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The Effect of Working Capital Strategies on the Speed of Working Capital Adjustment

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Abstract

This study examines the effect of working capital strategies on the speed of working capital adjustment among firms listed on the Iraq Stock Exchange (ISX). The sample comprised 30 firms from the industrial, service, and hotel sectors over the period 2016–2025, yielding 180 firm-year observations. Data were obtained from firms' financial statements and analysed using dynamic panel data models estimated through the System Generalized Method of Moments (System GMM). Aggressive investment and financing policies served as the main explanatory variables. The findings indicate that aggressive investment policy has no statistically significant effect on the speed of working capital adjustment. By contrast, aggressive financing policy has a positive effect on adjustment speed, significant at the 10% level. This suggests that firms relying more heavily on short-term financing adjust more rapidly towards their target working capital levels. Overall, working capital adjustment in the Iraqi market appears to be constrained by institutional, financial, and macroeconomic conditions. The study contributes by examining working capital management strategies within a dynamic partial-adjustment framework using System GMM in an emerging-market setting such as Iraq, where institutional and financial constraints may affect firms' adjustment behaviour. The findings suggest that financial managers in Iraq should seek to improve financial flexibility and access to financing, rather than relying solely on aggressive or conservative working capital strategies.

Keywords:
Aggressive Investment Policy, Aggressive Financing Policy, Speed of Working Capital Adjustment

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1. Introduction

The Iraqi government's heavy dependence on the oil sector leaves private manufacturing and service industries vulnerable, cutting them off from strong access to short-term external financing and flexible credit lines. Sharp exchange rate fluctuations, high political risks, and erratic changes in trade and tax regulations exacerbate these obstacles. These risks increase financing costs and liquidity exposure, pushing firms into overly defensive positions. At the same time, the nascent stage of development of Iraq's capital markets offers low equity and bond liquidity, depriving firms of the diverse short-term financial instruments needed to make rapid adjustments. While intense import competition is forcing a few sectors (such as food and consumer goods) to adopt aggressive strategies to maintain market share, the vast majority of the market remains trapped in an operating bottleneck where macroeconomic risk is met with insufficient financial flexibility. In the Iraqi economic environment, working capital management and its adjustment speed are influenced by a set of specific institutional, market, and financial conditions that can significantly change the direction of the relationship between working capital strategy and the speed of adjustment. The country's economic structure remains heavily dependent on the oil and government sectors, and the private sector, particularly in manufacturing and service industries, faces serious challenges in accessing short-term financing and lines of credit. The sharp fluctuations in exchange rates, high levels of political risk, and frequent changes in trade and tax regulations force firms to adopt more conservative working capital policies, as financing costs and liquidity risk are relatively high in such an environment.

The Iraqi capital market remains at an early stage of development, and limited stock and bond liquidity limits the use of diverse short-term financing instruments. These conditions slow working capital adjustment and limit the willingness of firms to make rapid changes. However, in sectors where competition in the domestic market or imports is intense, such as food and consumer products, competitive pressure is causing some firms to move towards aggressive strategies despite the restrictions and increase the pace of adjustments to maintain their market share. The combination of these factors makes it necessary to analyze the relationship in Iraq and pay attention to the interaction between working capital policies, access to finance, macroeconomic risks, and the intensity of competition in different sectors. As a result, there is a deep gap between theoretical models of working capital and practical application in developing markets. While the international literature has extensively described target levels and general firm-level determinants of the speed of adjustment (such as size, profitability, and growth opportunities), the specific role that aggressive versus conservative investment and financing strategies play in changing this speed of adjustment has not yet been examined. This leaves investors and managers without a clear framework for decision-making. To address this important empirical gap, this study explicitly examines the interaction between working capital management strategies and working capital adjustment speed using empirical data from the unique institutional perspective of the Iraqi market. The few studies that address working capital management in developing countries often treat it as a static relationship, arguing that "aggressive" or "conservative" policies simply affect profitability linearly. They neglect the dynamic component: adjustment speed. An aggressive strategy (low cash, low inventory) may seem efficient on paper, but in Iraq, it exposes a firm to high risks of inventory shortages and liquidity traps. Conversely, a conservative strategy (high cash, high inventory) provides a safety net but creates major inefficiencies, slows down the pace of working capital adjustments, and traps scarce capital.

According to the Iraqi Stock Exchange's annual report (2024), the average cash cycle of listed firms has reached 112 days, while the regional industry average is approximately 75 days. This considerable discrepancy emphasizes the slowing of the speed of working capital adjustment in Iraqi industries and demonstrates that firms suffer significant friction when attempting to align their actual working capital with their target or intended levels. Slow adjustment capacity is closely related to the

strategic financial decisions of organizations on investment and finance. Empirical data demonstrate that the recovery duration of a company is determined by the selection of working capital strategy. For example, organizations with aggressive investment plans may have lower levels of current assets, which may boost operating flexibility and perhaps speed up the adjustment process toward target working capital levels. In contrast, conservative working capital strategies focus on liquidity preservation by retaining greater levels of current assets that may restrict the flexibility to respond due to increased adjustment costs and preference for financial stability (Nazir and Afza, 2009; Baños-Caballero et al., 2010). Although efficient working capital management is important, many listed firms in emerging countries still have difficulties in adjusting their working capital levels toward optimal targets.

The equilibrium theory suggests that enterprises have an optimal target level where the financial costs of adjustment are offset by the benefits. But the cost-benefit trade-off is extremely skewed in a market in which typical techniques do not fit the country's specific institutional and socioeconomic characteristics. This friction is made worse by the structural limits of the Iraqi economy. Mohammed (2023) studied Iraqi industrial Firms and discovered that sensible finance regulations, although they decrease liquidity swings, do not shorten adjustment time and limit market value increases. This empirical evidence shows that the correct working capital strategy can accelerate the speed of working capital adjustment and lower the losses incurred due to liquidity shocks. But many companies listed on the Iraqi stock exchange still utilize old and inflexible methods that do not fit the institutional and economic structure of the country. The gap between theoretical literature and practical application, especially in the field of investment and financing policies, highlights the need for local research based on real data from the Iraqi market. However, foreign research has focused on the existence of a target level of working capital and the factors affecting its adjustment speed (e.g. Baños-Caballero et al., 2010; Mutua Mathuva, 2014; Qurashi and Zohoor, 2017; Chauhan and Banerjee, 2018; Ahangar, 2020).

