

Capital Intensity and Firm Liquidity: A Case of Deposit-Taking Savings and Credit Co-Operative Societies in Kenya

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Abstract

Tax has a significant implication on corporate decisions. Companies take the tax burden into account when designing their policies. To manage the effects of taxes on firms' profitability, liquidity, and performance, firms employ various tax-planning strategies to mitigate the impact of a high tax burden. The specific objective was to determine the effect of capital intensity on the liquidity of Deposit-Taking Savings and Credit Co-operative Societies in Kenya. The study was supported by Tax Shield Theory. The study focused on 176 licensed Deposit-Taking SACCOs in Kenya. The instrument of the study was secondary data obtained from the financial reports of licensed Deposit-Taking SACCOs over a 7-year period (2018-2024). The hypotheses were tested at the 0.05 significance level using regression analysis. A regression analysis model was used to analyze the data. The study's fixed-effect model concluded that capital intensity had a positive and significant effect on liquidity ($\beta = 0.475$, $p = 0.041$). Moreover, regarding capital intensity, management teams should prioritize strategic capital investment planning that views fixed asset acquisition not merely as a tax-planning activity and an operational necessity but as a foundation for enhanced liquidity resilience, allocating resources to build robust infrastructure that supports both operational efficiency and precautionary liquidity holding.

Keywords: *Capital intensity, Firm Liquidity and Deposit-Taking Savings and Credit Co-Operative Societies*

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1. Introduction

Tax is defined as a compulsory contribution addressed to individuals and/or business entities whose benefits are not directly felt. Taxation is the largest source of government revenue, and a major portion of it comes from direct taxes (Gober & Burns, 1997). According to Brotodiharjo (1995), taxes are mandatory contributions by the people to the state, are coercive, and are not accompanied by services in return; they are used directly to finance the expenses of the State. From a business perspective, taxes are expenses that reduce profits. As taxation represents a cost to a firm, it necessarily affects its liquidity and performance; hence, there is growing concern about finding ways to reduce the firm's tax burden.

According to Kieso et al. (2017), liquidity is an indicator of a company's capacity to meet obligations due within less than one year. To meet short-term obligations as they come due, a company must have sufficient cash and other current assets readily convertible to cash (Hanifah, 2022). According to Fahmi (2017), the liquidity ratio measures a company's ability to meet its short-term obligations on time. A company's ability to meet all its obligations is a measure of its operational continuity (Urrahmah & Mukti, 2021). A company can be considered liquid based on its ability to meet obligations on time (Saputro et al., 2021). A high liquidity ratio indicates the company's ability to meet its short-term obligations, signifying a healthy financial condition and no cash flow problems, and the ability to bear costs that arise, such as taxes, and to easily sell its assets (Rosalia & Sapari, 2017).

Capital intensity refers to the amount of money a company requires to generate revenue from its fixed assets. Capital concentration is the ratio of fixed assets, such as buildings and machinery, to the company's capital; this ratio is used for tax avoidance. According to Darsono (2015), the method of use is to invest in fixed assets or tangible goods with accelerated depreciation. This depreciation rate is the key to tax avoidance practice. Fixed assets have a depreciation value (exempt) which is tax-deductible, thereby reducing the amount of tax payable.

1.1 Problem statement

Taxes (direct and indirect) paid by companies heavily impact firms' cost structures and liquidity. Tax expense is a high cost for businesses, as it affects their cash flow and working capital. As a result, business entities take reasonable steps to mitigate their tax costs. One such strategy is tax avoidance, the legal manipulation of a company's financial activities to minimize tax liabilities. They do this by taking full advantage of legitimate opportunities under tax laws to increase their after-tax earnings and improve their liquidity position (Nwaobia & Joyeoba, 2016).

Corporate tax in Kenya takes nearly one-third of pre-tax profits, and when other tax levies are included in the tax costs, the total tax obligation is reasonably high, making corporate tax obligations a crucial matter to be watched. Organizations worldwide adopt tax-planning strategies to minimize their tax liability without adversely affecting their overall financial liquidity (Nwaobia & Joyeoba, 2016). Heavy tax burdens on companies' profits have been observed to reduce the funds available to meet their working capital needs. As noted by Ikpekan and Owolabi (2014), working capital management is very fundamental to the liquidity and profitability of any organization. Tax avoidance, just like any other business management activity, aims to improve the economic and financial performance of firms, thereby helping to maximize returns on owners' investments (Silvio & Rezende, 2016).

