CASH GAP IN IMPROVING FIRM PERFORMANCE AND VALUE: A CORPORATE STRATEGY STUDY

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Abstract

This research gauges the influence of the cash gap (CG) on firms' performance and value for Jordanian industrial firms listed in the Amman Stock Exchange (ASE) during the period (2010–2019). By applying a panel data analysis on a sample of 39 firms, the study used the *CG* as the main independent variable. However, for dependent variables, the research focused on two measures of companies' performance, which are operating profit margin (*OPM*) and return on assets (*ROA*). By employing Tobin's Q (*TQ*) as a proxy for firm value (FV), the research reveals that there is a significant and inverse linkage between *CG* and both *OPM* and *ROA*. These results align with previous studies conducted by Kouaib and Bu Haya (2024) and Ruguru (2023). The results also revealed that reducing the CG and debt ratio, while increasing volume, financial assets ratio, and sales growth, improves company performance. Moreover, based on the Arellano-Bond estimation results, the research notes a significant and inverse nexus between the CG and FV. The results of this research suggest fruitful insights for decision-makers, executive managers, and debt holders, contributing to their financing and investing activities.

Keywords: Cash Gap, Firms' Performance, Firms' Value, Amman Stock Exchange

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1. INTRODUCTION

The efficient management of working capital is a critical determinant of a firm's financial performance and its value. Central to this concept is the cash gap (CG), which represents a key indicator of working capital management efficiency reflecting the effectiveness of a firm's inventory, receivable, and payables management processes.

Over the last decades, CG management has been considered a challenging corporate aspect for firm managers, which can help companies maintain an appropriate level of liquidity in order to cover their current obligations. Therefore, a vast body of literature has emerged to gauge the role of CG management in firm performance (FP) and firm value (FV) (Abu Rumman et al., 2024; Baños-Caballero et al., 2019; Kouaib & Bu Haya, 2024; Soukhakian &

Khodakarami, 2019; Patricia & Izuchukwu, 2022; Ruguru, 2023). These studies noted that a shorter CG is generally considered a sign of operational efficiency and financial strength. It indicates that a firm is recovering its operating cash more quickly, allowing it to reinvest in growth opportunities, meet short-term obligations, and improve overall liquidity. The longer the CG, on the other hand, may indicate inefficiencies in inventory management, slow receivables collection, or late payment cash flow, and impair its FP and FV.

In dynamic and competitive markets, the ability to turn inventory into cash quickly is very important. Firms that optimize their CG can operate with lower working capital requirements, which in turn improves their return on invested capital (Irwansyah et al., 2024; Tayem & Altwal, 2023). Companies that are less dependent on external financing are usually in a strong position to deal with economic fluctuations (He & Ausloos, 2017).

Furthermore, a strand of literature has emerged to document that the inability of industrial firms to control their CG may lead to a liquidity issue, which may decrease their FP and FV (Kouaib & Bu Haya, 2024; Ruguru, 2023). Hence, the firm's manager is in the challenging aspect of maintaining the anticipated tradeoff between cash reserve and profitability to increase FP and FV.

Based on the above-mentioned points and given that Jordan's industrial segment plays an important part in the country's economy, contributing pointedly to economic growth, its contribution to the gross domestic product was about 24.3% as at the end of 2020. Moreover, industrial firms in Jordan operate within a dynamic, evolving environment characterized by market volatility and competitive pressures. Therefore, effective CG management because essential to enhancing operational efficiency, maintaining financial flexibility, and long-term sustainability. Within Jordan's corporate context, previous studies have documented that effective CG management becomes essential for enhancing operational efficiency and increasing FP and FV (Altawalbeh, 2020; Sharaf & Haddad, 2015). Consequently, this study aims to address two main objectives. Firstly, it explores how the CG could impact on performance of Jordanian industrial firms. Secondly, it investigates the influence of CG on the value of these firms during the period 2010–2019. In line with these objectives, the study seeks to answer the following key research questions:

RQ1: What is the impact of cash on the performance of Jordanian industrial firms?

RQ2: What is the impact of the CG on the value of Jordanian industrial firms?

This research adds to the existing literature by providing recent evidence from developing countries like Jordan regarding the impact of the CG on firms' performance and value.

The structure of the research is arranged as follows. Section 2 documents the theoretical framework and literature review. Section 3 pinpoints the methodology employed to test the impact of CG on performance and value firms. Section 4 offers the empirical results and discussions, and the last Section 5 proposes the conclusion.

2. LITERATURE REVIEW AND HYPOTHESES DESIGN

2.1. Cash gap and firm performance

From developed markets evidence, a strand of literature has emerged to gauge the influence of CG on firm profitability. In the US, Shin and Soenen (1998) tested the linkage between working capital management (WCM), including the CG, and firm profitability. The authors utilized an ordinary least squares (OLS) on a sample of 58,985 firms during the years 1975–1994. Their findings show an inverse relationship between the CG and firm profitability, indicating that a shorter CG can enhance FP. From the Belgian firm's context, Deloof (2003) gauged the impact of CG on FP. By employing an OLS on a sample of 1009 during the years (1992–1996). The researcher documented an inverse and significant linkage between FP and the components of CG. Recent evidence from Japan supports the importance of CG efficiency. Ishikawa et al. (2025) examined 125 Japanese software firms from 2021 to 2023 using fixed effects (FE) panel regression. They found that shorter cash conversion cycles significantly improve operating profit margins (OPMs).

