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Financial leverage and labor productivity in microfinance co-operatives in Tanzania

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Abstract: Microfinance co-operatives (MFCs) are increasingly accessing loans from other financial institutions to finance their lending activities. However, knowledge about the association between loans from other institutions and MFCs' performance is limited. Therefore this paper contributes to the body of knowledge by extending the application of agency theory to investigate the effe of financial leverage on MFCs' labor productivity. The paper applies fixed effect regression models on panel data of 442 observations established from a sample of 115 MFCs operating in five regions in Tanzania. The results show that financial leverage has a negative effect on labor productivity. The findings revealed that an increase in financial leverage results in lower labor productivity, which could be due to underinvestment because of the debt overhang problem, higher financing costs (which reduce future investments), high labor costs resulting from the high monitoring of lending, and loan collection activities. Such findings suggest that MFCs have to contain their costs and ensure that they generate more revenues from loans accessed from other financial institutions.

Subjects: Economics; Finance; Business, Management and Accounting

Keywords: Financial leverage; microfinance co-operatives; labor productivity

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PUBLIC INTEREST STATEMENT

Microfinance co-operative (MFCs) is the type of microfinance institutions established by group of people to meet their financial needs. They serve members who have a common bond, e.g. members of a local community, employees of a particular firm, or individuals with a common organizational affiliation. MFCs operate by mobilizing savings from their members, and these savings are used as part of the capital base for lending activities. However, they are faced with shortage of funds to meet their lending activities due to the mismatch between the mobilized savings and member's loan requirement. Due to the shortage of funds they borrow from other financial institutions in which they have to pay interest rate and to meet other borrowing conditions. This paper investigates the impact of borrowing from external sources, and the results shows that such MFCs are faced with lower labor productivity which could hinder their possibility of providing viable services to their members.

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1. Introduction

Microfinance co-operatives (MFCs) which are member-owned microfinance institutions, have emerged to encourage financial inclusion through the provision of loans to low-income individuals excluded from mainstream financial institutions (McKillop & Wilson, 2015). MFCs provide savings and credit facilities to members drawn from a certain geographical region, social grouping, or organization (McKillop & Wilson, 2011). Despite MFCs efforts to extend financial services to underserved populations, their members' demand for loans surpass their available internal funds (Kaleshu & Temu, 2012). As a result, MFCs resort to accessing credit from other financial institutions (Ishengoma, 2013).

MFCs' access to credit has resulted in increased loan portfolios and non-traditional MFCs' financial services, including insurance, money transfers, and remittance services (Ishengoma & Towo, 2016). Although MFCs aim to serve their members' interests rather than to maximize profits (Baltaca & Mavrenko, 2009), their growth and long-term survival depend on efficiency in providing services to their members. Access to debt has been seen as an alternative to overcoming a challenge of insufficient internal funds in MFCs (Kaleshu & Temu, 2012), but the empirical literature has demonstrated that financial leverage (debt) may influence cooperative societies' productivity growth (Russell, Briggeman, & Featherstone, 2017). Hamid and Shabkhaneh (2012) pointed out that the performance of a co-operative society depends to a large extent on the productivity of its employees to determine its survival and growth. Understanding the relationship between access to external debt and productivity in the MFCs' context is, therefore, important because it indicates the path for growth and provision of sustainable services to the members.

An increasing amount of theoretical and empirical literature has demonstrated that financial leverage affects firm growth due to its effect on labor productivity. From the agency theory perspective, the presence of debt serves as a disciplinary mechanism that induces managers to act in the best interests of the shareholders rather than maximizing their own utility (Jensen, 1986). This argument suggests that there may be a positive relationship between financial leverage and productivity. On the other hand, Myers (1977) contended that managers of the firm financed with debt may decide to engage in underinvestment due to the risk of default. According to this argument, leverage can lead to lower productivity because managers may invest less in productivity-enhancing undertakings in order to avoid failed debt repayment.

The empirical studies in non-financial firms have found evidence that financial leverage and labor productivity are significantly related (Avarmaa, Hazak, & Männasoo, 2013; Kale, Ryan, & Wang, 2007; Nunes, Sequeira, & Serrasqueiro, 2007). Although the relationship has been evidenced in non-financial firms, the relationship between financial leverage and labor productivity in the microfinance sector, and specifically in the MFC context, is less explored. Despite the less consideration, productivity exemplifies how efficiently a microfinance institution may utilize its resources, particularly its assets and personnel, in providing services (CGAP, 2003). Although few previous studies have focused on productivity in assessing microfinance institutions' performance (Gutierrez-Nieto, Carlos, & Molinero, 2007; Haq, Skully, & Pathan, 2010; Mia & Soltane, 2016; Nawaz, 2010), they have not addressed that relationship in the financial leverage setting. Therefore, due to the mixed views and the increased access to credit by MFCs as well as the evidenced relationship between debt financing and labor productivity in other industries than the microfinance sector, there is a need to investigate the relationship between financial leverage and labor productivity in the MFC context.

Thus, this study aims to investigate the relationship between financial leverage and MFCs' labor productivity. To respond to this objective, we use agency theory (Jensen & Meckling, 1976) to explain the relationship between financial leverage and labor productivity. The study used fixed-effect regression models in a four-year panel data from 115 MFCs with 442 observations. The results indicate that financial leverage is associated with lower labor productivity in MFCs. This implies that higher financial leveraging results in higher financing costs, which limit MFCs'

investment ability, as well as higher labor costs due to the increased monitoring of the loan portfolio and handling of lending activities.

The current study contributes to the literature on MFCs by providing insights into how financial leverage is related to labor productivity based on agency theory, which has been widely applied by studies in the non-co-operative sector. In addition, the shift of MFCs from dependence on members' deposits and equity to loans from other financial institutions has affected MFCs' provision of sustainable services to their members.

The rest of the paper is organized as follows. Section two provides an overview of MFCs in Tanzania, section three reviews both the theoretical and empirical literature, section four describes the methodology, section five presents and discusses the findings, and section six presents the conclusions and implications.

2. Microfinance co-operatives in Tanzania

An MFC is a member-owned financial co-operative democratically controlled by its members and operated for the purpose of maximizing the economic benefit of its members by providing financial services at competitive and fair rates. MFC membership is based on a common bond-a linkage shared by savers and borrowers who share a common characteristic (Mazure, 2016). The common bond might restrict membership to a local community, employees of a particular firm, or individuals with some other organizational affiliation (such as a church), professional association, or geographical association (Goddard, McKillop, & Wilson, 2008). The common bond mitigates information deficiencies inherent in financial transactions and enables MFCs to provide banking facilities and credit to financially excluded members, especially when it mainstream financial institutions would deem such activities to be too risky (D. G. McKillop & Wilson, 2015).

