

Does intellectual capital matter to MFIs' financial sustainability?

effect of
intellectual
capital

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Abstract

Purpose – This paper examines the effect of intellectual capital (IC) on the financial sustainability of microfinance institutions (MFIs). The study is motivated by the increased calls for MFIs to be self-sustainable and the growing importance of knowledge-based assets as contributors of competitive advantage and sustained performance.

Design/methodology/approach – With a global sample of 444 MFIs and data for 2013–2018, which yielded 2,664 MFIs-year observations, this study examines the effect of IC on MFIs' financial sustainability. The data are extracted from the MIX Market database. Value added intellectual capital coefficients are used as proxy measures of IC. Operational self-sufficiency is used to measure financial sustainability. Data are analyzed using three-panel data estimation models: the fixed effect, the random effect and the dynamic panel system generalized method of moments.

Findings – The results show that human capital efficiency and capital employed efficiency have a positive and significant effect on the financial sustainability of MFIs. However, structural capital efficiency has a significantly negative effect on financial sustainability. These results confirm the relative importance of both tangible and intangible assets as important positive contributors of financial sustainability of MFIs.

Research limitations/implications – The paper focused on the association between IC and financial sustainability of MFIs. Therefore, examining nonfinancial institution may validate the contributions of this study.

Practical implications – Based on the findings, MFIs' managers are encouraged to leverage IC, physical and financial capital to attain financial sustainability. In particular, MFIs should invest in employees training and development. Additionally, owing to the positive relationship between physical capital and financial sustainability, there is need for policy interventions to ensure MFIs access adequate funding. The study further recommends mandatory disclosure of IC among MFIs.

Originality/value – This is the first paper to investigate the relationship between IC and the financial sustainability of MFIs using panel data and a global sample of MFIs; therefore, it lays an empirical ground for future studies.

Keywords Intellectual capital, Financial sustainability, Microfinance

Paper type Research paper

1. Introduction

Since the inception of the *Grameen* bank (GB) in 1983, microfinancing has emerged as a practical lending strategy for poor households and entrepreneurs. Microfinance institutions (MFIs) are key agents of sustainable development owing to their role in poverty alleviation

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Erratum: It has come to the attention of the publisher that the article Githaiga, P.N., Soi, N. and Buigut, K.K. (2023), "Does intellectual capital matter to MFIs' financial sustainability?", *Asian Journal of Accounting Research*, Vol. 8 No. 1, pp. 41-52. <https://doi.org/10.1108/AJAR-06-2021-0080>, was originally published with the tables/figures presented as supplementary material via external links that do not meet Emerald's latest repository requirements; these have now been amended and the supplementary material hosted here to ensure that it remains accessible in perpetuity: <https://doi.org/10.1108/AJAR-06-2021-0080>



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and financial inclusion (García *et al.*, 2018). MFIs need to be financially sustainable to serve poor borrowers characterized as having low deposits, unpredictable income and high default rate. Financial sustainability is the ability of MFIs to generate sufficient revenue to cover their total operating cost (Mia *et al.*, 2016). Prior studies reveal that financially sustainable MFIs attract more external funding, have a wider outreach and cross-subsidize their loans (Quayes, 2012; Ahmad *et al.*, 2020). Thus, financially sustainable MFIs have a higher prospect of achieving their social objective of reaching out to poor households. However, a review of existing literature further demonstrates reveal that many MFIs are not self-sufficient and are experiencing a negative growth (Khachatryan *et al.*, 2017; Microfinance Barometer Report, 2019). Bhanot and Bapat (2015) assert that MFIs should look beyond social performance to attain financial sustainability. There is evidence showing that MFIs are gradually shifting toward commercialization because of the declining donations (Mia *et al.*, 2019; Bayai and Ikhide, 2018). Inversely, the urge for financial sustainability through commercialization has been linked to a mission drift (Jia *et al.*, 2016).

