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Impact of working capital management on profitability of private commercial banks in Ethiopia

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Abstract

Working capital management is an important financial management decision for the profitability of commercial banks. The purpose of this study is to examine the impact of working capital management on commercial banks' profitability. The study used secondary data from audited financial statements of five private commercial banks in Ethiopia covering the period from 2011 to 2020. The banks were selected on a convenience basis. The financial information from the banks was analyzed to determine the impact of the current ratio, bank size, a current asset-to-total asset ratio, loans and advances to total asset ratio, and current liabilities-to-total assets ratios on profitability. The researchers applied descriptive statistics and inferential statistics. The data were analyzed using the Stata data processing package. An econometric model is applied to examine the impact of working capital management on the profitability of commercial banks. A random effect model was employed and the result revealed that bank size and loans and advances to total assets were found to have a significant impact on banks' profitability. The current ratio, a current asset-to-total asset ratio, and current liabilities-to-total assets ratios were found insignificant to influence banks' profitability. Since the profitability of the banks depends on working capital management, rigorous attention should be given to those factors that influence the profitability of commercial banks.

Keywords: Working capital management, Profitability, Commercial banks

Introduction

Working capital management is a vital element in managing the finance of business organizations to determine the composition of the capital for operating and investing in the organization. Excess of current assets in business can result in low return on investment, while businesses with few current assets incur cash shortages and difficulties in maintaining smooth operations (Ayichelet, 2018; Horne & Wachowicz, 2009). Therefore, effective management of working capital involves planning and controlling of the current assets and current liabilities to meet the short-term financial needs of the business organization and the efficient management of working capital avoids the excess investment of current assets (Gulilat, 2020).

Working capital management deals with the current assets and current liabilities of the organization and directly affects the liquidity and profitability of the business (Raheman & Nasr, 2007). Working capital controlling is the trade between the liquidity and profitability goals of the organization and the risk. Working capital management deals with the discrepancies in current assets, current liabilities, and the interrelationships between current asset management and current liability (Umoren & Udo, 2015). Working capital management plays a vital role in the overall corporate strategy of maximizing shareholders' value (Nwankwo & Osho, 2010). Moreover, companies that are able to manage their working capital efficiently are likely to respond quickly to unanticipated economic changes (Alshubiri, 2011).

In Ethiopia, there have been few studies on bank profitability and working capital management, and no accurate count has been made of the metrics and outcomes. These methodological and empirical debates would make it difficult to determine how working capital management affects bank profitability. With this in mind, the primary question for this particular study was: why do the methodologies and variables used by different Ethiopian researchers vary? The goal of the current study is to close this information gap. As a result, the purpose of this study is to examine how working capital management affects the profitability of private commercial banks in Ethiopia while taking into account empirical and theoretical literature from various nations.

Statement of the problem

Maintaining the ideal level of working capital is the main goal of efficient working capital management in order to increase organizational value. In order to maximize shareholder value, working capital management is a critical component of the overall corporate strategy. Determining the ratios of both current assets and short-term liabilities is necessary to maximize shareholder wealth, nevertheless (Nwankwo & Osho, 2010). Additionally, businesses that can effectively manage their working capital are more likely to react swiftly to unanticipated changes in the economy (Alshubiri, 2011). By carefully managing current assets and current liabilities, the organization can reduce its risk of short-term default.

The contribution of working capital management to maximizing the firm's value is achieved when the marginal return on invested assets in working capital is equal to or greater than the cost of capital utilized to finance them. Raheman and Nasr (2007) argue that a company cannot survive for a long period if it does not care about profit. Meanwhile, it may face insolvency if it does not concern about liquidity and risk. It is worth noting that liquidity in the banking industry is more specific. Banks mainly tend to give out money as loans and receive interest in return. Holding big volumes of liquid assets decreases profit while holding insufficient liquid assets can cause financial distress. Thus, efficient management of liquid assets is crucial (Aregawi, 2019).

There are different studies on working capital management in Ethiopia. Tewodros (2010) studied working capital management's impact on banks' profitability. His findings reveal that longer accounts receivable and inventory holding time are associated with lower profitability of the banks. On the other hand, Tiringo (2013) examined the impact of working capital management on the profitability of micro and small enterprises in Ethiopia in the case of the Bahir dar city administration. The result showed that there is a strong positive relationship between the number of day's accounts payable and enterprises profitability. On the other hand, the numbers of days for inventory, the number of day's accounts receivable, and the cash conversion period have a significant but negative impact on the profitability of enterprises.

Ephrem (2018) made a study systematic on the impact of working capital management on the profitability of small and medium-scale enterprises. He took account receivable and payable period, cash conversion cycle, and firm size financial asset to total assets, debt ratio and current ratio as independent variables and gross profit as a proxy of the dependent variable. The result of the study revealed that there is a positive but not significant relationship between the sizes of firms and net operating profitability. Furthermore, Gullilat (2020) conducted a study on the effect of working capital management on the Performance of Private Commercial Banks in Ethiopia scenario. The result revealed that debt-to-equity ratio and cost-to-income ratios were found to have a significant positive and negative impact on return on equity, respectively.

