

Impact of the Increasing Adoption of a Commercial Approach on Microfinance Institutions.

Abstract

Purpose

This study examines the impact of the increasing adoption of a commercial approach on the financial performance and outreach of Microfinance Institutions (MFIs). Drawing on institutional theory, it investigates whether commercialisation enhances MFIs' financial performance and outreach, while also considering the risk of mission drift.

Design/methodology/approach

A two-step system Generalized Method of Moments (GMM) estimation is applied to a dataset of 2,102 MFIs across 114 countries over a 15-year period. The study evaluates both traditional financial performance measures such as return on assets (ROA) and operational self-sufficiency (OSS), and outreach indicators, including number of active borrowers (NAB), average loan size (ALS), and new measures such as market share of borrowers (MSB) and market share by assets (MSBA). Robustness checks, including the Arellano-Bond and Hansen test, confirm the validity of the instruments and the reliability of the results. Further, we conducted mean difference tests to confirm the results.

Findings

Results show that commercialisation has no significant effect on the financial performance of MFIs. However, commercialisation is positively associated with breadth of outreach, as reflected in an increased numbers of active borrowers and with the depth of outreach, as reflected in larger average loan sizes. The increase in average loan size suggests a shift away from serving the poorest clients, indicating mission drift. Additional results reveal that overall, commercial MFIs are moving toward larger scale and profitability, but with reduced focus on their traditional social mission.

Originality/value

This paper extends the debate on commercialisation and mission drift in microfinance by using a large cross-country dataset and multiple outreach measures, going beyond previous region-specific studies. It challenges the effectiveness of new outreach indicators like MSBA in dynamic panel models and highlights the trade-offs between social and financial goals. The findings provide valuable implications for policymakers and practitioners, suggesting the need for frameworks that encourage MFIs to balance legitimacy, scale, and sustainability with their original poverty-alleviation mission.

Keywords: Microfinance, Commercial Approach, Financial Performance, Outreach, GMM.

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1. Introduction

Microfinance Institutions (MFIs) are widely recognised for their role in providing financial services to low-income populations in developing countries, where a large share of the population consists of low-income earners. They have received considerable attention from international development agencies, as they are regarded as one of the most effective tools for fighting poverty (Dutta & Banerjee, 2015). This recognition largely stems from their provision of credit facilities to the poor, enabling them to start or expand micro-businesses and ultimately improve their living standards (Bradford *et al.*, 2020; Battilana & Lee, 2014; Khan *et al.*, 2021).

Historically, MFIs operated as non-commercial entities, relying on donations, government subsidies, grants, and members' savings to sustain their work (D'Espallier *et al.*, 2013; D'Espallier *et al.*, 2017; Beisland *et al.*, 2021). However, due to the considerable costs involved, this model proved unsustainable. As a result, some practitioners and policymakers began advocating for the adoption of a commercial approach in the microfinance industry (Mersland & Strøm, 2010; Beisland *et al.*, 2021). Consequently, many non-commercial MFIs started to embrace commercialisation, a process that has increased significantly across many developing countries in recent years (Singh, 2024; Nazariah *et al.*, 2024; Sarma & Mishra, 2022).

Only a few studies have examined the impact of MFIs' adoption of a commercial approach on financial performance and outreach, and their findings are not consistent. Some studies support commercialisation, suggesting that it positively affects both financial performance and outreach (Hossain, 2013; Lensink, 2011; Berger *et al.*, 2006). Others report negative impacts on these outcomes (D'Espallier *et al.*, 2017; Abrar & Javaid, 2014; Louis & Baesens, 2013), while some find no significant effect at all (Mersland & Strøm, 2009; Leite *et al.*, 2019; Nurmakhanova *et al.*, 2015). These mixed results create uncertainty, which may be attributed to differences in analytical techniques and variables used across studies. Therefore, there is a clear need to employ a rigorous econometric approach, such as dynamic panel GMM, to better investigate the relationship between the increasing commercialisation of MFIs, their financial performance, and outreach.