The main sources of funds for lending activities come from members' savings, members' equity, and recent wholesale loans from external sources. In Tanzania, the MFC service is offered only to members, who usually start by saving before they are eligible to borrow. According to Marwa and Aziakpono (2015), a member is allowed to borrow up to three times of his/her savings or/and shares with the organization, although some MFCs limit borrowings to twice the member's total investment. With regard to law and regulations, in Tanzania, MFC activities are guided by the Co-operative Societies Act No. 6 of 2013 and the Co-operative Societies Regulation of 2015. Due to the growing importance of MFCs' operations, the enactment of the Co-operative Societies Act led to the creation of the Savings and Credit Co-operatives Societies Regulations of 2016. Indeed, the Savings and Credit Co-operatives Societies Regulations stipulate the requirements for and extent of financial leverage in MFCs.

MFCs' involvement has shown continuous growth in the provision of financial services in Tanzania. For example, an analysis of the Tanzania Co-operative Development Commission's statistics shows that, from 2007 to 2018, members' MFCs increased from 3,506 to 6,137, with a population penetration rate of 2.14% (World Council of Credit Union, 2016). Members' equity increased by 373% while members' savings deposits increased by 977%, demand deposits increased by 459%, and outstanding loans increased by 800%, with a total of 13,318 employees being responsible for carrying out day-to-day activities. Despite such noticeable growth, MFCs face competition from commercial and community banks, especially those providing small loans, as well as microfinance companies and mobile money services.

3. Theoretical and empirical framework

3.1. Agency theory

Agency theory proposes that conflict arises between managers and shareholders due to the separation of ownership and control, as managers tend to maximize their own utility rather than the value of the firm (Jensen & Meckling, 1976). Agency theory posits that two different views

emerge on how leverage affects firm performance. Some scholars argue that leverage has a positive impact on firm performance. For example, Jensen (1986) explained that commitment to pay the future cash flow constitutes a constraint on the control exercised by the manager because the presence of debt necessitates that managers pay interest payments to lenders, which decrease cash flow available for investment. Accordingly, Grossman and Hart (1982) affirmed that the failure to meet debt obligation will cause managers to suffer personal losses, reduced salaries, and a deteriorating reputation while having to give up control of the firm. As managers are aware of the consequences of the failure to service debt, they will maximize their efforts in order to maintain their positions. In such circumstances, servicing debt serves as a motivating force to make such organizations more efficient (Jensen, 1986), thereby enforcing managers to direct the cash flow toward productivity-enhancing activities (Kale et al., 2007). This suggests that higher leverage levels may result in higher labor productivity.

Presenting a contrasting view, Myers (1977) contended that managers of the firm financed with debt may decide to make underinvestment due to a debt overhang problem and the risk of default. In such circumstances, managers may sacrifice investments in employees due to their over-indebtedness, which could otherwise improve their productivity. Financial leverage in cooperatives is also associated with increased agency costs, such as liquidation costs, monitoring costs, and default risk costs, which are passed on to the co-operatives by the lender in the form of covenants and higher interest rates (Russell et al., 2017). This suggests that the possibility of the MFCs to attain higher productivity may be compromised. In line with this, Mundakkad (2018) argued that firms with growth opportunities have to choose less leverage; otherwise, they will not be able to utilize the investment opportunities. In this regard, higher financial leverage levels could lead to lower productivity.

3.2. Empirical studies and development of hypothesis

Based on an agency theoretical point of view, financial leverage may lower agency costs and affect firm performance by disciplining or encouraging managers to act in the shareholders' best interests (Jensen, 1986). In this regard, managers are likely to invest in their employees to ensure the attainment of MFC members' needs. In addition, MFCs may need fewer managerial staff to monitor employees due to a stronger identification with the goals of their firm by individual employees, which affects labor productivity (Klinedinst, 2010). On the other hand, financial leverage is linked with a promise to use future cash flows to meet debt obligations, resulting in higher expected costs of financial distress, bankruptcy, and/or liquidation in the case of failure. In such circumstances, financial leverage may lead to low investment in employees crucial for the growth of the MFC.

However, findings of empirical studies examining the relationship between financial leverage and labor productivity in sectors other than the microfinance sector (Avarmaa et al., 2013; Kale et al., 2007; Mundakkad, 2018; Nunes et al., 2007; Russell et al., 2017) are contradictory. For example, Avarmaa et al. (2013) used a fixed effects regression model on panel data for companies operating in Baltic countries from 2001 to 2008 to demonstrate empirically that the relationship between leverage and labor productivity was nonlinear and differed between local and multinational firms. Kale et al. (2007) examined the relationship between employee productivity and financial leverage using 36 years of panel data, from 1970 to 2005, for 16,482 firms from different industries. The data were obtained from the Compustat Industrial Annual database. The authors found a concave relationship between leverage and labor productivity. Nunes et al. (2007) examined the effect of financial leverage on labor productivity using panel data for 162 large companies in Portugal from 1999 to 2003. The findings using quartile regression showed that firms with higher leverage had lower labor productivity whereas firms with lower leverage experienced higher productivity.

Mundakkad (2018) examined the relationship between firm leverage and labor productivity using panel data for Indian manufacturing firms from 1995 to 2010. Using a quartile regression approach, the author found that leverage did not increase productivity at the low levels of productivity. However, for medium and higher productivity firms, leverage tended to increase productivity. These findings point to the non-monotonic relationship between leverage and labor

productivity. Russell et al. (2017) investigated the relationship between financial leverage and agency costs in the context of agricultural cooperatives in nine states in the United States from 2005 to 2010. They found that financial leverage had a negative effect on labor productivity. They suggested that leverage's negative effect on productivity indicated that the agency costs of leverage outweighed its benefits.

According to Russell et al. (2017) when the cooperative has a higher level of leverage, the lender is subject to higher default risk because debt payments can become so large that a cooperative's free cash flow is no longer sufficient, resulting in default. In addition Ishengoma (2010) reported that leverage exerts pressure on employees to lend money to risky borrowers and for unintended projects while putting less emphasis on the MFCs' loan policies. As a result, MFCs with higher leverage are subjected to increased default risks. Thus, MFCs with higher leverage may face increased financing and monitoring costs and, as a result, they may pay higher interest rates, thereby facing difficulties in investing in their employees. In this regard, financial leverage may result in a negative impact on MFCs' labor productivity. *Based on the theoretical and empirical justification presented thus far, this study hypothesized that financial leverage is negatively related to MFCs' labor productivity*.