However, the result of the above studies contradicts each other and the variables used to measure working capital management were different. Moreover, the methodologies used by some researchers were not appropriate for panel data analysis. The existence of controversies is an indication which needs further research. Therefore, the study fills these gaps and a possible recommendation is forwarded that can help commercial banks in Ethiopia to identify the impact of working capital management on profitability.

Objectives

Evaluating the effect of current ratio on the profitability of commercial banks.
Exploring the effect of bank size on commercial banks profitability.
To examine the impact of loans to total assets on commercial banks profitability.
Evaluating the effect of current assets to total assets on commercial banks profitability.
Measuring the effect of current liabilities to total assets on commercial banks profitability.

Literature review

Working capital management

Efficient working capital management is very important for the firm's to have attractive performance and its realization depends on the financial manager's ability to effectively manage the working capital components. The goal of working capital management is to effectively manage each of the firm's current asset elements and current liabilities elements to increase profitability and reduce risk that contributes positively to the firm's value (Gitman & Zutter, 2012).

Making decisions about the quantity, make-up, and financing of current assets falls under the very delicate category of working capital management (Gulilat, 2020). In financial management, the utmost aim of any firm is to maximize profit. But, there is another important aim that the firm should preserve liquidity. In here, a problem incurs that increasing profits at the cost of liquidity can bring serious problems to the firm (Raheman & Nasr, 2007; Sastararuji et al, 2022). Therefore, there must be a trade-off between the profitability and liquidity of the business enterprise. Unless any firm does not concern with profit, such a business organization cannot survive for a longer period. On the other hand, unless any firm does not concern about liquidity, such a firm may be insolvent or bankrupt. Capital factor management from acquisition to use will require a decision-making quantitatively and qualitatively on resources observed in their sources and in their uses (Rossi et al., 2015).

Working capital management is referred to as a managerial accounting strategy that aims to maintain an adequate level of working capital (current assets and current liabilities) with respect to each other in order to make sure the company has enough cash to handle daily operations and to respond to immediate demands from the debt holders. In addition, Yahya and Bala (2015) contend that organizations must effectively employ the resource that affirms the significance of working capital management in the competitive business environment. The WCM idea refers to how businesses manage their current assets and liabilities, and this management strategy consists of two components: the amount invested in current assets and the method used to finance those assets.

Every business requires working capital for its survival. Working capital is required by a business to maintain liquidity, solvency and profitability of the organization (Umoren & Udo, 2015). The importance of managing the working capital of a business efficiently cannot be denied. Working Capital management explicitly impacts both the profitability and level of desired liquidity of a business (Raheman & Nasr, 2007). Therefore, the purpose of working capital management is to have optimum working capital amount, because excessive levels of current assets can result in lowering firm's profitability, whereas firms with too few investment in working capital would result in shortages and difficulties in maintaining smooth operations (Horne & Wachowicz, 2009). If a firm invests heavily in working capital, i.e., more than its needs, then the profits which can be generated by investing these resources in fixed or long-term assets diminished.

Profitability

Return on investment is one of the profitability ratios. Investments can be defined as either total assets or net assets. Capital used is the term used to describe the money used to create net assets. According to Aregawi (2019), net assets are equal to net fixed assets plus current assets minus current liabilities (excluding bank loans). According to Amarjit et al. (2010), the traditional method of determining return on investment is to divide profit after tax by investment. To determine if owners' investments were profitable, a return on shareholders' equity is computed. The paid-up share capital, share premium, reserves, and surplus less accumulated losses make up the shareholders' equity, or net value. The total liabilities minus the total assets can also be used to calculate net worth (Amarjit et al., 2010; Zhang et al., 2017).

Return on assets measures a company's net income as a proportion of all the assets that are at its disposal (Tufail et al., 2013; Yeboah & Yeboah, 2014). According to ROA, businesses should be able to generate more income if they have more assets. ROA measure management's capacity to generate a profit from the assets of the company. Since interest is the payment made to creditors in exchange for the capital they have provided to the company, it is assumed that the income amount utilized in this calculation is income before the deduction of interest expense (Ebben & Johnson, 2011).

The findings of Abebe's study from two years ago indicate that the ratio of assets to liabilities affects microloan returns in both favorable and unfavorable ways. The size of the microfinance institution, other current financial liabilities, and net loan portfolio all significantly and favorably influence return on assets. On the other side, deposits, borrowings, and other liabilities are strongly and negatively associated to financial performance. Overall, the study reveals that for better financial performance, asset–liability management needs to receive the proper attention (Abebe, 2022).