Consequently, this study investigates the impact of MFIs' adoption of a commercial approach on their financial performance and outreach. To address the gap identified in the critical literature review (see Section 2), the study seeks to answer two key questions: (i) What effect does the adoption of a commercial approach by MFIs have on their financial performance? and (ii) What effect does it have on their outreach? This study makes three main contributions to the literature. First, it provides one of the most comprehensive empirical examinations of the commercialisation of MFIs to date, drawing on data from 2,102 MFIs across 114 countries over a 15-year period. This extensive coverage allows for greater generalisability and a more reliable understanding of the effects of commercialisation than prior studies. Second, it addresses a methodological gap by applying the GMM technique, a more robust method that effectively addresses endogeneity concerns (Roodman, 2009). This issue may arise from reverse causality between commercialisation and MFI performance (i.e., better-performing MFIs might self-select into commercialisation) as well as from omitted variable bias. Lastly, this is the first study to apply the harmonised outreach indicators developed by Bibi *et al.* (2018), enabling a more standardised assessment of outreach alongside traditional measures such as the number of borrowers and average loan size.

This dual approach improves the precision of outreach measurement and facilitates systematic comparison between traditional and newer proxies, thereby generating fresh insights into how commercialisation influences both the breadth and depth of MFIs' outreach. Taken together, these contributions move beyond merely confirming existing findings. They enrich the ongoing debate on the microfinance schism, clarify contradictory prior results, and highlight the importance of methodological and measurement innovations in shaping conclusions about the effects of commercialisation.

Subsequent sections of this paper are organised as follows. Section 2 presents a review of the extant literature from which the hypotheses have been developed. Section 3 presents the data and methodological approach applied in this study and the reasons for applying the GMM estimation technique. The study's results and discussion are shown in Section 4. Section 5 presents the policy implications of this study and provides suggestions. Finally, Section 6 presents our conclusion.

2. Literature Review and Hypothesis Development

The adoption of a commercial approach by MFIs can be explained through institutional theory, which posits that organisations adapt their practices in response to institutional pressures, norms, and expectations in order to gain legitimacy and ensure survival (DiMaggio & Powell, 1983; Scott, 2014). MFIs, historically operating under non-commercial, donor-driven models, have faced increasing pressure from international development agencies, investors, and policymakers to become financially sustainable and reduce dependency on subsidies. As a result, many MFIs have adopted commercial practices such as mobilising savings, accessing capital markets, and improving efficiency in service delivery (Mersland & Strøm, 2010). This shift reflects coercive and normative institutional pressures that encourage commercialisation as a pathway to legitimacy and long-term viability.

From the perspective of the resource-based view (RBV), commercialisation equips MFIs with enhanced access to financial and managerial resources, enabling them to improve efficiency and sustainability (Barney, 1991). Access to commercial capital markets and reliance on internal revenue generation, rather than subsidies, provide MFIs with stronger financial autonomy. This autonomy is expected to enhance their financial performance through improved Return on Assets (ROA) and Operational Self-Sufficiency (OSS). ROA captures profitability relative to assets, while OSS reflects an institution's ability to cover operational costs through internally generated revenues, both critical indicators of financial sustainability (Cull *et al.*, 2007). Therefore, integrating institutional theory and the RBV suggests that commercialisation not only responds to external legitimacy pressures but also strengthens internal capabilities that improve financial outcomes.

Two schools of thought on microfinance institutions and resources have emerged, which Morduch (2000) described as the "*microfinance schism*." At the centre of this schism is the welfarist view that MFIs should remain non-commercial and focus on social welfare, whereas institutionalists argue that MFIs need to operate in a more commercial form. Both sides contend that their approach provides the best solution for poverty alleviation, assuming that small loans (depth of outreach) to many poor people (breadth of outreach) can help reduce poverty, as borrowers may use these loans to start micro-businesses and eventually escape poverty. Such proxies are widely used in the literature because poverty alleviation itself

is complex to measure (Olareswaju, 2018; Beisland *et al.*, 2021). Although numerous MFIs have adopted commercial models, many remain non-commercial, continuing to rely primarily on subsidies and donations (D'Espallier *et al.*, 2017).

The welfarist school maintains that poverty reduction should be the primary goal of MFIs. This belief was foundational to the establishment of Grameen Bank (GB), the first formal MFI, in the late 1970s. Welfarists argue that microfinance should be seen as an integrated programme for poverty alleviation and the improvement of poor people's well-being. They also contend that social investors should be driven by an intrinsic desire to help the poor rather than by financial returns. According to welfarists, commercial MFIs deviate from the core mission of microfinance, weakening organisational commitment to the poor (Christen & Drake, 2002). Moreover, they argue that many poor clients cannot bear the burden of commercial loans, as the interest rates are relatively high. Thus, the main concern of welfarists is that MFIs' adoption of a commercial approach harms their most vulnerable clients and undermines the industry's fundamental goal of delivering social welfare.

