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**Research Article**

# The Impact of Working Capital Management on Business Profitability: Evidence on Egyptian Banks

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**ABSTRACT**

The purpose of this research is to investigate the influence of working capital management on business performance. Inventory management, as well as account receivable and payable management, are all part of working capital management. Previous studies were conducted extensively in the case of developed countries. studies on working capital of banks in developing countries especially in Egypt are limited in addition, previous studies were limited to nonfinancial institutions, manufacturing companies and some companies listed in the stock market moreover it's important to address other performance measures such as return on investment and profit margin Therefore, This study seeks to fill this existing gap and answer the question; what effect does the working capital management have on profitability of Egyptian banks. The sample analyzed covers 21 listed banks in the Egyptian stock exchange from the period 2016 to 20223. The banks' profitability has been measured by 3 different proxies which are ROA, ROCE and ROI. However, the independent variables utilized in this paper are Account Receivables Period (ARP), Account Payables Period (APP) and Current ratio to show the impact of the working capital. The results showed a significant positive relationship between working capital on ROA, ROCE & ROI, however a significant negative effect of APP on ROI.

**Keywords:** Egypt, profitability, resource dependency theory, trade off, working capital.

## INTRODUCTION

Businesses exist all over the world to perform multiple operations in order to profit and boost economic prosperity of any nation. Business, whether large, medium, or small, requires financing to continue operations and achieve organizational objectives. As a result, financing the functioning of any organization is so important nowadays that it is rightfully referred to as the entity's lifeline. Every company, regardless of size or nature of commercial activities, whether profit-oriented or not, requires the appropriate quantity of working capitas working capital management, is critical to organization performance. Working capital is the difference between total current assets and total liabilities (Akgün and Karataş, 2019). Working capital also can be defined as a company's capital that is employed in its day-to-day activities (Chomba, 2018).

The purpose of this research is to investigate the influence of working capital management on business performance. Inventory management, as well as account receivable and payable management, are all part of working capital management. Working capital management is defined as the activities and procedures that management use to control working capital (Chomba, 2018). Working capital management's key objectives are to keep the working capital operating cycle going smoothly and to optimize the return on current asset investments. Proper financial management and financial structure are necessary due to the considerable influence on the company's success (EL-Ansary and Al-Gazzar, 2020). As a result, various studies were conducted to identify this relationship so the main objective of this paper is to examine and measure the relationship between working capital management and the profitability of Egyptian banks. the profitability is measured in terms of return on assets (ROA) while working capital is measured using inventory turnover (IT), accounts payable turnover (AP), accounts receivables turnover (AR) and cash conversion cycle (CCC) (Alsulayhim, 2019).

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According to Chomba (2018) Working capital management practice refers to the essential concepts and standards that businesses utilize to manage their working capital. Working capital management aims to contribute to the firm's value maximization goal by managing current assets in such a way that the marginal returns on investment in these assets are equal to or greater than the cost of capital used to fund them. However, ineffective working capital management can hinder a company's profitability (Piabuo, 2016). Inventory, payables, receivables, and effective cash management are all components of the company's everyday operations. Maintaining optimal working capital entails decreasing working capital requirements when required and maximizing cash flow (Gbalam and Uzochukwu, 2020).

In The next section the theoretical background the most important theories and the key concepts that are related to the working capital management are identified to establish an in-depth knowledge of the topic and to provide a direction and guidance for this research.

## Theoretical background

### *Working capital components*

*Inventories*

Pandey (2009) defined inventories as the product that a firm is producing for sale as well as the required to make its product also Inventory is defined as the availability of resources like components, consumables, spare parts, sales items, obsolete items, and all other supplies that are kept on hand for the purpose of upcoming production and well along for sales, and have economic value in meeting the projected level of demand (Singh, 2008). The difference in asset composition, particularly inventories, has a substantial impact on businesses' working capital efficiency since it has a significant impact on the trade-off between firms' profitability and liquidity. Theoretically, it is important for companies to invest in short-term assets as it is the dynamism that drives the business sales growth (Ling et al., 2018).

*Accounts Receivable*

Rafuse (1996) defines accounts receivable as consumers who have not yet paid for products or services provided by the company While (Purwanti, 2019) defines Accounts receivable as the right to make a claim against another person or company in the exchange for payment or the transfer of other assets or services to the party to whom he owns. Receivables resulting from the sale of goods or the provision of services in the company's routine business operations. Accounts receivable management is critical for achieving an appropriate balance between the cash flow management components, which has a direct effect on a firm's profitability (Purwanti, 2019).

*Accounts payable*

Falope and Ajilore (2009) defined accounts payable as vendors whose bills for products or services have been processed but not yet paid. Account Payables Management also refers to a company's collection of rules, processes, and practices for handling trade accounts payable, while accounts payable refers to invoices for products or services have been received but has not been paid yet (Knauer and Wöhrmann, 2013). A firm that follows successful practices in payables management can enjoy the benefits of stable operating cycles, which give a continuous operating cash flow and put the business in a better liquidity position than its competitor (Sharma, 2017).

*Cash conversion cycle*

The definitions of the cash conversion cycle vary. Stewart (1995), for instance, defined the cash conversion cycle as a composite indicator that describes the average amount of time required to convert a dollar invested in raw materials into a dollar recovered from a client. Also, the cash conversion cycle is defined by Scott and Eugene (2005) as the average length of time between the payment for raw materials and the collection of receivables related to the sale of a product.

Because it enhances the efficiency of working capital management, a shorter cash conversion cycle may be related to higher profitability. A short cash conversion cycle means that the corporation controls and processes inventory faster, collects cash from receivables sooner, and delays cash payments to suppliers. This improves the efficiency of a company's internal operations, resulting in greater profitability, a larger net present value of cash flows, and a higher market value for the company (Gentry et al., 1990).

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By minimizing the amount of time cash is held in working capital, the cash conversion cycle may be reduced. This might occur by reducing the inventory conversion time by faster processing and selling items to consumers, or by decreasing the receivable collection period through faster collections, or by extending the payable deferral period through slower payments to suppliers. Shortening the cash conversion cycle, on the other hand, may damage the firm's operations and result in bad performance. Decreasing the inventory conversion period may increase shortfall costs and cause corporations to lose strong credit clients, while increasing the payment period may harm the firm's credit reputation (Nobanee et al., 2011).