The management of the bank's management is responsible for the bank's vision, capability, agility, professionalism, integrity, and competency. Any institution needs good management to be successful, and management quality is typically given more weight when evaluating overall performance (Ayele, 2012). The success of a bank is determined on the management's abilities. The management's vision, skill, integrity, and risk tolerance have a significant impact on a bank's performance (Aregawi, 2019).

Studies conducted in the Swiss banking industry, according to Blatter and Fuster (2022) suggest that efficiency and profitability rise with bank size. They discovered that the relationship between size and efficiency and profitability is probably causal using an instrumental variables approach for a group of geographically constrained institutions. The findings also show that great efficiency and profitability are compatible with sound capitalization.

Working capital management and profitability

Profitability is referred to as an important variable to measure organizational performance. Profitability is the relationship between revenue and expenses and how well the firm is performing, how they manage working capital and the potential future growth of the company (Gulilat, 2020; Morshed, 2020).

Credit and liquidity risk, management efficiency, the diversification of business, market concentration and economic growth have an influence on bank profitability. Djalilov and Piesse(2016) conducted a study aimed to compare the determinants of profitability of banks in the early and late transition countries of Central and Eastern Europe. The influence of credit risk on bank profitability was found to be positive in early transition countries but negative in late transition countries. According to Saona (2016), investigation converse relationship between banks' profitability and capital ratio, asset diversification positively affects banks' profitability, and revenue diversification inversely affects banks' profitability.

A study conducted by Goncalves et al. (2018) on the relationship between working capital and profitability found that working capital management efficiency increases profitability, the positive impact of working capital management on profitability is even more important during the economic downturns. Similarly, Enqvist et al. (2014) study on Finland Companies finding support the positive effect of efficient working capital management on firm's profitability. They found that cash conversion cycle, account payable period and inventory conversion period have negative and significant impact on the firm's profitability, however, the study result show that account receivable conversion period has a negative but statistically insignificant impact on profitability. Moreover, the business cycle has impact on the working capital and profitability relationship, though the level of its impact is different under different economic situations. Consistent to these findings, Rey-Ares et al. (2021) also studied the impact of working capital management on Spanish Companies' profitability and found that efficient working capital management has positive impact on Companies' profitability.

An efficient working capital management company can raise capital for further strategic goals, reduce financial expenses, and consequently increase profit (Lind et al., 2012). Moreover, Knauer and Wöhrmann (2013) proposed that working capital management is highly pivotal to a firm's success. However, unjustifiable over-investment in working capital would inversely influence profitability. Umoren and Udo (2015) described working capital management as all administration decisions and actions that typically impact the size and efficiency of working capital. Similarly, Mandiefe (2016) study found that the management of working capital affected Cameroon's Afriland First Bank evidence that bank age, size, and cash conversion are the main factors explaining Pakistani banks' cash amount. Mazreku et al. (2020) studied working capital and its effect on commercial bank profitability in Kosovo. The study found that bank size and current ratio has a positive impact on banks' success in Kosovo, while the debt ratio had a negative effect.

The return on equity, the expense-to-income ratio, the loan-to-deposit ratio, and the growth rate are crucial to Tunisian banking technical efficiency, according to Jelassi and Delhoumi's research in 2022. In particular, the technical efficiency of the banking industry rises with capitalization and inflation while falling with size, the number of bank branches, and the loan-to-asset ratio. The most crucial service is deposit mobilization, which is a crucial aspect of banking operations. According to Banke and Yitayaw (2022), the primary function of banking in Ethiopia is to mobilize savings through vigorous deposit collection.

The findings of the study by Kato and Germinah (2022) demonstrate that venture capital-financed businesses do better than those that are not. The study significantly contributes by providing a flexible foundation for business success. The approach will help venture capital firms assess and tailor investment initiatives that can accelerate the development of early-stage businesses in Uganda and other emerging economies.

Osuma et al. (2018) conducted a study on working capital management and found the effect of working capital management and it is relevant to the success of the banking industry in Nigeria. They found that the effective working capital management had a significant effect on the profitability of the banks and return on assets is a better measure of bank profitability. The study clearly revealed that a unit change in the current ratio has negatively affected the return on equity in the study.

The biggest obstacles to building business that partners encounter are insufficient working cash. A positive and significant correlation between working capital and entrepreneur profitability was also shown in Abebe and Kegne(2023). The connection between working capital management and the profitability of commercial banks was examined by Muthubandara in 2019. The study's findings showed that, compared to other factors, the cash ratio had a greater impact on net profit margin and return on assets.

Empirical evidence from Ethiopia

Tewodros (2010) studied working capital management and its impact on profitability by taking 11 private limited manufacturing firms. He took ROA, OPM and ROE as a measure of profitability. The results show that longer accounts receivable and inventory holding periods are associated with lower profitability. There is also negative relationship between accounts payable period and profitability measures; however, except for operating profit margin this relationship is not statistically significant.