4. Methodology

4.1. Sample and data

This study used secondary data extracted from the financial reports of 115 MFCs from five regions in Tanzania (Dar es Salaam, Mwanza, Kilimanjaro, Iringa, and Arusha), which were selected based on the concentration of the total number of MFCs. The reports covered the 2011 to 2014 period, resulting in four years of panel data. Data from each region were collected at the district level, from which a total of 17 districts were selected upon consulting the assistant registrar of cooperatives from each region. MFCs' financial statements audited by the Co-operative Audit and Supervision Corporation (COASCO) or COASCO-appointed audit firms were the main source of data. Information from 145 MFCs was collected, but only 115 MFCs with four years of audited financial statements were used in order to ensure consistent data. This requirement was important because we observed that some MFCs were not audited every year. Therefore, MFCs with fewer than four years of continuous observations were eliminated, leaving 442 MFC observations over the 2011–2014 period.

4.2. Measurement of variables

4.2.1. Dependent variables

In this study, labor productivity is used as an important factor for the MFCs to provide sustainable services to their members. Previous studies in the microfinance sector have used total factor productivity (TFP) to measure productivity (Gutierrez-Nieto et al., 2007; Haq et al., 2010). However, different methods are used to measure productivity. For example, Avarmaa et al. (2013) and Kale et al. (2007) used sales per employee as a measure of labor productivity whereas Ferrando and Ruggieri (2015) used real value added divided by total employment. In this study, labor productivity is measured as gross loan portfolio outstanding divided by employee expenses (GLOEMP).

Gross loan portfolio of the MFCs is considered as output representing the capability of the MFC to provide loan services to its members as propounded by previous researchers (Gutierrez-Nieto et al., 2007; Haq et al., 2010; Mia, 2015; Nawaz, 2010). Following Haq *et al*.'s (2010) and Nawaz's (2010) studies, labor is used as an input represented by the amount of employee expenses. The use of the employee expenses as an input instead of quantities (e.g. number of employees) allows for capturing the effect of both the quantity and quality of labor in producing the output (Athanasoglou, Georgiou, & Staikouras, 2009; Brandolini & Cipollone, 2001; Darko, 2013). Athanasoglou et al. (2009) argued that human resource characteristics may change over time depending on the conditions in the labor market, which may, in turn; change the contribution of

human resources (human capital) to labor productivity. They further stipulated that, when labor productivity is computed based on the number of employees or the number of hours worked as labor input, it ignores the changes in human capital, thereby leading to underestimating the contribution of labor in the output. Based on this argument and given that some MFCs are changing from using volunteers and non-professionals to professionals, the use of employee expenses as input allows for capturing changes in employees' quality. Employee expenses included allowances paid to voluntary employees as well as wages, salaries, and contributions to social schemes for full-time and part-time employees for a particular year. Thus, the labor productivity ratio shows the extent to which a shilling invested in the employee generates output in terms of the outstanding loan. For a robustness check, in this study, total revenue was also used as an indicator of output because an MFC that fails to collect enough income will not be viable in the long term (Gutierrez-Nieto et al., 2007). Hence, a ratio of interest and non-interest revenue (total revenue) to employees' expenses (REVEMP) was used as an auxiliary measure of labor productivity. This ratio was modified from Kale et al. (2007) to conform to the setting of the current study; Kale *et al*. used the ratio of operating income before depreciation and amortization to the number of employees to measure labor productivity.

4.2.2. Independent variable

The previous literature shows that financial leverage can be measured in different ways that include three ratios: short-term debt to total assets, long-term debt to total assets, and total debt to total assets (Kyereboah-Coleman, 2007). In this study, financial leverage (LEV) is computed as total loans from other financial institutions divided by total assets (Ndiege, Qin, Kazungu, & Moshi, 2014). This ratio considers the value of outstanding loans from other financial institutions at the end of the particular year. The book value of loan was used because MFCs do not borrow from the public, where loans can be valued by the market.

4.2.3. Control variables

The current study controls for MFCs' specific variables in addition to the financial leverage, which is the explanatory variable of interest. The ***deposit-to-asset ratio (DAR)*** measures the portion of the MFC total assets funded by deposits. It is computed as total deposit divided by total assets (Bogan, 2012). Existing literature argues that MFCs with a higher deposit level are less likely to use leverage compared to MFCs with a low deposit level. This suggests that the DAR may positively or negatively affect MFCs' labor productivity. The ***Loan-to-asset ratio*** (LAR) measures the extent to which MFCs use their funds for lending purposes and is computed as the ratio of gross loan portfolio to total assets. The ratio indicates how well the MFCs focus on lending as their primary business, and in most cases it is a most profitable activity. Kar (2012) suggested that the greater focus on lending contributes to the firm's income flow and profitability that could subsequently enhance employees' performance. In this regard, LAR is likely to have a negative or positive effect on MFCs' labor productivity.

Age is defined as the natural logarithm of years since the start-up of the MFC. Ayayi and Sene (2010) argued that, as institutions mature, they acquire experience on operations of the micro-finance sector, thereby increasing the likelihood of providing sustainable services. Meanwhile, Kyereboah-Coleman and Osei (2008) pointed out that microfinance services do not necessarily follow the formal relationships of age and reputation because of the complex and specialized nature of their functions. Therefore, the relationship between age and MFCs' labor productivity can be positive or negative. ***Size*** is defined as the natural logarithm of total assets. Large MFCs may have established infrastructures and be better managed; therefore, they are expected to benefit from the economies of scale and product diversification, making them more efficient (Kar, 2012; Kyereboah-Coleman, 2007). On the other hand, smaller MFCs are more likely to have an opportunity for growth and, therefore, may be more efficient in order to have better performance (Hartarska, 2005). Thus, the relationship between size and MFCs' labor productivity can be positive or negative depending on their scale of efficiency. Table 1 shows the summary of the variables.

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Table 1. Definition and measurements of the variables

Variable	Acronym	Definition
Dependent Variable-Labor productivity		
Gross loan to labor	GLOEMP	Gross loan portfolio/Employees expenses
Revenue to labor	REVEMP	Total Revenue/Employee expenses
Independent Variable		
Financial leverage ratio	LEV	Loans from other financial institutions/Total assets.
Control Variables		
Deposit to assets ratio	DAR	Total deposits/Total assets
Loan to assets ratio	LAR	Gross loan portfolio/Total Assets
Age	Age	The natural logarithm of the number of years from the date of establishment as MFC.
Size	size	Size of MFC measured by natural logarithm of total assets

4.3. Analysis and model specification

A panel regression model was used to establish the relationship between labor productivity and financial leverage while controlling for the other independent variables. In the preliminary analysis, a pooled regression model was used to establish the relationship between independent variables and the dependent variables, ignoring the fact that the data were panel data. The following model was estimated:

$$y_{it} = \alpha_i + \beta' X_{it} + \varepsilon_{it}(Ui = 0)$$

Where y_{it} is the dependent variables, β is the coefficient of the independent variables X_{it}, α_i is the intercept, and (U_i = 0) indicates that the individual effect (cross-sectional or time-specific effect) does not exist.

