efficient management of working capital can impact a company's performance by influencing its current assets, short-term liabilities, revenues, and operational costs (Sensini and Vazquez, 2021; Braimah et al., 2021). Effective management of working capital is a crucial component of a company's overall business strategy to improve shareholder value. Therefore, firms strive to maintain optimal working capital that maximizes their total value (Deloof, 2003). In the past, research has primarily centered on investigating the impact of WCM on the financial performance of established companies (Gill et al., 2010; Raheman et al., 2010). The accessibility of information about large companies has resulted in a satisfactory grasp and awareness of their strategies for managing working capital (Tingbani, 2015). In contrast, the scarcity of resources in small and medium firms has posed challenges for academics in studying them, resulting in a lack of publicly accessible information about their strategies on managing working capital (Afrifa, 2013; Tingbani, 2015). Furthermore, available data on small and medium-sized firms in developing nations often need

more resources. The significance of managing working capital and its constituents to profitability must be balanced for SMEs with limited resources, including credit constraints, insufficient cash flow and lack of management competency. However, further investigation will be necessary to understand the significance of WCM and its components in the context of SMEs.

Moreover, numerous recent research studies have examined the relationship between WCM and corporate profitability, primarily from the perspective of developed economies such as the US, UK, and China (Dalci et al., 2019; Ren et al., 2019). On the other hand, only a few studies have explored the relationship in emerging economies like Amponsah-Kwatiah and Asiamah (2021) for Ghana, Tarek and Rafik (2020) for Egypt, and Ukaegbu (2014) for South Africa. However, none of these studies have focused on Morocco, a low-income Arab-speaking country with a significant fishing industry in North Africa. This oversight hinders our comprehension of WCM practices employed by SMEs in low-income countries. As a result, a gap exists in understanding WCM approaches among small and medium fisheries in Morocco. This research aims to gather and consolidate small and medium fisheries data and information in Morocco.

Empirical evidence demonstrates that WCM components, namely cash conversion cycle (CCC), days sales outstanding (DSO), days payable due (DPO), and days inventory outstanding (DIO), have both positive and negative effects on a company's profitability. Several authors have proposed a negative association between these variables (Fernández-López et al., 2020; Sensini and Vazquez, 2021). Conversely, other studies have demonstrated a positive association (Thapa, 2013; Tarek and Rafik, 2020). Additionally, some authors have indicated no statistically significant relationship between these variables (Rey-Ares et al., 2021). The published findings on the link are varied and inconclusive. This suggests that when making decisions about working capital investments, there is a need to balance the rising costs and falling costs associated with the level of working capital.

Following this introductory section, the subsequent sections of the paper are structured as follows. Section 1.2 offers a comprehensive overview of the fishing industry in Morocco, emphasising the importance of WCM within this sector. Section 2 reviews pertinent literature on WCM and elucidates the study's hypotheses. Section 3 outlines the methodology employed in this research. Section 4 delves into the empirical findings derived from the study. Lastly, Section 5 of the paper functions as the conclusion, encapsulating the core findings, acknowledging research contributions, and addressing limitations. It not only summarizes the study's outcomes but also highlights areas for potential future research, providing valuable insights for further exploration in the field.

1.2 The Moroccan fishing industry: characteristics and the importance of working capital management

The small-scale fisheries sector plays a crucial role in the Moroccan economy. This section provides a concise overview of the significance and primary attributes of the industry.

The coastal cities of Morocco span a distance of 3500 km along the Mediterranean and Atlantic coastlines. The country possesses a substantial seafood opportunity and over 1.2 million km² of internal marine resources. The nation has vast marine resources that are distinguished by their rich biodiversity, with a total of 600 documented fish species. The coastal regions of Morocco account for 59% of the country's Gross Domestic Product (GDP) and employ 52% of

its workforce (Assouss and Hady, 2023). Morocco holds the top position globally in marine fishing among Arab and African countries and ranks 17th worldwide in terms of fish resources (Assouss and Haddy, 2023). In 2019, as the Department of Marine Fishing (DPM) reported, the marine fishing industry produced over 1.46 million tonnes, with a value of almost Dh11.7 billion (\$1.2 billion). In addition, the sector provides direct employment for 170,000 workers and produces 4,900,000 indirect jobs (MAPM, 2008). Following Spain, Morocco is the second largest exporter of fish and fisheries goods in the Mediterranean region, with over half of this commerce being supplied to nations in the European Union. Fish exports account for around 50% of agricultural goods and approximately 12% of the nation's total exports. Nevertheless, much of its output relies on pelagic seafood transformed into items with less economic value.