## Theories of working capital

### *Operating and cash conversion cycle theory*

Operating and cash conversion cycle theory was developed by Richards and Laughlin (1980). This theory explains a cycle that starts with payment for raw materials, continues with the transformation and the emergence of new products, and ends with the collection of receivables from purchasers and probable debtors of the interaction because of the item sale. The cash conversion cycle in theory was the period required to convert a dollar of cash disbursements back into a dollar of cash inflow from a firm's regular course of operations is determined by the net time interval between actual cash expenditures on a firm's purchase of productive resources and the ultimate recovery of cash receipts from product sales. The cash conversion cycle theory is the most important in explaining working capital management because it includes all of the concepts and components, from raw materials to finished products, and outputs representing inventory levels, to receivables and payments representing the cash aspect.

### *The resource-based theory*

The resource-based theory was developed by Grant (1991). The author suggests that A business's resources and capabilities are key factors in developing its strategy: they are the major components on which a firm may create its identity and frame its policy, as well as the primary sources of the firm's profitability. 6 factors proposed in this theory as key resource categories, financial resources, physical resources, human resources, technology resources, reputation, and organizational resources. The theory highlights that Understanding the linkages between resources, capabilities, competitive advantage, and profitability is important to strategy design. Executives have individual-specific resources that facilitate and ensure the recognition of new opportunities, effective resource acquiring, as well as planning of making payments and recover receivables as and when due to ensure effective working capital management.

### *Free Cash Flow Theory*

Free cash flow is the cash flow generated in excess of what is necessary to fund business operations Jensen (1986) highlighted that Managers advocate for keeping a particular amount of cash to enhance their control over assets. The relationship between free cash flow and misuse of excess money has been inferred, since managers are more willing to invest in projects that will improve their own compensation and authority if these projects can utilize 'cost-free' financial resources to support the firm's expansion projects. In addition to the increase in the firm's size, it appears that managers may try to withhold additional resources within their control. A bigger corporation, on the other hand, tends to keep a lesser quantity of cash on hand, owing to well-established linked relationships with financial institutions as well as strong investor protection countries. The appropriateness of maintaining effective working capital management would greatly influence cash flow as suggested by the duration of the cash conversion cycle, where shorter CCC tends to enhance firm performance while longer CCC tends to need the use of external sources of funding.

### *Trade-off theory of capital structure*

Trade off theory was developed by Kraus and Litzenberger (1973). One fundamental goal of this theory is to explain why firms are often financed in part with debt and part with equity. It claims that there is an edge to financing with debt, the tax benefits of debt, and a cost to financing with debt, the cost of financial difficulty, including debt bankruptcy costs and non-bankruptcy costs. According to the theory, firms with a high amount of liquidity may have

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a lower profitability problem. In other words, there is a negative relation between liquidity and profitability is possible.

In conclusion, according to the preceding article, the theoretical framework on working capital is quite beneficial in establishing an in-depth knowledge of the topic and provides a strong direction and guidance for this research.

## LITERATURE REVIEW

Efficient working capital management is critical to the business' success. Several studies have been undertaken to investigate the link between working capital management and profitability.

Deloof (2003) investigated the relationship between working capital and business profitability and for recognizing this relationship he analyzed the behavior of profitability for 1,009 Belgian non-financial companies from 1992 to 1996. Profitability was used as dependent variable and measured using gross operating income and working capital was used as independent variable and measured using the cash conversion cycle [number of days accounts receivable + number of days inventory - number of days accounts payable]. In addition, size, sales growth, the financial debt ratio (financial debt/total assets), and the ratio of fixed financial assets to total assets were used as control variables. The results support the hypothesis that there is a strong negative relationship between account payable, inventory, the cash conversion cycle and profitability.

ul Haq etal. (2011) empirically examined the relationship between working capital management and profitability. Working capital was used as independent variable and was measured using Current Ratio, Liquidity Ratio, Current assets to Total assets ratio, Current assets to total sales ratio, Cash Turnover, Inventory Turnover Ratio, Debtor Turnover Ratio, Creditor Turnover Ratio while profitability was used as dependent variable and was measured using return on investment. Data of fourteen companies in cement industry in the Khyber Pakhtunkhwa Province of Pakistan for the period of six years from 2004 to 2009 is used to conduct the study. The author concluded that there is a positive but not significant relationship between working capital management and firm's profitability. The author recommends Future researchers to generalization of the findings beyond the Pakistan manufacturing sector and the scope of future research may be extended to the working capital components management including cash, marketable securities, receivables, and inventory management.

Bagchi et al. (2012) explained What is the nature and scope of the link between working capital management, solvency, and profitability. Working capital used as independent variable and was measured using age of inventory, age of debtors, age of creditors, solvency, debt-equity ratio, age of inventory, debt to total assets ratio and cash conversion cycle while profitability used as dependent variable and was measured using return on total assets and return on investment. Data of ten fast-moving consumer goods companies of India from 2000 to 2010 were analyzed to conclude that there is a negative relationship between debt to total assets, age of debtors, age of creditors, age of inventory and profitability when measured using return on total assets while there is a negative relationship between debt to total assets, cash conversion cycle, age of creditors and profitability when return on investment is used as a measure so the author concluded that there is a strong negative relationship between the measures of working capital and business profitability.

Makori and Jagongo (2013) attempted to offer evidence about how working capital management affects firm's profitability. The author used Working capital as an independent variable and measured using Average Collection Period, Inventory Conversion Period, Average Payment Period and cash conversion cycle while the dependent variable was profitability and measured using return on asset ratio. Sales Growth, Firm Leverage, Current Ratio and Firm Size as control variables. Data of five manufacturing and construction firms are listed on the Nairobi Securities Exchange from 2003 to 2012 and were analyzed to investigate this relationship. The results showed that Cash Conversion Cycle and average collection period have a negative impact on Profitability and a positive relation between Return on Inventory turnovers Accounts Payment Period and profitability. the author suggests that a longer credit period for the business, maintaining sufficiently high inventory levels, reducing costs of potential interruptions in the manufacturing process and loss of business due to product scarcity, and extending the accounts payable period will increase business profitability. one of the limitations in this study that the author used only 5 firms as a sample.

