Research article

Working capital management impacts on small-scale coffee wet mills' financial performance in eastern Kenya

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ARTICLE INFO

Keywords:
- Agro-processing
- Sustainable processing
- Return
- Working capital management
- Return on assets
- Return to farmers

ABSTRACT

The manufacturing sector is critical in the realization of the economic pillar of the Kenyan Vision 2030. Over the last decade, the sector has experienced declining growth, mainly attributed to the agro-processing industry’s poor financial performance. The Kenyan government has initiated stringent financial reforms across agro-based sectors, including coffee processing firms, to improve performance and increase farmers’ returns. However, limited studies have investigated the impacts of working capital management (WCM) on small-scale coffee wet mills’ financial performance. We assessed the effect of working capital management on financial performance in small-scale coffee wet mills. We collected the data from 41 small-scale coffee wet mills in Embu County, Eastern Kenya. We adopted a multivariate regression analysis approach on panel data (2014–2018) to analyze working capital management’s impact on small-scale coffee wet mills’ financial performance. Our findings showed that the current ratio and average payment period negatively affected the return on small-scale coffee wet mills’ assets. Thus, the wet mill processors could lower their payables period and current ratio to improve return on assets. The study revealed that the firm’s size and age also had a positive and negative effect, respectively, on return on assets of small-scale coffee wet mills. Both average payment period and current ratio had a positive effect on return to farmers. We conclude that working capital management, that is, average payment period and current ratio, negatively influences ROA while positively influencing farmers. Therefore, the management of the coffee wet mills should increase the current ratio and lengthen the average payment period to enhance return payable to farmers.

1. Introduction

Manufacturing continues to be a fundamental tool for sustainable development, food security, and poverty reduction in most developing countries, especially sub-Saharan Africa (United Nations Industrial Development Organization (UNIDO), 2016). In Kenya, manufacturing sectors contribute approximately 10% of the gross domestic product development rate and employ about 30% of the national labor force (World Bank Report, 2019). Like several other developing countries, Kenya’s growth in the manufacturing sector is mainly driven by the agriculture and services sectors (Mwangi, 2017). Of the five Kenya’s agricultural sub-sectors (industrial crops, horticulture, food crops, fisheries, and livestock), industrial crops contribute 55% of agricultural exports and 17% of agricultural GDP (Wairegi et al., 2018). Despite the significance of the manufacturing sector in national economic development, the average percentage growth rate has declined from 4.1% in 2015 to 3.2% in 2019 (Kenya National Bureau of Statistics (KNBS), 2019). The decline in the manufacturing sector was mainly due to poor agro-processing performance over the years (KNBS, 2017). Therefore, improving the performance of agro-processing industries could be imperative in enhancing Kenya’s economic development.

There is increasing interest in understanding the management of working capital by the coffee wet mill processors. For effective management of their most liquid assets, coffee wet mills must have strategies for managing their cash flows and maintaining financial obligations (Pandey, 2010). Aggressive working capital management practices could improve wet mills’ liquidity and profitability (Boisjoly et al., 2020). The daily operations of the coffee wet mills from the time raw coffee is received to the last stage of packaging the dry coffee require the firm to have cash in hand to pay for the labor

https://doi.org/10.1016/j.heliyon.2021.e07887

Received 5 May 2021; Received in revised form 3 July 2021; Accepted 25 August 2021

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force and other bills (Pandey, 2010). Therefore, the factories should invest sufficient funds in current assets for their day-to-day operations.

In Kenya, coffee is grown in 32 out of the 47 counties on an estimated 150,000 ha (KNBS, 2017). Kenyan coffee is mainly exported to the USA, Belgium, Sweden, and Germany (Kenya Coffee Traders Association (KCTA), 2012). The coffee is the highest-rated worldwide due to its high quality. For a long time, from independence to the 1990s, Kenyan coffee has attracted high prices with premium fetching double the average price on the New York market (Bagal et al., 2013; Andae, 2018). The significance of coffee in Kenya’s economy cannot be overemphasized. It contributes about US$ 230 million annually in foreign exchange earnings, constituting 6% of all foreign exchange earnings and 0.3% of the GDP by 2017 (KNBS, 2017).