Moreover, the unique operations of this sector result in greater complexity in implementing WCM compared to other food industries, as Rey-Ares et al. (2021) noted. This increased complexity can be attributed to the following factors. First, there is a significant decoupling between the various processes involved in the small-scale fisheries' daily operations. While sales and production remain relatively stable throughout the year, the supply of raw materials is seasonal and occurs over short timeframes. As a result, there may be an increased need for financing during these periods. The second contributing factor to the complexity of WCM implementation in the small-scale fisheries sector is the heavy reliance on natural resources as raw materials, which makes it challenging to regulate their production volume and quality, except in the case of aquaculture. This creates a level of uncertainty in production.

Furthermore, the sector's access to these natural resources is subject to international regulations that periodically review catch quotas and tariffs (Heaps and Helliwell, 1985). Additionally, the Moroccan fishing industry heavily depends on foreign demand for various fish products, which can be impacted by macroeconomic factors such as inflation and supply chain disruptions (Garcia-Isarch, 2014). This further exacerbates the uncertainty surrounding the core business operations of companies in this sector. Another factor contributing to the complexity of WCM implementation in the small-scale fisheries sector is the presence of well-established competitors in developed countries such as Spain, Italy, and the USA, which utilise modern technology in their production processes. In contrast, low-income countries rely on traditional, low-technology, or passive fishing gear for production (Garcia-Isarch, 2014). To address this challenge, the sector constantly seeks to create more value-added products through innovation. However, this process requires adequate financial resources, which can be unlocked through efficient WCM practices. Lastly, the absence of sufficient institutional support at the national level, combined with the unanticipated impacts of bureaucratic regulations, increases the vulnerability of small-scale fisheries and reduces their ability to withstand external shocks, ultimately resulting in reduced liquidity and lengthy payment periods.

2. Literature Review and Proposal Hypotheses

The existing literature on corporate finance has demonstrated that effective WCM can influence a firm's performance by affecting current assets, short-term liabilities, revenues, and operating costs (Brahmah et al., 2021; Sensini and Vazquez, 2021). Optimizing WCM is vital in a company's broader strategy to maximize shareholder value (Nazir and Afza, 2009). Hence, businesses endeavor to retain an ideal amount of working capital that optimizes their overall worth (Deloof, 2003). According to various studies, the relationship between WCM and profitability depends on the firm's chosen strategy (Afrifa, 2013; Tingbani, 2015). An aggressive WCM strategy involves reducing working capital investment by minimizing inventory and accounts receivable levels. This approach reduces inventory holding costs,

warehouse storage costs, and insurance costs, which can ultimately increase profitability. On the other hand, a conservative policy puts more capital in liquid assets, sacrificing some profitability. Aggressive financing policies rely on more short-term debt and less long-term capital to lower capital costs, but this increases the risk of short-term liquidity problems. Consequently, firms must carefully consider the advantages and disadvantages of various asset and financing strategies to achieve an optimal balance between profitability, liquidity, and risk.

In the following sections, the theoretical reasons and empirical results of recent studies that have examined the link between WCM components and profitability are outlined. The purpose is to put out research hypotheses.

2.1 Cash conversion cycle

Various studies (Rey-Ares et al., 2021; Afrifa, 2013; Tingbani, 2015) have identified the management of the Cash Conversion Cycle (CCC) as a crucial aspect of WCM. Companies must balance three components to manage the CCC effectively: inventory, accounts receivable, and accounts payable. Deloof (2003) emphasised the importance of balancing working capital components, which is crucial for optimal management. According to Nazir and Afza (2009), effective management of the CCC allows managers to exert better control over a company's short-term investments, which can impact risk, profitability, and overall firm value.

The objective of efficient WCM procedures is to reduce the CCC to achieve optimal levels most suitable for the unique company's needs (Oseifuah, 2016). A short CCC signifies an accelerated collection of accounts receivable and prolonged supplier payment periods. This is linked to profitability since it enhances business efficiency using working capital. According to Deloof (2003), maintaining low inventory levels, implementing strict trade credit standards, and using secured trade credit to finance operations may lead to increased risks of inventory stock-outs, reduced sales incentives, and higher accounts payable costs due to the absence of cash discounts. Managers must constantly consider the trade-off between liquidity and profitability when managing working capital. Compared to the advantages of retaining more extensive inventory and extending trade credit to customers, an accelerated increase in the expenses associated with investing in working capital may result in a decline in business profitability. Subsequently, we provide a comprehensive hypothesis that posits a predicted inverse relationship between the cash conversion cycle and business profitability:

H1: There is a negative relationship between cash conversion cycle and profitability of SMEs in Morocco's fishing industry.