In Spain, García-Teruel and Martınez-Solano (2007) gauged the influence of WCM on FP. By implementing a panel analysis on a sample of 8872 small and medium-sized (SMEs) firms during the period from 1996 to 2002. The scholars suggested that managers can enhance FP by shortening the CG. Recent research by Deari and Palomba (2024) examined 63 firms listed on the Macedonian Stock Exchange from 2011 to 2019, using fixed-effects panel regression analysis with return on assets (ROA) as the performance metric. Their findings reveal a clear negative relationship between CG and profitability, including that firms with shorter CG tend to deliver stronger financial results.

From the emerging markets' context, Kouaib and Bu Haya (2024) demonstrated the influence of CG components on firm profitability. By using a sample of 88 Saudi Arabian companies during the years (2018–2022). The scholars noted a negative nexus between CG components and firm profitability. Nevertheless, Vuran and Adiloglu (2018) investigated the influence of CG on FP on Turkish manufacturing firms in 2017 by utilizing a multiple regression analysis on a sample of 168 firms. The results revealed a slight nexus between CG and FP. In China, Ren et al. (2019) tested the effect of WCM on FP. WCM is measured by CG. By utilizing FE on a sample of 8201 manufacturing firms during the period from 2010 to 2017. For non-state-owned enterprises, the authors noted a significant and inverse linkage between CG and FP. However, this isn't held for state enterprises.

From frontier markets, a stream of literature has emerged to gauge the impact of CG on firm profitability. In Pakistan, Raheman and Nasr (2007) tested the influence of CG components on FP. By implementing an OLS on a sample of 94 firms during the period from 1999 to 2004. The scholars found an inverse and significant linkage between CG components and firm profitability. In Kenya, Mathuva (2010) gauged the impact of CG components on firm profitability. By employing an OLS and FE regression on a sample of 30 firms traded during the period from 1993 to 2008. The authors noted a significant and inverse nexus between CG components and firm profitability.

In India, Sharma and Kumar (2011) illustrated the influence of CG on FP. By using a sample of 263 non-financial firms over the years (2000–2008), the authors noted a positive relationship between longer duration of CG and FP. In Pakistan, Gul et al. (2013) illustrated the influence of WCM on FP. By utilizing a panel data regression on a sample of 55 SMEs during the period from 2006 to 2012. The scholars noted a positive link between the number of days' accounts payable and the firm's profitability. However, an inverse linkage has been detected between the average collection period, inventory turnover, and CG. Iqbal and Zhuquan (2015) examined the influence of WCM on firm profitability. The authors utilize a panel data regression on a sample of 85 firms during the period from 2008 to 2013. The scholars noted an inverse nexus between the CG components and firm profitability.

Oseifuah and Gyekye (2016) demonstrated the influence of CG theory on corporate profitability. By employing a panel data regression on a sample of 75 non-financial firms traded on the Johannesburg Stock Exchange during the years 2003–2012. The scholars documented that there is a significant and negative link between a shorter CG and profitability. More recently, both Patricia and Izuchukwu (2022) and Ruguru (2023) examined the effect of CG on FP. For instance, Patricia and Izuchukwu (2022) gauged the influence of CG on FP. By implementing a multiple regression model on 21 Nigerian manufacturing companies. The authors concluded there was a non-significant and negative impact of CG on FP.

In Kenya, Ruguru (2023) tested the impact of CG on FP by utilizing a descriptive survey design on 75 workers of Binathman Household Supermarket in Mombasa County during the years 2011–2019. The authors documented that there is a negative link between CG and FP.

From Greece, Lazaridis and Tryfonidis (2006) explored the influence of CG on firm profitability. The authors employed an OLS on a sample of 131 companies during the years 2001–2004. The authors documented a negative nexus between CG and firm profitability. Nevertheless, from the Jordanian corporate context, previous studies investigated the effect of CG management on FP (Abuzayed, 2012; AlMomani et al., 2021; Altawalbeh, 2020; Hayajneh & Yassine, 2011; Kaddumi & Ramadan, 2012; Sharaf & Haddad, 2015; Soda et al., 2022; Warrad, 2013). However, little work has been done on the influence of CG management on FV. Hayajneh and Yassine (2011) explored the influence of WCM on a firm's profitability, using the CG to express the efficiency of WCM. The scholars employed both an OLS and two-stage least squares (2SLS) on a sample of 53 Jordanian manufacturing firms traded on the Amman Stock Exchange (ASE) during the period from 2000 to 2006. The authors found a negative and significant linkage between CG and firm profitability. Nevertheless, Abuzayed (2012) tested the impact of WCM measured by CG in addition to its components on firm profitability. By employing both panel regression analysis and generalized methods of moments (GMM) on a sample of 52 non-financial Jordanian firms during the years 2000–2008. The researcher found a positive link between CG and firm profitability.

Similar to that, Kaddumi and Ramadan (2012) investigated the influence of WCM on FP. The researchers utilized both the FE panel model and an OLS on a sample of 49 Jordanian industrial firms during the years 2005–2009. The scholars documented a significant and positive linkage between WCM and FP. Furthermore, Warrad (2013) investigated the influence of WCM on firm profitability. The researcher utilized an OLS regression on a sample of 11 Jordanian chemical firms during the period from 2009 to 2011. The scholar found out that there is a significant nexus between WCM and firm profitability.