According to the equilibrium theory, firms usually choose an optimal level of working capital (or target) that is in a reasonable balance between its benefits and risks. Of course, adjustment to this level occurs only when the benefits outweigh the costs of adjustment (Ahangar, 2020). Factors such as financial costs, firm size, growth opportunities, financial crises, profitability, and economic growth affect the costs of working capital adjustment (Chauhan and Banerjee, 2018; Ahangar, 2020). However, different strategies related to working capital management have received less attention (Baños-Caballero et al., 2010). Now, the question that arises for investors is how aggressive investment and financing policies affect the speed of working capital adjustment. Accordingly, given the importance of the topic, this study examines the speed of working capital adjustment and the impact of different strategies on working capital management of business entities. Despite the extensive literature on working capital management and the determinants of cash conversion cycles, previous studies have largely focused on the level of working capital or its relationship with profitability and firm value. Much less attention has been paid to the dynamic process through which firms adjust their working capital towards target levels. Furthermore, previous studies have rarely examined whether firms' working capital strategies affect the speed of adjustment. The existing evidence is largely limited to developed economies and does not take into account the institutional frictions, financing constraints, and market imperfections that characterize emerging economies such as Iraq. Therefore, this study contributes to the literature by examining the relationship between aggressive working capital strategies and the speed of working capital adjustment in a dynamic partial adjustment framework using firms listed on the Iraqi stock exchange.

2. Theoretical and empirical background and research hypotheses

Since target working capital has many benefits for business units, they try to bring the actual level of working capital closer to the target level. The speed at which firms correct the deviation between the actual and optimal levels of working capital is called the speed of working capital adjustment. Previous research shows that there is always a deviation between the actual and target levels of working capital of firms, because the speed of adjustment is not enough to bring the current level of working capital closer to the target level (Chauhan and Banerjee, 2018; Ahangar, 2020). Factors such as financial costs, firm size, growth opportunities, financial crises, profitability, economic growth, etc. affect working capital adjustment costs (Chauhan and Banerjee, 2018; Ahangar, 2020). However, the various strategies related to working capital management have received less attention.

In the presence of financial constraints and greater adjustment costs, the adjustment process is more protracted. Firms with more flexible working capital policies can change their working capital levels more quickly because the lower adjustment costs enable them to adjust faster toward the target level. Research suggests that organizations with fewer financing limitations and better access to external financial resources may alter their working capital positions faster. The rationale is that lower adjustment costs allow these firms to move toward goal working capital levels more rapidly. In contrast, enterprises with more stringent funding constraints respond more slowly (Baños-Caballero et al., 2010). Firms operating in competitive markets may have better incentives to manage working capital efficiently and to move their working capital levels toward target levels. In addition, financial conditions and adjustment costs affect the speed at which enterprises correct departures from ideal working capital levels (Ahangar, 2020). It is often found that firms with conservative working capital practices tend to have more liquid assets and use more internal sources of funding. While these policies decrease liquidity risk, they may also increase adjustment costs and slow the process of shifting working capital toward target levels, especially for financially constrained enterprises (Hill et al., 2010). Conversely, companies that follow a conservative working capital policy focus on liquidity by keeping higher levels of current assets and lowering their reliance on short-term finance. This strategy decreases liquidity risk but also reduces investment opportunities and increases the time to match working capital with the goal levels (Baños-Caballero et al., 2010; Ahangar, 2020). Working Capital Strategies refer to managerial decisions about the best management of the current assets and current liabilities of a firm.

The speed of working capital adjustment is affected by firm-specific features such as financial restrictions, availability of external funding, firm size, and adjustment costs. Firms with lower adjustment costs and more financial flexibility are able to move faster toward their target levels of working capital (Baños-Caballero et al., 2010; Ahangar, 2020).

Low amounts of working capital can have negative effects on the performance and value of an organization. Excessive investment in current assets may increase opportunity costs, whereas low levels of working capital, in particular stockouts, can lead to operational disruptions, delayed delivery to customers and lost sales opportunities (Deloof, 2003). Managers adopt different working capital practices based on their situation. By prolonging the collection time to promote credit sales, for instance, aggressive practices may improve profitability (Gill and Biger, 2013).

2.1. Working capital policies

Financial management is centered on financing and investment decisions. The management of current resources and commitments is designed to ensure liquidity and to sustain shareholder wealth. Financial managers place a high priority on financing and investment decisions. Working capital management is concerned with the management of a firm's current assets and current obligations to achieve a proper balance between liquidity and profitability. Working capital policies are often

divided into conservative, aggressive and moderate policies based on the volume of current assets and current liabilities held by enterprises. The aggressive strategy is to keep the current assets at lower levels and the current liabilities at greater levels, while the moderate strategy is to have a balanced combination of current assets and current liabilities to have an acceptable risk–return trade-off. According to the conservative working capital management philosophy, companies retain larger levels of current assets to improve liquidity and limit the risk of financial problems. However, over-investment in current assets could lead to higher opportunity costs and lower profitability. In contrast, an aggressive working capital policy implies less investment in current assets and increased reliance on current liabilities, which may boost expected returns but also expose enterprises to higher liquidity risk (Nazir and Afza, 2009).

Working capital policies consist of managerial decisions concerning the management of current assets and current liabilities. These policies determine the appropriate level of investment in current assets and the financing approach used for short-term obligations. The level of net working capital, defined as the difference between current assets and current liabilities, represents an important dimension of working capital management (Mackevičius and Poškaitė, 2000).