Despite Kenyan coffee being lauded for its quality, high global demand, and its importance in Kenya’s macro-economic status, it has declined by around 50% over the past 25 years (Food and Agriculture Organization (FAO), 2018). Further, farmers’ returns have continued to decline over the years (Wairegi et al., 2018). Thus, the Kenyan government has instigated several initiatives to revamp the coffee industry over the past ten years. These include rehabilitation of coffee factories, effective and efficient coffee processing, operationalization of three billion Kenya shillings coffee cherry revolving fund, the publication of new coffee exchange regulations, intensive marketing of Kenya coffee, and frequent audit of coffee wet mills (Republic of Kenya, 2019). The government further waived the 4% fees and levies from coffee marketing and Khat ( locally referred to as ” miraa “) (locally referred to as miraa) (Aktas et al., 2015). Agriculture is the primary source of livelihood for Embu county people, with over 70 percent depending on rain-fed agriculture. Tea, coffee, and cotton are the main cash crops. Food crops include rice, beans, sorghum, onions, bananas (Ministry of Agriculture, Livestock, and Fisheries ((MoALF), 2016). Out of the County’s total area, coffee farming covers the largest area of 3,864 ha, producing about 800kg of clean coffee per ha; followed by tea which covers 2,595 ha, macadamia with 724 ha, and Khat (Catha edulis) (locally referred to as “miraa”) with 159 ha (MoALF, 2018). The County has 56 small-scale coffee wet mills, which fall under 24 coffee cooperative societies with over 79,000 members (Kenya Coffee Traders Association, 2019).

Embu County has a wide range of agro-ecological zones ranging from Upper Highland (UH1) at the foot of Mount Kenya to Inner Land (IL5) in the lowlands on the eastern slopes of Mount Kenya ( Jaetzold et al., 2007). However, only the highland portion of Embu County, including Embu North, Embu West, and Embu East, are prime for coffee production. The region is characterized by a mean annual temperature of 20.2°C, annual rainfall amount ranging from 1,400 to 1,700 mm, and an altitudinal range of 1520 to 1,820 m above sea level. The wettest season is experienced between March and July, characterized by the first rainy season lasting at least 140 days. The second rainy season is experienced between September and mid-December and takes between 105 to 115 days. Humic nitols with moderate to high inherent soil fertility is the primary soil type (Jaetzold et al., 2007).

2.2. Study variables

We used two dependent variables: i) return on assets (ROA), measured as the ratio of net revenue to total assets, a proxy for wet mill profitability similar to Enqvist et al. (2014). The ROA measures asset utilization’s efficiency within a firm to generate revenue (Singhania et al., 2014). Higher ROA indicates effective asset utilization within the firm. ii) return to farmers (RTF) as a measure of the financial well-being of the coffee wet mills expressed as the amount paid to farmers after the sale of the processed coffee, a proxy for firm financial performance (Gorton and Davideva, 2014). High RTF suggests that the firm is stable, properly managed, and profitable (Sharifi, 2015).

Aggressive working capital management practices are essential in improving firm value, cash flow, profitability, and lowering costs (Boisjoly et al., 2020). Several recent studies have used the cash conversion cycle (CCC), collection period, and inventory turnover as working capital management measures (Wahogo, 2014; Ponsian, 2014; Boisjoly et al., 2020; Nguyen et al., 2020). In this study, we used the average payment period (APP) and current ratio as the measure of WCM. According to Panda et al. (2021), APP is the second most significant determinant of WCM after the average collection period and could significantly impact a firm’s performance through improved operational efficiency and reduced transaction costs. However, we did not use the average collection period to measure WCM because the wet mills had no inventory and did not produce components for sales (Boisjoly et al., 2020). Studies have revealed mixed results on the impacts of APP on financial performance. For example, Sharma and Kumar (2011) found a positive relationship between APP and profitability. Conversely, Samiloglu and Demirgunes (2008) found a negative relationship between APP and profitability.