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One of the studies conducted on financial institutions was (Yahaya and Bala, 2015) which investigated the relationship between working capital management and financial performance of deposit banks in Nigeria. Working capital was used as independent variable and measured using current ration, quick ratio and cash ratio. Profitability was used as dependent variable and measured using return on assets. Data of 16 deposit money banks listed on the Nigerian Stock Exchange from 2007 to 2013. The study concluded that there is a significant positive relationship between current ratio, quick ratio and return on assets while there is a significant negative between cash ratio and return on assets.

Muhammad et al. (2016) investigated the relationship between working capital management and profitability of Tobacco Industry of Pakistan. The author used working capital as independent variable and was measured using Number of days accounts receivable, Number of days accounts payable, Number of days inventory and Cash conversion cycle while profitability used as dependent variable and was measured using return on assets. Data of selected companies of Tobacco Industry of Pakistan from 2005 to 2014 and were analyzed and the results of this analysis showed that there is a strong negative relationship between Number of days accounts receivable, Number of days accounts payable, Number of days inventory, Cash conversion cycle and profitability which supporting the hypothesis of the author. The author recommends that managers can create value for shareholders by reducing the cash conversion cycle and keep it at optimal level.

In the same year, Mahato and Jagannathan (2016) investigated the effect of Working Capital Management on Profitability To investigate the history and features of Indian telecom business and to create a framework for measuring the relation between working capital management ratios and company profitability in Indian telecommunications industry. previous studies Working capital was used as independent variable and measured using Average Collection Period, Inventory Conversion Period, Average Payment Period, Debt Ratio, Current Ratio and Cash Conversion Cycle while profitability measured using return on assets. Sales Growth and Firm

Size is used as control variables. The study was limited to Data about 8 Indian telecommunication companies only of five years from 2010 to 2015 which is a drawback that affects the results. The results showed that return on assets has negative relationship with Average Collection Period, Inventory Conversion Period, cash conversion cycle and Current ratio while return on assets has positive relationship with Average Payment Period, Debt ratio and Firm size which supporting Muhammad et al. (2016) results.

Şamiloğlu and Akgün (2016) Investigated the relationship between working capital management and performance of the firm to understand the relationship between working capital and Turkish firm performance. Working capital was used as independent variable and measured using accountant receivable period, accountant payable period and cash conversion cycle while firm performance as dependent variable measured using return on asset, return on equity, operating profit margin and net profit margin. firm size and firm leverage as control variables. Data of 120 Turkish firms from Istanbul Stock Exchange from 2003 to 2012 were analyzed to conclude that there is a strong negative relationship between account receivable period and operating profit margin while there is an insignificant positive relationship between inventory conversion period, cash conversion cycle and operating profit margin. Also, there is an insignificant positive relationship between accountant payable period and return on equity which not supporting the author hypothesis. Finally, there is a strong positive relationship between accountant receivable period, cash conversion cycle and return on assets

Hamid et al. (2017) investigated the relationship between working capital management and profitability of Pakistani textile companies. The author followed the past studies proxies and used Working capital as independent variable that was measured using Average collection period, Average payment period, Inventory turnover days and Cash conversion cycle while profitability used as dependent variable and measured using Net operating profit. Firm size, Current ratio, Leverage and Financial assets to total assets were used as control variables. Data of 92 Textile firms in Pakistan from 2006 to 2014 were used in this study to reach a conclusion that there is a strong negative relationship between inventory turnover in days, average payment period, cash conversion cycle, average collection period and profitability. The author recommends that If textile company executives want to improve profits, they should work to shorten the time it takes to collect from clients. They also shorten the inventory processing duration in order to

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boost profitability. In general, they should shorten the cash conversion cycle. Limitation faced by the author was limited sample for research.

Sulaiman et al., (2018) investigated the influence of working capital on profitability. Working capital was used as independent variable and was measured using Current Ratio, Trade Receivable Period, Trade payable Period and Inventory Conversion Period while profitability used as dependent variable and was measured using return on asset. Company size and growth were used as control variables. Data of sixteen Consumer Goods companies in Nigeria from 2010 to 2016 and were analyzed to conclude that there is a significant positive relationship between Trade Receivable Period and return on assets while there is an insignificant positive relationship between current ratio, trade payable period, inventory conversion period and return on assets. also, the author results revealed that Despite the fact that the trade receivables period has a positive significant influence on Return on Assets, the author finds that the working capital management variables in this study have no positive impact on performance. The author recommends that managers should set shorter credit periods for enterprises to be more liquid, reducing their reliance on high-interest loans to fund day-to-day operations, arrange with their vendors to extend the number of days accounts payable are due for payment in order to have more cash on hand and prevent a liquidity crisis, constantly evaluate their inventory levels in order to reduce the number of days product is kept before being sold and the positive relationship between Trade Receivable Time and Return on Assets implies that as the log average receivable period grows, so will profitability.

Moussa (2018) investigated the influence of working capital on business performance and value of Egyptian companies. Working capital and used as independent variable and was measured using Accounts receivables period, Inventory period, Accounts payable period, working capital requirement and cash conversion cycle while business profitability and value used as dependent variables and were measured using return on assets and Tobin's Q ratio respectively. Growth opportunities, Firm age, Size Firm size, Leverage, Economic condition (GDP) and Industry type were used as control variables. Data of sixty-eight industrial firms listed in the Egyptian Stock Exchange from 2000 to 2010 were analyzed to conclude that there is a positive relationship between performance, value and cash conversion cycle which not supporting the author hypothesis. The author suggests that Firms can increase their profits by maintaining greater levels of working capital and extending their cash conversion cycle. The author also concluded that organizations with high performance are less driven to optimize their working capital. This study has some limitations because it mainly focuses on industrial businesses, limited to a set of control variables relating to company characteristics, industry type, and economic conditions and limited to panel data analysis from 2000 to 2010 only so, the author recommends future researchers to Extend to service firms could better explain how industry practices affect the relationship between working capital management, performance, and firm value, use additional control variables like governance mechanisms, industry concentration, and financial constraints, and investigate the impact of working capital management on business performances and values following the Egyptian Revolution of 2011.

