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Working Capital Management and Profitability of Banks: Evidence from the Iranian Capital Market

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Abstract

The main objective of this research is to investigate the relationship between working capital management and the profitability of banks in the Iranian capital market. To achieve this objective, financial data from thirteen banks have been used in a balanced panel format over the period from 2013 to 2021. The dependent variable, profitability, includes two profitability indicators: Return on Assets (ROA) and Return on Equity (ROE). working capital management is measured using the cash ratio and Cash Conversion Cycle (CCC). In this research, hypothesis testing has been carried out using fixed-effect regressions and Generalized Method of Moments (GMM) estimations. The results indicate that there is no significant relationship between the cash ratio and profitability, while there is a positive and significant relationship between the CCC and profitability.

1 | Introduction

Working capital management is one of the critical areas within financial management because it directly influences the liquidity and profitability of companies and even the risk of bankruptcy for companies exposed to improper working capital management, despite having positive profitability. Working capital management revolves around current assets and current liabilities. Current assets represent a significant portion of a company's total assets. Excessive levels of current assets can lead to achieving investment returns below the norm. Conversely, companies with insufficient current assets will encounter shortages and operational challenges in their regular operations [1].

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In financial management, efficient working capital management plays a pivotal role in upholding a company's financial well-being and ensuring the sustainability of its operations. This study explores the intricate relationship between working capital management, current assets, and current liabilities in the context of financial management. The goal is to shed light on how these factors impact a company's liquidity and profitability. As we delve deeper into the multifaceted aspects of working capital management and its repercussions on businesses, it becomes evident that striking the right balance between current assets and current liabilities is paramount to optimizing financial performance. This equilibrium guarantees that a company can meet its short-term obligations while simultaneously maximizing returns on investments.

In the following sections, we will delve further into the constituents of working capital management, its significance for companies, and the potential ramifications of mismanagement. Furthermore, we will discuss the relevance of this study in the context of contemporary financial management practices. The theoretical foundations of working capital management are more closely associated with large corporations and developed economies. There is significant inequality, particularly when it comes to the study of financial management within banks. Banks in developing countries often face difficulties in accessing external financial resources, relying more on customer deposits compared to larger banks in developed nations. Therefore, working capital management plays a crucial role in the liquidity of banks in developing countries. Since working capital management is closely related to short-term financial planning, and liquidity, in general, serves as an indicator of short-term performance, effective and efficient working capital management is of vital importance [2].

This research aims to investigate the relationship between working capital management and the performance of banks in the Iranian capital market. One of the reasons banks hold reserves is their need for mandatory reserves. Banks also maintain reserves to meet unforeseen liquidity needs [3]. Reserves can be categorized into two types: precautionary excess reserves, which banks hold to mitigate uncertainty, and excess reserves beyond the precautionary level [4]. Since the 2008 financial crisis, banks have increased their excess reserves. Banks now find themselves in an environment where accumulating cash can be more attractive, as the cost of holding excess cash is significantly lower than before the crisis [5].

In short-term markets, a cash shortage has emerged and banks have faced severe financial difficulties. Throughout the years, the belief that cash management affects a bank's financial capacity has become more prominent [6]. The high risk of losing loans is associated with low cash levels. Therefore, there may be a level of cash resources where a reduction in cash accumulation negatively affects the bank's profitability. As a result, the relationship between working capital management and bank profitability is not linear but rather concave, and thus, it can be better captured by a second-degree relationship. Given the above, extensive research has been conducted on this subject. Dang et al. [7] demonstrated that greater cash accumulation reduces bank profits when the level of uncertainty is low. However, there is a high uncertainty point where increased cash accumulation improves bank profitability. Fernandes et al. [8] found a non-linear relationship between the Cash Conversion Cycle (CCC) and bank profitability. Asubonteng and Kong [9], in their study on role of the bank value in cash accumulation in Ghana, concluded that bank value has a positive and significant impact on the cash accumulation of global banks in Ghana. Similarly, their study showed that profitability, working capital, and growth all positively contribute to bank cash accumulation.

Sasaki and Suzuki [10] found that bank health restricts the financial capacity of companies and affects the cash accumulation and investment of companies in a bank-centric market. Kalanidis [11], in a study titled "the impact of liquidity on bank profitability after the european banking crisis," found that banks need to maintain higher levels of liquidity with their capital reserves and take action to reduce their credit risk in their investments and financial gap, which creates constraints on their financing methods.