Additionally, we used the current ratio (CR) as WCM to measure of liquidity of coffee wet mills. Firms are constantly faced with the dilemma of liquidity and profitability as they exhibit an inverse relationship, i.e., as profitability increases, liquidity decreases (Ponsian, 2014; Wahogo, 2014). Balancing between profitability and liquidity is pertinent for enhancing firms’ performance.

We used five control variables (Table 1): i) firm Size (number of active members registered in a wet mill and regularly take their coffee to the wet mill for processing). We used the number of active members as a measure of firm size since the coffee wet mills’ revenue generation is majorly determined by the quantity of coffee received from its member farmers for processing (Mathuva, 2010). Previous studies note that firm Size is an essential determinant of firm financial performance (Nguyen et al., 2020). Thus, many active members are likely to increase the quantity of coffee handled by a wet mill. ii) growth rate (GR), as firms with a long operation period, have a higher likelihood of better performance, as pointed out by (Thuku, 2013). iii) age of the firm that is the number of years the wet mill has been in operation). Also, we included the age of the firm as a control variable similar to (Wellalage et al., 2019). and argue that wet mills which have been in operation for long may have good financial strength than young firms. iv) capital expenditure (CE), the wet mill’s investment in fixed asset acquisition and maintenance, which is likely to affect firm’s return on assets (Runyon, 1983), and v) debt ratio (DR), which is associated with working capital and performance of a firm (Aktias et al., 2015).

2.3. Data collection

Out of the 56 small-scale coffee wet mills in the County, 49 were operational, while seven had closed down. We sampled 41 out of the 49
coffee wet mills that had required financial data across the five years. We employed census survey methodology in study design and implementation. We used secondary quantitative data for five years (2014–2018), with 205 observations. The data consisted of the income statement and balance sheet information of the 41 coffee wet mills. Data on revenues and operational costs were derived and computed to generate data on profitability. We extracted data on the payment due to members, accruals, current assets, and current liabilities for data related to working capital management. Other information obtained for this study included the number of years the wet mill had been in operation and capital expenditure.

2.4. Data processing and analysis

We classified the coffee wet mills based on APP and CR. For APP, we took the desirable period to be one year and assessed the wet mills’ cash flow management and how well the firms’ cash flow utilized to cover short-term needs (Sharifi, 2013). Although firms with a high value of APP can retain the available funds for a longer period, thus utilizing the funds for profits maximization (Lyngstadaas and Berg, 2016), a high APP beyond one year could indicate a firm’s inability to pay its bills on time. Therefore, we classified APP into two categories i) APP unconstrained (APP less than or equal to one year) and ii) APP constrained (APP greater than one year).

In most cases, a firm’s liquidity goal is to have sufficient cash to pay for its bills, make large unanticipated purchases, and have enough cash reserve to meet emergencies all the time (Aktas et al., 2015). A current ratio of 2:1 is desirable (Ponsian, 2014), and the higher the ratio, the higher the liquidity and better management of the working capital. We classified the CR as CR less than two as undesirable and CR equal or greater than two desirable.

We analyzed the data using STATA 15.0 software. We performed descriptive statistics, including means, standard error, and t-test. We

| Table 1. Description of the study variables. |
|---------------------------------------------|
| Variable | Explanation | Formula |
|----------|-------------|---------|
| Dependent variable | | |
| ROA | Return on assets | Net revenue/total assets |
| RTF | Return to farmers | Revenue – total cost |
| Explanatory variables | | |
| APP | Average payment period | (Payables/purchases*365) |
| CR | Current ratio | Current assets/current liabilities |
| Firm Size | Size of the firm, represented number of active members | |
| GR | Growth rate | (Revenue_{t}/Revenue_{t-1}) – 1 |
| Age | Age of the wet mill | Year of study – Year of establishment |
| CE | Capital expenditure | Depreciation/total assets |
| DR | Debt ratio | Total debt/total assets |