As our data set was panel data, we could use a fixed effect model or random effect model. According to Torres-Reyna (2007), the fixed effect model assumes that time-invariant characteristics are unique to the individual and should not be correlated with other individual. Thus, although the intercept may differ across individuals, each individual's intercept does not vary over time-that is, it is time invariant (Gujarati, 2004). Therefore, this model provides a means for controlling the omitted variable bias. According to Mori et al. (2013), a fixed effect regression can be used when one wants to control for omitted variables that differ between MFIs but are constant over time. Therefore, the following general fixed effects (FE) model was estimated to test the hypotheses of this study:

$$y_{it} = \alpha_i + \beta' X_{it} + \varepsilon_{it}$$

where y_{it} is the dependent variables for cross-section unit i—in this case, MFC at time t, where i = 1 … n and t = 1 … T; β is the coefficient of the independent variables X_{it} in period t for unit i; and X_{it} represents the j^{th} independent variable for unit i at time t. α_i is the intercept of the individual MFC or a group of MFCs' specific characteristics. This includes specific characteristics that can be observed, such as MFC age and size, and unobserved characteristics, such as employees' skills. ε_{it} is the regression error across time t and cross-section i.

On the other hand, the random effects model assumes that the variations across entities are random and uncorrelated with the predictor included in the model. Therefore, if differences across firms have an influence on the dependent variable, this model is more efficient. Thus, the following general random effect (FE) model was estimated to test the hypotheses of this study:

$$y_{it} = \beta X_{it} + \alpha + ui + \varepsilon_{it}$$

where y_{it} is the dependent variables for cross-section unit i at time t, where $i = 1 \ldots n$ and $t = 1 \ldots T$; θ is the coefficient of independent variables X_{it} in period t for unit i; and X_{it} represents the j^{th} independent variable for unit i at time t. α_i is the intercept of unobserved firm i's individual specific effects. Finally, $u_i+\varepsilon_{it}$ is the error term, where u_i is the random unobserved individual effects relating to firm i and ε_{it} is the regression random error across time t and cross-section i.

Following the estimation of the fixed effect and random effect models, it is necessary to choose the most appropriate model. This study adopted the Hausman specification test, as suggested by previous literature in econometrics (Baum, 2006; Gujarati, 2004; Wooldridge, 2013), to determine whether fixed or random effect estimates are more ideal. The test examines whether the individual effects (unique errors) are correlated with other regressors in the model. The null hypothesis of the Hausman test assumes that there is no systematic difference in fixed effect and random effect coefficients. If the test does not reject the null hypothesis (where the p-value is insignificant and greater than the 0.05 level), the random effect estimates are preferred; if the test rejects the null hypothesis ($p < 0.05$), then the fixed effect estimates are preferred (Baum, 2006; Gujarati, 2004; Wooldridge, 2013).

If the random effects are preferred, the Breusch-Pagan Lagrange multiplier (LM) test may be used to decide whether to use a random effects model or a simple OLS regression (Torres-Reyna, 2007). The null hypothesis in the Breusch-Pagan LM test is that variance across entities is zero-that is, there is no significant difference across units. Therefore, if the null hypothesis is rejected, the random effects model is preferred because it is able to deal with heterogeneity better than the pooled OLS.

The univariate outliers were detected by examining a box plot, which indicated the existence of outliers. The multivariate outliers were estimated using the bacon (blocked adaptive computationally efficient outlier nominators) command (Weber, 2010). Before running the regression models, the values of the variables were checked by using a histogram to determine if they were normally distributed. In addition, the multivariate normal distribution was checked using the Doornik-Hansen test for multivariate normality. Both tests indicated that the variables were not normally distributed. According to Field (2009), data transformation can be used to remedy the problem of non-normality. Therefore, in order to solve the problem of normality, variables were transformed to the natural logarithm and square root. Moreover, in the regression analysis, the variance of the error term is assumed to be homoscedastic. However, sometimes error terms do not have constant variance, meaning they are heteroskedastic. The existence of heteroskedasticity results in biased estimators and standard errors. In addition, panel data are likely to suffer serial correlation, which is the relationship between the observations of the same variable over specific periods of time. The existence of serial correlation biases the standard errors and causes the results to be less efficient (Drukker, 2003). We used robustness standard errors (the Huber-White sandwich estimator) to deal with the presence of heteroskedasticity and serial correlation similar to previous studies (see Avarmaa et al., 2013).

4.3.1. Empirical model

A linear equation that relates MFCs' labor productivity to financial leverage is specified below:

$$Lproductivity_{it} = \alpha_0 + \beta' X_{it} + \beta' M_{it} + \delta d_t + \varepsilon_{it}$$

$Lproductivity_{it}$ is MFCs' labor productivity, represented by GLOEMP and REVEMP for MFC i at time t; θ measures the effect of the variation of independent variable X_{it} on the dependent variable for MFC i at time t; and M_{it} is the specific characteristics variables for MFC i at time t. Finally, d_t are the time dummy variables (0,1) for each year t (except for the base year), and ε_{it} is the error term for MFC i at time t.

Following Kale et al. (2007), Russell et al. (2017), and the microfinance literature, the following model was used to estimate the relationship between financial leverage and labor productivity in MFCs.

$$Lproductivity_{it} = \alpha + \beta_1 LEV_{it} + \beta_2 DAR_{it} + \beta_3 LAR_{it} + \beta_4 Age_{it} + \beta_5 Size_{it} + \delta d_t + \varepsilon_{it}$$

where *Lproductivity* is the dependent variable captured by two indicators, the GLOEMP and REVEMP of a MFC *i* (I = 1, 2, 3 … 115) in year *t*, which takes the value of 2011 to 2014 LEV stands for financial leverage of a MFC *i* in year *t*; and DAR, LAR, age, and size represent the control variables of MFC *i* in year *t*. In addition, d_t is the time dummy variables. Based on the developed hypothesis, GLOEMP and REVEMP are expected to have a negative relationship with financial leverage.

5. Results and discussions

5.1. Summary statistics

The summary statistics in Table 2 show that the average output (gross loan portfolio) per employee expenses is TZS 68 (local currency). Thus, based on employee expenses, each employee produces an average of TZS[1] 68 of the gross loan portfolio. Meanwhile, the average output (revenue) per employee expenses is TZS 9, implying that each employee produces an average of TZS 9 of revenue. The financial leverage ratio (LEV) in MFCs averages 17%, which is relatively larger than the 15.69% reported by Bogan (2012) in Africa, East Asia, Eastern Europe, Latin America, the Middle East, and South Asia. In addition, the ratio is larger than the 5% recommended by the World Council of Credit Unions (WOCCU, 2009). However, the maximum value of 98% indicates a higher dependence on external funds for operations in some MFCs. The 98% ratio exceeds the maximum ratio of 25% stipulated by the Tanzania Savings and Credit Co-operative Societies Regulation of 2016 (URT, 2016).