Many DT SACCCOs in Kenya struggle to meet the liquidity ratio due to high loan demand that is not supported by deposits mobilized from their members. High taxation also contributes to liquidity strain. SACCOs therefore adopt many strategies to mitigate liquidity risks. One of the strategies is tax avoidance/planning. They do this by taking full advantage of legitimate tax-law opportunities to increase their after-tax earnings and manage liquidity.

2. Literature Review

2.1 Theoretical Review

The Tax Shield Theory/Tax Strategies Theory was developed by Modigliani and Miller in 1963. The term "tax shield" refers to a deduction's ability to shield portions of a taxpayer's income from taxation. Tax shield or tax strategies theory states that highly profitable companies have more incentives and resources to engage in tax avoidance strategies and report lower ETR. MNCs have lower ETRs by utilizing tax deductions and credits more efficiently than less profitable firms, resulting in greater book-tax differences (Manzon & Plesko, 2002; Rego, 2003; Zainol, 2013; Kraft, 2014). In addition, MNCs can reduce their tax burden through a range of incentives, thereby enabling effective tax planning. This is because MNCs with higher pre-tax income have greater incentives and resources to engage in effective tax planning to reduce their tax burden, resulting in a lower effective tax rate.

Tax shields vary from country to country, and their benefits depend on the taxpayer's overall tax rate and cash flows for the given tax year. A tax shield is a reduction in taxable income for an individual or corporation achieved through claiming allowable deductions such as mortgage interest, medical expenses, charitable donations, amortization, and depreciation. These deductions reduce a taxpayer's taxable income for a given year or defer income taxes into future years. Tax shields reduce the overall amount of taxes owed by an individual taxpayer or a business, resulting in tax savings that improve liquidity ratios. Tax shields allow taxpayers to deduct amounts from their taxable income, thereby reducing it. The lower the taxable income, the lower the amount of taxes owed to the government; hence, tax savings for the taxpayer.

Previous studies have shown a negative relationship between profitability and ETR, indicating that highly profitable MNCs pay less tax and thus have a lower tax burden. According to the tax shield or tax strategies theory, highly profitable SACCOS have greater incentives and resources to engage in tax avoidance strategies and report lower ETRs, thereby reducing their tax burden and positively impacting liquidity.

2.2 Empirical Review

Capital intensity is the ratio of a company's fixed assets to its principal amount. According to Afiana and Mukti (2020), capital intensity is an investment activity undertaken by business actors in the form of fixed assets, such as buildings, machinery, and land. Christina and Wahyudi (2022) state that capital intensity comprises debt and equity, which companies usually use in capital policies to ensure that the company's debt and equity are maximized. Capital intensity relates to business investment in assets that increases as the cost of assets decreases. Because this will impact the company's profit growth, the need for tax obligations will decrease. All property, plant, and equipment are subject to depreciation, which is recognized as a depreciation expense in a company's financial statements. This depreciation charge is a cost that can be deducted from income when calculating corporate income tax. The higher the depreciation expense, the lower the tax rate the company must pay (Pangestu & Pratomo, 2020; Shaheen & Malik, 2019). However, several prior studies have found that capital intensity does not affect tax avoidance (Nuryeni & Hidayati, 2021; Yahya et al., 2022). Salawu, Ogundipe, and Yeye (2017) examined the impact of corporate governance on the tax planning of non-financial companies quoted on the Nigerian Stock Exchange between 2004 and 2014. 50 of 151 firms were selected, covering about 10 sectors. The data were analyzed using the Generalized Method of Moments. Findings showed a significant positive relationship between

Effective Tax Rates and firm value (TobinQ). All the variables, such as leverage, Liquidity, Net Working Capital, Growth opportunities, and capital intensity, were found to have a positive and significant relationship with firm value. This suggests that tax planning practices, when properly applied, will lead to higher liquidity and firm value.

Muzakki and Darsono (2015) and Budianti and Curry (2018) found that capital intensity has a negative effect on tax avoidance. Meanwhile, Irianto, Sudibyo, & Wafirli (2017) found that capital intensity has a positive effect on tax avoidance.

According to Kraft (2022), companies with greater capital have more opportunities for tax planning and other corporate tax-avoidance tactics. Managers' personal interests, according to agency theory, are fulfilled by maximizing performance compensation to reduce the company's tax burden and boost liquidity and profits. The company's tax expense paid on the depreciation of fixed assets will be deducted from profit. This demonstrates that for corporations with many fixed assets, the effective tax rate tends to be low (Ardyansah & Zulaikha, 2021). Capital intensity and tax avoidance are positively related, according to research by Irianto et al. (2017) and Dharma and Noviri (2017). This suggests that the higher the capital intensity, the higher the probability of tax avoidance.