*Purchases represent materials bought to facilitate the processing of the coffee cherry, such as fuel and electricity, drying materials, insurance, and licenses. **t is the year under consideration.
subjected the ROA and RTF across the five-year Tukey’s posthoc test and means differences separated at p < 0.05. We employed a non-parametric local polynomial regression to assess the relationship between age and financial performance (ROA and RTF) under the working capital management categories, i.e., unconstrained and constrained APP and desirable and undesirable CR. We used multivariate regression to assess the determinants of financial performance. Before the multivariate regressions analysis, we tested the data plausibility for regression using pairwise Pearson correlation between independent variables, multicollinearity test for variance inflation factors, and endogeneity test using Durbin and Wu-Hausman test. We used panel data (2014–2015) to eliminate any unobservable heterogeneity among our variables (Sanos-Caballero et al., 2014). Our primary model for analysis was Multivariate regression. Other models appropriate for our study include Ordinary Least Squares (OLS), system Generalized Method of Moments (GMM), difference GMM and panel vector autoregression (VAR) model.

However, since our objective was to assess the effect of working capital management on coffee wet mills’ financial performance without considering the time effect, we employed a multivariate regression model in our analysis. Multivariate regression was also preferred to OLS because of its ability to assess our two independent variables simultaneously instead of separately (Moro and Fink, 2013; Lazaridis and Tryfonidis 2006; Tu and Nguyen, 2014; Singhania et al., 2014). In addition, we checked for data quality and fitness, and the data were credible for multivariate regression. The multivariate regression model is described in Eq. (1).

\[
FP = \beta_0 + \beta_1 APP + \beta_2 CR + \beta_3 DR + \beta_4 Age + \beta_5 Size + \mu
\]

Where FP is the financial performance (ROA and RTF), \(\beta_0\) is the intercept, \(\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_0\), and \(\beta_7\) are the regression coefficients of independent variables, APP is the average payment period, CR is the current ratio, GR is the growth rate, DR is the debt ratio, CE is the capital expenditure, Age is the number of years the wet mill has been in operation, Size is the number of active members, and \(\mu\) is the error term.

3. Results and discussion

3.1. Descriptive characteristics of the sampled coffee wet mills

We showed the coffee wet mill characteristics by status (unconstrained and constrained, APP, desirable and undesirable CR) (Table 2). Sixty-nine (34%) observations were APP unconstrained, while 136 (66%) were in APP-constrained (Table 2). The results reveal that most coffee wet mill processors take over three years to pay creditors (pooled APP mean of 3.5), which indicates the WCM problem. The APP-constrained wet mills had a significantly higher APP, CR, and growth rate. The APP-constrained wet mills had a significantly higher APP (0.064) than the unconstrained ones. The findings imply that part of the cash held by constrained wet mills in a period could be used for creditors’ accounts settlement. Constrained firms also had a significantly (p = 0.051) higher growth rate than the unconstrained firms (Table 2). This indicated that constrained coffee wet mills hold creditors’ money for a more extended period to utilize the funds to create more value for the firm. The age of the wet mills significantly (p = 0.002) differed between APP constrained and unconstrained. The APP unconstrained wet mills had 35.29 years compared to 33.88 years of constrained and significantly differed significantly (p = 0.001). The APP unconstrained wet mills had more (p = 0.001) active members (730.23) than constrained (578.34).