Nevertheless, Sharaf and Haddad (2015) analyzed the effect of WCM components on firm profitability. The authors employed a panel data regression analysis on a sample of 43 industrial firms traded on ASE during the period from 2000 to 2012. The authors revealed that there is a significant and negative linkage between the CG and firm profitability.

Altawalbeh (2020) gauged the influence of WCM components on FP. One of the components is the CG, which was used as a comprehensive measure of WCM. By utilizing a panel data regression analysis on a sample of 33 industrial companies during the years 2013–2017. The authors noted an insignificant influence of the CG on FP.

More recently, papers by AlMomani et al. (2021) and Soda et al. (2022) pointed to mixed results between the WCM and FP. For instance, AlMomani et al. (2021) studied the effect of WCM on FP. The researchers employed an OLS regression on a sample of 42 manufacturing firms during the years 2010–2018. The scholars concluded that there is a significant positive linkage between WCM and FP. However, Soda et al. (2022) investigated the effect of WCM on FP. The researchers used an FE panel data analysis on a sample of 23 firms during the period from 2014 to 2020. The empirical findings indicated a negative and significant link between WCM and FP. Based on the above screening of the literature, this study formulates the following proposition:

H1: There is no significant impact of CG on Jordanian industrial performance.

2.2. Cash gap and firms' value

Oseifuah and Gyekye (2017) examined the effect of CG and FV. By employing a panel data regression on a sample of 75 firms traded on the Johannesburg Stock Exchange during the years 2003–2012. The results revealed an insignificant and positive nexus between CG and the FV. From the frontier market's context, both Arachchi et al. (2017) and Vijayakumaran (2019) investigated the effect of WCM efficiency on FV. The CG and its components were utilized to assess WCM, while the FV was evaluated by Tobin's Q (TQ) ratio. For instance, Arachchi et al. (2017) conducted a panel data regression analysis on a sample of 44 traded on the Colombo Stock Exchange during the period from 2011 to 2015. The authors noted an inverse linkage between CG and FV. In addition, Vijayakumaran (2019), in China, conducted a panel data analysis on a sample of 1651 non-financial firms traded during the period 2004–2013. The author documented a negative relationship between CG and FV. From Malaysia, Nurein and Din (2017) investigated the influence of CG on FV by employing a FE panel data analysis on a sample of firms during the period from 2006 to 2015. The scholars noted a significant and inverse link between CG and FV.

In Pakistan, Khan et al. (2022) gauged the impact of CG on FV. By using a sample of the textile industry during the period from 2012 to 2017. The authors revealed a significant nexus between CG, liquid assets, and FV. In Turkey, Bilgin and Turan (2023) tested the influence of CG management on FV. By utilizing the system GMM estimation on a sample of 317 Turkish publicly traded companies during the years 2010–2018. The authors concluded that firms that manage their liquid assets could enhance their market value.

According to the above-mentioned studies, this research formulates the following proposition:

H2: There is no significant impact of CG on Jordanian industrial value.

3. RESEARCH METHODOLOGY

This study uses panel data and multiple regression analysis; alternative methods like structural equation modeling (SEM) could also be suitable. However, the chosen method is the most appropriate given the nature of the data and research objectives.

3.1. Sample and data

This work utilizes all Jordanian industrial firms traded on the ASE during the period 2010–2019. However, the study sample was selected according to the following conditions: regular publication of financial reports at the end of the firm's fiscal year on December 31, and obtaining the necessary data to calculate the study variables. Pointedly, this study removed firms that did not meet the above-mentioned conditions, then applied the winsorization process at 1% and 99%. Therefore, the final comprises 39 industrial firms. This study employs balanced panel data analysis by using the Stata program.

3.2. Research models

To achieve study objectives, models' specifications were employed to examine the effect of the CG on the performance and value of Jordanian firms. Thus, this research uses two regression models.

The first model (Model 1) is based on the hypothesis *H1* that there is no significant impact of CG on Jordanian industrial performance.

Model 1

$$Firms'\ performance_{i,t} = \beta_0 + \beta_1 CG_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 DR_{i,t} + \beta_4 FAR_{i,t} + \beta_5 SGR_{i,t} + \varepsilon_{i,t} \tag{1}$$

To measure the *FP*, this study uses both the *OPM* and *ROA*. Pointedly, this research considers the *FP* as a dependent variable. However, for the independent variable in this study, *CG* is used. Other explanatory variables for firms' performance and value are used as control variables. For instance, this research used the firm size (*SIZE*), debt ratio (*DR*), financial assets ratio (*FAR*), and sales growth rate (*SGR*). Where *i* denotes the firm; *t* stands for year, β is the intercept, $\varepsilon_{i,t}$ denotes an error term. The variables' descriptions are reported in Table 1.

The second model (Model 2) is based on the hypothesis *H2* that there is no significant impact of CG on Jordanian industrial value.

Model 2

$$Firms'\ value_{i,t} = \beta_0 + \beta_1 CG_{i,t} + \beta_2 SIZE_{i,t} + \beta_3 DR_{i,t} + \beta_4 FAR_{i,t} + \beta_5 SGR_{i,t} + \varepsilon_{i,t} \tag{2}$$

In Model 2, the *FV* means the market value of the company and was measured by *TQ*.

3.3. Variables' measurements

The study depends on a set of variables necessary to analyze the impact of *CG* on *FP* and *FV* of Jordanian industrial firms over the years from 2010 to 2019.