Richardson and Lanis (2020) and Stickney and McGee (1982) indicate an inverse relationship between capital intensity and ETR. Conversely, Feeny et al. (2006), Plesko (2003), and Wilkinson et al. (2001) have found a direct link between capital intensity and tax burden and, by extension, the firms' profitability and liquidity. Previous studies have suggested that firms with large investments in depreciable assets can minimize tax liabilities by utilizing higher investment tax credits (ITCs) and accelerated capital allowances, thereby reporting lower ETRs (McGee & Stickney, 1982). However, other studies do not find any link between capital intensity and ETR (Fernández-Rodríguez, 2004; Liu & Cao, 2007). Fernández-Rodríguez and Martínez-Arias (2011) find a nonlinear relationship between capital intensity and tax burden, positive up to a certain level of noncurrent assets and negative thereafter.

3. Methodology

Research design refers to the arrangement of conditions for the collection and analysis of data, aiming to combine relevance to the research purpose with procedural economy (Babbie, 2002). Research design is the way the study is designed, that is, the method used to carry out the research (Mugenda, 2008). The study adopted a longitudinal research design. A longitudinal study is an observational, correlational study that involves monitoring a population over an extended period of time. In a longitudinal study, researchers repeatedly examine the same individuals to detect any changes that might occur over time. A longitudinal research design is preferred because it provides unique insights that many other types of research fail to offer. Also, because the objectives and rules for long-term studies are established before data collection, longitudinal studies are authentic and have high validity. The panel data analysis sought to establish the effect of capital intensity on the liquidity of deposit-taking savings and credit co-operative societies. The independent variable includes capital intensity. The study focused on all 176 licensed Deposit-taking SACCOs in Kenya. According to the SASRA website, the Authority has licensed 176 DT-SACCOs to undertake deposit-taking business (FOSA) in Kenya for the financial year ending 31 December 2024. A census survey was adopted; therefore, there is no need for sampling.

4. Results and Discussion

4.1 Descriptive statistics of Capital Intensity

Table 1: Descriptive statistics of Capital Intensity

Variables	Obs	Mean	Std. Dev.	Min	Max	Skew.	Kurt.
Capital intensity	N= 1232 n=176 T= 7	0.070	0.017	0.040	0.100	-0.014	1.791

Table 1 shows that Capital Intensity, measured by the ratio of investment in fixed assets to total assets, had a mean of 0.070 (7.0%). The small standard deviation of 0.017 shows that Dt SACCOs maintain a consistently low proportion of their assets in fixed, illiquid forms. The skewness value (-0.014) and kurtosis (1.791) confirm a very symmetric, flat distribution. This low mean suggests that SACCOs are not heavily invested in physical capital, which is characteristic of financial intermediaries whose primary assets are financial in nature (loans and securities) rather than fixed assets (Muriithi, Waweru, & Muturi, 2020).

4.2 Descriptive statistics of Domestic Firm Liquidity

Table 2: Descriptive statistics of firm liquidity

Variables	Obs	Mean	Std. Dev.	Min	Max	Skew.	Kurt.
Liquidity	N= 1232 n=176 T= 7	1.346	0.157	1.111	1.666	0.300	1.895

The results presented in Table 2 for liquidity show that the mean liquidity ratio was 1.346 (SD = 0.157), indicating that, on average, the SACCOs held 1.35 units of current assets for every unit of current liabilities. This aggregate finding suggests that the DT SACCOs maintained a prudent liquidity buffer above the theoretical threshold of 1.0, often considered the minimum required to cover short-term obligations (Borio, 2019). This aligns with the fundamental principle that financial institutions manage liquidity risk to meet members' withdrawal demands and other immediate liabilities (Chen et al., 2018).

The standard deviation of 0.157 indicates a moderate degree of variation in liquidity management practices across the SACCOs. The liquidity ratios ranged from 1.111 to 1.666. Critically, the minimum value confirms that no institution across the DT SACCOs was technically illiquid (i.e., with a ratio below 1.0) during the observed periods, a finding consistent with findings for regulated financial entities subject to supervisory oversight (Dietrich & Wernli, 2021). The maximum value indicates that some SACCOs adopted a more conservative and potentially less profitable approach to liquidity holding.

An examination of the distributional shape shows a skewness value of 0.300 and a kurtosis value of 1.895. The positive skewness indicates a slight asymmetry in the distribution, with a tail extending toward higher liquidity values. This suggests that while most SACCOs cluster around the mean, a smaller number hold significantly larger liquidity buffers. The kurtosis

value is below the benchmark of 3 for a normal (mesokurtic) distribution, indicating a platykurtic, or flatter, distribution (Byrne, 2016). This implies that the data have lighter tails and a wider peak than a normal distribution, indicating fewer extreme outliers than would be expected. Together, these values suggest that the liquidity variable, while not perfectly normal, does not exhibit severe non-normality that would typically violate the key assumptions of standard parametric panel data regression techniques (Wooldridge, 2019).