Peprah and Riziki (2019) were one of few researchers who examined the relation between working capital management and profitability of banks. Working capital management used as independent variable and was measured using current ratio and cash ratio while profitability used as dependent variable and was measured using return on assets. Data of twenty-five banks in Ghana from 2016 to 2018 and were analyzed to conclude that there is a weak negative relation between working capital and profitability. The author at the end of the study recommended that banks in Ghana should achieve a balance between working capital and profitability in order to avoid a probable collapse. Banks should examine their cashflow situation as they pursue profitability in the goal of maximizing shareholder value also, Bank assessment processes should be improved in order to minimize non-performing loans, which boost profitability but diminish liquidity.

One of the studies that conducted on the countries of the middle east such as Alsulayhim (2019) to investigate the relationship between working capital management and profitability of non- financial companies in Saudi Arabia. Working capital used as independent variable and measured using accounts receivable collection period, accounts payable period, current ratio and inventory period (Although CCC has been used extensively in previous studies, only components of cash conversion cycle and current ratio were included in this Study). while profitability used as

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dependent variable and measured using return on assets, return on equity, gross operating profit, net operating profit and return on capital employed while company size and GDP annual growth was used as a control variable. Data of 67 companies from 2007 to 2016 and were analyzed and the results showed that there is a significant negative relationship between receivable collection period, accounts payable period and profitability which supporting the author hypothesis the study also showed a Positive but not significant relationship between inventory turnover and profitability. The author didn't observe an impact of GDP, as a proxy for economic conditions, on the link between working capital and profitability. The author stated that a limitation of this study was that it's limited to non-financial companies listed in the Saudi Stock Exchange.

Anton and Afloarei Nucu (2020) investigated the relationship between working capital and profitability of Polish listed firms in Warsaw stock exchange. Working capital was used as an independent variable and was measured using working capital ratio and its square while profitability was used as a dependent variable and measured using return on assets. debt ratio, cash ratio, sales growth and firm size as control variables. Data of 719 Polish firms listed in Warsaw stock exchange from 2007 to 2016 and were analyzed and concluded that there is an inverted U-shaped relationship between working capital and profitability the results also showed that the debt and cash ratios are statistically significant drivers of business profitability, and that debt has a negative relationship with firm profitability. Other control factors (sales growth, cash ratio, and firm size) are discovered to be powerful determinants of firm profitability. When another proxy for the dependent variable–operating return on assets and other control variables were included, the empirical findings were the same. The author suggests that maintaining working capital at a low level, increase sales and early payments strongly influence profitability in a positive way but more increase in working capital above its optimum level establishes a negative working capital &amp, profitability relationship. The study has some limitations like its limited to firms listed on Warsaw stock exchange in addition; most financial variables at the business level are determined by a network of relationships.

(EL-Ansary and Al-Gazzar, 2020) is Another study conducted in case of Middle East and North Africa region and considered various countries to examine the relationship between working capital and profitability. Working capital was used as independent variable and was measured using net working capital rate [inventories+ trade receivables+ trade payables)/sales] while profitability was measured using return on assets and return on equity. Firm size, leverage, sales growth, cash level and economic growth were used as control variables. Data of 134 consumer goods listed companies in 12 Middle East and North Africa region countries from 2013 to 2019 were analyzed which represents an edge comparing to other studies. The results concluded that there is a significant concave relationship between net working capital ratio and return on assets indicating that there is an optimal level of working capital to maximize the return on assets also the results explained that when using the positive net working capital ratio sample there is a strong negative influence of net working capital on return on assets and when using return on equity as a profitability measure the coefficient's magnitudes of net working capital ratio in the negative net working capital ratio sample are greater than those in the positive sample indicating that working capital increased corporate profits for the negative sample substantially faster than it decreased profitability for the positive sample which supporting the author hypothesis. The results also suggested that there is a positive relationship between positive net working capital ratio sample and return on equity, meaning that there is a linear relationship. The study revealed that cash flow availability has no effect on the relationship between working capital and business profitability.

PHAM et al. (2020) investigated the relationship between working capital management and profitability of steel businesses listed on the Vietnam Stock Exchange. Working capital was used as an independent variable and was measured using Days Sales Outstanding, Days Inventory Outstanding, Days Payable Outstanding and Cash Conversion Cycle in addition to firm size, financial leverage and current ratio used as control variables while profitability was used as dependent variable and was measured using return on assets. Data of 20 steel companies listed on the Vietnam Stock Exchange from 2010 to 2019 to conclude that that Days Sales Outstanding, Days Inventory Outstanding and Days Payable Outstanding have a positive relationship with profitability of steel companies while Cash Conversion Cycle has a negative tie with profitability. The study was limited to considering the impact of working capital on other profitability indicators like return on equity, Return on Invested Capital and return on capital employed also the sample used wasn't large, so the author recommended future researchers to consider these limitations.

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Syeda (2021) selected a sample of 15 trading companies listed companies in the New York Stock Exchange for period of five years from 2015 to 2019 to examine the relationship between Profitability and several variables to measure working capital management. The working capital was used as independent variable and was measured using average collection period, average inventory turnover in days, average payment period and cash conversion cycle while profitability was used as dependent variable and was measured using net profit margin (net income/net sales*100). The results showed that there is a negative relationship between profitability and the average collection period, the lower the average collection period the higher the profitability, meaning that a decrease in the number of days a business receives payment from sales positively affects the profitability of the firm. In addition, there is a highly significant positive relationship between average payment period and profitability. This indicates that the longer a firm makes the payment to its creditors, the more profitable it is. Also, when the cash conversion cycle decreases, this will lead to an increase in profitability of the business, and managers can create a positive value for the shareholders.