Tiringo (2013) examined the impact of working capital management on profitability of micro and small enterprises in Ethiopia for the case of Bahir dar city administration. The result showed that there is a strong positive relationship between number of day's accounts payable and enterprises profitability. However, number of days accounts receivable, number of days inventory and cash conversion cycle have a significant negative impact on profitability of micro and small enterprises.

Henok(2015) made a study with the title "Working Capital Management and Firms profitability: Evidence from Manufacturing S.C. in Addis Ababa". He studied whether working capital management has effect on profitability of manufacturing firms. In his regression analysis show that there is inverse relationship between accounts receivable and inventory holding periods with profitability of the studied firms. He also found out that there is significant negative relationship between cash Conversion cycle and profitability of the sampled firms.

Beemnet (2018) study revealed that a significant negative relationship between average collection period and profitability indicating that an increase in the number of days a firm receives payment from sales affects the profitability of the firm negatively. Secondly, the result stated that there exists a negative relationship between inventory holding period with profitability and positive relationship between accounts payable period and profitability of the samples firms which were under the study.

Ephrem (2018) made a study on five grade 1 construction companies on the impact of working capital management on profitability of small and medium-scale enterprises. The result of the study revealed that there is a positive but not significant relationship between sizes of firms and net operating profitability. The result has also shown that longer Cash Conversion cycle and average collection period have negative impact on net operating profitability of a firm.

Eyob (2019) has made a research with the aim of examining the effect of liquidity risk on financial performance of Ethiopian commercial banks. The result of panel data regression analysis showed that liquidity coverage ratio, net stable funding ratio, loan-to-deposit ratio and liquidity ratio had negative and statistically significant impact on Ethiopian commercial banks financial performance. The result also revealed that cash reserve ratio, portion of nonperforming loan from the total bank loan, CPI and GDP growth rate had negative but statistically insignificant/has no any impact on financial performance of Ethiopian commercial banks for the tested period.

Gullat (2020) evaluate the effect of working capital management on the performance of private commercial banks in Ethiopia. A random effect model was employed and the result revealed that debt-to-equity ratio and cost-to-income ratios were found to have significant positive and negative impact on ROE, respectively.

Based on theoretical and empirical literature review, the following conceptual frame work developed (Fig. 1).

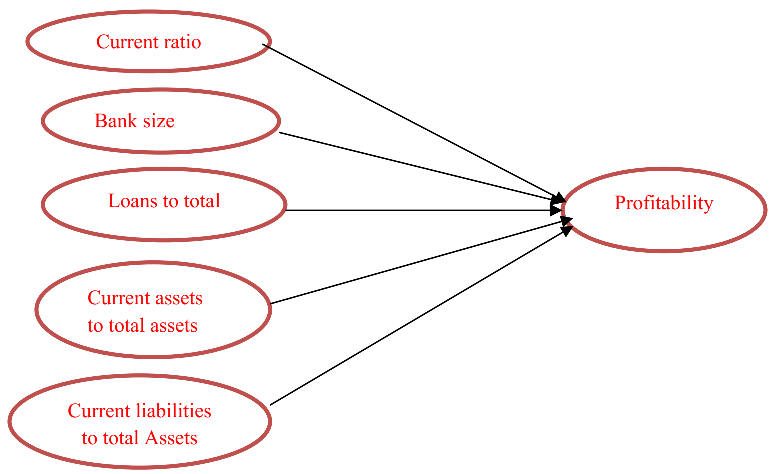

Fig. 1 Conceptual framework of the study

Research methodology

Panel data collected from relevant sources that help to answer the research questions and to achieve the research objectives. Secondary data for this study were collected from audited financial report of banks from 2011 to 2020.

To achieve the objectives of the study, the researchers used a quantitative approach to examine the data and determine the results. Quantitative research provides precise, numerical data and since it is so intensely rooted in numbers and statistics, it has the capability to successfully interpret data into simply quantifiable charts and graphs. In addition, quantitative research can permit for greater objectivity and precision of outcomes and the results are relatively independent of the researcher.

Explanatory and descriptive research designs were used in this research. Explanatory research is a research design used to identify any causal links between the factors or variables that pertain to the research problem of working capital management on banks profitability.16 private commercial banks exist in Ethiopia. Return on assets is a measure of a bank's profitability. This ratio shows how well a bank uses the profit it makes in relation to the capital invested in assets. As a result, banks need a lot of time to calculate their profitability, so five banks with a combined experience of more than 20 years in the banking industry were used as a sample.