The average DAR is 56%. A sample of MFCs from around the world indicated an average deposit ratio of 51.9% (Bogan, 2012). The average ratio is less than the 70%–80% recommended by WOCCU (WOCCU, 2009). The low average suggests that MFCs in Tanzania depend on wholesale loans for financing their operations due to the difficulty of mobilizing deposits from their members. The average gross loan portfolio to asset ratio of 79.8% was within the WOCCU-recommended 70%–80% (WOCCU, 2009). The average age of MFCs is 12 years, which is close to that of Bogan's (2012) estimate of 14 years for MFCs worldwide. The average asset value is TZS 929 million, with a minimum of TZS 13 million and a maximum of TZS 24 billion, suggesting that some MFCs are large enough to benefit from economies of scale whereas others are still small, which could be one reason they borrow from external sources.

Table 2. Summary Statistics

Variable	Observations	Mean	Std. Dev.	Minimum	Maximum
Labor productivity					
Gross loan to labor expenses (GLOEMP)	442	68.164	113.915	1.794	1195.601
Revenue to labor expenses (REVEMP)	442	9.322	12.246	0.754	172.258
Independent variables					
Financial Leverage Ratio (LEV)	460	0.170	0.198	0.02	0.984
Control variables					
Deposit to asset ratio (DAR)	460	0.560	0.184	0.072	0.993
Loan to asset ratio (LAR)	460	0.798	0.167	0.147	1.311
Age (Years)	460	12.813	9.462	4	48
Size	460	929.00	1,880.00	13.80	24,000.00

Size is the book value of assets in million TZS.

5.2. Correlation analysis

A pairwise correlation analysis was performed to determine the correlation among labor productivity (GLOEMP and REVEMP), financial leverage, and control variables (Table 3 below). The employee productivity indicators, GLOEMP and REVEMP, were positively and highly significantly correlated with each other at the 1% level, indicating that the indicators are a different dimension of one variable. In addition, the results showed that LEV was positive and significantly related to loans to GLOEMP and REVEMP. With regard to control variables, the LAR and size were positively and significantly related to GLOEMP and REVEMP whereas the DAR was negatively and significantly related to GLOEMP and REVEMP. Although age was positively and significantly related to GLOEMP, it was negative and insignificant in terms of REVEMP. The significant and contradicting correlations suggest that further analysis is required.

The pairwise correlation also allowed for establishing the early indicators of the existence of multicollinearity. Field (2009) suggested that correlation coefficients above 0.90 are a sign of multicollinearity. The pairwise correlation showed that none of the explanatory variables was highly correlated with the others. Furthermore, the variance inflation factor (VIF) was used as a diagnostic test to determine whether there was any sign of multicollinearity among the explanatory variables. The VIF shows how the variance of an estimator is inflated by the presence of multicollinearity (Gujarati, 2004). The rule of thumb is that, when the VIF is 10 or more, it is a sign of multicollinearity (Saunders, Lewis, & Thornhill, 2009). The results, as reported in Table 3, indicate that the VIF values all fall below 10, with a maximum value of 1.55, indicating that the multicollinearity among the explanatory variables is not a problem for the estimation results of the regression equations.

5.3. Regression results

The results of the Hausman test for the GLOEMP and REVEMP models in Table 4 indicate that $\chi^2 = 49.85$, $p < 0.01$, and $\chi^2 = 58.86$, $p < 0.01$, respectively. Therefore, the null hypothesis that individual effects are not correlated was rejected. Thus, the fixed effect model was used to estimate the relationship between financial leverage and labor productivity. To control for bias in the presence of heteroskedasticity and serial correlation, the robust standard error estimate, which relaxes the assumption that the errors are independent and identically distributed, was used. In addition, in all models we included year dummies to control for potential fixed-year effects, although the coefficients are not reported. The variables are listed with their coefficients, and their corresponding standard errors are listed below the coefficient figures.

The estimated coefficients in the regressions in Table 4 show that financial leverage is negatively and significantly related to GLOEMP (β − 1.331, $p < 0.10$) and REVEMP (β − 2.692, $p < 0.10$), suggesting that an increased reliance on debt from other financial institutions is associated with MFCs' decreased labor productivity. The negative correlation likely reflects that, because financial leverage leads to an increased loan portfolio, MFCs may incur higher employee costs in order to manage the lending activities. The results confirm the hypothesis that financial leverage is negatively related to MFCs' labor productivity.

Furthermore, the results indicate a significant positive relationship between size and measures of labor productivity GLOEMP (β 0.636, $p < 0.01$) and REVEMP (β 0.494, $p < 0.01$). The positive relationship between size and labor productivity suggests that large MFCs might benefit from economies of scale and learning effect. Age was negatively related to labor productivity in terms of GLOEMP (β − 0.944, $p < 0.01$) and REVEMP (β − 1.004, $p < 0.01$). The negative coefficient of age could be due to the unwillingness of MFCs' older management to keep up with changes and their limited efforts to invest in employees. The LAR coefficient was positive and significant (β 0.850, $p < 0.01$) for GLOEMP, implying that the MFCs focus on issuing loans as the main income-generating assets.

5.3.1. Robustness of the regression results

The MFCs in Tanzania can be categorized as employee based and community based. Employee-based MFCs' membership is made up of salary and wage earners who share a common bond; community-based MFCs' membership is drawn from other activities mainly agriculture with

Table 3. Correlations Matrix

		1	2	3	4	5	6	7	VIF
1	Gross loan to labor expenses (GLOEMP)	1.000							
2	Revenue to labor expenses (REVEMP)	0.751***	1.000						
3	Financial leverage ratio (LEV)	0.221***	0.236***	1.000					1.15
4	Deposit to asset ratio (DAR)	−0.124***	−0.201***	−0.487***	1.000				1.28
5	Loan to asset ratio (LAR)	0.509***	0.302***	0.103**	−0.137***	1.000			1.11
6	Age	0.140***	−0.026	−0.045	0.146***	0.029	1.000		1.41
7	Size	0.339***	0.213***	0.253***	−0.125***	0.253***	0.483***	1.000	1.55

****, **, and * denote the significant level of < 0.01, < 0.05, and < 0.10 respectively.*

Table 4. Financial leverage and labor productivity

	Gross loan portfolio to labor (GLOEMP)	Total revenue to labor (REVEMP)
Variables	**(Model 1)**	**(Model 2)**
Financial leverage	−1.331*	−2.692*
	(0.765)	(1.572)
Deposit to asset	0.055	0.016
	(0.213)	(0.362)
Loan to asset	0.850***	−0.036
	(0.127)	(0.217)
Age	−0.944***	−1.004***
	(0.139)	(0.181)
Size	0.636***	0.494***
	(0.074)	(0.106)
Year fixed effect	Yes	Yes
Constant	−7.279***	−5.523***
	(1.333)	(2.004)
R-squared	0.347	0.187
F-statistics	34.72	9.20
Hausman χ^2	49.85***	58.86***
Observations	442	442