2.2 Accounts receivable

Granting credit to consumers may significantly affect the profitability of a company. since it attracts more customers. These clients not only get finance at a lesser cost compared to what financial institutions typically provide, but they also have the advantage of trying and experiencing the items or services before making payment.

Furthermore, a number of authors have been unsuccessful in identifying any substantial correlation between DSO and profitability (Sarwat et al., 2017). However, past research has shown that the majority of studies have discovered a negative correlation between both variables (Sensini and Vazquez, 2021; Braimah et al., 2021; Deloof, 2003; Gill et al., 2010) .

One possible explanation for this evidence is that shorter collection periods have a tendency to deter customers with lower creditworthiness. In other words, when these customers are not provided with immediate financing at the time of purchase, they are more likely to avoid making the purchase altogether. Consequently, the number of customers who default on payments and the potential for defaults would decrease. Therefore, it can be hypothesized that:

H2: There is a negative relationship between days sales outstanding and profitability of Moroccan small and medium fisheries.

2.3 Accounts payable

Accounts payable is an important source of short-term financing for most companies (Afrifa, 2013; Tingbani, 2015). It constitutes a significant portion of a company's existing assets that may be used as a means of obtaining short-term funding. Peterson and Rajan (1997) mentioned that trade payables serve as the main source of short-term external funding for U.S. companies, constituting approximately 35% of medium-sized firms in the United States. Martinez-Sola et al. (2013) argue that firms have an ideal accounts payable strategy because of market inefficiencies that can affect their decision-making and overall value. Nonetheless, trade payables come with both benefits and costs for firms, as highlighted by previous research (Deloof, 2003; Banos-Caballero et al., 2014).

Prior research has shown empirical support for a detrimental correlation between the payment period (also known as Days Payable Outstanding or DPO) and the economic success of companies (Raheman and Nasr, 2007; Gul et al., 2013). According to Raheman and Nasr (2007), the negative correlation observed is attributed to companies potentially missing out on early payment discounts by delaying payments to suppliers, leading to increased costs for their purchases. In addition, Deloof (2003) suggests that the negative relationship may be attributed to less profitable companies intentionally delaying payments to suppliers, resulting in a cause-effect relationship that is the opposite of what is expected. Thus, the following hypothesis is put forward:

H3: There is a negative relationship between days payable outstanding and profitability of Moroccan small and medium fisheries.

2.4 Inventories

Likewise, for accounts receivable, a number of authors have identified an immediate association between the inventory conversion period (also known as Days Inventory Outstanding or DIO) and profitability (Jakpar et al., 2017). A significant amount of inventory helps companies avoid missed sales opportunities and minimises the possibility of incurring expenses due to damaged goods in their manufacturing or supply chain (Deloof, 2003). Baños-Caballero et al. (2014) further highlight that maintaining substantial inventory levels enables the opportunity to obtain more significant commercial savings when making more substantial purchases. In addition, Gul et al. (2013) suggest that a corporation might enhance its value by maintaining a safety stock.

Nevertheless, the majority of authors have discovered compelling evidence indicating a negative association between the DIO and business profitability. This conclusion is supported by several studies. Excessive inventory levels incur significant expenses, including maintenance costs, insurance costs, and potential obsolescence costs, which might potentially

reduce profitability. Nevertheless, by decreasing the inventory level and implementing effective procurement practices, the firm's economic viability would be enhanced. Based on the associated holding costs of high inventory levels, including security cost, rent, heating, obsolescence, and theft, the following hypothesis is proposed:

H4: There is a negative relationship between days inventory outstanding and profitability of Moroccan small and medium fisheries.