2.1 Commercial Approaches and Their Positive Impact

The commercial school, also known as the *institutionalists*, argues that MFIs should adopt a commercial model to achieve self-sustainability and, ultimately, facilitate poverty alleviation. This shift is often explained through institutional theory, which suggests that organisations adopt practices in response to institutional pressures, norms, and expectations in order to gain legitimacy and ensure survival (DiMaggio & Powell, 1983; Scott, 2014). They emphasise financial independence, where MFIs meet costs through self-generated funds rather than relying on subsidies or donations (Mersland & Strøm, 2010). Moreover, institutionalists believe that commercialisation creates a “win-win” situation, simultaneously increasing outreach and sustainability while delivering social benefits.

Institutional theory suggests that MFIs adopt commercialisation strategies to align with external legitimacy pressures and to secure critical resources for survival (DiMaggio & Powell, 1983). From the resource-based view, commercialisation allows MFIs to leverage financial, managerial, and technological resources that strengthen their ability to generate competitive advantage and improve performance metrics

such as ROA (Barney, 1991). Moreover, signalling theory indicates that commercialisation signals credibility and financial discipline to investors and stakeholders, which helps attract investment and improve operational efficiency (Connelly *et al.*, 2011). Empirically, commercialisation has been shown to positively influence ROA by improving portfolio quality and cost efficiency (Cull, Demirgüç-Kunt, & Morduch, 2009). Similarly, Operational Self-Sufficiency (OSS) is expected to benefit from commercialisation, as commercially oriented MFIs often adopt rigorous governance structures and performance monitoring mechanisms that reduce subsidy dependence and promote sustainability (Mersland & Strøm, 2010).

Furthermore, adopting a commercial approach is expected to positively influence the outreach of MFIs by expanding both the number of active borrowers (NAB) and the average loan size (ALS). According to institutional theory, commercialisation enables MFIs to adapt to market norms and external pressures, thereby securing legitimacy and resources that facilitate outreach expansion (DiMaggio & Powell, 1983). Resource dependency theory further posits that commercial MFIs, by gaining access to diverse funding sources, are better positioned to scale their operations and serve more clients (Pfeffer & Salancik, 2015). The financial intermediation theory suggests that commercialisation improves the efficiency of resource allocation, allowing MFIs to provide larger loans and broaden their borrower base (Jensen & Meckling, 1976). According to Brau and Woller (2004), financial viability and sustainability are essential to the success of inclusive financial provision for the poor. Thus, institutionalists advocate for the establishment of sustainable MFIs capable of adequately serving low-income populations, an approach increasingly adopted by commercial MFIs.

Studies such as Berger *et al.* (2006) also highlighted the case of Compartamos in Mexico (2004–2005), which achieved exceptionally high returns and attracted 400,000 clients by September 2005. Lensink (2011) also argued that commercialisation is essential for expanding MFIs' funding base, particularly in developing nations where access to financial services remains limited. Chahine and Tannir (2010) further demonstrated that the transformation of NGOs into commercial MFIs can positively influence financial performance. Similarly, Hossain (2013) found that adopting a commercial approach

enhances financial performance by improving cost recovery and efficiency. Therefore, based on the review, we proposed following *Hypothesis 1*:

Hypothesis 1 (H1): *Adopting a commercial approach has a significant positive effect on MFIs' financial performance.*

H1a: Adopting a commercial approach has a significant positive effect on MFIs' Return on Assets (ROA).

H1b: Adopting a commercial approach has a significant positive effect on MFIs' Operational Self-Sufficiency (OSS).