*Robust standard errors in parentheses corrected for potential heteroskedasticity and serial correlation in the error term at *** p < 0.01, ** p < 0.05, * p < 0.1. Hausman tests for fixed effect and random effect models are given in χ^2 values.*

Table 5. Financial leverage and MFCs labor productivity

	Community Based		Employee Based	
Variables	**GLOEMP**	**REVEMP**	**GLOEMP**	**REVEMP**
Leverage	−1.898**	−1.630*	−1.751***	−6.746
	(0.872)	(0.972)	(1.801)	(1.660)
Deposits to asset	0.114	0.003	0.149	−0.134
	(0.261)	(0.291)	(0.420)	(0.551)
Loans to asset	0.957***	0.0284	0.469**	0.110
	(0.161)	(0.180)	(0.233)	(0.160)
Age	−0.903***	−1.067***	−0.953***	−0.872**
	(0.165)	(0.184)	(0.269)	(0.369)
Size	0.579***	0.511***	0.722***	0.498***
	(0.0878)	(0.098)	(0.147)	(0.171)
Year effect	Yes	Yes	Yes	Yes
Constant	−6.644***	−6.008***	−8.409***	−5.574*
	(1.537)	(1.714)	(2.942)	(3.283)
R-squared	0.380	0.197	0.326	0.214
F-statistics	23.69***	9.49***	32.72***	5.38***
Hausman χ^2	28.56***	30.49***	30.46***	28.94***
Observations	264	264	178	178

*Robust standard errors in parentheses corrected for potential heteroskedasticity and serial correlation in the error term at *** p < 0.01, ** p < 0.05, * p < 0.1. Hausman tests for fixed effect and random effect models are given in χ^2 values.*

a common bond (Bwana & Mwakujonga, 2013). As our sample includes both community- and employee-based MFCs, we checked labor productivity for both types. When we look at the relationship between financial leverage on labor productivity based on community MFCs, the results in Table 5 are similar to the baseline model—namely, the financial leverage was negative and significant (β − 1.898, $p < 0.05$ and β − 1.630, $p < 0.1$) when labor productivity was measured in terms of GLOEMP and REVEMP, respectively. With regard to employee-based MFCs, the results in Table 5 shows that the relationship between financial leverage and labor productivity in terms of GLOEMP was negative and significant (β − 1.751, $p < 0.01$). However, when REVEMP was used as an indicator of labor productivity, the financial leverage was negatively but insignificantly related to REVEMP (β 6.746, $p > 0.1$). The age control variable maintained a negative and significant relationship while size showed a positive and significant relationship. These results are consistent with our baseline results; therefore, it is unlikely that community- and employee-based MFCs are treated differently by lenders irrespective of their membership base.

5.4. Discussion of the results

This study hypothesized that a negative relationship exists between financial leverage and labor productivity. As expected, the results indicated a negative and statistically significant relationship between financial leverage and labor productivity. These results are consistent with Russell *et al.'s* (2017) findings that leverage has a negative relationship with productivity in agricultural cooperatives in the United States and Nunes *et al.'s* (2007) findings that, in small and medium non-financial firms in Portugal, leverage reduces labor productivity. The results indicate that, because financial leverage leads to increased loan portfolio, MFCs may need to incur higher employees' costs in order to manage the lending activities, including evaluating borrowers' projects and their repayment capacity.

According to Ishengoma and Towo (2016), financial institutions lending to MFCs require them to recruit professional employees, which could lead to increased employee costs. This condition is a probable reason for lower productivity because MFCs could incur higher employee costs by recruiting professional employees who would have to be paid higher wages. It is claimed that MFCs depend mostly on volunteers (Labie & Périlleux, 2008) who are normally paid mere allowances. Although the recruitment of professional employees could bring about an improved loan portfolio, MFCs' boards of directors, which are supposed to supervise management and make strategic decisions, have been attributed with incompetency and, hence, the failure to effectively supervise senior managers, maintain integrity, and protect the interests of members and other relevant stakeholders (Cornforth, 2004). Thus, labor productivity would be thwarted by the incompetence of a board of directors lacking the leadership skills necessary to supervise and motivate employees. Even if professional employees have the necessary capabilities, they may still underperform, leading to a low loan portfolio irrespective of the costs incurred by them, thereby decreasing labor productivity. Accordingly, the recruited professionals who work in tandem with the volunteers may use their productive time to train the latter on handling the MFCs' activities professionally; as a result, they might not complete their work, thereby causing low labor productivity.

Furthermore, wholesale loans from other institutions encourage the misuse of funds by some MFCs' management, employees, and members, which is partly due to lenders' delay in disbursing loans to the MFCs (Ishengoma, 2013). This situation is exemplified by the wholesale loan intended for agricultural activity members being disbursed after the start of the crucial season. When the lenders delay loan disbursements, some MFC members refuse to borrow because the loans would not meet their requirements. In such cases, the MFCs would have idle funds because the wholesale loan was borrowed to meet demands of pre-identified members. With idle funds, the MFCs could scout around for alternative borrowers to replace the ideal ones who declined to borrow. Conversely, the MFCs may attract risky borrowers, leading to higher default rates (Ishengoma, 2013), implying that increased default rates would lower the loan portfolio compared to employees' expenses and, hence, lead to lower labor productivity. Although the higher default rate seems

to lower the loan portfolio, it would also increase the agency costs due to increased default risk, which lenders will observe. These findings corroborate Jensen and Meckling's (1976) claim that, as leverage increases, the usual agency costs of debt rise, which in the MFC context could be due to underinvestment because of the debt overhang problem, higher financing costs (which reduce future investment), high labor costs resulting from the high monitoring of lending, and loan collection activities.

With regard to control variables, the study established that the DAR has a positive but insignificant relationship with labor productivity. The results suggest that, although deposits are considered to be a cheap source of funds, members' mobilization of deposits does not help MFCs steer toward providing efficient services. Perhaps the most likely reason for the insignificant effect of deposits is that the mobilization of deposits in MFCs depends on the confidence members have in the management and board of directors rather than employees' ability to mobilize deposits. Meanwhile, the LAR has a positive and significant relationship with labor productivity. The positive relationship lies on the fact that MFCs are extensively depend on borrowed funds for lending activities. In this regard, the increase of MFCs lending funds though it is associated with increased return; it is also linked to higher risks. Therefore, to reduce the involved risks the MFCs might be issuing large loans to few big creditworthy members. In this case, costs of providing loans such as screening, monitoring and administration costs are low, which in turn improve employee productivity.