This section presents the variable measurements of the dependent, independent, and other explanatory variables.

3.3.1. Independent variable: Cash gap

This study uses the *CG* as a proxy for the cash conversion cycle (*CCC*) and considers it as the main independent variable. Following Johan et al. (2024), this research measures the *CG* according to the following Eq. (3).

$$CG = Average\ collection\ period + Average\ storage\ period - Average\ payment\ period \tag{3}$$

3.3.2. Dependent variable: Firm's performance and firm's value

This research utilizes two measures for dependent variables. For *FP*, this study utilizes the *OPM* and *ROA*. In particular, this research uses the following equations to measure both the *OPM* and *ROA*.

- Operating profit margin (*OPM*) is a measure of a company's performance and is calculated by dividing net operating income by operating revenues.

$$OPM = \frac{Net\ operating\ income}{Operating\ revenues} \tag{4}$$

• Return on assets (*ROA*) is a measure of a company's performance and is calculated by dividing net income by total assets.

$$ROA = \frac{Net\ income}{Total\ assets} \quad (5)$$

• Tobin's Q (*TQ*). For *FV*, this research employs the *TQ* as a measure of a firm's value and applies the following equation:

$$TQ = \frac{Market\ value\ of\ equity}{Replacements\ cost\ of\ assets} \quad (6)$$

For other explanatory variables, this study uses the *SIZE*, *DR*, *FAR*, and *SGR* as control variables as follows.

• Firm size (*SIZE*). This study measures the *SIZE* by the natural logarithm of total assets.

• Debt ratio (*DR*). This research calculates the *DR* by dividing the sum of current and non-current liabilities by total assets.

• Financial assets ratio (*FAR*). The financial assets are the assets that can be quickly converted into cash, and it is calculated by dividing (cash & cash equivalents + short-term investments + accounts receivable) by total assets.

• Sales growth rate (*SGR*). To measure *SGR*, this research employs the ratio of (current period sales - the prior period sales) to the prior period sales.

Table 1. Study variables and their measurement

Variables	***Measurement***
Independent variable	
Cash gap (*CG*)	$Average\ collection\ period\ + Average\ storage\ period - Average\ payment\ period$
Dependent variable	
Firm's performance (*FP*)	
Operating profit margin (*OPM*)	$\frac{Net\ operating\ income}{Operating\ revenues}$
Return on assets (*ROA*)	$\frac{Net\ income}{Total\ assets}$
Firm's value (*FV*)	
Tobin's Q (*TQ*)	$\frac{Equity\ market\ value + Liabilities\ book\ value}{Equity\ book\ value + Liabilities\ book\ value}$
Control variables	
Firm size (*SIZE*)	Natural logarithm of total assets
Debt ratio (*DR*)	$\frac{Total\ debt}{Total\ assets}$
Financial assets ratio (*FAR*)	$\frac{Cash\ and\ cash\ equivalents + Short - term\ investments + Account\ receivable}{Total\ assets}$
Sales growth rate (*SGR*)	$\frac{Sales_{i,t} - Sales_{i,t-1}}{Sales_{i,t-1}}$

4. EMPIRICAL RESULTS

This part relates to the analysis of the accounting data of the public shareholding industry companies listed in ASE for the period from 2010 to 2019.

4.1. Descriptive statistics

Table 2 reports summary figures of variables for the study. The average *CG* or *CCC* is 183.65 days, with a standard deviation of 139.51 days. This means that, on average, Jordanian industrial companies have a *CG* or *CCC* of around every 184 days. Furthermore, the lower value for *CG* is -26.23 days. The negative value indicates that some firms in the study have a longer payment period to suppliers than the combined storage period and collection period for customers. The highest value for *CG* is about 417 days because the operating cycle in some Jordanian industrial firms exceeds the fiscal year.

Table 2. Summary statistics

Variables	***Obs.***	***Mean***	***Std. dev.***	***Min***	***Max***
OPM	390	-0.007	0.206	-0.571	0.280
ROA	390	0.001	0.09	-0.214	0.140
TQ	390	1.312	0.761	0.468	3.455
CG	390	183.65	139.51	-26.23	471.12
SIZE	390	7.434	0.609	5.505	9.088
DR	390	0.375	0.231	0.073	0.892
FAR	390	0.270	0.153	0.074	0.594
SGR	390	0.0004	0.243	-0.469	0.523

Note: The figures in Table 2 illustrate the descriptive statistics of the data during the sample period (2010–2019). Average, standard deviation, minimum, and maximum values clarify the descriptive outcomes. The dependent variable is calculated by OPM and ROA, and TQ. The independent variable of the research is the CG, and the other explanatory variables comprise SIZE, DR, FAR, and SGR.

Table 2 notes that the mean and standard deviation for the first measure of *FP*, which is the *OPM*, are -0.007 and 0.206, respectively. Furthermore, the value for *OPM* ranges from -0.571 to a maximum value of 0.280. The above results also show that the average of the second measure of *FP*, which is the *ROA*, is equal to 0.001, and its minimum and maximum values are equal to -0.214 and 0.140, respectively. The lower value appears as negative for both *OPM* and *ROA* due to the losses incurred by some companies during the study period.

The *TQ* ratio is widely used to determine the value of the company. However, the average for *TQ* is 1.312, which means that the average market value of Jordanian industrial firms exceeds the value of their booked assets, and the firms may be performing well in their market activities. This result is consistent with Singh and Pandey (2008), who found that the *TQ* is more significant if it is greater than one. This suggests that market values of the firms are considered worthy, indicating that they have made good investment decisions.