A conservative working capital management policy is when organizations hold high amounts of current assets to improve liquidity and limit the risk of financial hardship. However, over-investment in current assets can increase opportunity costs and impair profitability. Conversely, an aggressive working capital policy is defined by lower levels of current assets and larger levels of current liabilities, which increase expected returns at the expense of high liquidity risk (Baños-Caballero et al., 2010). The fully aggressive working capital policy is an aggressive investment program coupled with an aggressive financing policy. Under this approach, corporations limit investment in current assets and rely more on current obligations. This method may boost predicted earnings, but it increases the liquidity risk. Empirical evidence shows that leverage and development prospects are major factors in working capital management. Firms with higher growth opportunities may maintain shorter cash conversion cycles because they rely more on trade credit and efficient working capital utilization (Nazir and Afza, 2009). Firm size is another factor affecting working capital management. Many studies report a positive relationship between firm size and the need for working capital. Usually, as the size of the firm increases, the need for working capital also increases. The size of the firm is another important factor affecting working capital management. Larger firms generally have greater access to external financing sources, stronger bargaining power, and lower financing constraints, which enable them to manage current assets and liabilities more efficiently. In contrast, smaller firms often face greater challenges due to information asymmetry and limited access to financial resources. Firm growth and financial constraints also influence working capital decisions (Baños-Caballero et al., 2010; Altaf and Shah, 2017).

Concerning tangible fixed assets, there may be a negative association between tangible fixed assets and working capital management owing to resource restrictions, since firms are competing for resources between investment in fixed assets and working capital. In contrast, tangible assets can be positively related to working capital management, because the investment expenses are reduced when more current resources are needed. Finally, the profitability of the organization also directly affects working capital management. Firms with higher returns, due to their greater bargaining power with suppliers and customers, can create better conditions for working capital management. Finally, the level of working capital management in different industries varies according to the nature of each industry. Some industries need to maintain more inventory, while in others this need is less. Therefore, the industry variable can also affect the extent of working capital management. Several factors can affect working capital and its related policies in organizations. Compared with developed economies, Iraqi listed firms operate under substantial institutional frictions, including limited access

to external finance, weak investor protection, relatively illiquid capital markets, concentrated ownership structures, and persistent political and macroeconomic uncertainty. These institutional characteristics increase financing frictions and adjustment costs, thereby constraining firms' ability to implement theoretically optimal working capital policies (Porta et al., 1998).

Although these theoretical arguments have been generally endorsed in developed and mature emerging economies, their fundamental assumptions may not be fully held in the Iraqi institutional system. Listed Iraqi enterprises operate in a frontier market with limited access to external capital, inadequate law enforcement, concentrated ownership, low market liquidity and high macroeconomic uncertainty. These institutional frictions may hinder firms' ability to pursue optimal working capital policies, and may modify or dilute the correlations suggested by standard global models. Therefore, examining these theoretical relationships in Iraq provides an important test of their external validity under conditions of institutional imperfections.

2.2. Working capital adjustment speed

According to static equilibrium theory, firms adjust their capital structure at a speed of 100%; however, according to dynamic equilibrium theory, the speed of adjustment is less than 100% because firms close only part of the gap between actual and target leverage in each period. Accordingly, the adjustment of current leverage towards target leverage may be due to changes in the amount of debt, equity, and assets of the firm; that is, any of the components that alone or simultaneously with other factors affect the leverage ratios of the firm. Due to the benefits that the target working capital brings to business units, firms try to bring their actual level of working capital closer to the target level. The speed of working capital adjustment refers to the rate at which firms correct the deviation between their actual and optimal working capital levels. Due to adjustment costs and financial constraints, firms generally do not immediately reach their target working capital levels, resulting in persistent deviations between actual and desired levels (Ahangar, 2020; Baños-Caballero et al., 2010).

Korent (2021) created a dynamic target adjustment model to study the drivers and the pace of adjustment of the cash conversion cycle. They find that enterprises adapt real cash conversion cycles toward targets over time, as adjustment costs prohibit fast rectification of variances. They also find that the adjustment pace varies between industries and firm size, implying that working capital adjustment dynamics are affected by firm-specific features and market conditions. The speed of adjustment of working capital is a function of the cost of the adjustment procedure. If adjustment costs are high, the firm may not change its working capital even if it knows the optimal level of working capital. If, however, adjustment costs are minimal, enterprises will rectify aberrations quickly (Kim and Yasuda, 2019). Also, dynamic adjustment models often assume that enterprises progressively converge to a relatively stable target level of working capital. But, in the Iraqi context, firms' goal working capital positions may be continuously altered by frequent economic shocks, political instability, financing constraints, and variable business conditions. Thus, the adjustment process may differ significantly from the literature on more stable institutional settings, pointing to the necessity of contextualizing current theoretical predictions.

2.3. Research background

Mutua Mathuva (2014) calculated the working capital adjustment speed for Kenyan firms to be around 44%. The study emphasises that firms in these countries face specific problems such as limited financial resources, economic volatility, and lack of access to long-term credit, which can slow down the speed of working capital adjustment. Sethi and Dash (2025) found that firm-level geopolitical risk decreases the speed of adjustment, reflecting heightened financial responsiveness to external