3. Methodology

3.1 Data and sample

The hypotheses regarding the relationship between WCM and profitability were empirically tested using data obtained from The Moroccan Office of Industrial and Commercial Property (OMPIC) database. OMPIC is a public entity with legal status and financial independence. Its purpose is to play a proactive and proficient role in supporting the establishment of businesses and safeguarding industrial property rights. Additionally, it manages the financial records of certain organized enterprises on an annual basis. A dataset containing 300 active companies was initially gathered through a search process. To maintain data consistency and eliminate inaccurate information due to potential company misreporting, the dataset underwent a refinement process. Therefore, the final sample selection followed two conditions. First, all companies were required to meet the definition of small and medium enterprises as defined by the government of Morocco Law 53-00, Article 1 of the Official Bulletin No. 5036 of 27 Jumada II 1423 (Sefiani, 2013). Second, companies had to have their financial statements available for the entire period under consideration, which was from January 1, 2015, to December 31, 2020, inclusive. Furthermore, any observations meeting the following conditions are omitted: if DSO or DPO exceeds 365 days; if fixed assets have a negative value or exceed non-current assets; if accounts receivable surpass current assets; if the current ratio (current assets/current liabilities) falls below the acid test threshold; or if accounts payables exceed current liabilities.

Despite the substantial initial sample size of companies, issues like company closures, incomplete data on key variables, and the necessity of having more than two consecutive observations for dynamic panel data analysis have considerably decreased the number of companies suitable for empirical study. Consequently, the final sample consists of a balanced panel of 100 firms observed over the period of 2015-2020.

3.2 Strategy of estimation and model specification

The panel data methodology is employed to examine the hypotheses regarding the impact of WCM on the profitability of small and medium-sized enterprises operating in Morocco's fishing industry. Generalised Method of Moments (GMM) will be applied to address potential endogeneity issues in the data, given that the dependent variable (profitability) may influence some of the independent variables used in the models (WCM variables, financial leverage or firm size). Because WCM variables and control variables are endogenous there is an individual effect that the fixed effect cannot capture. Hence, static panel data models such as fixed-or random-effect estimators are ineffective in controlling endogeneity bias. To address this concern, the utilization of an instrumental variable estimator such as the GMM suggested by Blundell and Blond (1998) eases the incorporation of the endogeneity of all time-varying explanatory variables.

Therefore, the fundamental form of the model is depicted in Eq (1):

$$Prof_{it} = \beta_0 + \beta_1 prof_{i,t-1} + \beta_2 X_{it} + \beta_3 V_{it} + \mu_i + \lambda_t + \varepsilon_{it} \quad (1)$$

Where:

$Prof_{it}$ is the dependent variable; $prof_{i,t-1}$ refers to lagged dependent variable (ROA_{t-1}); X_{it} denotes the independent variables referring to the key elements of WCM; V_{it} refers to the control variables; The unobservable heterogeneity is denoted as μ_i ; λ_t denotes time dummy variable, and ε_{it} denotes the error term. In this study, return on assets (ROA) is used as a dependent variable measuring profitability as it refers to the performance of management with regard to the given resources. The primary independent variables (X_{it}) in this study are the periods related to significant financial data of working capital, such as the DSO, the DPO, the DIO, and the CCC, as indicated in previous research. The control variables (V_{it}) include firm size (FIRM_SIZE), financial leverage (DEBT_RAT), and working capital requirement (WCREQ).

All specifications of Equation (1) are estimated using the GMM estimator method, executed with the Stata command `xtabond2`. During this procedure, the variables on the equation's right side are treated as endogenous, and their lags from t-2 to t-3 are employed as instruments for the differenced equations. Furthermore, the lagged first-differenced endogenous variables are employed as instruments for the level equations. The analysis incorporates exogenous variables such as time dummies. The econometric models' validity is assessed through two tests. Initially, the Hansen J statistic (over-identification test) is used to verify the absence of correlation between the instruments and the error term, ensuring instrument validity. Subsequently, the AR statistic introduced by Arellano and Bond (1991) is applied to check for the lack of second-order serial correlation in the residuals.

4. Empirical Results

4.1 Descriptive statistics

Table 1 presents the descriptive statistics for all variables. The findings indicate that Moroccan small and medium fisheries achieve an average annual ROA of 9.8%, with returns ranging from -12.1% to 84.5% during the study period. This suggests that while the majority of these fisheries were profitable, some experienced significant losses throughout the period. On average, the DIO is 125.70 days, implying that, on average, small and medium fisheries in the sample take over four months to turn over their inventory. The DSO range from -1 day to 260.84 days, with an average collection period of 85.08 days. This average collection period of 85 days indicates that companies take approximately over two months, nearly three months, to collect credit sales from customers. This duration is slightly longer than the findings of Rey-Ares et al. (2021), who reported an average accounts receivable period of Spanish fish canning companies between 2010 and 2018 as 80.73 days. The DPO is 75.76 days on average, with a range from 19.97 days to 146.88 days, indicating that companies typically take around two and a half months to pay their suppliers. Regarding the CCC, the study reveals an average CCC of 135.27 days, with a maximum of 502.38 days and a minimum of 22.31 days. This suggests that, on average, companies take approximately four and a half months to convert inventory into sales and receive payments from customers compared to making payments to trade

creditors, indicating a slower process in converting inventory into sales and collecting payments for Moroccan small- and medium-sized fisheries.