Turning to the control variables. For example, *SIZE* has an average of 7.434 and ranges from 5.505 to 9.088. Moreover, Table 2 demonstrates that the average (standard deviation) for *DR* is 37.5% (23.1%), respectively. This means that the financing of the sample firms for their internal assets was 62.5% higher than the financing of their assets from third parties. Regarding the *FAR*, Table 2 documents that the average (standard deviation) is 27% (15.3%), respectively, and the values for *FAR* roughly range from 7% to 59% of the total assets. Finally, concerning the *SGR* variable, this research reports that the average (standard deviation) for *SGR* is 0.04% (24.3%), respectively.

4.2. Correlation test

This section highlights the pairwise correlations among *CG*, *FP* (*OPM* and *ROA*), *FV* (*TQ*), and control variables (*SIZE, DR, FAR,* and *SGR*) in ASE. The results showed that *CG* and *DR* are statistically negatively associated with the FP *OPM* (*ROA*), with a correlation coefficient of -0.128 (-0.120) and -0.471 (-0.542), respectively.

The results also provide initial evidence of the negative relationship between *CG* and *FP* (*OPM* and *ROA*). This indicates that the lower the *CG*, the greater the *FP*.

Table 3. Pairwise correlations

Variables	*OPM*	*ROA*	*TQ*	*CG*	*SIZE*	*DR*	*FAR*	*SGR*
OPM	1.000							
ROA	0.913* (0.000)	1.000						
TQ	0.166* (0.001)	0.273* (0.000)	1.000					
CG	-0.128* (0.012)	-0.120* (0.018)	-0.088 (0.084)	1.000				
SIZE	0.435* (0.000)	0.346* (0.000)	0.064 (0.208)	-0.230* (0.000)	1.000			
DR	-0.471* (0.000)	-0.542* (0.000)	-0.267* (0.000)	-0.157* (0.002)	0.020 (0.690)	1.000		
FAR	0.260* (0.000)	0.258* (0.000)	0.177* (0.000)	0.068 (0.178)	-0.107* (0.034)	-0.137* (0.007)	1.000	
SGR	0.347* (0.000)	0.325* (0.000)	0.093 (0.066)	-0.225* (0.000)	0.093 (0.066)	-0.012 (0.814)	0.045 (0.375)	1.000

*Note: The figures in Table 3 illustrate the pairwise correlation of the data during the sample period (2010–2019). The dependent variable is calculated by OPM, ROA, and TQ. The independent variable of the research is the CG, and the other explanatory variables comprise SIZE, DR, FAR, and SGR The * reflects the significance level at 1% and better.*

In addition, the results in Table 3 show a significant positive relationship between (*SIZE, FAR,* and *SGR*) and FP when using either *OPM* or *ROA*. The relationship between *CG* and the firm's market value (*FV*), measured by *TQ*, is positively and significantly correlated with two of the control variables (*DR* and *FAR*), but it is positively and insignificantly correlated with the other two of the control variables (*SIZE* and *SGR*).

Moreover, the correlation matrix table reveals a positive and high correlation between *OPM* and *ROA*. Since they are dependent variables, this correlation is not meaningful, and the research does not employ the two variables in the same model.

4.3. Multicollinearity test

However, this study applies the variance inflation factor (VIF) test to check for the multicollinearity issue. Table 4 illustrates the figures for the VIF. Notably, the overall mean VIF value for all variables during the sample period is 1.069, and VIF values ranged between 1.035–1.136, which are all less than 10, and consequently, these two checks infer that there appears to be no multicollinearity problem.

Table 4. Variance inflation factor

Variables	*VIF*	*Tolerance*
CG	1.136	0.880
SIZE	1.069	0.935
SGR	1.062	0.942
DR	1.045	0.957
FAR	1.035	0.966
Mean VIF	1.069	

4.4. Hypotheses testing

Before testing the hypotheses, the authors performed a Hausman test between two methods: the FE model (FEM) and the random effects model (REM) for the first study model, which measures *FP* by using *OPM* and *ROA*, and the second study model, which measures *FV* by using *TQ*.

Table 5. Hausman test summary

Model	*Independent var.*	*Chi² test value*	*Prob.*	*Appropriate model*
1	*OPM*	42.33	0.0000	FEM
	ROA	29.53	0.0000	FEM
2	*TQ*	0.89	0.9710	REM

Source: Authors' estimation.

The test results in Table 5 indicate that the Prob < 5% for *OPM* and *ROA*, which means that the FEM is more appropriate for the observations than REM. Accordingly, the authors selected the FEM and excluded the REM. The Hausman test also indicated that the Prob associated with *TQ* was greater than 5%, suggesting that the REM is more appropriate than the FEM for the data. Consequently, the authors selected the REM.