Given the aforementioned considerations, this research aims to investigate the relationship between working capital management and profitability in the banks operating in the capital market of the country.

2 | The Model and Variables

In this study, to examine and test the hypotheses, the following regression models, adapted from Fernandes et al. [8], have been employed:

$$PRO_{i,t} = \beta_0 + \beta_1 Cash_{i,t} + \beta_2 CCC_{i,t} + \beta_3 CCC^2_{i,t} + \sum \beta_j X_{i,t} + \lambda_t + \eta_i + \varepsilon_{i,t}.$$

In the above model, the dependent variable (PRO) represents profitability, which is measured using two proxies, Return on Assets (ROA) and Return on Equity (ROE). The independent variables are calculated using two proxies as well, CCC and Cash Ratio (CASH). Finally, the control variables include Firm Size (Size), Log of Total Assets (LnAssets), Credit Risk (CRISK), the ratio of Loan Loss Reserves to Total Loans (LLR), Leverage (LEV), Bank Age (Age), and Growth Rate (GROWTH) in interest income.

2.1 | Methodology

The present research method is descriptive-correlational and, in terms of purpose, is applied. From the data collection perspective, it falls into post-event research. The research population includes all banks operating in the country's capital market from 2013 to 2021. The research sampling was purposeful and involved eliminating banks, resulting in the selection of 13 remaining banks. Given the possibility of endogeneity in the bank's decision regarding working capital management, potential endogeneity issues may arise in the standard Ordinary Least Squares (OLS) approach, leading to biased and inconsistent coefficient estimates. To mitigate endogeneity concerns in this research, fixed-effect models have been employed. Additionally, the primary model analysis is supplemented using the Instrumental Variables-Generalized Method of Moments (IV-GMM) technique, which addresses the endogeneity of the loan diversification measure. In the presence of heteroscedasticity, the Generalized Method of Moments (GMM) estimator is more efficient than the 2-Stage Least Squares (2SLS) estimator [12]. The GMM estimator also addresses concerns of overidentification, where the number of instruments exceeds the number of endogenous regressors. Following the theoretical foundations from the literature [13], a Heteroskedasticity and Autocorrelation Consistent (HAC) variance estimation technique is employed to account for potential serial correlation and heteroscedasticity in the error terms. The IV-GMM approach includes appropriate instrumental variables. An instrumental variable must satisfy two essential conditions, the relevance condition and the exogeneity condition. The relevance condition requires that there should be a partial correlation between the instrument relevance condition and the endogenous variable that is not equal to zero. The exogeneity condition requires that there should be no correlation between the instrumental variable and the structural error term [14].

3 | Findings

3.1 | Descriptive Statistics

In this section, to analyze the findings, the descriptive statistics of each variable in *Table 1*.

Table 1. Descriptive statistics.

Symbol/Variables	ROA	ROE	CASH	CCC	SIZE	CRISK	LEV	AGE	GROW
Mean	0.001	0.197	0.034	1169	19.4	0.136	0.952	18.53	0.960
Median	0.008	0.149	0.019	542	19.4	0.012	0.938	13.00	0.145
Max	0.06	3.203	0.172	3406	22.2	3.397	2.884	67.00	12.91
Min	-0.53	-0.419	0.001	183	15.1	0.005	0.368	2	-0.924
Std. Dev.	0.07	0.41	0.039	3256.1	1.29	0.417	0.23	16.40	3.84

In this study, to examine and test the above hypotheses, the following regression models, adapted from Fernandes et al. [8], have been employed in *Table 1*, the primary and most commonly used central measure is the mean, with a ROA mean of 0.1%, indicating that the profitability of banks is relatively low based on this metric. Additionally, the mean of financial leverage is 0.952, which, given its high value, suggests that for

banks primarily engaged in deposit attraction, it results in higher ROE. Furthermore, the mean cash ratio is 3.4%, indicating a high liquidity risk within banks.

3.2 | Results of Estimation-Fixed Effects Method

Based on the results obtained from *Table 2*, the model has been estimated using the OLS method.

Table 2. Fixed effects estimator.