A very few studies have considered multiple countries as well such as (khan and Alam, 2021). investigating the relationship between firms' working capital management and the profitability of SMEs listed on six Gulf Cooperation Council stock exchanges. The authors conducted the study to determine and analyze the relationship between working capital components (cash cycle management, accounts receivable management, debt management, and inventory management) and profitability of SMEs listed on six Gulf Cooperation Council stock exchanges. Working capital used as independent variable and measured using cash cycle, days of accounts receivable, days of accounts payable, debt turnover rate and inventory days. While the dependent variable used was profitability and measured using gross profit. Fixed financial asset ratio, financial debt ratio and company size were used as control variables. Data of 136 SMEs listed on six Gulf Cooperation Council stock exchanges from 2019 to 2020 and were analyzed to reach a conclusion that there is a significant relationship between size, cash cycle, days of accounts receivable, number of days of accounts payable, inventory days and profitability. the author suggested that Managers can help small and medium-sized businesses make a profit by properly managing the cash cycle and keeping each of several other components (accounts receivable, accounts payable, and inventory) at ideal level also, maintaining a balance between accounts receivable and managing the turnover of accounts receivable is critical to maximize working capital. This study has limitations which is focusing only on consumer goods-related SMEs. The author recommends future researchers not to focus on working capital management components only, but also on external factors affecting SMEs, such as economic conditions, inflation rates, and foreign currency exchange rates.

Hernandez et al. (2021) The author investigated the relationship between working capital and profitability of companies that operates in emerging economies. Working capital was used as independent variable and was measured using inventory, accounts receivables, accounts payable and cash conversion cycle while profitability was used as dependent variable and was measured using return on assets. Firm size, current ratio and assets turnover ratio were used as control variables. Data of 123 manufacturing companies in the Santiago metropolitan region from 2014 to 2018 were used and analyzed in this study and concluded that there is a non-linear relationship between working capital and profitability which means that till the optimum level of working capital the relation is positive but when the exceeding the optimal level the relation will be negative.

Mohamed Eladly (2021) one of a few researchers who investigated the relationship between working capital and profitability of financial institutions. Working capital used as independent variable and was measured using current Ratio, Quick Ratio and Liquidity while profitability used as dependent variable and was measured using Return on Assets, Return on Equity and Earning Assets. Data of 19 firms that represent 49 % from all companies working under Financial Regulatory Authority in Egypt from 1999 to 2019 were analyzed to conclude that There is a positive significant relationship between independent variables (current ratio, quick ratio, and liquidity) and dependent variables (Return on Equity, return on assets, current ratio and quick ratio).

According to the literature analysis, the relationship between working capital and corporate performance is not static also our attempt to analyze the impact of working capital management on firm profitability for a sample of Egyptian banks is a pioneering effort especially when taking into consideration that previous studies on financial institutions or in case of developing countries like Egypt is very few.

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### *Research gap*

As a conclusion from the literature review on this topic, previous studies were conducted extensively in case of developed countries. studies on working capital of banks in developing countries especially in Egypt are limited in addition, previous studies were limited to nonfinancial institutions, manufacturing companies and some companies listed in the stock market moreover it's important to address other performance measures such as return on investment and profit margin Therefore, This study seeks to fill this existing gap and answer the question; what effect does the working capital management have on profitability of Egyptian banks?

## METHODOLOGY

The sample analyzed covers 51 listed banks in the Egyptian stock exchange from the period 2016 to 2020. The banking sector was analyzed specifically because the WCM practices differ between different sectors and industries suggesting the non-homogeneous effects of WCM on different corporate performance metrics.

**Table 1:** Description of the variables

| Variable | Acronym | Formula | Description And Citation |
|---|---|---|---|
| Return on assets | ROA | EBIT/TA | ROA is a comprehensive financial measurement used to assess a bank's profitability performance. Using ROA as a proxy for profitability following (Muhammad et al. 2016; Mahato and Jagannathan 2016; Alsulayhim 2019; Anton and Afloarei Nucu 2020; Hernandez et al. 2021) |
| Return on capital employed | ROCE | EBIT/(TA-CL) | ROCE is a ratio that evaluates the efficiency and profitability of a company's capital investments. Using ROCE as a proxy for profitability following Alsulayhim (2019) |
| Return on investment | ROI | NI/cost of investment | ROI is likely the most widely used profitability ratio. it analyzes the performance of business units organized as profit centers and with the capacity to make investment choices. Using ROI as a proxy for profitability following (ul Haq etal. 2011; Bagchi et al. 2012) |
| Account receivables period | ARP | Account receivable/net sales*365 | ARP is the average period that a business takes to collect its receivables (Purwanti, 2019). Using ARP to measure working capital following (Şamiloğlu and Akgün 2016; Moussa 2018; Muhammad et al. 2016; Mahato and Jagannathan 2016; ul Haq et al. 2011). |
| Accounts payable period | APP | Account payable/Cost of goods sold*365 | APP is the period that a business takes to pay its creditors Falope and Ajilore (2009). Using APP to measure working capital following (Moussa 2018; Muhammad et al. 2016; Mahato and Jagannathan 2016; ul Haq et al. 2011). |
| Current ratio | CR | CA/CL | CR measures a company's capacity to pay down short-term debt using its current assets. (Heikal et al., 2014). Using CR to measure working capital following (ul Haq etal. 2011; Mahato and Jagannathan; Alsulayhim 2019; PHAM et al. 2020; Sulaiman et al., 2018; Peprah and Riziki 2019). |

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Research Article

**Regression Models**

$ROA = \beta 0 + \beta 1ARPit + \beta 2APPit + \beta 3CRit + \beta 4SIZEit + \varepsilon it$

$ROI = \beta 0 + \beta 1ARPit + \beta 2APPit + \beta 3CRit + \beta 4SIZEit + \varepsilon it$

$ROCE = \beta 0 + \beta 1ARPit + \beta 2APPit + \beta 3CRit + \beta 4SIZEit + \varepsilon it$

**Hypothesis**

**H1:** there is a positive relationship between working capital and return on assets.

H1.1: there is a positive relationship between accounts receivables period and return on assets.

H1.2: there is a positive relationship between accounts payables period and return on assets.

H1.3: there is a positive relationship between current ratio and return on assets.

**H2:** there is a positive relationship between working capital and return on capital employed.

H2.1: there is a positive relationship between accounts receivables period and return on capital employed.

H2.2: there is a positive relationship between accounts payables period and return on capital employed.

H2.3: there is a positive relationship between the current ratio and return on capital employed

**H3:** there is a positive relationship between working capital and return on investment.

H3.1: there is a positive relationship between accounts receivables period and return on investment.

H3.2: there is a positive relationship between accounts payables period and return on investment.