Insert Table 1 about here.

4.2 Correlations results

Table 2 illustrates the estimated coefficients reflecting the correlations among the variables utilised in the model. The correlation analyses are presented to offer preliminary insights into the relationships between the study variables. The findings indicate a positive and statistically significant association between DSO and ROA while revealing a negative and significant relationship between DIO, CCC, DPO and ROA. More importantly, the estimated coefficients between the independent variables are all less than 0.8, indicating the absence of potential multicollinearity, as Field (2005) suggested.

Insert Table 2 about here.

4.3 Regression results and discussions

Table 3 presents the results of the dynamic panel data models analyzing profitability-WCM relationship. These models incorporate the lagged dependent variable (ROA_{t-1}), a range of independent variables related to working capital management (WCM), and control variables. Each of the four models (Model 1–Model 4) alternatively includes the four components of WCM. Model 1 in Table 3 reports the test results on the relationship between CCC and ROA. The test results show that CCC has a negative and significant association with ROA ($\beta_2 = -.001$). It is consistent with the view that decreasing CCC will generate more profits for the company. The results, therefore, provide support for Hypothesis 1. This result also aligns with previous studies (Tingbani, 2015; Raheman et al., 2010). Model 2 in Table 3 reveals the test results on the relationship between DPO and ROA. DPO is negatively associated with ROA ($\beta_2 = -.074$). This finding indicates that making early payments to suppliers will help improve ROA. Therefore, the results confirm Hypothesis 3 and align with the findings from several studies that document a negative relationship between DPO and ROA (Deloof, 2003; Afrifa, 2013). As reported under Model 3 of Table 3, DSO positively and significantly impacts ROA. In effect, the result means that the longer it takes a company to recover amounts owed by customers, the more profitable it will be. Therefore, the results reject Hypothesis 2 and contradict many prior researchers (Raheman et al., 2010; Tingbani, 2015; Sensini and Vazquez, 2021; Braimah et al., 2021; Deloof, 2003; Gill et al., 2010). Under Model 4 of Table 3, DIO has a negative and significant influence on ROA, which reveals that the more extended inventory is kept in stock, the lower the ROA. The finding confirms the developed Hypothesis 4, which predicted a significantly negative association between DIO and ROA. There are several reasons that can be expounded to explain the negative relationship between ROA and DIO. First, investment in inventory represents the amount of money locked up, which could have been invested in a high-return venture to increase ROA. Such a move further reduces ROA because it may require a company to seek short-term financing, which increases financing

costs and eventually minimises ROA. In addition, the results in Table 3 reveal that the lagged dependent variable ROA_{t-1} has a positive and statistically significant influence on the present profitability. This indicates that the financial success of a corporation has a level of temporal durability, similar to findings from previous research on the food business (Rey-Ares et al., 2021).

To check control variables, WCREQ shows a positive and significant relationship with ROA, except models 2 and 3, which indicate that small and medium fisheries benefit from sufficient working capital, leading to increased sales and profitability. It further revealed a significant negative relationship between DEBT_RAT and ROA in all GMM models except model 2, which indicates that as the firms' leverage grows, the financial cost profitability decreases. Finally, FIRM_SIZE has a negative and significant impact on profitability, as shown in all GMM models. This evidence indicates that as firms increase in size, the rate of profit growth decreases; furthermore, diseconomies of scale may materialise, and a company may reach a size at which the advantage derived from a previously internalised transaction may be nullified by management incompetence or another internal or external element.

Finally, the post-estimation tests indicate that the AR (2) statistic (Arellano and Bond, 1991) in all models is insignificant, which suggests the absence of autocorrelation. Hansen test is used to examine over-identifying restrictions in the econometric models, and the estimated values in Table 3 reject the assumption of overidentified restrictions. Hence, the instruments used are valid across all the models.