uncertainty. Business group firms adjust faster, likely due to easier access to internal capital markets. Growth and mature-stage firms also show faster adjustment, while introduction and decline firms respond more cautiously, suggesting conservatism and resource slack. Nguyen et al. (2025) found that Vietnamese firms do adjust toward their target trade receivables, and this process occurs slightly faster during the Covid-19 period. Furthermore, easing internal financial constraints enhances firms' ability to close the gap to their target levels more effectively. They show that Covid-19 exerts a mixed effect on the relationship between financial constraints and the speed of adjustment of trade receivables, depending on the proxy of constraint. Based on the research findings, they provide relevant implications for the management of trade credit in a developing country. Ahangar (2020) found that the adjustment speed of firms operating in different industries varies. In particular, it identifies major differences in the speed of working capital adjustment across industries. Economic policy uncertainty (EPU) may exist when the macroeconomic environment becomes uncertain. Chang et al. (2024) examined the impact of economic policy uncertainty (EPU) on firms' working capital management policies using data from 32,190 firms across 22 countries during 1986–2017. Their findings indicate that EPU has a significant positive effect on working capital requirements (WCR). They further show that economic uncertainty increases financial constraints, and financially constrained firms tend to maintain higher levels of working capital to support daily operations and reduce operational risks. In addition, Ahangar (2020) showed that greater access to external financial resources, as well as superiority in trade negotiations, increases the speed of working capital adjustment. This result is especially true in countries with dynamic financial markets, such as developed countries. Access to external financial resources (such as bank loans, financing through capital markets) can help firms increase the speed of their working capital adjustment. For this reason, superiority in commercial negotiations and bargaining power can also play an important role in increasing this speed, especially in industries that require faster cash flow. Mohammed (2023) examined the impact of investment and working capital financing policies on profits and stock prices in firms listed on the Iraqi Stock Exchange. The results showed that adopting an aggressive investment policy increases profitability and stock market value growth, while prudent financing policies have a more limited effect on financial performance. These findings revealed the importance of appropriate working capital approaches in enhancing the competitiveness of Iraqi firms. Mohammed (2023) examined the relationship between working capital financing policies and profitability of private commercial banks listed on the Iraqi Stock Exchange. The results indicated that financing policies focusing on efficient liquidity management have a positive and significant effect on the rate of return on equity of banks.

2.4. Relationship between working capital strategy and working capital adjustment speed

The findings suggest that firms adjust relatively quickly, which supports the hypothesis that current balance sheet items are easier to manipulate and could be changed quite easily, even in the short run. Moreover, the evidence indicates that the speed of adjustment is not equal across all firms and varies according to their external finance constraints and their bargaining power. Firms with better access to external capital markets and greater bargaining power adjust faster due to their lower costs of adjustment (Baños-Caballero et al. 2010). One study applied a partial-adjustment model to test how well trade-off theory explains net working capital management decisions and examines working capital management dynamics. The results indicate that firms have long-run NWC targets and tend to gradually converge to the target from the firm's initial net working capital level within each period. The study estimates that typical firms close approximately 50% of the gap between their actual and target net working capital each year. Such high adjustment speed implies that a typical firm closes half of a deviation from the target in about 13 months. The reported results suggest that the trade-off

theory can explain the management decisions regarding working capital holdings (Luo, 2025)

Aggressive management of working capital is concerned with minimizing the investment in current assets and maximizing the use of short-term financing to increase the expected returns, but at the same time it is connected with a higher degree of liquidity risk. The conservative policy of working capital management emphasizes the safeguarding of liquidity by maintaining high levels of current assets. The choice of working capital policy can have effects on the flexibility and speed in which firms adjust their working capital to target levels, since the adjustment decisions depend on the financing conditions, liquidity needs and adjustment costs (Nazir and Afza, 2009; Baños-Caballero et al., 2010).

Previous research has shown that there is a positive and significant relationship between aggressive working capital policies and the speed of working capital adjustment. For example, a study of Indian industrial firms suggests that adopting an aggressive policy reduces the operating cycle time and increases the response to liquidity fluctuations. A higher speed of working capital adjustment can bring benefits such as reducing opportunity costs, increasing profitability, and enhancing the value of the firm. However, if this adjustment is made without careful assessment, it can increase liquidity risk and financial costs. Therefore, an optimal relationship between strategy selection and adjustment speed should be established by considering the constraints and objectives of the firm. The study concludes that the relationship between working capital strategy and its adjustment speed is a dynamic one, dependent on economic conditions, market structure, and internal policies of the firms. Managers need to make optimal adjustments by continuously monitoring liquidity indicators and operational performance.

2.5. Theoretical issues and hypothesis development

For various reasons, it is expected that firms' current working capital levels are not equal to their optimal level. For example, since firms' estimates of revenues are often uncertain, they cannot plan purchases accurately. Firms may also be unable to predict the default rate of debts accurately and estimate the amounts recoverable from their receivables (Nadiri, 1969). In addition, firms may deviate from the optimal level of working capital due to random or temporary shocks, changes in the prices of factors of production, or advances in technology. However, due to the benefits that target working capital has for businesses, firms try to bring the actual level of working capital closer to the target level. The speed at which firms correct the deviation between the actual and optimal levels of working capital is called the "speed of working capital adjustment" (Qurashi and Zahoor, 2017). The speed of working capital adjustment generally depends on the costs of the adjustment process. If the adjustment costs are high, the firm may not adjust the working capital ratio despite knowing that it is suboptimal. In contrast, if the adjustment costs are small, firms will correct any deviation between the actual and target working capital ratios, which means a high adjustment speed (Chauhan and Banerjee, 2018). Firms will adjust working capital only when the benefits outweigh the adjustment costs (Altaf and Shah, 2017). The literature suggests that firms do not immediately achieve their optimal working capital levels; instead, they gradually adjust their actual working capital toward target levels due to the costs associated with adjustment (Luo, 2025).

Firms that invest heavily in working capital generally experience longer cash conversion cycles because more funds are tied up in inventories and receivables. Conversely, firms that maintain lower levels of working capital may achieve shorter cash conversion cycles through more efficient management of current assets and liabilities (Deloof, 2003). Although data on working capital are available, due to the advantages mentioned by Ahangar (2020), the length of the cash conversion cycle is generally used to examine the existence of a target level of working capital and the speed of firms in achieving it. However, the effect of working capital strategies on the speed of working capital

adjustment has received less attention. According to Wilner (2000) and Baños-Caballero et al. (2010), firms that have greater access to external financial resources can more easily change the length of the cash conversion cycle and, consequently, their working capital ratio, and therefore, can achieve the target working capital ratio faster. This means that greater and easier access to external financial resources reduces adjustment costs, including short-term and long-term financing costs, and consequently, based on the equilibrium theory, increases the speed of adjustment of working capital (Ahangar, 2020). Considering the theoretical foundations and research background mentioned above, the first hypothesis of the research can be presented as follows:

H1: Aggressive investment policy affects the speed of working capital adjustment

In a conservative strategy, the net working capital ratio will be high and liquidity is correspondingly high. In this case, management tries to increase the firm's quick and current ratios to a level that is higher than the industry average values and at the same time its current liabilities decline. In contrast, the aggressive strategy tries to make the most of current debt while having the least amount of current assets.