Within the present knowledge economy and the growing concerns on sustainable development, firms' survival depend on leveraging intellectual capital (IC) for innovativeness, competitive advantage and sustainability (Li and Liu, 2018; Alvino *et al.*, 2020). The resource-based view (RBV) theory conjectures that sustained competitive advantage emanates from the effective exploitation of both physical and intangible resources (Barney, 1991). Correspondingly, the dynamic capabilities theory argues that the strategic acquisition, reconfiguration and deployment of intangible resources enable a firm respond and adapt effectively to a dynamic environment for sustainable competitive advantage (Singh and Rao, 2016). Therefore, for MFIs to be achieve their mission there is need to understand how knowledge assets such as IC contributes to their financial sustainability. Alvino *et al.* (2020) associates IC with long-term firm value and sustainability. Dal Mas (2019) further suggests a reverse causality between IC and sustainability. Pulic and Kolakovic (2003) defines IC as the unique skills, knowledge and solutions that create economic value. Therefore, IC is a collection of firm knowledge and capabilities that generate competitive edge and maximize shareholders wealth. The main dimensions of IC are human capital, structural capital (SC) and relational capital (Chen *et al.*, 2020).

Existing studies show that intangible assets such as IC drive firm performance; however, there is little empirical evidence to show how IC affects MFIs' financial sustainability (Jordão, 2017; Dal Mas, 2019). Only a few studies have examined the association between IC and MFI financial performance (Hashim *et al.*, 2018; Barpanda and Bontis, 2021). Yet, some authors attribute MFIs failure to underutilization of human resource and low investment in R&D and technology (Jha and Singh, 2015). Therefore, this study seeks to contribute to the current debate on MFIs' financial sustainability by investigating the effect of IC on the financial sustainability of MFIs.

A global dataset of 444 MFIs for 2013 to 2018 and the SGMM are used to test the hypotheses. IC is measured using the value added intellectual capital (VAIC) model, while operational self-sufficiency (OSS) as a proxy for financial sustainability. The findings reveal that IC is a key driver of MFIs' financial sustainability. This study has several managerial and policy contributions. First, it contributes to the gap in literature by examining the effect of IC on MFIs' financial sustainability. Second, the findings reveal the importance of tangible and intangible assets in the achievement of MFIs' objectives. Thus, MFIs should leverage IC resources and financial capital to attain financial sustainability. Finally, the study recommends reforms in disclosure of IC as a determinant of a MFI financial sustainability. The rest of the paper is organized as follows. Section 2 provides an overview of the MFI sector and a review of literature. Section 3 describes the data, measurement of variables and the estimation model. Section 4 presents the empirical results, descriptive statistics, correlation analysis and regression results. Section 5 concludes the paper.

2. Institutional setting and review of literature

2.1 Overview of the global micro finance sector

Microfinance institutions (MFIs) are drivers of socio-economic development as they help alleviate poverty and promote entrepreneurial activities through access to cheap credit. MFIs strive to bridge the financing gap created by the traditional banking system by availing financial services to the unbanked and poor population considered “high-risk borrowers” (Niklis *et al.*, 2019). Over the decades MFIs have generated considerable enthusiasm that culminated in the Nobel Peace Prize award to Muhammad Yunus and the GB in 2006 (Nawaz, 2019). According to the MIX Market, there are approximately 3,114 MFIs; however, the number may be higher since reporting to the MIX Market is voluntary. As of 1999, 754 MFIs were reporting to the MIX Market and had a gross loan standing at USD 1.766 billion, 9.104 million active borrowers, total assets worth USD 1.344 billion and an average return on assets (ROA) of 0.025. The global statistics show that these MFIs received donations worth USD 62.437 million in the same year, while the leverage ratio was 6.047. By 2018, the MFI sector had an average ROA of 0.025, a gross loan portfolio of USD 108.722 billion, 88.701 million active borrowers, total assets worth USD 136.808 billion and the average leverage stood at 6.082. However, the donations declined to USD 20.112 million. These statistics suggest several things. First, MFIs have expanded in breadth and are now serving more customers. Second, MFIs performance remained significantly constant over the decade. Third, subsidies and donations declined over the period, which perhaps explains the shift toward commercialization of services and increased leverage.

While there are disparities in MFIs regulatory framework across jurisdictions, the general objective of these regulations is to stimulate financial inclusion, protect the integrity of the microfinance sector, protect consumers and depositors, and ensure MFIs adhere to good corporate governance. Recently, there have been calls for a more unified, less fragmented structure for credit regulation that cuts across all financial sector participants. In the advent of financial technologies, MFIs have witnessed major technological transformations in operation, such as Internet and mobile banking, enabling MFIs to reach more customers and lower operating costs. Using mobile banking applications, MFIs can offer varied mobile phone-based banking services, for instance, loans, withdrawals, deposits and insurance.