4.3 Correlation Analysis

The correlation analysis determined the relationship between capital intensity and the liquidity of DT SACCOs' collections, and assessed its significance and impact.

Table 3: Correlation Analysis

Variables	Liquidity	Capital intensity
Liquidity	1.000	
Capital intensity	0.674*	1.000
Sig:	0.010	

Table 3 shows that capital intensity had a positive and significant correlation with liquidity ($r = 0.674$, $p = 0.010 < 0.05$), signifying that SACCOs with greater capital investment tend to maintain stronger liquidity positions.

4.4 Hausmann Test

The Hausman test, as described by Torres (2007), is a statistical method used in econometrics to assess the consistency of an estimator relative to an alternative, less efficient but consistent estimator. In the context of panel data, the Hausman test is commonly used to decide between fixed-effects and random-effects models.

Table 4: Hausman Test

	Coef.
Chi-square test value	13.45
P-value	0.037

A p-value less than 0.05 indicates a preference for the fixed effects model, while a p-value of 0.05 or greater suggests the random effects model should be chosen. Table 4 shows a p-value of $0.037 < 0.05$; this implies that the fixed effects model was sufficient.

4.5 Regression Analysis

The regression coefficient results were summarized in Table 5 through the equation below

$$Y_{it} = 22.392 + 0.475X_{2it}$$

Table 5: Fixed Effect Regression Model

liquidity	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]
capital intensity	0.475	0.228	2.083	0.041	-.07	1.02
Constant	22.392	6.202	3.610	0.000	10.222	34.563
Mean dependent var	1.346					SD dependent var
R	0.674					1232
R-squared	0.454					Prob > F
F-test	6.145					Bayesian crit. (BIC)
Akaike crit. (AIC)	-1321.505					-1272.874

** $p < .05$,

Table 5 found that capital intensity had a positive and significant effect on liquidity ($\beta = 0.475$, $p = 0.041$); a unit change in Capital intensity led to a 0.475 standard deviation increase in liquidity, indicating that SACCOS with higher fixed asset investments maintain greater liquidity levels. This contradicts traditional liquidity theory but aligns with Distinguin et al. (2013), who observed that financial institutions with substantial capital investments may hold higher precautionary liquidity to meet unexpected capital maintenance requirements. The R of 0.674 implied that capital intensity correlated with liquidity by 67.4%. The R-squared of 0.454 shows that capital intensity accounted for 45.4% of the variance in liquidity. The remaining 54.6% was caused by factors not included in the model.

4.6 Discussion

The study objective sought to establish the effect of capital intensity on liquidity of deposit-taking savings and credit co-operative societies. The correlation analysis found that capital intensity was positively and significantly correlated with liquidity ($r = 0.674$, $p = 0.010$), indicating that SACCOS with greater capital investment tend to maintain stronger liquidity positions. This finding supports contemporary studies indicating that adequate capitalization enhances financial stability and provides a buffer that facilitates better liquidity management, as well-capitalized institutions possess greater capacity to absorb shocks and maintain liquid reserves (Otieno et al., 2016; Wanjiru & Nasieku, 2022). Capital intensity also had a positive and significant effect on liquidity ($\beta = 0.475$, $p = 0.041$), indicating that SACCOS with higher fixed asset investments maintain higher liquidity levels. This contradicts traditional liquidity theory but aligns with Distinguin et al. (2013), who observed that financial institutions with substantial capital investments may hold higher precautionary liquidity to meet unexpected capital maintenance requirements. The study's novel conclusion that capital intensity positively influences liquidity is supported by research linking capital investment to improved financial performance.

5. Conclusion

The study concludes that capital intensity is beneficial for liquidity performance, indicating that greater investment in fixed assets and capital infrastructure strengthens, rather than weakens, liquidity positions. The study adds new knowledge by revealing that capital intensity serves as a proxy for institutional maturity and financial strength in cooperative financial institutions, suggesting that substantial fixed asset investments signal organizational stability

that necessitates and enables the maintenance of higher liquidity reserves to meet regulatory requirements and unexpected capital maintenance obligations.

6. Recommendations

With regard to capital intensity, management teams should prioritize strategic capital investment planning that views fixed asset acquisition not merely as a tax-planning activity and an operational necessity but as a foundation for enhanced liquidity resilience, allocating resources to build robust infrastructure that supports both operational efficiency and precautionary liquidity holdings.

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