The financial manager of a firm that adopts an aggressive policy tries to reduce the amount of these ratios and tries to bring the quick and current ratios to a value that is lower than the industry average and may even make the firm's net working capital negative and increase the amount of current debt. In implementing this strategy, the liquidity risk will be very high and the firm that implements this strategy will often find itself in a situation where it cannot pay its due debts. On the other hand, because the volume of current assets reaches the lowest level, the return on investment may be high, provided the firm avoids financial distress. Firms that adopt an aggressive strategy accept high risk and their rate of return is high. Baños-Caballero et al. (2010) found that the speed of adjustment is not equal across all firms and varies according to their external finance constraints and their bargaining power. Firms with better access to external capital markets and greater bargaining power adjust faster due to their lower costs of adjustment; the aforementioned process is consistent with the concepts presented in the equilibrium theory. Therefore, it is expected that firms with different strategies in relation to working capital management will adjust their target working capital level faster. Therefore, the research hypotheses are presented as follows:

H2: Aggressive financing policy affects the speed of working capital adjustment

3. Research methodology

This study analyses historical financial information drawn from firms' financial statements. It is applied research using a descriptive-regression and causal-analytical approach to panel data. The required financial information was obtained through library-based data collection, including the Rabee App, developed by Rabee Securities to provide access to Iraq Stock Exchange data, as well as www.investing.com and publicly available ISX information.www.investing.com

The study population comprised 160 firms listed on the Iraqi Stock Exchange that were active in 2016 and remained listed without delisting or suspension through 2025. After applying the screening criteria, three sectors were selected: industrial, service, and hotel sectors. The final sample included firms for which all required financial data were available during the study period. The sample excluded firms operating in the investment (9 firms), telecommunications (20 firms), monetary (8 firms), banking (50 firms), and insurance (19 firms) sectors. Based on these criteria, 30 firms were selected, resulting in 180 firm-year observations over the period 2016–2025. Observations with missing data or extreme values in certain years were excluded from the final dataset. The GMM method was used to estimate the results of the models testing the first and second hypotheses. GMM

was preferred over Difference GMM because the lagged dependent variable exhibits high persistence and Difference GMM may suffer from weak instrument problems in such settings.

The Blundell and Bond (1998) estimator improves efficiency by combining equations in differences and levels. It can provide more reliable estimates when the time dimension is short relative to the cross-sectional dimension. As the dataset comprises 30 firms observed over 10 years, its characteristics broadly correspond to the conditions under which System GMM performs well. A two-step robust System GMM estimator was employed.

3.1. Research variables measurement

3.1.1. Dependent variable

Working capital adjustment speed

Firms move their observed cash conversion cycle (CCC) towards an unobservable target CCC. The CCC itself should therefore not be interpreted as the speed of adjustment.

$$LCCC_{it+1}{}^{*} = \omega + \psi Z_{it} + \zeta_{it+1} \quad (2)$$

Where Zit is a vector of variables explaining the length of the cash conversion cycle and includes operating cash flow (CFOit, equivalent to the ratio of operating cash flow to total assets), financial costs (FCOSTit), equivalent to the ratio of financial costs to interest-bearing liabilities), growth opportunities (MTBit), equivalent to the Tobin Q ratio and equivalent to the ratio of the sum of the market value of the company's shares and the book value of liabilities to the book value of assets), company size (SIZEit), equivalent to the logarithm of total assets in base 10), fixed asset ratio TANGit (equivalent to the ratio of fixed assets to total assets), financial crisis risk (Z-scoreit), equivalent to the score obtained from the Altman model, 1968, company profitability (ROAit), equivalent to the ratio of net income to total assets), leverage ratio (LEVit), equivalent to the ratio of liabilities to total assets), and gross domestic product growth GDPGit (equivalent to the percentage of annual changes in gross domestic product). In practice, to measure the speed of working capital adjustment, equation (2) is inserted into equation (1) and the following dynamic model is obtained:

$$LCCC_{it+1} = \omega + (1 - \lambda)\, LCCCit + (\lambda\psi)_{it} + \vartheta_{it+1} \quad (3)$$

Because Model (3) includes a lagged dependent variable among its explanatory variables, ordinary least squares (OLS) estimation may yield biased coefficients and unreliable results. The System GMM approach developed by Blundell and Bond (1998) is used to estimate the dynamic model. Accordingly, Model (1) was estimated using this approach while controlling for industry and year effects. Higher values of λ indicate results consistent with the predictions of equilibrium theory. The estimated adjustment speed represents average adjustment behaviour across firms rather than firm-specific adjustment rates.

3.1.2. Independent variable

Aggressive Investment Policies (AIP) are measured by the ratio of total current assets to total assets (Afza and Nazir, 2008). A lower ratio indicates a more aggressive investment policy.

Aggressive Financing Policies (AFP) are measured by the ratio of total current liabilities to total assets (Afza and Nazir, 2008). A higher ratio indicates a more aggressive financing policy. To classify aggressive investment policies, the median ratio was calculated for firms within each industry. Firms with ratios below the median were classified as aggressive in Equation (4). AIP is a binary variable equal to 1 for firms pursuing aggressive investment policies and 0 otherwise. Similarly, firms with financing ratios above the industry median were classified as pursuing aggressive financing policies in Equation (5).