Multivariate regression analysis using the FEM was conducted to test the first hypothesis (*H1*), in order to obtain a better understanding of the impact of the *CG* on Jordanian industrial performance as measured by *OPM* and *ROA*. The *CG* of the company is measured by *CCC*. The results in Table 6, Model 1, indicated that the adjusted R^2 values were 0.4760 and 0.4654 by using *OPM* and *ROA*, respectively. This means that the study variables explained around 48% and 46.5% of the variance in the dependent variables (*OPM* and *ROA*), respectively, which was significant at a level less than 1%. The β coefficients of the variables (*CG*) were negative (-0.0005 and -0.0002) with t-statistics of -6.78 and -5.79, respectively, and a p-value of 0.000, significant at a level less than 1%. Table 6 also shows the regression coefficients of the SIZE as positive (0.336 and 0.114) by using *OPM* and *ROA*, respectively, and a p-value of 0.000, significant at a level less than 1%. Based on these results, if the *SIZE* increases by one unit, there would be a 34% increase in *OPM* and an 11% increase in *ROA*.

Table 6. Regression results for Model 1

Panel A: Regression results (FEM)						
Variables	***OPM***			***ROA***		
	β	***t***	***Sig.***	***β***	***t***	***Sig.***
CG	-0.0005	-6.78	0.000	-0.0002	-5.79	0.000
SIZE	0.3364	7.67	0.000	0.1139	5.83	0.000
DR	-0.5843	-13.67	0.000	-0.2986	-15.67	0.000
FAR	0.2886	4.11	0.000	0.0559	1.79	0.075
SGR	0.1663	7.03	0.000	0.0666	6.31	0.000
Constant	-2.2738	-7.03	0.000	-0.7137	-4.95	0.000
Observation	390			390		
Adj. R^2	0.4760			0.4654		
F-value	90.57		0.000	83.97		0.000
Breusch and Pagan test	223.61		0.000	243.05		0.000
Panel B: Hausman test						
Test summary	***Chi²***		***Prob.***	***Chi²***		***Prob.***
FEM	42.33		0.000	29.53		0.000

Note: Dependent variable: OPM or ROA. Panel least squares (FE).
Source: Authors' elaboration.

The findings of the *DR* of the company showed that the values of the coefficients were negative (-0.584 and -0.299), and a p-value of 0.000 is significant at a level less than 1%. Based on these results indicate that *DR* is negatively and significantly related to *OPM* and *ROA*, respectively. This supports that a decrease of one unit in *DR* leads to an increase in *OPM* and *ROA* by 58% and 30%, respectively.

In addition, the *FAR* of the company showed the values of the β coefficient were positive (0.289 and 0.056) with t-statistics of 4.11 and 1.79, when using *OPM* and *ROA*, respectively, and a p-value of 0.000, significant at a level less than 1% only when using the dependent variable *OPM*. However, when using *ROA*, the *FAR* was insignificant. The β coefficients of the *SGR* of the firm were positive (0.166 and 0.067) with t-values of 7.03 and 6.31, when using *OPM* and *ROA*, respectively, and a p-value of 0.000, significant at a level less than 1%.

Table 7. Regression results for Model 2

Panel A: Regression results (REM)			
Variables	***β***	***t***	***Sig.***
CG	-0.0008	-3.24	0.001
SIZE	0.1230	1.08	0.282
DR	0-.7135	-5.07	0.000
FAR	0.5145	2.27	0.023
SGR	0.0351	0.44	0.661
Constant	0.6708	0.78	0.434
Observation	390		
Adj. R^2	0.1059		
Chi²	45.30	Prob. > chi² 0.000	
Panel B: Hausman test			
Test summary	***Chi² test value***		***Prob.***
REM	0.9710		0.89

Note: Dependent variable: TQ. Panel least squares (random effect).
Source: Authors' elaboration.

To test the second hypothesis, *H2*, a multivariate regression analysis using REM was performed to determine if there is no significant impact of the *CG* on Jordanian industrial value (*TQ*).

In Table 7, Model 2 above showed that the independent variable (*CG*) had a significant adverse effect at the 1% level. The adjusted R^2 of 0.1059 indicated that 10.59% of the variation in the dependent variable (*TQ*) is explained by the main independent variable (*CG*) and other explanatory variables. Table 7 also showed the β coefficient of the variable *CG* was negative (-0.0008) with a t-statistic of -3.24, and a p-value of 0.001.

According to Table 7, the findings indicated that *TQ* was not affected by *SIZE* and *SGR*. The results indicated that *TQ* was negatively and significantly related to *DR* at a level less than 1%. A high *DR* may indicate increased financial risk of the company, which negatively affects the market value. And *TQ* was positively and significantly affected by *FAR* at a level less than 5%.

4.5. Empirical outcomes and discussion

The correlation analysis revealed a negative relationship between the *CG* and *FP*, as measured by *OPM* and *ROA*, among listed industrial firms in Jordan. The regression results in Table 6 confirmed this relationship, showing a significant negative impact of the *CG* or *CCC* on FP. This suggests that firms can enhance their performance by reducing the length of their *CG* or *CCC*. Firms that shorten their *CG* can better manage operations and improve profitability, as effective working capital management enhances liquidity and operational efficiency (Shin & Soenen, 1998; Deloof, 2003). In simpler terms, firms that manage to shorten the inventory holding periods, collection times, and payment delays tend to perform better financially. A long *CG* means cash is tied up for too long, limiting the firm's ability to grow or invest in opportunities, which negatively affects performance (Altaf & Shah, 2017).