2.2 Intellectual capital and financial sustainability of MFIs

IC performance is usually measured by VAIC model, which consists of three efficiencies: human capital efficiency (HCE), structural capital efficiency (SCE) and capital employed efficiency (CEE). HCE measures the value added by investing in human resources (Chen *et al.*, 2004). Human capital theories claim that attracting and retaining high quality workforce generates competitive advantage and superior performance (Delery and Roumpi, 2017). Likewise, the RBV suggests that human capital is a unique internal resource and the main driver of organizational outcomes (Barney, 1991). Scholars also contend that human capital is the main pillar of IC (Moon and Kym, 2006). Mariz-Pérez *et al.* (2012) also note that human capital plays a role in enhancing a firm’s innovative capacity. Employees’ skills generate the necessary knowledge required in this production of goods and rendering of services, therefore significantly determining the performance of the firms. Mavridis (2004) found that well-performing Japanese banks were the most efficient in managing their human capital. Similarly, Sharabati *et al.* (2010) and Chowdhury *et al.* (2019) report a positive relationship between HCE and firm performance. A study by Ousama *et al.* (2019) found a positive and significant relationship between HCE and the performance of Islamic banks operating in the Gulf Cooperation Council (GCC) countries. Al-Musali and Ismail (2016) found a significantly positive association between HCE and the financial performance of banks in Bahrain, Saudi Arabia, Oman and Kuwait. However, the study reported a significantly negative relationship

between HCE and ROA among banks in Qatari and UAE. [Weqar et al. \(2021\)](#) study shows interesting findings on the relationship between HCE and firm performance indicators. The effect of HCE on ROA is significant and positive; however, HCE has no significant effect on asset turnover ratio (ATO) and return on equity. Therefore, based on empirical literature and the RBV, we hypothesize the following:

H1. HCE has a significant effect on financial sustainability of MFIs.

SCE measures how much capital has been created by SC. SC denotes what remains in an organization when employees go home ([Roos et al., 1997](#)). [Hsu and Wang \(2012\)](#) view SC as comprising operations, systems and procedures. SC (also referred to as organizational capital) denotes structures of an organization that enable employees to achieve optimal IC performance. Employees may have the highest attainable intellectual level; however, if the organization lacks an efficient structure, systems and processes that support their contribution to be effective, then the company will not benefit from their full potential ([Hasan and Cheung, 2018](#)). Therefore, the role of SC is to coordinate, organize, preserve and institutionalize knowledge based on an organization's systems and procedures. [Bozbura \(2004\)](#) notes that SC transforms human capabilities into economic value. From a SC perspective, the success of a firm is crucially dependent on appropriate technologies, a good organization structure, favorable policies and having a supportive culture. Recent evidence confirm that organizational structure and culture have a significant impact on firm performance ([Tan, 2019](#)). However, studies on SCE and firm performance show mixed findings. [Bontis et al. \(2000\)](#) report a positive relationship between SCE and financial performance of Malaysian firms. In contrast, [Ousama et al. \(2019\)](#) and [Ozkan et al. \(2017\)](#) and [Weqar et al. \(2021\)](#) found no statistically significant association between SCE and performance. Therefore, we hypothesize the following:

H2. SCE has a significant effect on MFIs' financial sustainability.

CEE an indicator of the value added (VA) efficiency of capital employed. Capital employed (also known as physical or financial capital) is the money, debt and other sources of finance that strengthen the value of the firm. CEE captures the efficiencies that SCE and HCE fail to capture ([Clarke et al., 2011](#)). [Pulic \(1998\)](#) argues that IC cannot create value independently; IC must be supported by tangible capital. Financial capital is very important for financial institutions such as banks and MFIs that are engaged in direct lending. For instance, [Anglin et al. \(2020\)](#) notes that while MFIs have a huge potential in fighting poverty most of them are struggling to find sufficient capital to support their operations. Similarly, a study by [Nwanyanwu \(2011\)](#) shows that inadequate financing is a major challenge facing the microfinancing sector. Recent studies also show a significant relationship between CEE and MFIs' performance. [Chauhan et al. \(2022\)](#) found a positive and significant relationship between capital structure and social and financial performance dimensions of MFIs. [Chikalipah \(2019\)](#) found a significantly positive relationship between equity and the financial performance of MFIs. The author further found that debt and microsavings negatively affected the financial performance of MFIs. While access to adequate financing improves MFIs performance, recent studies show that the use of commercial debt hinders the achievement of MFIs' social mission of serving the poor ([Jia et al., 2016](#)). Studies on the CEE and firm performance show mixed findings. For example, [Chowdhury et al. \(2019\)](#) found that CEE had a positive effect on performance among Bangladesh pharmaceutical companies. [Zeghal and Maaloul \(2010\)](#) and [Ousama et al. \(2019\)](#) reported similar findings. [Weqar et al. \(2021\)](#) found that CEE positively and significantly affected financial institutions' profitability (ROA). However, CEE did not affect the ATO. Consequently, this study hypothesizes the following:

H3. CEE has a significant effect on MFIs' financial sustainability.

3. Methodology

3.1 Data and sample

The study uses a global data set of MFIs obtained from the MIX Market (Microfinance Information Exchange), a web-based platform that contains comprehensive financial and operational data on more than 3,000 MFIs globally that offer microcredit services to over 140 million borrowers across the world. The essential advantage of the MIX Market database is the large number of MFIs. At the same time, a significant limitation is that submitting data by MFIs voluntarily leads to possible self-selection bias. However, the financial reports (income statements and balance sheets) of the MFIs are audited relatively reliable. Previous studies have also used the database (Quayes, 2012; Ayayi and Sene, 2010; Memon *et al.*, 2020). The study period is between 2013 and 2018, which witnessed a relatively regular voluntary reporting of financial data to the MIX Market. The study employed an inclusion/exclusion criterion to screen eligible MFIs: the firm must have been in operation throughout the study period and data were complete. After applying the inclusion/exclusion criterion, the final sample consisted of 444 MFIs that yielded 2,664 firm-year observations for the sample period ranging from 2013 to 2018.

3.2 Variable definition and measurements

This study has three sets of variables: the dependent variable (financial sustainability), the independent variable IC (VAIC) and four control variables (firm size, leverage, income diversification and breadth of outreach).

3.2.1 Financial sustainability. This study uses OSS, the ratio of financial revenue to the sum of financial expenses, loan loss provision expenses and operating expenses, as the proxy measure of financial sustainability (Rosenberg, 2009; Jordão, 2017). The strength of this measure is that it is an indicator of whether the MFI can afford its operating costs. Nurmakhanova *et al.* (2015) further argue that OSS does not account for subsidies received for operating expenses; hence, an objective indicator of a firm's ability to cover operating costs using internally generated income. OSS value greater than 1.1 implies that the MFI is financially sustainable and has adequate revenue to cover its operating costs. Conversely, if the ratio is less than 1, the MFI is considered unsustainable. However, a very high value may signify that the MFI exploits its clients.

3.2.2 Intellectual capital. IC is the study's predictor variable. Value Added Intellectual Capital VAICTM is a widely used proxy measurement of IC. VAICTM comprises three components that are HCE, SCE and CEE. VAICTM is calculated as follows (Pulic, 2000):

$$VAIC^{TM} = HCE + SCE + CEE$$

VAICTM is derived from the total value generated by the firm VA, which is calculated as shown below.

$$VA = OP + EC + A$$

OP represents the firm's operating profit, EC denotes the employee (staff) costs, whereas A is the amortization and depreciation. The respective efficiencies are computed based on the VA. HCE is the ratio of VA to HC; HC is the total employee costs or payroll expenditure (staff salaries, pension, insurance and related expenses).

$$HCE = VA/HC$$

SCE is the ratio of total expenses on SC, VA – HC, to VA and is calculated as;

$$SCE = SC / VA$$

CEE is obtained by dividing its VA by the capital employed and the book value of the net assets (CE). A high coefficient indicates higher value creation using the firm's resources, including IC.

$$CEE = VA / CE$$

3.2.3 Control variables. The study controls for MFI-specific characteristics to insulate the effect of IC on MFIs' financial sustainability. There is a trade-off between the breadth of outreach and the financial sustainability of MFIs. MFIs seeking financial sustainability will focus on financial performance rather than targeting poor clients. Following previous studies, breadth of outreach is measured as the natural logarithm of the number of active borrowers (Memon *et al.*, 2020; Churchill, 2020). High leverage complements the internal governance mechanism. In particular, debt improves profitability and minimizes misappropriation of cash due to debt obligations and possible liquidation (Williams, 1987). Thus, the study includes the ratio of debt to equity as a control (Quayes, 2012; Bayai and Ikhide, 2018). Firm size is likely to affect financial sustainability. Large MFIs have higher financial and outreach efficiency, attributed to cost advantages arising from economies of scope. MFIs' size is measured as the natural logarithm of total assets (Lensink *et al.*, 2018). As a survival strategy, financial institutions diversify into a wide range of non-traditional lending activities to increase income and mitigate risk related to credit crunch. Therefore, MFIs with a large share of non-interest income are more likely to be financially sustainable. Income diversification is computed using the Herfindahl–Hirschman Index of income specialization (Chiorazzo *et al.*, 2008).