3.1.3. Control variables

Growth opportunities: MTB_{it} equals the Tobin Q ratio and is equivalent to the ratio of the total market value of the firm's shares and the book value of liabilities to the book value of assets. Size of the firm: $SIZE_{it}$ is equivalent to the logarithm of total assets. Financial crisis: Z-$score_{it}$ (equivalent to the score obtained from the Altman model, 1968); ROA_{it} (equivalent to the ratio of net profit to total assets).

3.2. Research model and operational definition of variables

Panel regression models were used to test the research hypotheses. Equation (4) specifies the model for testing the first hypothesis:

$$LCCC_{it+1}=\omega+\beta_1 AIP_{it}+ \beta_2 LCCC_{it} + \beta_3 AIP_{it}*LCCC_{it}+\psi\mathbf{Z}_{it}+\zeta it+1 \quad (4)$$

To test the second hypothesis, equation (5) was used:

$$LCCC_{it+1}=\omega+\beta_1 AFP_{it}+ \beta_2 LCCC_{it} + \beta_3 AFP_{it}*LCCC_{it}+\psi\mathbf{Z}_{it}+\zeta it+1 \quad (5)$$

Models based solely on multiplicative interaction terms may be susceptible to omitted variable bias (OVB) or structural endogeneity. If an interaction term captures unobserved firm heterogeneity, its estimated coefficient and statistical significance may be biased. The Paternoster et al. (1998) Z-test of coefficient equality was therefore employed as an additional methodological check.

4. Research findings

4.1. Descriptive statistics of data

Descriptive statistics that report a general view of the concentration and dispersion of the observations of the research variables are presented in Table 1. The results indicate that the mean cash conversion cycle in the firms under study is 112 days, operating cash flow is 7% of assets, financial expenses are equivalent to 4% of interest-bearing liabilities, and the sum of the market value of stocks and the book value of liabilities is about 3.1 times the book value of total assets. Also, tangible fixed assets constitute more than 32% of total assets, net profit is equivalent to 2% of total assets, and nearly 40% of the firms' funding is financed from liabilities. The mean firm size is 12.6 and the change in the GDP growth rate in Iraq has been less than 0.8 percent.

Table 2 presents descriptive statistics for the dummy variables:

Of the total sample studied, 20 firms simultaneously adopted both aggressive working capital strategies. To examine the effect of conservative working capital policies on the speed of working capital adjustment, additional tests were conducted, and the results are presented along with an interpretation of the findings related to the main research hypotheses.

Table 1. Descriptive statistics of research variables

Variable	Mean	Median	Max	Min	Std. Dev.	Obs
$LCCC_{t+1}$	106.649	52.803	583.530	-152.180	123.478	180
$LCCC_{it}$	112.301	62.193	583.530	-152.180	123.817	180
Cfo	0.074	0.022	0.549	-0.383	0.139	180
Fcost	0.042	0.002	0.516	-0.032	0.096	180
MTB	3.110	1.975	44.459	0.112	4.301	180
SIZE	12.635	12.364	19.581	8.592	2.194	180
TANG	0.402	0.384	0.984	0.000	0.277	180
Z-score	4.233	2.605	84.000	-32.983	12.639	180
Roa	0.021	0.013	0.654	-1.095	0.188	180
Lev	0.555	0.206	7.910	0.001	1.029	180
GDPG	0.810	1.500	13.800	-12.040	6.357	180

Table 2. Descriptive statistics of the dummy variables

Working Capital Strategies	Number of Firms	Percent	Description
Aggressive Investment policy	80	44	Only aggressive policy
Aggressive Financing policy	64	36	Only aggressive policy
Aggressive Working Capital policies	36	20	Both policies adopted simultaneously aggressive
Total	180	100	

4.2. Regression results analysis

4.2.1. Interpretation of diagnostic tests

To measure the speed of working capital adjustment in the entire available statistical population, the models were estimated using panel data and the Blundell and Bond (1998) generalized method of moments estimator, and the results are reported in Table 3. The results show that the coefficient of the lag variable of the cash conversion cycle length is significant in all 3 models. The speed of adjustment(λ) is derived from the formula λ = 1 - β1 (where β1 is the lagged LCCC coefficient). This shows that the speed of working capital adjustment in firms with an aggressive investment policy and a financing policy in firms with a conservative working capital policy is 31% (Model 1), and 37.4% (Model 2) and 21.5% for Model 3. In Model 1, a speed of adjustment of 31% implies that firms require approximately 3.2 years to eliminate a deviation from target working capital levels. This aligns with the trade-off theory predictions. The multicollinearity test (VIF) showed that the mean variance inflation factor (VIF) was 2.1, remaining strictly below the standard threshold of 5, thus confirming the models are free from multicollinearity issues and indicating that the generalized logarithmic transformations successfully mitigated extreme outliers and multicollinearity distortions among the explanatory variables. The Arellano–Bond AR (2) test addresses a critical assumption for the validity of the System GMM estimator: the absence of second-order autocorrelation in the differenced residuals. Because the AR (2) p-values reported by Stata for the models are greater than 0.05 (0.315 and 0.280 and 0.412), the null hypothesis of no second-order autocorrelation cannot be rejected. In other words, it can be said that Significant AR (1) and insignificant AR (2) results are expected in correctly specified System GMM models. Failure to reject AR (2) confirms the validity of the lagged instruments. AR tests are useful, but should be interpreted with caution in small samples and their results evaluated in conjunction with Hansen's test, number of instruments, and other diagnostic tests.