The results of the study indicate that age has a negative and significant relationship with MFCs' labor productivity measures. The findings suggest that, as the MFCs get older, their management may become more rigid and unwilling to use developed management information systems (MIS). Older MFCs were expected to have an efficient MIS in place; however, the current study suggested that older MFCs lack the advanced technology systems to reduce operational costs. Indeed, some older MFCs hesitated to use technological innovations because system operators might misappropriate and misuse their funds because the MFCs' board members lack advanced technology-related skills. As a result, these MFCs have a greater dependence on labor to provide services to their members and, thus, increasing operational costs.

The findings of this study show that size has a positive and significant relationship with MFCs' labor productivity. As larger MFCs are likely to use an advanced MIS, they benefit from low operational costs and become more efficient. According to the study, larger MFCs use specialized MFC software to provide service to members and maintain records, including processing deposits, loan management, and preparation of financial reports. In some larger MFCs, members were able to apply for loans by obtaining loan application forms from the MFCs' website, and the loan was disbursed and repaid through the mobile money transfer or through the bank account. Therefore, the utilization of advanced technology helps lower operational costs, including labor costs and loan administration costs, thereby making MFCs more efficient and leading to enhanced labor productivity. The results are consistent with D'Espallier *et al.*'s (2017) finding that the use of developed MIS helps microfinance service providers to become more efficient.

6. Conclusions and implications

Financial leverage is found to be negatively related to MFCs' labor productivity, suggesting that the more MFCs access loans from the external sources, the more likely the MFCs are to experience lower labor productivity. The results support the agency theory claim that increased leverage is associated with high agency costs, leading to lower performance (Jensen & Meckling, 1976). Agency costs are higher because MFCs may need to incur higher costs in order to manage the lending activities due to increased default risks and increased monitoring costs. The findings suggest that some agency theory insights are also relevant in MFCs despite existing differences between non-financial firms in developed economies and MFCs in Sub-Saharan Africa, particularly Tanzania.

Therefore, the findings suggest that the MFCs have to contain their costs and make sure they generate more from a unit of loan accessed from other financial institutions in order to ensure the

provision of sustainable services to their members. In addition, during the time of the study, the cooperative society's existing rules in use indicated that MFCs should not borrow more than one third of their assets. In 2016, Tanzania's government again passed savings and credit cooperative society-related regulations, indicating that external borrowing should not exceed 25% of the total assets. The results of this study demonstrated that MFCs' loans from other financial institutions account for up to 98% of the assets, implying that the regulations were not followed. Therefore, the government should strengthen supervision through cooperative inspectors/officers to ensure that all MFCs adhere to the cooperative regulations in order to reduce their dependence on external funds and perhaps improve MFCs' labor productivity and provisioning of sustainable services to their members.

However, the study used the total outstanding loan from other financial institutions to determine the level of financial leverage. The different loan maturity periods could have different impacts on labor productivity. Therefore, a future study should examine the effect of long-term and short-term loans on MFCs' labor productivity.

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Note
1. The approximate exchange rate is 1 USD = TZS 2340.

References
Athanasoglou, P. P., Georgiou, E. A., & Staikouras, C. C. (2009). Assessing output and productivity growth in the banking industry. *The Quarterly Review of Economics and Finance*, *49*(4), 1317–1340. doi:10.1016/j.qref.2009.08.003

Avarmaa, M., Hazak, A., & Männasoo, K. (2013). Does leverage affect labour productivity? A comparative study of local and multinational companies of the Baltic countries. *Journal of Business Economics and Management*, *14*(2), 252–275. doi:10.3846/16111699.2011.651624

Ayayi, A. G., & Sene, M. (2010). What drives microfinance institution's financial sustainability. *The Journal of Developing Areas*, 44(1), 303–324. doi:10.1353/jda.0.0093

Baltaca, B., & Mavrenko, T. (2009). Financial cooperation as a low-cost tool for effective microfinancing. *Journal of Business Management*, *2*, 56–64.

Baum, C. (2006). An introduction to modern econometrics using stata. Texas, USA: StataCorp LP.

Bogan, V. L. (2012). Capital structure and sustainability: An empirical study of microfinance institutions. *Review of Economics and Statistics*, *94*(4), 1045–1058. doi:10.1162/REST_a_00223

Brandolini, A., & Cipollone, P. (2001). *Multifactor productivity and labour quality in Italy, 1981-2000.* Bank of Italy, Economic Research and International Relations Area, Temi di Discussione, No. 422, Italy.

Bwana, K. M., & Mwakujonga, J. (2013). Issues in SACCOS development in Kenya and Tanzania : The historical and development perspectives. *Developing Country Studies*, *3*(5), 114–122.

CGAP. (2003). *Microfinance Consensus Guidelines: Definitions of selected financial terms, ratios, and adjustments for microfinance*. Washington D.C: Author.

Cornforth, C. (2004). The governance of co-operatives and mutual associations: A paradox perspective. *Annals of Public and Co-Operative Economics*, *75*(1), 11–32. doi:10.1111/apce.2004.75.issue-1

D'Espallier, B., Goedecke, J., Hudon, M., & Mersland, R. (2017). From NGOs to banks: Does institutional transformation alter the business model of microfinance institutions? *World Development*, *89*, 19–33. doi:10.1016/j.worlddev.2016.06.021

Darko, F. A. (2013). *Commercialisation and efficiency of microfinance institutions in sub Saharan Africa*. UK: School of Economics, University of Kent.

Drukker, D. M. (2003). Testing for serial correlation in linear panel-data models. *The Stata Journal*, *3*(2), 168–177. doi:10.1177/1536867X0300300206

Ferrando, A., & Ruggieri, A. (2018). Financial constraints and productivity: Evidence from Euro area companies. *International Journal of Finance and Economics, 23*(3), 257-282.

Field, A. (2009). *Discovering statistics using SPSS* (3rd Ed.). New Delhi: Sage Publications, Inc.

Goddard, J., McKillop, D., & Wilson, J. O. S. (2008). The diversification and financial performance of US credit unions. *Journal of Banking & Finance*, *32*(9), 1836–1849. doi:10.1016/j.jbankfin.2007.12.015

Grossman, S. J., & Hart, O. D. (1982). Corporate financial structure and managerial incentives. In J. J. McCall (Ed.), *The economics of information and uncertainty* (pp. 107–140). University of Chicago Press.

Gujarati, D. (2004). *Basic econometrics* (4th ed.). New Delhi, India: Tata McGraw-Hill Education.