Statistical Package for Social Science (SPSS) and STATA software were employed to analyze the data. Descriptive and regression statistical analysis techniques used to analyze the data. Regression analyses were employed to investigate the impact of working capital management on banks profitability. Many prior reviews such as AL-Omar et al. (2008), Alper and Anbar (2011), and Salike and Ao (2018) have used regression models (random effect model). The econometrics model to be used in this study is as follows:

$$\mathbf{PT} = \boldsymbol{\beta}_{\mathbf{0}} + (\mathbf{CR}) + (\mathbf{BSIZE}) + (\mathbf{LATA}) + (\mathbf{CATA}) + (\mathbf{CLATA}) + \acute{\epsilon},$$

where PT = banks profitability peroxide by return on asset, β_0 = Constant, β_1, β2, β3, β4,β5, are the coefficients, CR = current ratio, BSIZE = bank size, LATA = loans and advances to total assets, CATA = current assets to total assets, CLATA = current liabilities to total assets, and $\acute{\varepsilon}$ = error term.

Variable measurement

Working capital management measurements (independent variables)

Current ratio Current ratio implies that whether a business entity's current assets are sufficient to meet the current liabilities or not. This measures the liquidity position of any business entity in terms of its short-term working capital requirement. Almazari (2013) study revealed that current ratio was the most important liquidity measure which affected profitability of the industry. The research by Akoto et al. (2013) also tried to analyze the relationship between working capital management practices and profitability of listed manufacturing firms in Ghana. The result of the analysis by using panel data methodology and regression analysis, revealed that a significant positive relationship with current asset ratio.

Many researchers have used this ratio as an independent variable to find the impact of working capital management on profitability (Gullat, 2020; Afza & Nazir, 2008; Raheman & Nasr, 2007; Tufail et al., 2013; Mohamad and Saad, 2010; Raheman et al., 2010).

Bank size Many researchers also claimed that there is a positive relationship between bank size and performance measures. The study by Short (1979) suggested that relatively large banks tend to raise less expensive capital and hence appear more profitable, size being closely related to capital adequacy of a bank. In a local research made by Efrem (2018), company size is found to affect the gross profit of a company positively and this relationship is also statistically significant. There is a positive and significant relationship between older MSMEs with access to finance and MSMEs growth (Lakuma et al., 2019). To show the firm size, natural logarithm of total asset is used to measure bank size. Bank size has a positive relation with profitability (Padachi, 2006; Raheman & Nasr, 2007; Efrem, 2018; Raheman et al. 2010).

The loan and advances to total assets The loan and advances to total assets measure the percentage of assets that is tied up in loans. The higher the ratio, the less liquid the bank is (Mabwe & Robert, 2010). The research made by Andebet (2016) stated that the ratio of loans and advances to total asset ratio is a measure of the percentage of total assets that is tied up in loans and advances. Loans and advances to total assets is a measure of the percentage of total assets that is tied up in loans and advances. The higher the ratio, the less liquid the bank is (Mabwe and Robert, 2010; Andebet, 2016; Gullat, 2020).

The ratio of current assets to total assets The ratio of current assets to total assets represents the proportion of investment on current assets relative to the total assets of the business entity. The value of this ratio portrays the working capital investment policy of the business. In the study of Tufail et al. (2013), investigation of the impact of working capital policies on profitability was done. The outcome of the regression analysis revealed that aggressiveness of working capital management policies is negatively associated with profitability. This is evidenced by the works of several researchers (Lazaridis and Tryfonidis, 2006). These researchers have used the ratio of current assets to total assets as an independent variable to find its impact on profitability of firms. Henok (2015) study result about the relationship between current assets to total assets ratio and return on assets is found to be positive. Different researchers used current asset to total asset for working capital management (Raheman & Nasr, 2010; Tufail et al., 2013; Gullat, 2020).

Current liabilities to total assets Current liabilities-to-total assets ratio is included to discover the working capital financing policy. Many researchers used this variable to measure working capital management (Afza & Nazir, 2008; Mohamad and Saad, 2010; Raheman & Nasr, 2007; Gullat, 2020).

Henock (2015) in his study analyzed the correlation between current liabilities-to-total assets ratio and profitability and found that there is a positive relationship between the current liabilities-to-total assets ratio and profitability measures. The higher the current liabilities-to-total assets ratio, the higher is the degree of aggressiveness in working capital financing policy, which leads to the corresponding higher level of profitability. The researches compiled by Kaddumi (2012), claimed that a direct relation between current liabilities-to-total assets ratio and profitability exists putting the expected relation between this ratio and profitability to be positive.

There different variables which measure working capital management. Current ratio, bank size, loans and advances to total assets, current assets to total assets, current liabilities to total assets are important variables which measure working capital management as aforementioned literature clearly showed.

Banks profitability (dependent variable) Profitability is the ability to make profit from all the business activities of an organization. Profitability measures efficiency of management in the use of organizational resources in adding value to the business. Profitability may be regarded as a relative term measurable in terms of profit and its relation with other elements that can directly influence the profit (Padachi, 2006). According to Enad and Gerinda (2022), performance is a significant purpose to be accomplished by any banks' everywhere, for the reason that the performance is a reflection of the banks capability to manage and allocate resources.