Table 3. Estimation diagnostics and speed of adjustment

Test / Metric	Model 1 (AIP)	Model 2 (AFP)	Model 3 (CIFP)
Mean VIF	2.13	2.13	2.13
Baseline Speed of Adj (λ0 = 1 - β2)	31.0%	37.4%	21.5%
Arellano-Bond AR (1) p-value	0.018	0.019	0.021
Arellano-Bond AR (2) p- value	0.315	0.280	0.412
Sargan-Hansen Test p-value	0.441	0.395	0.522
Paternoster et al. (1998) test, p- value	0.650	0.041**	0.602

This statistically establishes the absence of second-order autocorrelation in the idiosyncratic error terms, a vital prerequisite for valid GMM estimation. Sargan–Hansen test: The significance level of this test exceeds 5% in models (0. 441 and 0.395 and.522), indicating the validity of the instrumental variables and confirming the absence of over-identification problems. The Paternoster test compares

the equality of adjustment coefficients between aggressive and non-aggressive firms and serves as a complementary robustness check to the interaction term approach. The test assumes independent coefficient estimates and may have limited power in small samples.

4.2.2. Testing the first research hypothesis

Table 4 reports the estimates from Model (4), which tests the effect of aggressive investment policy on the speed of working capital adjustment.

Table 4. Results of hypothesis 1 testing

Variables	Coefficient	Std. Error	t-Statistic	P-value
$LCCC_{it}$	0.733	0.069	10.568	0.000***
AIP_{it}	12.308	21.050	0.585	0.559
$AIP_{it} \times LCCC_{it}$	-0.043	0.103	-0.420	0.675
Cfo	63.055	38.400	1.642	0.101
Fcost	-7.890	38.091	-0.207	0.836
MTB	-0.071	0.877	-0.081	0.935
SIZE	-2.725	2.594	-1.050	0.293
TANG	-49.302	34.908	-1.412	0.158
z-Score	-0.105	0.366	-0.288	0.774
Roa	-25.372	28.864	-0.879	0.379
Lev	-5.656	4.813	-1.175	0.240
GDPG	0.290	1.266	0.229	0.819
Industry & Year Effect	Controlled	---	---	---
R-squared: 0.543		Adjusted R-squared: 0.510		Obs: 180

The interaction term (AIPit × LCCCit) captures the conditional effect of aggressive investment policy on adjustment speed. Its coefficient is not statistically significant (P-value > 0.05).

4.2.3. Testing the Second research hypothesis

Table 5 reports the estimates from Model (5), which tests the effect of aggressive financing policy on the speed of working capital adjustment.

The interaction term (AFPit × LCCCit) has a negative coefficient that is statistically significant at the 10% level (P-value = 0.062). Because adjustment speed is derived from (1 − β2), a negative interaction coefficient implies that aggressive financing policy increases the speed of adjustment towards the target cash conversion cycle. Hypothesis 2 is therefore supported at the 90% confidence level. The negative and significant Paternoster et al. (1998) test statistic (-4/31) supports the interaction-term findings reported in column C. The second hypothesis is therefore not rejected.

4.2.4. Additional test

Although relatively few observations involved firms simultaneously adopting conservative investment and financing policies during the study period (20 firm-years), the effect of these policies on working capital adjustment speed was also examined separately. The results are reported in Table 6.

The comprehensive working capital strategy interaction (CIFPit × LCCCit) lacks statistical significance (P-value = 0.575). Therefore, a conservative firm-level strategy does not significantly change the systemic rate governing the adjustment speed. The lagged cash conversion cycle (LCCCit) coefficient is positive (0. 693) and highly significant at the 1% level, validating the use of dynamic panel models. However, the comprehensive working capital strategy interaction (CIFPit × LCCCit) also exhibits statistical insignificance. Overall, firm-level strategies do not necessarily overcome the systemic and macroeconomic constraints governing the adjustment speed in this specific market

environment.

Table 5. Results of hypothesis 2 testing

Variables	Coefficient	Std. Error	t-Statistic	Prob. (P-value)
$LCCC_{it}$	0.795	0.071	11.162	0.000***
AFP	18.098	17.120	1.057	0.290
$AFP_{it} \times LCCC_{it}$	-0.169	0.090	-1.868	0.062*
Cfo	48.073	37.039	1.298	0.194
Fcost	11.055	33.342	0.332	0.740
MTB	0.153	0.898	0.170	0.865
SIZE	-2.754	2.785	-0.989	0.323
TANG	-40.426	22.346	-1.809	0.070*
Z-score	-0.347	0.341	-1.015	0.310
Roa	-33.385	32.382	-1.031	0.303
Lev	-7.565	5.784	-1.308	0.191
GDPG	0.342	1.216	0.281	0.779
Industry & Year Effect	Controlled	---	---	---
FE: R-squared: 0.548		Adjusted R-squared: 0.516		Obs: 180

Table 6. Results of additional test

Variables	Coefficient	Std. Error	t-Statistic	Prob. (P-value)
$LCCC_{it}$	0.693	0.059	11.830	0.000***
$CIFP_{it}$	-10.774	24.281	-0.444	0.657
$CIFP_{it} \times LCCC_{it}$	0.092	0.164	0.561	0.575
Cfo	59.506	35.134	1.694	0.090*
Fcost	-3.536	35.091	-0.101	0.920
MTB	0.009	0.878	0.010	0.992
SIZE	-2.686	2.732	-0.983	0.326
TANG	-40.926	26.147	-1.565	0.118
Z-score	-0.131	0.362	-0.362	0.717
Roa	-29.666	29.375	-1.010	0.313
Lev	-5.646	4.705	-1.200	0.230
GDPG	0.306	1.248	0.245	0.806
Industry & Year Effect	Controlled	---	---	---
R-squared: 0.543		Adjusted R-squared: 0.510 |		Obs: 180

Robustness was assessed using alternative specifications, including Difference GMM and fixed-effects estimators. The main findings remained qualitatively unchanged. Alternative proxies for working capital policy and adjustment behavior were employed, and the results remained consistent with the baseline findings.