Gutierrez-Nieto, B., Carlos, S.-C., & Molinero, C. M. (2007). Microfinance institutions and efficiency. *Omega*, *35* (2), 131–142. doi:10.1016/j.omega.2005.04.001

Hamid, S., & Shabkhaneh, S. Z. (2012). Compensatory payment and labor productivity of industrial co-operatives in Iran. *Research Journal of Business Management*, *6*(4), 134–143. doi:10.3923/rjbm.2012.134.143

Haq, M., Skully, M., & Pathan, S. (2010). Efficiency of microfinance institutions : A data envelopment analysis. *Asia-Pacific Financial Markets*, *17*(1), 63–97. doi:10.1007/s10690-009-9103-7

Hartarska, V. (2005). Governance and performance of microfinance institutions in Central and Eastern Europe and the Newly Independent States. *World*

Development, *33*(10), 1627–1643. doi:10.1016/j.worlddev.2005.06.001

Ishengoma, E. (2010). Financial linkages and cost efficiency: Lesson from Tanzania Microfinance Co-operatives. *Business Management Review*, *14*, 1–22.

Ishengoma, E. (2013). Linkage banking and outreach: A case of Microfinance Co-operative in Tanzania. *Business Management Review*, *16*, 140–160.

Ishengoma, E., & Towo, N. (2016). Bank requirements and governance for savings and credit co-operative societies (SACCOS) in Tanzania and Kenya. *Enterprise Development and Microfinance*, *27*(3), 236–254. doi:10.13140/RG.2.1.2674.0323

Jensen, M. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *The American Economic Review*, *76*(2), 323–329.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*(4), 305–360. doi:10.1016/0304-405X(76)90026-X.

Kale, J., Ryan, H., & Wang, L. (2007). Debt as a bonding mechanism: Evidence from the relations between employee productivity, capital structure, and outside employment opportunities. Paper presented at the *Annual Conference on Financial Economics and Accounting*. New York University.. doi: 10.1094/PDIS-91-4-0467B.

Kaleshu, J., & Temu, S. (2012). Expansion of rural financial services through linkage banking in Tanzania: Is joint action between savings and credit cooperative societies (SACCOS) a promising approach? *Enterprise Development and Microfinance*, *23*(2), 146–160. doi:10.3362/1755-1986.2012.015.

Kar, A. K. (2012). Does capital and financing structure have any relevance to the performance of microfinance institutions? *International Review of Applied Economics*, *26*(3), 329–348. doi:10.1080/02692171.2011.580267

Klinedinst, M. (2010). *A strength of credit unions: Employee productivity of credit unions versus banks in the US. Munich Personal RePEc Archive paper No. 26296. http.//mpra.ub.uni-muenchen.de/26296/, Munich University Library.*

Kyereboah-Coleman, A. (2007). The impact of capital structure on the performance of microfinance institutions. *Journal of Risk Finance*, *8*(1), 56–71. doi:10.1108/15265940710721082

Kyereboah-Coleman, A., & Osei, K. A. (2008). Outreach and profitability of microfinance institutions : The role of governance. *Journal of Economic Studies*, *35*(3), 236–248. doi:10.1108/01443580810887797

Labie, M., & Périlleux, A. (2008). *Corporate Governance in Microfinance : Credit Unions. Universite Libre de Bruxelles, Centre Emile Bernheim working paper No. 08/003. Brussels, Belgium.*

Marwa, N., & Aziakpono, M. (2015). Financial sustainability of Tanzanian saving and credit co-operatives. *International Journal of Social Economics*, *42*(10), 870–887. doi:10.1108/IJSE-06-2014-0127

Mazure, G. (2016). Performance of international credit unions movement. *Proceedings of the Economic Science for Rural Development Conference, 2016.* Jelgava (pp. 323-332).

McKillop, D., & Wilson, J. (2011). Credit Unions: A theoretical and empirical overview. *Financial Markets, Institutions & Instruments*, *20*(3), 79–123. doi:10.1111/j.1468-0416.2011.00166.x

McKillop, D. G., & Wilson, J. O. S. (2015). *Credit Unions as co-operative unions: Distinctiveness, performance and prospects. Centre for responsible banking and finance No. 15-003, University of St Andrews, Scotland.*

Mia, A. (2015). Measuring financial and social outreach productivity of microfinance institutions in Bangladesh. *Social Indicators Research*. doi:10.1007/s11205-015-0979-5

Mia, A., & Soltane, B. B. (2016). Productivity and its determinants in microfinance institutions (MFIs): Evidence from South Asian countries. *Economic Analysis and Policy*, *51*, 32–45. doi:10.1016/j.eap.2016.05.003

Mori, N., Randoy, T., & Golesorkhi, S. (2013). Determinants of board structure in microfinance institutions: Evidence from East Africa. *Journal of Emerging Market Finance*, *12*(3), 323-365. doi: 10.1177/0972652713512916

Mundakkad, P. (2018). Firms' leverage and labour productivity: A quantile regression approach. *Economics Bulletin*, *38*(4), 2331–2344.

Myers, S. C. (1977). Determinants of corporate borrowing. *Journal of Financial Economics*, *5*(2), 147–175. doi:10.1016/0304-405X(77)90015-0

Nawaz, A. (2010). *Efficiency and productivity of microfinance : Incorporating the role of subsidies. Universite Libre de Bruxelles, Centre Emile Bernheim working paper No. 10/009. Brussels, Belgium.*

Ndiege, B., Qin, X., Kazungu, I., & Moshi, J. (2014). The impacts of financial linkage on sustainability of less-formal financial institutions : Experience of savings and credit co-operative societies in Tanzania. *Journal of Cooperative Organization and Management*, *2*(2), 65–71. doi:10.1016/j.jcom.2014.10.003

Nunes, P. M., Sequeira, T. N., & Serrasqueiro, Z. (2007). Firms ' leverage and labour productivity : A quantile approach in Portuguese firms. *Applied Economics*, *39*(14), 1783–1788. doi:10.1080/00036840600707076

Russell, L. A., Briggeman, B. C., & Featherstone, A. M. (2017). Financial leverage and agency costs in

agricultural co-operatives. *Agricultural Finance Review*, *77*(2), 312–323. doi:10.1108/AFR-09-2016-0074

Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students* (5th ed.). England: Pearson Education Limited.

Torres-Reyna, O. (2007). *Panel data analysis: Fixed and random effects using Stata*. Princeton University.

URT. (2016). *Savings and Credit Cooperative Societies Regulations of 2016*. Dar es Salaam: United Republic of Tanzania.

Weber, S. (2010). Bacon : An Effective way to Detect Outliers in Multivariate Data Using Stata (and Mata). *The Stata Journal*, *10*(3), 331–338. doi:10.1177/1536867X1001000302

WOCCU. (2009). *World Council of Credit Union toolkit series: Pearls monitoring system*. Madison, WI: World Council of Credit Union.

Wooldridge, J. (2013). *Introductory econometrics: A modern approach* (5th Ed.). USA: South Western, Cengage Learning.

World Council of Credit Union. (2016). *World Council of Credit Union 2016 Statistical report*. Washington, D.C.: World Council of Credit Union.

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