3.3 Estimation model

This study focuses on the effect of IC (measured using VAIC) on the financial sustainability of MFIs. The study adopts the econometric model.

$$FSN_{i,t} = \alpha + \beta_1 HCE_{i,t} + \beta_2 SCE_{i,t} + \beta_3 CEE_{i,t} + \beta_4 Z_{i,t} + \varepsilon_{i,t}$$

Where, $FSN_{i,t}$ represents financial sustainability; $HCE_{i,t}$ represents human capital efficiency; $SCE_{i,t}$ represents SC efficiency, and $Z_{i,t}$ represents the control variables. $\varepsilon_{i,t} = v_i + \gamma_t + \mu_{i,t}$ is the disturbance term. Where γ_t represents the unobservable time effects, v_i is the unobserved complete set of country and MFI-specific effects and $\mu_{i,t}$ is the idiosyncratic error. The study deploys a set of panel data estimation models (fixed effect [FE], random effect [RE]) and the system generalized method of moments) to investigate the relationship between the research variable. Following the work of Baltagi (2005), Arellano and Bond (1991) and Blundell and Bond (1998), the study applies the system generalized method of moments (S-GMM) to test hypotheses. S-GMM use internally generated instruments to account for endogeneity. STATA 13 software is used for the analysis due to its wide application and acceptance in panel data estimation models.

4. Empirical findings

4.1 Descriptive statistics and correlation results

Table A1 (Appendix) presents the descriptive statistics of the research variables. The mean FSN of 1.150 selected MFIs are financially sustainable. The standard deviation of 24.3% implies a low variation in financial sustainability among the MFIs as it is below the mean value. The means of HCE (0.587), SCE (0.628) and CEE (0.121), are slightly lower compared to those reported by Nadeem *et al.* (2018) among listed firms in Australia, Chowdhury *et al.* (2019) in the Bangladeshi's pharmaceutical industry and Ozkan *et al.* (2017) among Turkish banking firms. Therefore, the MFIs sector can be classified among those with low IC performance. The results of the pairwise correlation matrix are presented in Table A2 (Appendix). HCE and CEE are positively associated with MFIs' financial sustainability. Conversely, SCE is negatively correlated with MFIs' financial sustainability. For the control variables, while the breadth of outreach, MFIs' size and income diversification are positively correlated with the financial sustainability of MFIs, leverage is significantly negatively correlated.

4.2 Regression results

Table A3 (Appendix) presents the regression results for the three-panel data estimation techniques: FE, RE and the S-GMM. S-GMM is used as an efficient estimator for examining the relationship between IC and financial sustainability of MFIs. Therefore, the results of two-step system GMM are more robust as opposed to those of the first difference GMM. Based on Table A3, the relationship between the components of VAIC (HCE, SCE and CEE) and financial sustainability is statistically significant. Therefore, H1, H2 and H3 are supported. These findings are consistent with the RBV theory's argument that proper management and strategic alignment of IC resources improves a firm's financial sustainability. HCE has a significant and positive effect on the financial sustainability of MFIs. These findings are consistent with those of Sharabati *et al.* (2010) and Chowdhury *et al.* (2019) who reported a positive association between HCE and performance. Borrowing from RBV and human capital theories, the findings emphasize the importance of firm-specific human capital as a driver of competitive advantage and firm sustainability. In addition, as doorstep financial institutions, MFIs depend on their loan officers' abilities, skills and motivation to reach out to more clients and monitor loan repayment. Therefore, human resource practices such as recruitment of qualified employees, training, motivation, performance appraisal and compensation are positive drivers of MFIs' financial sustainability. The second hypothesis sought to examine the effect of SCE on the financial sustainability of MFIs. Unexpectedly, the regression results show a significantly negative relationship between SCE and the financial sustainability of MFIs. Ousama *et al.* (2019) found a negative and insignificant association between SCE and performance. These findings suggest that organizational culture, systems, processes and procedures are not enablers of MFIs' financial sustainability. There are several probable explanations for these findings. First, acquiring and maintaining SC (for instance, information and communication technologies) is very expensive. MFIs must decide to either hold high financial capital for lending purposes or invest in expensive technologies. Second, one of the VAIC model's shortcomings is the failure to measure the constituent components of SC: process capital and innovation capital. Finally, microfinancing is relatively a new lending concept and the structural inertia theory provides some understanding of how SC creates competitive advantage and sustainable firms. However, the value of SC increases with age, implying that older firms are more likely to benefit from organizational culture, information systems and organizational processes. Inversely, younger firms or older firms that attempt structural reorganization are more likely to fail. The third hypothesis sought to determine the effect of CEE on the financial sustainability of MFIs. The results reveal that CEE is positively and significantly associated with the financial sustainability of MFIs. Thus, H3 is supported and the results are related to Zeghal and Maaloul (2010). Like other lending institutions, the success of MFIs is largely influenced by their ability to mobilize deposits and efficiently turn them into loans. The positive association between CEE and financial sustainability suggests that managers should optimize the use of physical and financial capital to realize financial sustainability.