5. Conclusion

This research empirically investigates the association between working capital management and the profitability of SMEs within Morocco's fishing sector. The study analysed a sample of 100 SMEs from 2015 to 2020 over six years. Various metrics of working capital management, such as days sales outstanding, days payable outstanding, days inventory outstanding, and cash conversion cycle, were utilised. Profitability was assessed using returns on assets. Applying a dynamic GMM estimator, the study examined the potential linear association between each working capital management component and corporate profitability. The GMM technique addressed unobservable variations and concerns regarding potential endogeneity. The dynamic panel data analysis results indicate a significant relationship between the profitability of small and medium fisheries and DSO, DIO, DPO, and CCC. In line with previous empirical research, the findings show that the relationship between CCC and profitability is negative. This indicates that a firm can improve its economic performance by shortening CCC. While DSO suggests a rationale for augmenting investments in working capital, the adverse association between DPO and firm profitability implies potential elevated financing expenses incurred by firms deferring payments to suppliers. This underscores the significance of strategies like extending trade credit to customers, ensuring timely supplier payments, and efficient inventory control in influencing firm profitability. Notably, control variables were factored into the analysis. The study reveals that factors such as working capital requirement, financial leverage, and company size emerge as statistically significant drivers of profitability.

5.1 Research contributions

This study contributes significantly to the literature on the relationship between working capital management and profitability in two key ways. First, the primary emphasis is on the fishing sector, a food industry that has received limited attention in the literature despite increased

studies on the working capital management – profitability relationship since 2008 (Fernandez-Lopez et al., 2020; Singh and Kumar, 2014). Second, the study is known to several small owner-managers in the fishing sector. It will help owner-managers of small and medium fisheries and practitioners predict the operating cash flows needed and manage the factors defining working capital. Thus, it will assist SMEs in implementing practical managerial strategies and providing valuable professional knowledge for efficient managerial operations. Finally, this examination will guide government institutions and organisations on efficient actions to enhance the growth and development of SMEs and will support the critical priorities of the Blue Economy (BE) program, aiming to assist Morocco’s institutional frameworks and enhance the utilisation of resources in the Moroccan fish and seafood processing value chain (Hanine et al., 2023); it will also substantiate the second-phase framework of the Industrial Acceleration Plan (2021–2025), a Moroccan industrial-reform policy planning to integrate SMEs in various industries.

5.2 Limitations and future research directions

This study has significant findings that suggest avenues for future research. While the analysis focused on the linear relationship between working capital management and profitability, there is scope for exploring non-linear connections between different working capital management components and business profitability. The research and current literature have yet to delve into the various factors that impact the interplay between working capital management and profitability. This signifies a promising avenue for future studies to examine how multiple variables, including firm-specific attributes and environmental factors, may interact with working capital management practices to influence business performance. By exploring the moderating influences of these variables, researchers can enhance their comprehension of the intricate mechanisms underlying the association between working capital management and profitability.

References

1. Afrifa, G., 2013. Working capital management and AIM listed SME companies profitability: a mixed research method approach (Doctoral dissertation, Bournemouth University).
2. Amponsah-Kwatiah, K. and Asiamah, M., 2021. Working capital management and profitability of listed manufacturing firms in Ghana. *International journal of productivity and performance management*, 70(7), pp.1751-1771.
3. Arellano, M. and Bond, S., 1991. Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The review of economic studies*, 58(2), pp.277-297.
4. Assouss, M. and Haddy, M., 2023. Economic dynamics, sustainability of fisheries resources and environment protection: An analysis of Sahara coastal cities in Morocco. In *E3S Web of Conferences* (Vol. 412, p. 01027). EDP Sciences.
5. Baños-Caballero, S., García-Teruel, P.J. and Martínez-Solano, P., 2014. Working capital management, corporate performance, and financial constraints. *Journal of business research*, 67(3), pp.332-338.
6. Blundell, R. and Bond, S., 1998. Initial conditions and moment restrictions in dynamic panel data models. *Journal of econometrics*, 87(1), pp.115-143.
7. Braimah, A., Mu, Y., Quaye, I. and Ibrahim, A.A., 2021. Working capital management and SMEs profitability in emerging economies: The Ghanaian case. *SAGE Open*, 11(1), p.2158244021989317.
8. Cui, L., Yue, S., Nghiem, X.H. and Duan, M., 2023. Exploring the risk and economic vulnerability of global energy supply chain interruption in the context of Russo-Ukrainian war. *Resources Policy*, 81, p.103373.
9. Dalci, I., Tanova, C., Ozyapici, H. and Bein, M.A., 2019. The moderating impact of firm size on the relationship between working capital management and profitability. *Prague Economic Papers*, 28(3), pp.296-312.
10. Deloof, M., 2003. Does working capital management affect profitability of Belgian firms?. *Journal of business finance & Accounting*, 30(3-4), pp.573-588.
11. Demirgüç-Kunt, A., Pedraza, A. and Ruiz-Ortega, C., 2021. Banking sector performance during the COVID-19 crisis. *Journal of Banking & Finance*, 133, p.106305.
12. Fernández-López, S., Rodeiro-Pazos, D. and Rey-Ares, L., 2020. Effects of working capital management on firms' profitability: evidence from cheese-producing companies. *Agribusiness*, 36(4), pp.770-791.
13. Ferriani, F. and Gazzani, A., 2023. The impact of the war in Ukraine on energy prices: Consequences for firms' financial performance. *International Economics*, 174, pp.221-230.
14. Field, A.P., 2005. *Discovering statistics using SPSS:(and sex, drugs and rock'n'roll)*. (No Title), p.xxxiv.
15. Frankel, R., Levy, H. and Shalev, R., 2017. Factors associated with the year-end decline in working capital. *Management Science*, 63(2), pp.438-458.