H3.3: there is a positive relationship between current ratio and return on investment.

**Empirical evidence**

The goal of this part is to shed light on analysis of data and the testing of research hypotheses and consists of 3 subsections. First is data summary to analyze the data in general second is Pearson's correlation analysis to test the multicollinearity of the variables third is the regression results.

Summary statistics are completed prior to initiating the regression analysis to highlight the nature of the data in general, listing the mean, standard deviation, minimum and maximum values for each of the selected variables utilized in the model.

**Table 2:** Descriptive Statistics

| Variable | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|
| ROA | 0.0284399 | 0.0130923 | 0.010638 | 0.094523 |
| ROCE | 0.2035854 | 0.1152757 | -0.53114 | 0.692457 |
| ROI | 0.4097426 | 0.4366214 | 0.052931 | 2.868384 |
| ARP | 182.2613 | 107.0698 | 29.10638 | 628.7675 |
| APP | 25.77198 | 7.093681 | 2.99849 | 40.18784 |
| CR | 1.127183 | .0523253 | .9342217 | 1.252768 |
| size | 7.954856 | .4832028 | 7.074344 | 9.207906 |

Table 2 presents descriptive statistics for the variables analyzed within the current study. The mean value of ROA, ROCE and ROI of the selected banks are 2.84%, 20.35% and 40.97% respectively. The mean value of ARP is 183 days for the sampled banks which indicates that the banks within the sample wait 183 days on average to collect their receivables, the minimum and the maximum collection period was 29 days and 629 days respectively with a standard

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deviation of 107 days. The mean value of APP is 26 days indicating that on average the banks take 26 days to pay its creditors with minimum and maximum value of 3 days and 41 days respectively and a standard deviation of 7 days. The table also shows that an average bank within the sample has a size of 7.95 as measured by the natural logarithm of its total assets. The table also shows that the banks, on average, have a 1.12 current ratio.

**Table 3:** Pearson's correlation

| | ROA | ROCE | ROI | ARP | APP | CR | size |
|---|---|---|---|---|---|---|---|
| ROA | 1 | | | | | | |
| ROCE | 0.5820 | 1 | | | | | |
| ROI | 0.7622 | 0.4477 | 1 | | | | |
| ARP | -0.1410 | -0.1134 | 0.3003 | 1 | | | |
| APP | 0.0971 | 0.0546 | 0.6188 | 0.6690 | 1 | | |
| CR | 0.3972 | 0.0980 | 0.3603 | 0.2124 | 0.2266 | 1 | |
| size | -0.0552 | -0.0991 | -0.0564 | 0.0999 | -0.0103 | 0.3933 | 1 |

Correlation analysis is used to determine the degree of correlation between multiple variables. The correlation matrix of all variables included in the study is shown in the previous table. It can be noticed that profitability proxies (ROA, ROCE and ROI) are correlated positively with APP and CR while ROA and CR are negatively correlated with ARP and the size of the bank. The results indicate that when APP and CR increase the profitability also increases and its consistent with the perspective that the longer the time taken by the banks to collect their receivables will increase the interest earned on these receivables and as result increase the profitability on the other hand the longer the period taken by the banks to pay creditors the higher the interest paid on these payables and as a result the profitability decreases. The positive relationship of profitability with APP and CR is consistent with the results of (Muhammad et al. (2016); Mahato and Jagannathan (2016); Sulaiman et al., (2018); PHAM et al. (2020)) while the negative relationship between profitability and ARP is consistent with the results of (Bagchi et al. (2012); Muhammad et al. (2016); Şamiloğlu and Akgün; Hamid et al. (2017); Alsulayhim (2019)). The table also shows that all the values is less than 80% which means a low correlation between the variables and indicating the absence of multicollinearity.

**Hausman test**

**Table 4:** ROA

| | **Coefficients** | | | |
|---|---|---|---|---|
| | **(b) fe** | **(B) re** | **(b-B) Difference** | **Sqrt (diag (V_b-V_B)) S.E.** |
| ARP | -0.6864372 | -1.071241 | 0.3848042 | 0.1735969 |
| APP | -0.1276541 | -0.0069697 | -0.1206844 | 0.0195283 |
| CR | 0.1049817 | 0.1200283 | -0.0150466 | 0.0113462 |
| size | -0.0416802 | -0.0082305 | -0.0334497 | 0.0087557 |

chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 17.07

Prob>chi2 = 0.0019

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**Table 5:** ROCE

| | **Coefficients** | | | |
|---|---|---|---|---|
| | **(b) fe** | **(B) re** | **(b-B) Difference** | **Sqrt (diag (V_b-V_B)) S.E.** |
| ARP | -5.64208 | -7.314244 | 1.672167 | 3.173128 |
| APP | -0.35198 | 0.4057896 | -0.7577745 | 0.3690792 |
| CR | 1.100444 | 0.5357719 | 0.5646723 | 0.2054519 |
| size | -0.58363 | -0.0549982 | -0.528634 | 0.1075394 |

chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 59.82

Prob>chi2 = 0.0000

**Table 6:** ROI

| | **Coefficients** | | | |
|---|---|---|---|---|
| | **(b) fe** | **(B) re** | **(b-B) Difference** | **Sqrt (diag (V_b-V_B)) S.E.** |
| ARP | -9.139768 | -21.51809 | 12.37832 | 5.47565 |
| APP | 1.476645 | 7.403288 | -5.926643 | 0.576105 |
| CR | 1.408418 | 2.508564 | -1.100147 | 0.343638 |
| size | -1.082156 | -0.1524585 | -0.9296974 | 0.251212 |

chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 24.76

Prob>chi2 = 0.0001

Hausman test can be defined as a test for model misspecification. In the case of panel data analysis, Hausman test is used to help in choosing between fixed and random effect models. The Hausman test was conducted to discover the variability of unobserved errors and to choose between fixed-effects and random-effects models. From table 3, chi2 value is (0.0019) which means rejecting the random effect model and the fixed effect model is more consistent with the current study. From table 4, chi2 value is (0.000) which means rejecting the null hypothesis and the fixed effect model is more consistent with the current study hypothesis. From table 5 chi2 value is (0.0001) which also means rejecting the null hypothesis and the fixed effect model is more suitable for the current study hypothesis.