The profitability ratios are calculated to measure the operating efficiency of the company (Padachi, 2006). According to Ebabu Engidaw(2021), business organizations should measure their overall performance with the use of set of financial and non-financial symptoms which provide statistics on degree of accomplishing their objective.

Return on asset measures management's ability to earn a return on the firm's resources (assets). The income amount used in this computation is income before the deduction of interest expense, since interest is the return to creditors for the resources that they provide t the firm. The resulting adjusted income amount is thereby the income before any distribution to those who provided funds to the company. ROA is computed by dividing net income plus interest expense by the company's average investment in asset during the year (Ebben & Johnson, 2011).

Amarjit et al., 2010 and Zhang et al.(2017) used return on equity to measure profitability. Andreas and Gabrielle (2009) stated that Bank profitability is usually measured by the return on total assets and is expressed as a function of internal and external determinants. ROA is a ratio which explains how efficiently the bank is utilizing its existing resources for the maximization of profits. Increase in return on asset shows an increase in profitability of the business. Many researchers used ROA to measure profitability (Tufail et al., 2013; Yeboah & Yeboah, 2014; Aregawi, 2019, Gitman, 2002).

Results and discussion

This section presents the results of the analysis of the panel data collected from audited financial report of private commercial banks. The overall objective of the study is to examine the impact of working capital management on banks profitability. Working capital management is the most important financial decisions of financial institutions. Efficient level of working capital should be present for smooth running of business organizations even though the nature of business varies.

Descriptive result

As shown in Table 1, Awash bank shows a good performance in 2020 and 2019 than in the other years. In 2018, the bank shows a lower performance as compared to another period (from 2014 to 2020). When Awash bank's profitability compares to other banks it is best profitable in private commercial banks. Table 1 revealed that the net profit of Awash international bank is increasing from 618,267,020 in the year 2014 to 3,432,829,000 in the year 2020.

Abyssinia bank's highest profitability ratio was recorded in the year 2015 and the lowest is in the year 2020. The return on assets of Abyssinia bank is decreasing from 2014 to 2020. The bank should investigate it to improve earnings from the invested investment. When we see the net profit of Abyssinia bank it is increasing particularly in the year 2019 and 2020 777,014,000 and 853,644,000 profit, respectively.

Similarly, Dashen bank's return on assets decreased from 2014 to 2020 with the highest performance in 2014 and the lowest performance 2019. However, the net profit of Dashen bank is increasing from 712,484,276 in 2014 to 1,536,933,000 in 2020. Dashen bank ranks second next to Awash international bank, Research findings consistently reveal that political instability deters countries from supporting fundamental innovative activities of their enterprises (Shumetie & Watabaji, 2019).

As shown in the table above, Buna International bank shows a better performance in 2015 than in other years. In 2017 the bank shows a lower performance as compared to other periods ranging from 2014 to 2020.in terms of net profit Buna international bank's profit after tax is increasing from 2014 to 2020 with a profit from 79,953,483 to 671,000,000.

Table 1 Net profit of five banks

Banks	Year						
	2014	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
AIB	618,267,020	645,337,629	743,765,868	951,586,000	1,492,426,000	2,432,829,000	3,432,829,000
AB	270,711,362	287,806,706	374,781,181	534,729,199	562,800,000	777,014,000	853,644,000
DB	712,484,276	729,133,970	727,049,906	756,103,732	800,387,000	895,318,200	1,536,933,000
BIB	79,953,483	134,503,018	187,046,906	201,285,408	315,263,000	440,290,000	671,000,000
NIB	313,768,037	337,072,879	356,678,952	516,443,380	514,853,000	722,001,000	917,000,000

Table 2 Normality test skewness/kurtosis tests for normality joint

Variable	Obs	Pr(skewness)	Pr(kurtosis)	adj_chi2(2)	Prob > chi2
ROA	34	0.008	0.001	14.050	0.001
CATA	35	0.147	0.542	2.670	0.263
BSIZE	35	0.098	0.385	3.770	0.152
CR	35	0.000	0.000	43.100	0.000
LATA	35	0.000	0.001	20.650	0.000
CLATA	35	0.000	0.000	48.800	0.000

Table 3 Shapiro–Wilk *W* test for normal data

Variable	Obs.	*W*	*V*	*z*	Prob > *z*
ROA	34	0.890	3.853	2.811	0.002
CATA	35	0.949	1.822	1.253	0.105
BSIZE	35	0.969	1.121	0.238	0.406
CR	35	0.254	26.644	6.852	0.000
LATA	35	0.776	8.007	4.343	0.000
CLATA	35	0.389	21.813	6.435	0.000

Nib international bank's profitability ratio indicated that there is a decrease from 2014 to 2016 and then an increase in 2017 than after it is decreasing until 2020.net profit of Nib international bank is increasing from 2014 to 2020 like other banks mentioned above.