2.2 Drawbacks of a Commercial Approach

Although MFIs have been increasingly commercialised over the past two decades, their commercialisation activities did not receive serious scrutiny until the “*Andhra Pradesh crisis*” in India in 2010. In this case, MFIs' commercial orientation led to aggressive market penetration, followed by market saturation, over-lending, and client over-indebtedness (Maes & Reed, 2012). Similar issues were later reported in Bosnia, Morocco, Pakistan, Bolivia, and Nicaragua, although the dynamics varied (Maes & Reed, 2012; Hossain, 2013; Schicks, 2013). Following these incidents, several studies investigated commercialisation in microfinance. For example, Louis and Baensens (2013) found that commercial MFIs are no more efficient than non-commercial ones and demonstrate shallower outreach. Similarly, D'Espallier *et al.* (2017) found that transformed (commercial) MFIs tend to provide larger loans compared to NGO-based MFIs.

Other studies have similarly indicated that commercialisation negatively affects outreach (Chahine & Tannir, 2010; Abrar & Javaid, 2014). Similarly, Mumi *et al.* (2020) found that non-commercial MFIs are better at achieving depth of outreach, largely due to their reliance on informal networks that reinforce their social goals. They also reported that non-commercial MFIs often outperform commercial MFIs in terms of financial performance. Further, Sherpa (2025) reported negative impact of commercialisation of

MFIs on their financial sustainability in short run and on the depth of outreach. This aligns with the mission drift literature, which suggests that commercialisation is positively associated with the breadth of outreach (higher NAB) and also with the depth of outreach (larger ALS). However, the positive relationship with ALS indicates an increase in average loan size, which is commonly interpreted as a proxy for mission drift, reflecting a shift toward serving relatively less-poor clients (Karrer–Rüedi, 2011).

Collectively, grounded in institutional theory, resource dependence theory, and financial intermediation theory, and supported by empirical findings, this study proposes the following *Hypothesis 2*:

Hypothesis 2 (H2): *Adopting a commercial approach has a significant positive relationship with MFIs' outreach.*

H2a: *Adopting a commercial approach has a significant positive relationship with MFIs' number of borrowers (NAB).*

H2b: *Adopting a commercial approach has a significant positive relationship with MFIs' average loan size (ALS).*

2.3 Adoption of a Commercial Approach and Its Lack of Relationship

Other studies, however, found no relationship between commercialisation and MFI's performance. Mersland and Strøm (2009) reported no significant differences between commercial and non-commercial MFIs in terms of financial performance or outreach. Likewise, Cull *et al.* (2007) found no significant effect of commercial orientation on MFI profitability or sustainability. Similarly, Nurmakhanova *et al.* (2015) reported no relationship between commercial orientation and outreach, while Leite *et al.* (2019) found that commercialisation does not significantly affect financial sustainability. This discussion highlights the need to further investigate the consequences of the growing commercialisation of MFIs.

3. Data and Methodological Approach

3.1 Data

The data relating to MFIs were collected from the MIX Market, which is the optimal platform from which to gather data about individual MFIs from around the world (Singh, 2024). The data is self-reported and ranked based on its quantity and quality using a 5-diamond system (5 diamonds indicate data that is audited and available for at least 3 years; 4 indicate data that is audited and available for at least 2 consecutive years; 3 mean that the general information, outreach and financial data is available for two consecutive years; 2 mean that outreach data is available for two consecutive years; and 1 means that only general information is available). This research only used data that was ranked at 3 or more diamonds, in line with good practice (Assefa *et al.*, 2013).

The data relating to world governance and macroeconomic conditions were collected from the World Bank database (www.worldbank.org), while economic freedom-related data was drawn from the Heritage Foundation website (www.heritage.org). The data from these sources have been included as control variables, in line with previous studies (Chikalipah, 2017; Ahlin *et al.*, 2011; Barry and Tacneng, 2014). This study makes use of the MIX Market data from 2002 to 2016, and the final sample incorporates 2,102 MFIs in 114 countries. The data were collected only up to 2016 because MFI-related data were only available until that year at the time of data collection for this study. The data is nominal-value-adjusted by US dollar parity for all years (Leite *et al.*, 2019; Galema and Lensink, 2011).

3.2 Dependent Variables

3.2.1 Financial Performance

Previously, studies have used different indicators to measure MFIs' financial performance. For instance, Cull *et al.* (2014) applied financial self-sufficiency (FSS) and return on assets (ROA), Mersland and Strom (2009) used operational self-sufficiency (OSS) and ROA, and Shettima and Dzikarnaini (2018) used ROA and return on equity (ROE). Both FSS and OSS measure the MFI's ability to cover its costs. However, FSS-related data is not available on the Mix Market platform. Although both ROA and ROE measure the

institution's profitability, ROE measures the institution's performance from an investor perspective, whereas ROA compares the profitability against the institution's assets, which is a better measure to achieve the objective of this study. Among the various indicators, ROA and OSS are the most common and widely accepted indicators in microfinance studies (Assefa *et al.*, 2013; Tchakoute-Tchuigoua, 2010; Mersland and Strom, 2009). Consequently, this study uses ROA and OSS to measure MFIs' financial performance.