16. García-Isarch, E., 2014, October. Report of the FAO Working Group on the Assessment of Small pelagic Fish off Northwest Africa. Dakar, Senegal, 21-25 May 2012/Rapport du Groupe de travail FAO/COPACE sur l'évaluation des petits pélagiques au large de l'Afrique nord-occidentale. Dakar, Senegal, 21-25 mai 2012. In E-ISBN 978-92-5-007751-2. Centro Oceanográfico de Cádiz.
17. Gill, A., Biger, N. and Mathur, N., 2010. The relationship between working capital management and profitability: Evidence from the United States. *Business and economics journal*, 10(1), pp.1-9.
18. Gul, S., Khan, M.B., Raheman, S.U., Khan, M.T., Khan, M. and Khan, W., 2013. Working capital management and performance of SME sector. *European Journal of Business and management*, 5(1), pp.60-68.
19. Hanine, S., Dinar, B. and Meftah, S., 2023. The blue economy 3.0: innovation for a sustainable ocean economy in Morocco. *Int. J. Econ. Studies. Manag*, 3(6).
20. Heaps, T. and Helliwell, J.F., 1985. The taxation of natural resources. In *Handbook of public economics* (Vol. 1, pp. 421-472). Elsevier.
21. Jakpar, S., Tinggi, M., Siang, T.K., Johari, A., Myint, K.T. and Sadique, M., 2017. Working capital management and profitability: Evidence from manufacturing sector in Malaysia. *Journal of Business & Financial Affairs*, 6(2), pp.1-9.
22. Martínez-Sola, C., García-Teruel, P.J. and Martínez-Solano, P., 2013. Corporate cash holding and firm value. *Applied Economics*, 45(2), pp.161-170.
23. Ministère de l'Agriculture, de la Pêche Maritime, de Développement Rural et des Eaux et Forêts (MAPM),. 2008. Plan Maroc Vert. Morocco.
24. Nazir, M.S. and Afza, T., 2009. Impact of Aggressive Working Capital Management Policy on Firms' Profitability. *IUP Journal of Applied Finance*, 15(8).
25. Oseifuah, E.K., 2016. Cash Conversion Cycle theory and corporate profitability. In *Cash Conversion Cycle theory and corporate profitability: Oseifuah, Emmanuel Kojo*.
26. Petersen, M.A. and Rajan, R.G., 1997. Trade credit: theories and evidence. *The review of financial studies*, 10(3), pp.661-691.
27. PwC., 2022. Working Capital Report. Retrieved from <https://www.pwc.de/de/content/769fc591-0450-4bd6-aa42-db37d85146d5/pwc-germany-working-capital-report-2021-2022.pdf>.
28. Raheman, A., Afza, T., Qayyum, A. and Bodla, M.A., 2010. Working capital management and corporate performance of manufacturing sector in Pakistan. *International Research Journal of Finance and Economics*, 47(1), pp.156-169.
29. Raheman, A. and Nasr, M., 2007. Working capital management and profitability—case of Pakistani firms. *International review of business research papers*, 3(1), pp.279-300.
30. Rey-Ares, L., Fernández-López, S. and Rodeiro-Pazos, D., 2021. Impact of working capital management on profitability for Spanish fish canning companies. *Marine Policy*, 130, p.104583.
31. Ren, T., Liu, N., Yang, H., Xiao, Y. and Hu, Y., 2019. Working capital management and firm performance in China. *Asian Review of Accounting*, 27(4), pp.546-562.
32. Sarwat, S., Iqbal, D., Durrani, B.A., Shaikh, K.H. and Liaquat, F., 2017. Impact of working capital management on the profitability of firms: Case of Pakistan's cement sector. *Journal of Advanced Management Science*, 5(3).
33. Sefiani, Y., 2013. Factors for success in SMEs: a perspective from Tangier (Doctoral dissertation, University of Gloucestershire).