Generally speaking, Awash international bank ranks first in its profitability followed by Dashen bank; however, the net profit of all banks increased from 2014 to 2020. An enterprise's age has a significant effect on growth for the reason that older firms have more experience and a superior financial position to execute their business activities than their counterparts relatively (Afande 2015; Meressa, 2020). Relevant knowledge on how to raise adequate capital to establish their business and the accurate calculation of cost are the two most important aspects of financial knowledge for encouraging businesses to be profitable (Rachapaettayakom et al., 2020; Yang et al., 2022).

Regression result

Assumption of regression

In order to accept the regression results, most common assumptions should be considered and fulfilled. For this reason the following tests were conducted to check whether the assumptions of multiple linear regression were met or not (Tables 2 and 3).

Test of normality

The distribution of scores on the dependent variable should be 'normal' describing a symmetrical, bell-shaped curve, having the greatest frequency of scores around the mean, with smaller frequencies towards the extremes. In order to test normality of the data, kurtosis and skewness checked and the result indicates that data used in the study are normally distributed.

Test of multicollinearity

One of the assumptions of regression is that the independent variables should not have very high correlation. When the independent variables are highly correlated, it is regarded as a problem in the model and this problem is called multicollinearity. From Table 4 all independent variables have correlation coefficient values less than 0.9, which shows no multicollinearity among the independent variables.

Test for heteroskedasticity

The error terms are heteroskedastic if the scatter of the errors varies according to the value of one or more independent variables. The heteroskedasticity test is crucial, because in the event that the model has a heteroskedasticity issue, the OLS estimators are no longer the best and the error variances are inaccurate, making the hypothesis testing, standard error, and confident level useless. A *p* value of 20%, which is significantly higher than the level of significance at 5%, is the outcome of the stata analysis. As a result, the heteroskedasticity assumption is proven to be valid.

Choosing random effect vs fixed effect

The collected data were estimated based on the panel model, which included time series observations for five private commercial banks for the period from 2011 to 2020. A regression analysis with random effect model was used to analyze the panel data in order to investigate the impact of working capital management on banks profitability. Choosing between the random effect model and the fixed effect model while processing longitudinal data is standard procedure. These are the models for the panel data that are frequently utilized. A formal test known as the Hausman test, which was based on the null hypothesis, was used to determine whether to adopt the fixed effect model or the random effect model. Because the decision was based on the *p*-value, it is crucial to see it when the test is conducted. Accordingly, random effects are preferred if the *p* value is greater than 0.05, but fixed effects are preferred if the *p* value is less than 0.05 (i.e., it is significant).based on the result random effect model was appropriate for this study. Random effects regression results are illustrated in Table 5.

In a random effect model, the results show that bank size, loans, and advances to total assets ratio are significant because their *p*-values are significant at the 5% level of significance. This shows that a 1 unit increase in loans and advances to total asset ratio causes an increase of 3.35 units in ROA. Moreover, a 1 unit increase in bank size causes a decrease of 2.87 units in ROA. So, they have a significant impact on the

Table 4 Multicollinearity test

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) ROA	1.000					
(2) CATA	0.016	1.000				
(3) BSIZE	− 0.171	0.287	1.000			
(4) CR	0.016	− 0.529	0.084	1.000		
(5) LATA	0.025	0.082	0.141	0.084	1.000	
(6) CLATA	0.008	0.220	− 0.019	0.004	0.516	1.000

Table 5 Random-coefficients regression

ROA	Coef.	St. Err.	*t*-value	*p*-value	[95% Conf.	Interval]	Sig.
CATA	0.102	0.152	0.67	0.501	− 0.196	0.4	
BSIZE	− 0.013	0.005	− 2.87	0.004	− 0.022	− 0.004	***
CR	0.011	0.019	0.57	0.571	− 0.027	0.049	
LATA	0.05	0.015	3.35	0.001	0.021	0.079	***
CLATA	− 0.113	0.058	− 1.94	0.052	− 0.228	0.001	*
Constant	0.351	0.191	1.84	0.066	− 0.023	0.725	*
Mean dependent var	0.023			SD dependent var	0.007		
Number of obs	28			Chi-square	3616.181		

****p* < 0.01, ***p* < 0.05, **p* < 0.1*

banks' profitability, the dependent variable measured by return on assets. The ratio showed a positive coefficient, and it is a statistically significant variable (*P*-value of 0.001). This implies that for the study period (2011–2020), there was a significant correlation between loans and advances to profitability at selected private commercial banks in Ethiopia. Current asset-to-total asset ratio, current ratio, and current liability-to-total asset ratio are insignificant independent variables in a random effect model with *p* values of 0.51, 0.571, and 0.052, respectively. These three independent variables did not have a significant impact on private commercial banks' profitability.

Loans and advances to total assets have a significant impact on a bank's profitability. The contribution of loans and advances to the total asset ratio is a common measure used to assess a bank's working capital management. According to Andebet's (2016) study, the ratio of loans and advances to total assets is a measure of the percentage of total assets that is tied up in loans and advances. He stated that loans and advances give an indication of how much of the bank's assets is tied to illiquid loans.