3.2.2 Outreach

MFIs' outreach is measured using the breadth and depth of outreach to people who need credit (Chahine and Tannir, 2010; Bibi *et al.*, 2018). An indicator frequently used to measure the breadth of outreach is the number of active borrowers (D'Espallier *et al.*, 2017; Mersland and Strøm, 2009; Cull *et al.*, 2009). A higher number of borrowers suggests greater outreach and a lower one suggests less outreach. Meanwhile, depth of outreach is measured by average loan size, which is calculated using the formula average loan balance per borrower divided by the per capita gross national income (GNI) of the particular country (D'Espallier *et al.*, 2013; Bibi *et al.*, 2018; Tchakoute-Tchuigoua, 2010). A small value shows that MFIs are providing small loans while a large value indicates that MFIs are providing larger loans to wealthier clients (Hartarska, 2005) because the poorer clients are expected to borrow smaller loans (relative to their income); MFIs may also be unwilling to provide larger loans to poorer clients because of the potential risk of non-repayment (Hermes and Hudon, 2018). This indicator is referred to as 'average loan size' in this study, in order to understand and interpret it more easily (Hartarska, 2005; Mersland and Strom, 2009).

Despite these indicators being widely used to measure MFIs' outreach, Bibi *et al.* (2018) introduced new indicators to measure MFIs' breadth and depth of outreach: *Market share of borrowers* (MSB) and *Market share of borrowers adjusted by market share of assets* (MSBA) respectively. MSB measures the breadth of outreach and is calculated by dividing the number of active borrowers of individual MFIs in a country by the total number of active borrowers of MFIs in that country. The proportion of borrowers served by each institution is indicated in a range between 0 and 1, with a larger number indicating broader outreach. MSBA measures MFIs' depth of outreach and is calculated as the market share of

borrowers divided by the market share of assets. A value less than 1 indicates relatively large loans and less outreach, while a value greater than one indicates relatively small loans and greater outreach. On the basis that these indicators are superior to previous indicators, as claimed by Bibi *et al.* (2018), this study has used the new indicators as well as the previous outreach indicators. Utilising and comparing both sets of indicators also help to determine whether the new indicators are indeed better than the existing ones.

3.3 Independent Variables

The main independent variable in this study is the *Commercial vs non-commercial MFI*, which is a binary variable. Here, ‘commercial MFI’ refers to those who have adopted a commercial approach, and ‘non-commercial MFI’ refers to those who have not adopted a commercial approach and stayed a non-profit MFI. The data source (Mix Market) provides information about the MFI's profit status, which shows whether the MFI is profit-oriented or non-profit-oriented. Profit orientation is used as a proxy for commercial and non-commercial MFIs because it shows whether the MFI is motivated by profit or not, as well as determining the goals that an MFI pursues (McIntosh and Wydick, 2005). Therefore, profit-oriented MFIs are categorised as commercial while non-profit-oriented MFIs are categorised as non-commercial in this study. If an MFI is commercial, a value of 1 is given; and if an MFI is non-commercial, a value of 0 is given.

3.4 Control Variables

Control variables are included when estimating the causal effect of a treatment on an outcome to obtain unbiased causal effect estimates by controlling for their effect (Hunermund and Louw, 2020). We controlled for several factors that could affect the performance of MFIs (Hartarska and Nadolnyak, 2007; Mersland and Strom, 2009; Chikalipah, 2017; Ahlin *et al.*, 2011). Those factors have been divided into two categories: internal factors and external factors.

3.4.1 Internal factors

This study has included the size and age of MFIs as internal control variables as these two factors are likely to have an impact on the performance of MFIs (Hartarska and Nadolnyak, 2007; Bibi *et al.*, 2018). MFI assets have been used as a proxy for the size of the MFI as they are the most common indicator used to measure the size of a financial institution (Mersland and Strom, 2009; Golesorkhi *et al.*, 2019). The effect of age on MFI has been controlled by including a mature MFI binary variable. Based on the information available in the MIX Market online platform, if an MFI has been operating for more than 8 years then it is considered a mature MFI.