The results also showed that the average length of the *CG* for the Jordanian industrial firms included in the current study sample is approximately 184 days. These results align with previous studies that have emphasized the importance of efficient *CG* management in improving *FP* (Sharaf & Haddad, 2015; Soda et al., 2022; Hayajneh and Yassine, 2011; Warrad, 2013). Table 6 shows that the *DR* has a significant negative impact on both *OPM* and *ROA*. Firms that rely less on debt to finance their assets are generally exposed to lower financial risk, as servicing debt and paying interest reduces the cash liquidity available for operational activities. Reducing reliance on debt helps firms avoid financial stress and increases investor confidence, since high debt levels are associated with greater financial risk and lower flexibility (García-Teruel & Martinez-Solano, 2007). As a result, low-debt firms are often viewed more favorably by investors, as they tend to demonstrate stronger liquidity and financial stability. This financial health, in turn, supports improved FP and profitability. These findings are in line with previous research by Al-Mohareb (2019), Al-Naif and Al Shra'ah (2019), and Sharaf and Haddad (2015).

According to Table 2, the *FAR* ranges approximately between 7% and 60% of total assets. Furthermore, the findings presented in Table 6 reveal that both *FAR* and *SIZE* exert a significant and positive influence on *OPM* and *ROA*. Firms with a higher *FAR* are better positioned to handle unexpected expenses and maintain financial stability, supporting better performance and *FV* (Hayajneh & Yassine, 2011). This suggests that *SIZE* plays a critical role in enhancing performance within the industrial sector. Larger firms tend to maintain higher *FAR* levels, enabling them to improve their performance by capitalizing on investment opportunities and engaging in more profitable projects. Additionally, larger firms are more capable of minimizing the *CG* or shortening the *CCC*, which further contributes to superior performance compared to smaller firms.

Moreover, the results presented in Table 6 indicate that the *SGR* has a significant and positive impact on *FP*, whether measured by *OPM* or *ROA*. Higher sales growth is a strong indicator of operational success, often translating into stronger profitability and *FV* (Soda et al., 2022). This finding implies that firms experiencing higher growth tend to achieve better performance, aligning with previous studies such as Sharaf and Haddad (2015).

Collectively, the results suggest that reducing the *CG*, operating at a larger scale (*SIZE*), maintaining a low *DR*, increasing the *FAR*, and achieving higher *SGR* contribute positively to *FP*. These findings are consistent with prior studies (Deloof, 2003; Shin & Soenen, 1998; Altaf & Shah, 2017), which emphasize the importance of efficient *CG* management and firm-specific financial characteristics in enhancing performance and operational efficiency.

Based on these findings, the *H1* is rejected. Instead, the alternative hypothesis is supported, indicating that there is a significant impact of the *CG* on Jordanian industrial performance.

Turning to Table 7, the findings related to *H2* reveal that the *CG* has a statistically significant negative effect on the value of Jordanian industrial firms, as measured by *TQ*. This indicates that firms that succeed in reducing their *CG* or shortening the *CCC* tend to achieve higher market value. These results are in line with prior empirical evidence from the Jordanian context (Al-Mohareb, 2019; Sharaf & Haddad, 2015).

Furthermore, the *DR* is also shown to exert a significant negative influence on *FV*. This suggests that firms with lower reliance on external debt — hence, reduced exposure to financial risk — tend to signal better financial stability, which is generally viewed favorably by investors and other stakeholders. These findings are consistent with international literature (Deloof, 2003; García-Teruel & Martinez-Solano, 2007; Shin & Soenen, 1998), which has established that minimizing cash can enhance *FV* through improved liquidity management, reduced dependence on costly external financing, and a stronger ability to exploit investment opportunities.

Moreover, the *FAR* demonstrates a positive and significant influence on *FV*. A higher *FAR* indicates better liquidity, which strengthens the firm's ability to meet short-term obligations and assures continuity, contributing positively to firm valuation.

As for the control variables, *SIZE* and *SGR* show a positive but insignificant impact on *FV*. This contrasts with the findings reported in Table 6, where both variables had a significant and positive impact on *FP*.

Based on these findings, the *H2* is rejected, and the alternative hypothesis, which posits a statistically significant impact of the *CG* on Jordanian industrial value, is accepted.

4.6. Further test

To address for endogeneity problem, this work applies the Arellano-Bond estimation. In particular, this research runs the following models:

Model 3

$$\frac{Firms' \ performance_{i,t}}{Value_{i,t}} = \beta_0 + \beta_1 lagFP_{i,t} + \beta_2 CG_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 DR_{i,t} + \beta_5 FAR_{i,t} + \beta_6 SGR_{i,t} + \varepsilon_{i,t} \quad (7)$$

Table 7 presents the Arellano-Bond estimation results for all of our dependent variables, respectively. *OPM*, *ROA*, and *TQ*, to assess the dynamic impact of the *CG*, measured as the *CCC*, firm characteristics, prior *FP* (FP_{t-1}), and prior *FV* (FV_{t-1}) for Jordanian industrial firms.

The results show that past *FP* (FP_{t-1}) has a strong and statistically significant positive effect on both *OPM* and *ROA*. Simply put, companies that performed well in the past are likely to continue performing well in the present. This highlights how consistent financial health over time contributes to maintaining strong current performance.

In the case of past *FV* (FV_{t-1}), the findings reveal a clear positive relationship with the current *FV* (*TQ*). This suggests that firms with strong market value in the past tend to retain that strength, likely due to continued investor confidence and a solid reputation.

As for the *CG* as the main independent variable, its effect was negative and significant across all three performance and *FV* indicators. This means that the longer a company takes to convert its investments in inventory and other resources into cash from sales, the worse its performance becomes. Inefficient *CG* management, such as slow receivables collection or poor inventory turnover, can reduce profitability and hurt the company's overall firm market value (Shin & Soenen, 1998; Lazaridis & Tryfonidis, 2006; Deloof, 2003). This result is consistent with Models 1 and 2 (see Tables 5 and 6).