The size of the bank was measured as the legal limit of the total assets of private commercial banks. The random effect regression model found that bank size has a significant impact on banks' profitability. According to study, bank size signals specific bank risk, although the expected sign is controversial. The findings of the study were consistent with the theory that the size of the bank affected its profitability. The size of private commercial banks can determine their profitability in Ethiopia during the study period. Efrem's (2018) study in Ethiopia found that bank size has a significant effect on banks' profitability. Many researchers also claimed that there is a positive relationship between bank size and performance measures. Bank size has a positive relationship with profitability (Raheman & Nasr, 2007; Raheman & Nasr, 2007).

Another important variable that was examined in this study is the measure of liquidity (current ratio). The current ratio is a poor predictor of the impact of working capital management on a bank's profitability. The current ratio indicates whether or not the bank's current assets are sufficient to cover its current liabilities. The current ratio measures the liquidity position of banks in terms of their short-term working capital requirements. Unlike this finding, study on non-financial firms on the Nairobi securities exchange revealed the significant impact of the current ratio on bank profitability. According to this study, liquidity is not significant, so this implies that liquidity has no influence on profitability. However, the findings of this study are consistent with previous research in Ethiopian commercial (Ephrem, 2018; Aragawi, 2019; Gulilat, 2020).

The result of the regression model revealed that the ratio of current assets to total assets and current liabilities to total assets are not significant enough to influence the return on asset at the 5% significance level. The research conducted by Henock (2015) claimed that there is a negative relationship between excessive investment in working capital and profitability. A greater value of current assets to total assets shows a less aggressive investment policy for working capital (Afza & Nazir, 2008). From this, it can be concluded that a less aggressive working capital investment policy leads to greater profitability. If a firm invests more in fixed assets, then it can generate more profits. A company wastes resources when it uses more of its resources as current assets.

In this study, the current liability-to-total asset ratio is insignificant. Previous studies showed different results. The empirical result about the relationship between the current asset-to-total asset ratio and the return on assets is found to be positive (Afza & Nazir, 2008; Tufail et al., 2008; Kaddumi, 2012). For example, Henock's (2015) study showed that there is a positive relationship between the ratio of current liabilities to total assets and a bank's profitability. He contended that the greater the amount of current liabilities used to finance the bank's working capital, the more profitable the bank will be. A business entity is claimed to be aggressive in its working capital financing policy when it uses large amounts of current liabilities relative to total sources of funds. The higher the current liabilities-to-total assets ratio, the greater the degree of aggressiveness in working capital financing policy, which leads to a higher level of profitability for the firm. The Gulilat (2020) study indicated that the current liability-to-total asset ratio has an insignificant impact on private banks' profitability in Ethiopia.

The management of working capital is one of the most important financial decisions for a firm. Regardless of the nature of the business, an adequate level of working capital should be present to ensure its smooth operation. From this study, it is concluded that maintaining an efficient level of working capital is very important for commercial banks, like all other sectors of business.

Conclusion and implications

This study focuses on the impact of working capital management on bank profitability. The present study includes five private commercial banks from Ethiopia for a time span of ten years, from 2011 to 2020. Working capital management includes many indicators; however, in this study, working capital management is measured by five variables: the current ratio, the current asset-to-total asset ratio, bank size, loans and advances to total assets, and current liabilities to total assets. The dependent variable is bank profitability, which is measured by return on assets.

The panel data regression result depicts that bank size and loans and advances to total assets ratio have a significant impact on a bank's profitability. The current asset-to-total asset ratio, the current ratio, and the current liability-to-total asset ratio were found to be insignificant. These variables did not have a meaningful impact on the bank's profitability.

The findings of this study have important implications for interventions designed to enhance the bank's profitability. Since the profitability of the banks depends on working capital management, rigorous attention should be given to those factors that influence the growth of the commercial banks. Such factors are identified and reported in the results and discussion of the study. We are proceeding based on the outcomes of three recommendations. Securities, debt loans, and advances have a positive and significant effect on the profitability of private commercial banks. As a result, management of private commercial banks should use loans at an optimal level with the goal of achieving a better result and maximizing the banks' profitability. Second, there is a significant relationship between bank size and the return on assets of private commercial banks. Therefore, it is recommended that the bank's management increase the number of branches to maximize the profitability of the bank. Finally, private commercial bank managers should strike a balance between liquidity and bank performance in order to maximize profit by avoiding unnecessary costs and high investment in current assets.

Suggestions for further research

The results estimated from this study should be evaluated keeping in mind that there could be many other dependent and independent variables whose relationships could be studied, and hence the study here is limited only to the effect of the five selected independent variables on one dependent variable. Therefore, further study can be extended by including some other independent variables and dependent variables in the model for multivariate analysis.

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