3.4.2 External factors

The external factors refer to the environment that is not under MFIs' control but rather is situated outside them. Various external factors have been used to control their effect on the performance of MFIs, as different countries are likely to have different external environments, and these may affect MFI performance differently. We included world governance indicators (WGIs), macroeconomic variables and the economic freedom variables of the countries as external control variables (Chikalipah, 2017; Ahlin *et al.*, 2011; Sainz-Fernandez *et al.*, 2015; Barry and Tacneng, 2014). The WGIs consist of six indicators. However, including all six indicators may confuse the interpretation of the results and may also cause a multicollinearity issue between variables. Hence, we have only included two indicators, *political stability* and *rule of law*, as governance indicators.

Macroeconomic indicators control for the national market where MFIs are located. Larger markets may create economies of scale and reduce the cost of serving the poor. Countries with strong economies may not need credit from MFIs because the people in those countries will have income from jobs or easy access to finance from various other sources. This means there may be less demand for microfinance in economically strong countries and greater demand in less developed economies. However, a growing economy may motivate entrepreneurs to invest in new businesses or extend existing businesses, resulting in higher demand for MFIs, which may improve MFI performance. This suggests that macroeconomic

conditions do affect the performance of MFIs. Therefore, we have included *GDP per capita*, *lending rate* and *population* as macroeconomic variables.

Finally, the economic freedom index measures the level of liberty and market freedom around the globe. A country with high economic freedom allows businesses to start, operate, and shut down easily. High freedom leads to more businesses and more demand for capital from MFIs; this can directly impact MFIs' performance. Thus, this study includes economic freedom variables. Heritage Foundation provides data on six indicators related to countries' economic freedom. However, as stated above, including all these variables may create a multicollinearity issue and confusion. Therefore, only the three variables that are most likely to affect the performance of MFIs have been included as controls in this study: *business freedom*, *trade freedom*, and *financial freedom*. In addition, we have also used the year dummies to control for the effects of time and the financial crisis as the data covers a wider period than that in which the global financial crisis took place.

A detailed description of all variables used in this study, including definitions, measurements, and data sources, is provided in Appendix A (Table A1) to enhance clarity and replicability.

3.5 Estimation Strategy

Previous studies have applied various estimation techniques to examine the commercialisation of MFIs. For example, Ault (2016) employed Random Coefficient Modelling (RCM) to capture heterogeneity across countries. Although, RCM is useful to address heterogeneity, it does not fully address dynamic endogeneity or the potential reverse effect between the commercialisation and MFI performance. Similar other studies applied static model like OLS, random & fixed effects (Cull *et al.*, 2007; Mersland & Strøm, 2009) with the assumption that the variables are exogenous within the model which may yield biased estimates.

In contrast, the system GMM estimator is particularly suited to this study as it accommodates the dynamic nature of MFI performance, consider robust and more efficient at addressing heteroscedasticity and autocorrelation (Roodman, 2009). It also effectively mitigates endogeneity by using internal instruments which means more information is used to estimate the coefficient, which in turn leads to an increase in

efficiency (Bond, 2002a; Zainal, 2021). Precisely, we applied two-step system GMM as it is considered more augmented when the number of units (N) is larger and the periods (T) are relatively small (Arellano and Bond, 1991; Roodman, 2009).

3.5.1 Identifying Endogeneity

In this study, the independent variables are believed to be correlated with residuals. Indeed, variables such as the size and commercial or non-commercial orientation of MFIs may have relationships with MFI management intentions, motivations, and rules and regulations – none of which have been included in the model because it is hard to quantify this qualitative information and nor is the data related to this information available. Furthermore, the dependent variables (i.e., financial performance and outreach) might also affect whether MFIs choose to be commercial or non-commercial. For example, when an MFI starts to make a profit, this may motivate them to make more profit and, as a result, they might become a commercial MFI (reverse effect). It may also encourage MFIs to obtain more assets as they have surplus money. Similarly, being a non-commercial MFI and having a smaller number of borrowers and providing a smaller amount of loans to borrowers may not be cost-effective. Consequently, MFIs may have to become commercial by necessity. In addition, Hartarska (2005) argues that MFIs with more experienced managers reach poorer borrowers and produce more sustainability. This shows that some managers are socially motivated and may decide to operate their firms as non-commercial MFIs, but this qualitative data is difficult or impossible to obtain. Therefore, it is the norm for these unobserved variables to be residual. Thus, the commercial MFI variable and assets are considered endogenous variables in the model. The governance indicators, macroeconomic and economic freedom variables, and age are all considered to be exogenous variables as dependent variables do not have reverse effects on these indicators.