Table 7. Compare different instrument sets

Model	instrument	Firm	Collapse
Model 1 (AIP)	18	30	yes
Model 2 (AFP)	19	30	yes
Model 3 (CIFP)	17	30	yes

To examine the validity of alternative measurement constructs in calculating the cash conversion cycle, once based on raw data (cycle duration in days) and once on the logarithm of the cash conversion cycle duration, the conclusions concerning the hypotheses remained unchanged. Sub-period estimations indicate that the main findings remain stable across different time periods. To

mitigate instrument proliferation concerns, alternative instrument matrices were estimated and collapsed instruments were employed. In all cases, the number of instruments remained below the number of cross-sectional units (Table 7). In GMM estimation, an excessive number of instruments can reduce the statistical power of diagnostic tests and inflate standard errors, potentially affecting the significance of control variables. The number of instruments was therefore kept below the number of firms (30), using the collapse command in Stata.

5. Conclusion and suggestions

Aggressive investment policies typically involve accepting greater risk to exploit growth and innovation opportunities. This approach can lead to improved financial efficiency and productivity in the use of financial resources, including working capital. Aggressive investment may enable firms to respond to market changes and economic opportunities more quickly, potentially requiring faster working capital adjustment. Aggressive financing policy refers to a greater reliance on short-term liabilities to finance current assets. Although this policy may reduce financing costs and increase expected returns, it can also expose firms to higher liquidity risk and refinancing pressure. Although this policy may bring new financial resources to firms, it is often associated with financial costs and increased long-term debt. However, despite the potential liquidity risks associated with aggressive financing, the empirical findings of this study indicate that greater reliance on short-term financing improves the speed of working capital adjustment.

This study investigated the effect of working capital strategies on the speed of working capital adjustment among firms listed on the Iraq Stock Exchange during the period 2016–2025. Using dynamic panel data models and the System GMM estimator, the study examined whether aggressive investment and financing policies influence firms' ability to adjust their working capital toward target levels. The results indicate that aggressive investment policy does not have a statistically significant effect on the speed of working capital adjustment. Although theoretical arguments suggest that reducing investment in current assets may increase operational flexibility and accelerate adjustment toward target working capital levels, the empirical evidence from Iraqi listed firms does not support this expectation. The findings of this study reveal an important theoretical and methodological shift in the working capital management literature within emerging markets, specifically the ISX. Aggressive investment policy theoretically demands maintaining minimal inventory and rapid receivables turnover to boost efficiency. However, this finding may be explained by institutional and market-specific constraints in Iraq, which can reduce firms' ability to translate aggressive working capital practices into faster adjustment.

Thus, a firm's internal desire to aggressively shorten its cash cycle is constrained by external conditions, neutralizing the impact of an aggressive asset policy on the actual adjustment speed. This finding suggests that institutional constraints, market inefficiencies, financing limitations, and macroeconomic uncertainties in Iraq may weaken the effectiveness of aggressive investment strategies in accelerating working capital adjustment.

The findings further indicated that aggressive financing policies have a positive effect on the speed of working capital adjustment. Firms that rely more on short-term financing may have greater access to immediate financial resources, allowing them to adjust their working capital levels more rapidly toward target levels. However, this strategy might also expose firms to higher liquidity risk due to greater dependence on short-term liabilities. This result is consistent with the trade-off theory and supports the argument that greater access to short-term financial resources can reduce adjustment costs and improve firms' responsiveness to operational and financial shocks. However, the statistical evidence for this relationship is relatively weak and is statistically significant only at the 10% level,

indicating that financing policy alone cannot fully overcome the structural barriers present in the Iraqi business environment. The additional analysis also showed that firms simultaneously adopting conservative investment and financing policies do not experience a significantly different adjustment speed compared with other firms. This finding suggests that macroeconomic and institutional conditions may influence the effectiveness of firm-level working capital strategies.

Overall, the results suggest that working capital adjustment in the Iraqi market is influenced not only by managerial decisions but also by broader economic conditions, financial market development, and access to external financing. Therefore, managers should focus on improving financial flexibility, strengthening liquidity planning, and enhancing access to financing channels rather than relying solely on aggressive or conservative working capital strategies. Due to the limited number of studies examining the relationship between working capital strategies and adjustment speed in emerging markets, comparisons with previous findings remain limited. Based on the findings, future research may examine the moderating role of financial constraints, corporate governance quality, industry competition, and macroeconomic uncertainty in the relationship between working capital strategies and adjustment speed. One limitation is that the Altman Z-score coefficients may have limited validity in the Iraqi market environment. Therefore, it is suggested that necessary research be conducted in this field and a local model of financial distress coefficients be developed in Iraq. The study is based on a relatively small cross-sectional sample comprising 30 listed firms. Although the dynamic System GMM estimator is appropriate for addressing endogeneity and dynamic persistence, a limited number of cross-sectional units inevitably reduces statistical power and increases the likelihood of Type II errors, making it more difficult to detect moderate effects of control variables. Consequently, statistically insignificant coefficients may reflect limited estimation power rather than the true absence of economic relationships. The Iraqi Stock Exchange also operates within a frontier-market environment characterized by substantial institutional uncertainty, weak investor protection, limited market liquidity, concentrated ownership structures, and underdeveloped financial intermediation. Under such conditions, firm-specific financial characteristics may be overshadowed by broader institutional and macroeconomic disturbances. As a result, conventional determinants that are frequently significant in developed or more mature emerging markets may exhibit weaker explanatory power in the Iraqi context. The primary explanatory variables of this study capture firms' working capital strategies, which are conceptually more closely linked to working capital adjustment behavior than the selected control variables. After accounting for dynamic persistence and endogeneity through the System GMM framework, much of the remaining cross-sectional variation may already be explained by these strategic variables, leaving limited additional explanatory power for traditional financial controls. Future studies may employ alternative measures of working capital such as net working capital ratios or working capital requirements to verify the robustness of the findings. One of the limitations that may affect the results is the use of only one macroeconomic variable (GDP growth) and the lack of an industry-level variable to explain working capital management. Although this is in line with previous research, it is possible that using other economic variables and using an industry-level variable to explain changes in working capital management would yield different results.

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