4.3 Robustness checks

We also did some additional tests to ensure that the results are robust and consistent. As presented in Table A3, we retested with two additional panel data estimation models; the FE and RE and the result shows the consistency of the findings. Then, we performed the Hansen tests of over-identifying restrictions that yield *p-values* of 0.121, and as such, we fail to reject the hypothesis that our instruments are valid. Similarly, the results of the Arellano–Bond (AR) test, precisely the AR (2) second-order serial correlation test, reveals a *p-value* of 0.657. This means that we cannot reject the null hypothesis of no second-order serial correlation. The results of the difference-in-Hansen (DiH) test of exogeneity show a *p-value* of 0.820.

This indicates that we fail to reject the hypothesis that the additional subset of instruments employed when estimating the dynamic system GMM estimator in levels is exogenous. Taken together, these results indicate goodness of fit of the system GMM estimator.

5. Conclusion

MFIs are agents of financial inclusion and sustainable development. Conversely, MFIs face numerous challenges that threaten their financial sustainability and ability to serve the poor. For that reason, what drives financial sustainability of MFIs remains a topical issue in research, industry and policymaking. Knowledge-based assets are gradually becoming important source of competitive advantage and long-term survival. Specifically, MFIs must invest in human capital and financial innovations to continue serving the poor households while at the same time be self-sufficient. Therefore, this study sought to examine the effect of IC on the financial sustainability of MFIs. The study used a global sample of 444 and data for 2013–2018. The empirical findings show that HCE and CEE had a significant positive effect on the financial sustainability of MFIs. Conversely, the association between SCE and the financial sustainability of MFIs was significantly negative. The findings provide a strong empirical evidence that components of IC drive financial sustainability of MFIs. As a consequence, these findings have managerial, theoretical and policy implications. MFIs' managers are encouraged to leverage IC and financial capital to realize full financial sustainability and ultimately maximize shareholders' wealth. Specifically, MFIs should invest more in human resource development, adoption of financial technologies and the development of a supportive organizational structure and culture. There is need to raise managerial awareness of the significance of the IC to organizational outcomes. Therefore, the regulators can contribute in the acquisition of key technologies and offer technical assistance in development of managers and practitioners in the sector. The study further recommends the need for financial reporting policies on IC disclosure to aid managers and investors in making strategic decisions and reveal to the public the hidden firm value in knowledge-based resources. From a theoretical perspective, the findings support the RBV theory on the importance of firm-specific resources (both tangible and intangible) as a source of sustainability. Despite the novelty of this study, the use of VAIC as a measure of IC presents several limitations. First, VAIC as a measure of IC fails capture relational capital an important element of IC. Second, VAIC ignores a possible interaction between the components. Third, VAIC cannot handle firms that disclose negative profits or negative book value. Thus, future researchers may consider using qualitative measures of IC that might shed light on the IC and financial sustainability relationship. Future studies could reconsider the IC and financial sustainability by focusing on nonfinancial sectors of the economy such as health care, education and manufacturing.

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Further reading

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Supplementary material

The supplementary material for this article can be found online.

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