3.6 Model Specification

To test the purposed hypotheses above, we apply a two-step system GMM method which is represented by the following dynamic linear equation:

$$Y_{itc} = \alpha + \beta_1 Y_{itc-1} + \beta_2 Y_{itc-2} + \beta_3 X_{itc} + \beta_4 C_{itc} + \beta_5 I_{itc} + \beta_6 M_{itc} + \beta_7 E_{itc} + \varepsilon_{itc} \quad (1)$$

In this model, the subscript i indicates MFI, t indicates time (year), and c denotes the country in which MFI is located. The dependent variable Y_{itc} measures the financial performance and outreach of MFI i at time t , located in country c . Because MFI performance is often linked to performance in previous years, we included the first and second lags of dependent variables (Y_{itc-1} and Y_{itc-2}) to account for previous years' outcomes.

The variable X_{itc} represents the main independent variable capturing the profit status of the MFI i at year t , located in country c . The vector C_{itc} includes a set of MFI-specific control variables, namely asset size (log of total assets, as a proxy for size) and a binary indicator for MFI maturity. To control for cross-country differences, we include institutional environment variables I_{itc} , which capture political stability and the rule of law in country c at time t . Furthermore, M_{itc} represents a set of macroeconomic control variables, including GDP per capita, the real interest rate, and population size in country c at time t . Finally, E_{itc} denotes a set of economic freedom variables- trade freedom, business freedom, and financial freedom used to measure market openness in country c at time t . Finally, ε_{itc} represents the error term.

4. Empirical Results

This section presents the results obtained from empirical analysis. First, it shows the descriptive statistics, then presents the correlation between variables used in this study and finally shows the two-step system GMM regression results. The results related to hypotheses H1a and H1b are presented in Table 4, while those related to H2a and H2b are presented in Table 5. Thereafter, this section discusses the new outreach indicators introduced by Bibi *et al.* (2018); and, finally, the section concludes with a robustness checks.

4.1 Descriptive Results

Table 2. Summary statistics of the variables used.

Variable	Obs	Mean	Std. Dev.	Min	Max
<i>Dependent Variables</i>					
ROA	10,436	0.008	0.128	-3.453	0.799
OSS	11,719	1.161	0.847	-47.845	36.627
NAB	12,368	64913.44	371042.9	0	8166287
ALS	12,279	0.751	2.294	0	112.769
MSB _{ij}	12,704	0.009	0.034	0	0.785
MSBA _{ij}	12,704	8.219	145.145	0	10336.590
<i>Main independent variable</i>					
Commercial MFI	12,704	0.431	0.495	0	1.000
<i>MFI-specific control variables</i>					
Assets	12,318	6.01	5.57	0	4.23
Mature MFIs dummy	12,704	0.671	0.470	0	1.000
<i>Institutional environment</i>					
Political stability	12,583	-0.766	0.721	-3.181	1.272
Rule of law	12,632	-0.608	0.457	-1.897	1.433
<i>Macroeconomic variables</i>					
GDP per capita	12,622	3136.89	3162.76	111.36	21188.12
Real interest rate	9,744	6.766	11.193	-42.31	508.74
Population	12,511	1.35	3.08	103604	1.36
<i>Economic freedom variables</i>					
Business freedom	12,315	58.819	11.485	4.100	90.600
Trade freedom	12,304	69.700	11.864	15.000	89.200
Financial freedom	12,304	47.272	14.097	10.000	90.000

Note(s): This table shows the summary statistics of all the variables used in this study that includes the number of observations of each variable, mean, Standard deviation, minimum value (min) and maximum value (max).