The descriptive results further indicate that 74% (151 out of 205) observation during the five years had desirable CR (Table 2). Coffee wet mills with a desirable CR paid significantly (p = 0.01) higher RTF (16.61 million KSH, 154,800 USD) than those with undesirable current ratio (12.88 million KSH, 120,037 USD). This implies that firms with desirable CR have better financial performance than their counterparts with undesirable CR. Our findings were consistent with previous WCM studies in Kenya (Singhania et al., 2014; Wahogo, 2014; Ponsian, 2014), who found the current ratio to be a significant determinant of firm financial performance. We observed significantly (p = 0.001) higher CR from wet mills with desirable CR (18.574) compared with those who had undesirable CR (0.99). Results showed that wet mills with desirable CR had a better growth rate than those with undesirable CR (1.57). The wet mills’ debt ratio differed significantly (p = 0.0024) between those with desirable CR and those with undesirable CR. Small-scale coffee wet mills with undesirable CR had a higher debt ratio (0.94) than those with desirable CR with a mean debt ratio of 0.22. This implied that the former require debt financing to pay current liabilities, as the current assets are not adequate to meet their current obligations as and when they fall due. Small-scale coffee wet mills with desirable CR had better management of their physical assets, as indicated by higher capital expenditure (0.04) than those with undesirable CR (0.02).

3.2. Small-scale coffee wet mills financial performance during the study period

The return on assets was similar (p = 0.089) during the study period (Figure 2). The return to farmers significantly (p < 0.001) differed across the five years. The highest (24.13 million KSH, 224,884 USD) RTF was observed in 2014 and the lowest (6.72 million KSH, 62,628 USD) in 2018. The variation in RTF could be attributed to the decreasing trend of average coffee prices over the years (FAO, 2018; Wairegi et al., 2018).

Figure 3 shows the result of the local polynomial regression that establishes a relationship between the following: return on assets and age of the wet mill for desirable current ratio (panel A); return on assets and age of the wet mill for undesirable current ratio (panel B); return to farmers and age of the wet mill for desirable current ratio (panel C), and return to farmers and age of the wet mill for undesirable current ratio (panel D). For the first 30 years of operation, a smooth positive but less rapid ROA trend was observed among firms with desirable CR (panel A); and a sharper positive trend for the undesirable CR category of wet mills (panel B). This indicated better financial performance, in terms of ROA, for firms with low CR. Return to farmers decreased gradually among firms with desirable CR during the first 20 years (panel C). We observed a constant trend for firms with undesirable CR (panel D), implying that an increase in the current ratio decreases RTF. In line with Enqvist et al. (2014), our findings underscore CR’s importance in increasing RTF among small-scale coffee wet mills.

Figure 4 shows a smooth, positive, and more rapid trend in ROA for APP unconstrained coffee wet mills (panel A) than the APP constrained wet mills (panel B). However, the ROA declined for both APP constrained and unconstrained wet mills past 30 years. This implies that younger coffee wet mills had a better return on assets. APP unconstrained small-scale coffee wet mills had a reasonably constant RTF trend across the years (panel C). However, the APP-constrained wet mills had a positive trend in RTF for the first 30 years (panel D). This indicates that the RTF among small-scale coffee wet mills increased with years of operation up to a certain age (30 years), then performance started declining.

3.4. Working capital management effects on coffee wet mills’ financial performance

The variance inflation factor (VIF) ranged between 1.10 and 1.04 with a mean of 1.05 (Annex A). The rho values of pairwise correlation were less than 0.3 (Annex B). Since the VIF was less than ten and rho values less than 0.5, the independent variables were not correlated, thus credible for multivariate regression analysis. We also found non-existence of endogeneity problem, that is, our variables were exogenous (Chi-Square = 380321, p = 0.8268; F = 180243, p = 0.8352).
Pairwise correlation ($\beta = -0.047$, $p = 0.50$) was not significantly different between ROA and RTF among small-scale wet mills (results not reported). However, the negative sign indicated that as the ROA increased, RTF decreased.

The estimated value of the regression coefficient and their related statistics are presented in Table 3. The model goodness of fit ($R^2$) implies that 63% of the variation in the financial performance of small-scale coffee wet mills in Embu County was explained by the independent variables used in the model. The significant F-value (47.40****) indicates that all the independent variables included in the model were important for explaining the variations in small-scale coffee wet mills' financial performance.