34. Sensini, L. and Vazquez, M., 2021. Effects of Working Capital Management on SME Profitability: Evidence from an emergent economy. *International Journal of Business and Management*, 16(4), pp.85-95.
35. Singh, H.P. and Kumar, S., 2014. Working capital management: a literature review and research agenda. *Qualitative Research in Financial Markets*, 6(2), pp.173-197.
36. Tarek, Y. and Rafik, M., 2020. The impact of working capital management on corporate's performance: Evidence from Egypt. *International Journal of Business and Management*, 15(6), pp.151-162.
37. Thapa, P.D.P., 2013. How does profitability get affected by working capital management in food and beverages industry?. *Journal of Advanced Research in Management (JARM)*, 4(08), pp.79-88.
38. Tingbani, I., 2015. Working capital management and profitability of UK firms: a contingency theory approach (Doctoral dissertation, Bournemouth University).
39. Ukaegbu, B., 2014. The significance of working capital management in determining firm profitability: Evidence from developing economies in Africa. *Research in International Business and Finance*, 31, pp.1-16.

Table 1 Descriptive statistics for all variables

Variable	N	Mean	Median	SD	Min	Max	Skewness	Kurtosis
ROA	600	.098	0.108	.090	-.121	.845	5.488	48.325
CCC	600	135.278	81.319	99.744	22.31	502.383	1.361	5.212
DIO	600	125.702	109.050	114.148	0	552.319	.926	4.178
DPO	600	75.769	61.280	28.413	19.972	146.889	.532	2.394
DSO	600	85.087	96.395	49.072	-1.382	260.849	.444	3.586
DEBT_RAT	600	.514	0.237	.903	-.080	3.823	3.184	11.607
FIRM_SIZE	600	17.995	17.866	1.327	14.984	20.568	.333	3.165
WCREQ	600	.674	0.636	.272	.438	2.893	5.495	44.603

Table 2 Correlation analyses of the study variables

	ROA	DSO	DIO	CCC	DPO	DEBT_RAT	FIRM_SIZE	WCRQ
ROA	1							
DSO	.075*	1						
DIO	-.297***	-.310***	1					
CCC	-.319***	.072	.792***	1				
DPO	-.351***	.231***	.349***	.240***	1			
DEBT_RAT	.012	.028	-.225***	-.315***	.309***	1		
FIRM_SIZE	-.189***	.036	.427***	.482***	.072	-.589***	1	
WCREQ	.348***	-.146***	.366***	.302***	.133**	-.108**	-.081*	1

Significant levels are designated at 1% (***), 5% (**) and 10% (*) for tests of whether the correlation coefficient is equal to zero

Table 3 Dynamic model estimation on ROA

Variables	Model 1	Model 2	Model 3	Model 4
ROA _{t-1}	.274*** (.017)	.0815* (.045)	.190** (.081)	.081** (.031)
CCC	-.001*** (.000)			
DPO		-.074** (.036)		
DSO			.125** (.062)	
DIO				-.023** (.000)
DEBT_RAT	-.018*** (.001)	-1.125 (1.101)	-4.538* (2.580)	-.049*** (.012)
FIRM_SIZE	-.007*** (.002)	-2.820** (1.402)	-3.805* (2.045)	-.050** (.010)
WCREQ	.036*** (.001)	.498 (.939)	3.891 (12.614)	.132** (.066)
Constant	.210 (.037)	67.279** (30.384)	52.469 (50.376)	.453** (.359)
Number of Observations	600	600	600	600
Number of instruments	31	40	23	23
Years	Yes	Yes	Yes	Yes
F test	44.101	18.712	92.071	311.182
F p-val	.000	.000	.000	.000
AR(2) p-value	.111	.822	.416	.269
Hansen J Statistic	39.99	26.062	23.722	28.132
Hansen J p-value	.489	.570	.405	.178

Standard errors are in parentheses *** p<.01, ** p<.05, * p<.1