Variable	ROA	ROE
C	-0.190**	-5.134
CASH	0.014	1.901
CCC	0.005**	0.135*
CCC²	-0.233***	-0.547
SIZE	0.012**	0.324**
CRISK	-0.035***	0.089
LEV	-0.031	0.514
AGE	-0.002*	-0.061**
GROW	-1.14E-05	0.038***
R²	0.968	0.392
Adjusted R²	0.961	0.261

In this study, to examine and test the above hypotheses, the following regression models, adapted from Fernandes et al. [8], were employed. According to *Table 2*, the level of significance between the cash ratio and profitability indicators was not statistically significant, while the CCC had a statistically significant positive impact on ROA and ROE at confidence levels of 95% and 90%, respectively. Additionally, the CCC exhibited a non-linear U-shaped effect with ROE.

The adjusted R-squared of the model with the dependent variable ROA is 96.1%, indicating a higher explanatory power of this model compared to the model with the dependent variable ROE.

3.3 | Results of Estimation-GMM Approach

In equations where unobservable industry-specific effects and the presence of a structural break in the explanatory variables pose a fundamental problem, the GMM estimator is used, which is based on dynamic panel models [14]–[16]. To estimate the model using this method, it is first necessary to specify instrumental variables. The validity of the GMM estimator relies on the assumption of no serial correlation between error terms and instruments, which can be tested using two tests proposed by Arellano and Bond [15], Arellano and Bover [16], and Blundell and Bond [17]. The first test is the Sargan test, which tests the validity of predetermined restrictions on instruments. The second is the M_2 test, which examines the second-order serial correlation in first-differenced error terms. The rejection of the null hypothesis in both tests provides evidence of the absence of serial correlation and the validity of the instruments. The GMM estimator is consistent if second-order serial correlation in first-differenced errors is not present.

Table 3. GMM dynamic panel estimator.

Variable	ROA	ROE
PRO(-1)	-0.06	0.083
CASH	0.801**	0.79
CCC	0.135**	0.14**
CCC²	-0.747***	-0.86
SIZE	-0.012	-0.01
CRISK	-0.02	-0.037
LEV	0.44	-0.602
AGE	0.001**	-0.016
GROW	0.0003	0.053***
J-statistic	3.10	19.77
Prob(J-statistic)	0.53	0.40

According to *Table 3*, the level of significance between the cash ratio and profitability indicators is not statistically significant using the GMM method. However, the CCC has a statistically significant positive impact on ROA and ROE at confidence levels of 95% and 99%, respectively. Additionally, the CCC exhibits a non-linear U-shaped effect with ROE.

Since the GMM method relies on instrumental variable ranking, the Sargan test is used to assess the validity of the instrument matrix. In this test, the null hypothesis suggests the absence of a correlation between the instruments and the disturbance terms. Therefore, here, the Sargan statistic has p-values of 0.53 and 0.40, indicating the validity of the instruments used.

4 | Conclusion

One of the aims of this research has been to investigate working capital management, with a particular focus on empirical theories related to working capital management in large companies and developed settings. financial management in banks shares many similarities with large corporations. However, there is a significant difference that studying financial management in banks highlights. Given that banks in developing countries face difficulties in accessing external financial resources, they rely more heavily on customer deposits compared to large banks in developed countries. Therefore, working capital management plays a crucial role in the liquidity of banks in developing countries. Additionally, since capital-related problems in circulation are among the leading causes of bank failures, this research has investigated the relationship between effective working capital management and the profitability of banks accepted in our country's capital market.

In this regard, two hypotheses were formulated to examine the relationship between working capital management and performance based on profitability in banks. The results indicate that, statistically, an increase in the liquidity ratios did not have a significant impact on profitability. One possible reason for this is that these ratios are primarily used in manufacturing companies to determine working capital policies. In the banking industry, the analysis of these ratios is usually used for liquidity risk assessment and control. The lack of attention by managers to the analysis of these ratios about bank performance may have led to the lack of a significant correlation between them. This analysis is not consistent with the findings of Fernandes and colleagues [8].

Furthermore, the results show that an increase in the CCC in profitability ratios has led to significant and positive changes statistically. One can explain this by the fact that Iranian banks still owe a significant portion of their profitability to providing facilities to their customers. Therefore, providing facilities to customers over a longer period leads to increased bank risk in working capital management, or, in other words, bold strategies. Accordingly, it is expected that an increase in risk will also lead to increased bank returns, which is consistent with the results of Fernandes and colleagues [8]. In conclusion, based on these results, it is recommended that senior bank managers, like those in other developing and developed countries, do not overlook working capital management in their analysis of profitability. It is suggested that they take steps to working capital management and accumulate more cash through the sale of non-listed participation securities to ensure liquidity.

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