The Multivariate regression analysis revealed that four factors significantly predicted small-scale wet mills' return on assets (Table 3). The APP ($\beta = -0.0001$, $p = 0.000$) negatively predicted ROA among small-scale coffee wet mills. This implied that small-scale coffee wet mills with short APP were more likely to have a higher return on assets. This could be attributed to a good credit rating when a firm takes a short period to pay creditors. Thus the wet mills attract more farmers who bring more coffee to the farms. The high quantity of coffee processed by a wet mill could increase revenue, hence a high return on assets. Our finding was in agreement with Agbo (2018), who reported that APP was a negative determinant of ROA.

The CR negatively ($\beta = -0.3416$, $p = 0.001$) determined coffee wet mills' return on assets. This implied that an increase in CR by 10% could decrease ROA by 34%. It means that pursuing a higher current ratio leads to low utilization of assets in generating revenue for the firm. It further implies that wet mills efficient in asset utilization may not perform well in settling their short-term obligations using current assets in the short run. However, our findings were contrary to previous research that found that the current ratio was a positive determinant of ROA, attributing it to conservative investment policy (Agbo, 2018; Mwangi et al., 2014).

We found that wet mill's Size positively ($\beta = 0.0011$, $p = 0.000$) influenced small-scale coffee wet mills' ROA. This showed that coffee wet mills with high number of active members had a better financial performance. This could be attributed to increased quantity of coffee supplied to the wet mills with increased active members, hence optimal asset utilization in revenue generation. While our finding contradicts Agbo (2018) and Singhania et al. (2014), who found that firm Size was a negative predictor of ROA, it corroborates with the findings of Nguyen et al. (2020) and Mathuva (2010) that firm Size was a positive determinant of firm's financial performance.

Our findings indicated that the wet mill's age was a negative ($\beta = -0.0111$, $p = 0.0052$) determinant of small-scale coffee wet mills' ROA. This could be attributed to the reduced efficiency of assets (especially fixed assets due to depreciation effect) in income generation as firms
grow older. This is contrary to Singhania et al.'s (2014) findings, who reported that age was a positive determinant of ROA among the Indian manufacturing firms.

The APP, CR, DR, CE, Size, and age variables significantly affected the return to farmers (Table 3). Our results indicated that if all factors were held constant, a 10% increase in APP, CR, GR, DR, CE, and Size would increase return to farmers by 0.003, 7.6, 0.4, 5.9, 26.0, and 0.08%, respectively. We, however, found that the coefficient of age was negative and significant ($\beta = -0.1636; p = 0.001$). The positive relationship between APP and RTF could be explained in two ways. First, firms wait longer to pay creditors to take advantage of the available cash to meet their working capital needs. Second, this finding is of economic sense because the longer the firm takes to pay creditors, the higher the operating capital reserve level it has and utilizes to increase its profitability.

Our finding is consistent with the working capital management rule that firms should strive to delay their payment to creditors as much as possible but not spoil their business relationship with them (Mathuva, 2010). Agbo (2018), Aktas et al. (2015), and Enqvist et al. (2014) reported that the current ratio was a positive determinant of firm financial performance. Our results imply that small-scale coffee wet mills could improve their financial performance by increasing current assets’ proportion to current liabilities. The finding that DR was a positive determinant of performance as measured by RTF was contrary to that of Aktas et al. (2015), which reported that debt ratio was a negative determinant.
of financial performance. However, the age of the wet mill was found to have a negative effect on RTF. This confirms the FAO (2018) report that return to farmers has been on the declining trend over the year.

4. Conclusion

The study sought to empirically analyze working capital management’s effect on the financial performance of small-scale coffee wet mills in Embu county from 2014 to 2018. The result showed that working capital management, measured by average payment period and current ratio, negatively affected return on assets. This implied that coffee wet mills need to lower their APP and CR to increase their ROA. This confirms our first hypothesis that working capital management significantly affects ROA among coffee wet mills. We also observed that Size and age of the coffee wet mill were significant predictors of ROA, with Size being a positive predictor while age a negative predictor.