So, based on Table 3,4 &5 which show that chi2 value is less than 5% which indicates that the fixed effects model is more consistent and to be used to test all the current study hypothesis.

**Table 7:** (Random/Fixed – Effects Regession) Number of observations = 204

| ROA | Coef. | T |
|---|---|---|
| ARP | *** 0.0000344 | 2.02 |
| APP | ** 0.00027 | 1.43 |
| CR | *** 0.0907936 | 2.73 |
| size | *** -0.0475514 | -4.05 |
| _cons | *** 0.2911365 | 3.2 |

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**Table 8:** (Random/Fixed – Effects Regession) Number of observations = 204

| ROCE | Coef. | T |
|---|---|---|
| ARP | ** 0.0001545 | 0.85 |
| APP | * 0.0001379 | 0.07 |
| CR | *** 1.037155 | 2.93 |
| size | *** -0.5882336 | -4.71 |
| _cons | *** 3.682122 | 3.8 |

**Table 9:** (Random/Fixed – Effects Regession) Number of observations = 204

| ROI | Coef. | T |
|---|---|---|
| ARP | * 0.0000449 | 0.11 |
| APP | ** -0.0089658 | -1.99 |
| CR | *** 1.431158 | 1.81 |
| size | *** -0.9083314 | -3.26 |
| _cons | *** 6.2451 | 2.88 |

Note: *Significant @ 10%; **Significant @ 5%; and ***Significant @ 1%

**Regression results**

To test the hypothesis (H1) and the significance of the relationship we go back to table 7 that uses ROA as a proxy for bank performance which indicates that there is a significant positive relationship between CR and ROA with a statistical significance at 1%, indicating that the higher the CR the higher the ROA. Based on this finding, hypothesis H1.3 is accepted. This results in line with Eladly (2021), who empirically proved a positive significant relationship between CR and ROA with a statistical significance at 1%. In addition, in line with Peprah and Riziki (2019) results who concluded a statistically significant positive relationship between CR and ROA at 1%. Moreover, we can support our results with Yahaya and Bala (2015)'s results that showed a statistically significant positive relationship between CR and ROA at 1%.

Model 1 also showed a significant positive relationship between ARP and ROA with a statistical significance at 5% suggesting that Egyptian banks should extend their collection periods to increase ROA. This result is supporting H1.1 hypothesis. The significant positive relationship between ARP and ROA had been supported by previous studies like (Sulaiman et al., 2018) which showed a positive effect of ARP on ROA with a statistical significance at 1%. Also, in line with Pham et al. (2020) results which showed a significant positive relationship between ARP and ROA with a statistical significance at 5%. On the contrary with this study (Bagchi et al. 2012: Şamiloğlu and Akgün, 2016) revealed that there is a significant negative relationship between ARP and ROA. This difference in results of (Bagchi et al. 2012: Şamiloğlu and Akgün, 2016) results and current study results may be due to the difference in type of businesses under each study also each study conducted in different economy which has proven that how significantly these factors can affect the results.

In addition, model 1 showed a significant positive relationship between APP and ROA with a statistical significance at 5%. Based on these findings, hypothesis H1.2 is accepted. The current study result in line with Makori and Jagongo (2013) results who revealed a statistically significant positive relationship between APP and ROA at 1%. Also, this result is supported by Syeda (2021) results who concluded a significant positive relationship between APP and ROA. On the contrary with this study (Şamiloğlu and Akgün, 2016) results revealed a statistically significant negative relationship between APP and ROA at 1%.

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The significance link between working capital and profitability resulted from model 1 is supported by the resource-based theory which developed by Grant (1991) who is suggesting that one of the key resources for business profitability is financial resources. In addition, the positive link between ARP, APP, CR and ROA is explained previously in Trade-off theory which developed by Kraus and Litzenberger (1973). The theory highlights that firms with a high amount of liquidity may have a lower profitability problem. The operating and cash conversion cycle theory developed by (Richards and Laughlin, 1980) similarly emphasizes the relationship between ARP, APP, CR and ROA, defining the cash conversion cycle as the time required to convert a dollar of cash outflows back into a dollar of cash inflow from a firm's normal course of operations.

H2 states that there is a positive relationship between working capital proxies and ROCE.

To test the hypothesis (H2) and the significance of the relationship we go back to table 7 that uses ROCE as a proxy for bank performance, indicates that there is a significant positive relationship between ARP and ROCE with a statistical significance at 5% showing that the longer the ARP the higher the ROCE. Based on this result, hypothesis H2.1 is accepted.

Also, there is a significant positive relationship between APP and ROCE with a statistical significance at 10% which indicating that the longer the APP the higher the ROCE. As a result, hypothesis H2.2 is accepted.

In addition, there is a significant positive relationship between CR and ROCE with a statistical significance at 10% which indicating that the higher the CR the higher the ROCE. Based on this result the hypothesis H2.3 is accepted. These results are also consistent with the relationship between the current ratio and ROCE, as per the strong positive relationship between ARP and ROCE and the moderate positive significant relationship between APP and ROCE, I have found out that there is also a strong positive significant relationship between CR and ROCE. ROCE is not widely used as proxy to measure the performance of the banks in the literature like Alsulayhim (2019), who concluded a positive but not significant relationship between CR and ROCE and a negative but not statistically significant relationship between ARP, APP and ROCE. The contrast between the results of this study and of Alsulayhim (2019) is because of the difference between the type of business between the two studies. Alsulayhim (2019) conducted his research on non-financial institutions while the current study is considering financial institutions (banks). Besides, Alsulayhim (2019) conducted the research on a different economy (Saudi Arabia).

Model 2 results, consistent with the resource-based theory proposed by Grant (1991), suggest that one of the important resources for firm profitability is financial resources. Furthermore, the positive relationship between ARP, APP, CR, and ROCE has already been described in trade off theory that proposed by Kraus and Litzenberger (1973) and demonstrated that companies with a high level of liquidity may face a reduced profitability problem.