Table 8. Arellano–Bond estimation for Model 3

Variables	*OPM*	*ROA*	*TQ*
FP_{t-1}	0.328*** (24.86)	0.461*** (21.42)	
FV_{t-1}			0.580*** (44.80)
CG	-0.001*** (-47.64)	0.000*** (-11.86)	-0.001*** (-9.57)
SIZE	0.258*** (16.29)	0.069*** (5.16)	-0.338*** (-7.47)
DR	-0.311*** (-26.50)	-0.132*** (-22.54)	-0.808*** (-11.25)
FAR	0.246*** (11.71)	0.035*** (2.64)	-0.378*** (-7.79)
SGR	0.125*** (22.36)	0.063*** (21.75)	0.123*** (8.32)
Intercept	-1.773*** (-14.68)	-0.438*** (-4.50)	3.567*** (9.29)
Sargan Prob > chi2	0.7348	0.4029	0.6836
Autocorrelation first order Prob > chi2	0.0036	0.000	0.004
Autocorrelation second order Prob > chi2	0.9476	0.226	0.094

*Note: Dependent variables: OPM, ROA, and TQ. The statistical significance at 1%, 5%, and 10% levels is denoted as ***, **, and *, respectively.*
Source: Authors' elaboration.

For the control variables (*SIZE*, *DR*, *FAR*, and *SGR*) in Table 6 (Model 1), the results were consistent with those of the results of Sargan test and Arellano-Bond autocorrelation tests (Table 8, Model 3).

However, the results obtained from the regression analysis (Model 2) and Arellano-Bond estimation (Model 3) show a clear difference in the influence of the variables on enterprise value. While the regression model further indicates that variables such as *SIZE* and *SGR* have no statistically significant effect on enterprise value, the Arellano-Bond model further indicates that these variables are highly significant, with *SIZE* having a negative effect and *SGR* having a positive effect. Furthermore, the *FAR* in the regression Model 2 shows a positive relationship to enterprise value, while in the Arellano-Bond estimate, it shows a negative relationship.

These inconsistencies are likely to add to the dynamic nature of *FV*, potential endogeneity, and unobserved heterogeneity. These aspects can better justify the Arellano-Bond estimate. Based on their robustness in dealing with panel data issues such as autocorrelation and endogeneity, as evidenced by the Sargan and AR (2) tests. The conclusions drawn from the Arellano-Bond model are considered more reliable.

Therefore, the study concludes that *CG*, *SIZE*, *FAR*, and *SGR* have a significant positive impact on enterprise value. In contrast, the *DR* shows a negative effect on *FV*.

5. CONCLUSION

From the Jordanian context, this study examines the impact of the *CG* on *FP* (*OPM* and *ROA*) and *FV* (*TQ*). The study notes that there is a significant and inverse nexus between *CG* and both *OPM* and *ROA*. Furthermore, the study reveals a significant and inverse association between the *CG* and *TQ*. However, for *FP*, the research documents a significant and positive association between *SIZE*, *FAR*, and *SGR*. Nevertheless, significant and negative relationships have been detected between *FP* and

DR. This means reducing the *CG*, having a high volume (*SIZE*), keeping a low *DR*, increasing the *FAR*, and achieving a high *SGR* contribute to enhancing the performance of the company.

The results of the dynamic panel estimation using the Arellano-Bond method (Table 6) show a robust and statistically significant positive relationship between prior *FV* (FV_{t-1}) and current *FV*. This establishes the stability of the enterprise value over time and justifies the use of a dynamic modeling approach, especially in a context like Jordan, where past financial behavior mainly influences current management decisions and investor confidence.

To examine the effects of *CG*s on the value of Jordanian industrial enterprises, the results of the Arellano-Bond test were repeated. This test shows that the *CG* negatively affects enterprise value (*TQ*). This means that a narrowing of the *CG* leads to positive outcomes on enterprise value. This can be achieved by improving the inventory turnover ratio and dealing with the average collection period to maintain timely cash flows. Moreover, policies affecting *CG* management can also substantially affect the *FV*.

When examining the effects of control variables on enterprise value, the Arellano-Bond test showed that enterprise *SIZE, FAR*, and *SGR* had a positive influence on enterprise value. However, the *DR* is a strong and negative relationship with enterprise value. This implies that excessive dependence on debt financing can limit profitability and increase financial risk, especially for industrial enterprises operating in a volatile macroeconomic environment such as Jordan.

One of the limitations of this paper is the small sample size. Additionally, the sample was limited to the Jordanian industrial sector and did not cover all sectors, thus, the findings of this study cannot be generalized to all companies in Jordan. Moreover, our study examines the CG without considering its components: average collection period, average storage period, and average payment period.

One of the most vital recommendations from the study is encouraging managers of Jordanian industrial firms to reduce the duration of the CG by: improving accounts receivable collection policies, reducing dead stock levels without impacting production continuity, and negotiating longer payment terms with suppliers whenever possible.

This is because the length of the CG has a negative and significant impact on FP and FV.

Future research is recommended to explore the impact of CG components (average collection period, average storage period, and average payment period) on the performance and value of firms across various sectors in Jordan, including the industrial, services, and financial sectors.

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