Our study ventures further into analyzing the effect of working capital management on return to farmers. We conclude that an increase in the average payment period and the current ratio increases return to farmers, validating our second hypothesis that working capital management significantly determines small-scale coffee wet mills’ return to farmers. We also conclude that growth rate, debt ratio, capital expenditure, Size, and age significantly determined return to farmers of the small-scale coffee wet mills farmers in Eastern Kenya.

Our findings underscore the importance of CR and APP in improving small-scale coffee wet mills’ financial performance. Contrary to the negative effect observed between WCM metrics and ROA, the results indicated a positive impact of WCM metrics on RTF. This contradicting finding between ROA and RTF determinants can be explained by the small-scale coffee wet mills’ overall objective of increasing return to farmers. While high APP shows a problem of WCM and the firm’s inability to pay creditors on time, it is advantageous to the coffee wet mill as it leads to an increase in RTF. Thus, consistent with their overall objective, the coffee wet mills should increase APP. However, they should do this sparingly to maintain the business relationship with the creditors. Similarly, the wet mills should increase CR to increase RTF. Implicitly, the study concludes that working capital management impacts small-scale coffee wet mills’ performance. Hence, the wet mills can improve their financial performance by adopting suitable working capital management strategies.

This study’s novelty is fourfold and contributes to the literature on working capital management in several ways. First, this research is the first to examine the working capital management of the small-scale coffee processors in Kenya using multivariate regression analysis. Secondly, this study contributes to the existing knowledge in understanding the performance of the small-scale coffee wet mills in Kenya and guides firm managers on the strategies to shape the working capital management of the coffee wet mills. Thirdly, the study investigates the effect of working capital management on return to farmers. Lastly, we use panel data methodology to estimate the models to eliminate the unobservable heterogeneity. Our results showed that working capital had a positive effect on firm performance as measured by return to farmers, but it had a negative impact on ROA. In line with the core mandate of the coffee wet mills, return to farmers is more superior to the firm’s return on assets. Therefore, the management of the coffee wet mills should increase the current ratio and lengthen the average payment period to enhance return payable to farmers.

Declarations

Author contribution statement

Dancan O. Othuon: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Wrote the paper.

Karambu Kiende Gatimbu: Conceived and designed the experiments; Performed the experiments; Wrote the paper.

Felix Kipchirchir Ngetich: Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Collins M. Musafiri: Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

Funding statement

This work was supported by the University of Embu Management.

Data availability statement

Data included in article supplementary material/referenced in article.

Declaration of interests statement

The authors declare no conflict of interest.
Annexes.

Annex A. Multicollinearity test results

| Variable | VIF  | 1/VIF |
|----------|------|-------|
| APP      | 1.10 | 0.912636 |
| CR       | 1.02 | 0.982133 |
| GR       | 1.01 | 0.994840 |
| DR       | 1.01 | 0.988424 |
| CE       | 1.01 | 0.986562 |
| Size     | 1.15 | 0.870651 |
| Age      | 1.04 | 0.958025 |
| Mean VIF | 1.05 |       |

APP is natural logarithm of average payment period; CR is current ratio; GR is growth rate; DR is debt ratio; CE is capital expenditure; Size is number of active members of the coffee wet mill; Age is number of years the wet mill has been in operation. *** denotes the 1% significance level.

Annex B. Pearson correlation of independent variables

| APP    | CR       | GR       | DR        | CE       | Age   | Size   |
|--------|----------|----------|-----------|----------|-------|--------|
| 1.0000 |          |          |           |          |       |        |
| 0.0494 | 1.0000   |          |           |          |       |        |
| 0.0059 | -0.0169  | 1.0000   |           |          |       |        |
| 0.0116 | -0.0710  | -0.0427  | 1.0000    |          |       |        |
| 0.0362 | 0.0816   | -0.0330  | -0.0283   | 1.0000   |       |        |
| -0.0352| 0.0816   | 0.0064   | 0.0181    | -0.0340  | 1.0000|        |
| -0.2875***| 0.0872 | -0.0346  | -0.0518   | -0.0817  | 0.1889***| 1.0000|

Mean VIF 1.05

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