To test the hypothesis (H3) and the significance of the relationship we go back to table 8 that uses ROI as a proxy for bank performance indicates that there is a positive relationship between ARP and ROI but significant at 10% while there is a significant positive relationship between CR and ROI with a statistical significance at 1%. These results support our hypothesis H3.1 & H3.2. But there is a significant negative relationship between APP and ROI with a statistical significance at 1%. Based on this result, hypothesis H3.3 which states that there is a positive relationship between APP and ROI is rejected. The reason for APP negative relationship could be interpreted as the increase of APP will increase the interest expense paid on these payables and as a result the cost of investment will increase, and it will affect the ROI negatively. The result of this model suggests that banks should increase the ARP and increase the short-term resources within the bank and pay their payables as soon as possible to increase ROI and maintain a good relationship with investors.

Previous studies showed a positive effect of working capital components on ROI like Ul Haq et al. (2011), who concluded a statistically significant positive relationship between ARP, APP and ROI. Unlike other researchers like Bagchi et al. (2012), who concluded a significant negative relationship between ARP, APP and ROI. The contrast between ul Haq et al. (2011) & Bagchi et al. (2012) could be because of conducting the two studies in two different countries Pakistan & India respectively, or because of the difference in the context of both studies cement & fast-moving consumer goods (FMCG). That contrast highlights our debate that working capital management practices

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differ between different sectors and industries suggesting the non-homogeneous effects of working capital on different corporate performance metrics.

According to the results of Model 3, which are consistent with Grant's (1991) resource-based theory, financial resources are a key resource for company profitability. Additionally, the positive association between ARP, APP, CR, and ROI has already been outlined in Kraus and Litzenberger's (1973) trade off theory, which suggested that enterprises with a high level of liquidity may encounter a reduced profitability problem. Similarly, the operating and cash conversion cycle theory developed by (Richards and Laughlin, 1980) emphasizes the relationship between ARP, APP, CR and ROI, defining the cash conversion cycle as the time required to convert a dollar of cash outflows back into a dollar of cash inflows from a firm's normal course of operations. Similarly, the operating and cash conversion cycle theory developed by (Richards and Laughlin, 1980) emphasizes the relationship between ARP, APP, and ROI, defining the cash conversion cycle as the time required to convert a dollar of cash outflows back into a dollar of cash inflows from a firm's normal course of operations.

Size is used as a control variable since the concept of economies of scale directly affects the performance. The negative relationship between bank size and profitability is consistent with the perspective that when the firm size grow it will be harder to manage and control its assets in an efficient way, also consistent with free cash flow theory that highlights the direct relation between availability of free cash and miss use of excess money also highlights that the increase of the firm's size, the managers may try to withhold additional resources within their control which causes an inefficient management of resources.

The contrast between the current study results and the previous studies may be due to the difference in business under the current study and the activities performed to generate profits. For instance, banks mainly depend on interest to generate profits so it's more profitable to extend the collection period of their receivables to earn more interest unlike a manufacturing company, for example that tries to shorten the collection receivables period to purchase more inventory and pay bills to keep a good reputation with creditors.

## CONCLUSION

This paper aims to empirically test the relationship between working capital management and banks profitability using different profitability proxies (ROA, ROCE & ROI). In this context and using a data of 21 Egyptian banks, our 3 regression models showed a significant effect on all profitability proxies used. The results showed a significant positive relationship between working capital on ROA, ROCE & ROI, however a significant negative effect of APP on ROI.

Many studies have been conducted to investigate the relationship between working capital and firm performance like Pham et al. (2020); Şamiloğlu and Akgün (2016); EL-Ansary and Al-Gazzar (2020); Sulaiman et al., (2018). The outcomes are divided into two opposing viewpoints. According to one viewpoint, higher levels of working capital are expected to improve a firm's financial performance, particularly for firms with a low level of net working capital. Having more working capital on hand can improve operational efficiency, prevent operational disruptions, and help in meeting short-term obligations (Muhammad et al. 2016; Bagchi et al. 2012; khan and Alam, 2021; Hamid et al. 2017). According to the opposing viewpoint, when a firm's working capital level exceeds a certain level, it has a negative impact on its financial performance. Comparable results arise from various reasons, such as the fact that keeping inventory stock requires additional costs such as warehouse and insurance, which rise as inventory levels rise and results in a negative effect on firm performance. With the absence of the inventory in case of financial institutions, aside from the fact that the main operations and profitability drivers of financial institutions are different, it gives managers a greater incentive to increase working capital levels, extending receivables and collection periods. As demonstrated in this study, managers of Egyptian financial institutions could benefit from increased working capital levels.

### Implications

This study has significant implications for working capital literature as well as the roots of working capital management concepts and also offering insight on the Egyptian banking system. We create an additional layer of

academic value by focusing on a specific sector, particularly the banking sector, and providing a better knowledge of the working capital influence on banks performance. Also, this study suggesting that Egyptian banks should extend their collection, receivables period and increase their investment in working capital to maximize their financial performance. In addition, this research focuses primarily on the banking sector, which has received little attention in the literature on developing economies, and none has been applied to Egypt. This study would contribute to enhance the performance of the banking sector in the Egyptian context.

This study has significant implications for working capital literature as well as the roots of working capital management concepts and also offering insight on the Egyptian banking system. We create an additional layer of academic value by focusing on a specific sector, particularly the banking sector, and providing a better knowledge of the working capital influence on banks performance. Also, this study suggesting that Egyptian banks should extend their collection, receivables period and increase their investment in working capital to maximize their financial performance. In addition, this research focuses primarily on the banking sector, which has received little attention in the literature on developing economies, and none has been applied to Egypt. This study would contribute to enhance the performance of the banking sector in the Egyptian context.

### limitations

Despite the fact that this study helps to a better knowledge of WCM for Egyptian banks in Egypt, it unavoidably has some limitations. First, the findings may not be applicable to other businesses or companies in more developed nations. Second, management techniques may differ from one country to another. Third, because of data availability, the study sample of 21 banks does not cover all Egyptian banks. Thus, future study should investigate hypotheses based on country-by-country analyses or in diverse contexts such as other sectors over longer periods of time, comparing the analysis before and after 11 January Egyptian revolution, or during the COVID-19 pandemic would extend the examined periods which will increase the number of observations and the reliability of the results. The inclusion of more banks or profitability proxies such as net profit margin or gross profit may result in different findings.

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