Source(s): Authors' own work

Table 2 above shows the descriptive statistics of the variables included in this study. The results show a comprehensive view of MFIs across multiple countries and years. The results show that the financial performance, i.e., average ROA is 0.008 (0.8%), which is modest, but the minimum value -3.453 (negative 345%) suggests that at least one MFI made a huge loss, and the maximum value 0.799 suggests that at least one MFI within the data made approximately 80% profit at some point. Similarly, the mean OSS 1.161(116%) suggest that on average MFIs are operationally self-sufficient. The outreach indicator, i.e., mean number of active borrowers suggests that MFIs have 64,913 active borrowers on average, whereas minimum (0) and maximum (8,166,287) values suggest there is at least one MFI within the dataset that has no borrower and at least one had a maximum of 8,166,287 borrowers in some year. It also shows that there may be an outlier issue, as a result, the variable has been converted into natural log after this. The main variable of interest commercial MFI dummy's mean value is 0.431 (43%), which shows well-balanced distribution, with approximately 43% consisting of commercial MFIs, allowing for a good comparison. Assets, serving as a proxy for MFI size, average approximately USD 60.1 million, ranging from USD 557 million to USD 42.3 billion, suggesting the presence of extreme values or outliers. Therefore, the assets variable was transformed using the natural logarithm to normalize its distribution. The mature MFI dummy's mean value 0.671 (67%) suggest that 67% of MFIs included in this dataset are 8 years old or above. Institutional, macroeconomic and economic freedom are control variables that show substantial variation, which may potentially affect the performance of MFIs.

Correlation Matrix

Table 3. Correlation matrix

Variables	ROA	OSS	Log NAB	ALS	MSB	MSBA	Commercial MFI	Assets (Log)	Mature MFI	Political stability/ no violence	Rule of law	GDP per capita (Log)	Real interest rate	Population (Log)	Business freedom	Trade freedom	Financial freedom
ROA	1																
OSS	0.405	1															
Log NAB	0.0177	0.00147	1														
ALS	0.0206	0.0266	-0.0347	1													
MSB	0.0188	-0.00046	0.124	-0.00025	1												
MSBA	-0.018	-0.00912	-0.0047	-0.0117	0.0129	1											
Commercial MFI	0.0178	-0.0125	0.0388	0.0934	0.11	0.00913	1										
Assets (Log)	0.153	0.0261	0.32	0.106	0.268	-0.0737	0.268	1									
Mature MFI	0.102	0.0192	0.0849	-0.0394	0.051	-0.0192	-0.167	0.291	1								
Political stability/no violence	-0.048	-0.0011	-0.068	0.056	0.11	-0.0037	-0.0745	-0.002	-0.0093	1							
Rule of law	-0.047	-0.0128	0.0195	-0.133	0.0397	0.0134	-0.00447	0.0316	0.00783	0.31	1						
GDP per capita (Log)	0.0264	0.0215	-0.0532	-0.143	0.0721	0.003	0.0966	0.209	0.103	0.322	0.294	1					
Real interest rate	0.0407	0.011	-0.032	0.018	-0.023	0.000	-0.033	0.047	0.019	0.104	-0.059	0.049	1				
Population (Log)	-0.014	-0.0231	0.158	-0.174	-0.124	0.0115	0.0714	-0.008	-0.0141	-0.481	0.247	-0.050	-0.118	1			
Business freedom	0.0174	0.0144	-0.0025	-0.0772	0.00772	0.00734	0.103	0.125	0.02	0.0452	0.0941	0.491	0.042	-0.162	1		
Trade freedom	0.0633	0.034	-0.0367	0.0249	0.00735	-0.0112	0.0376	0.153	0.159	0.221	-0.13	0.447	0.016	-0.422	0.295	1	
Financial freedom	0.0387	0.00849	-0.0999	-0.0559	-0.0247	0.00335	0.07	0.193	0.0645	0.246	0.115	0.441	0.143	-0.367	0.384	0.397	1

Note(s): This table shows the correlation coefficients among the variables used in this study.
Source(s): Authors' own work

Table 3 shows that the independent, and control variables are not highly correlated with each other. This means there is no multicollinearity issue as the issue only arises when the correlation coefficient is above 0.70 (Baltagi, 2008; Kennedy, 2008). Further, the researchers also applied a variance inflation factor (VIF) to check if the multicollinearity issue exists between the variables. The result shows that the VIF values of individual variables are not greater than 10 and the mean VIF is 1.61 (i.e., less than 4), which indicates that the independent variables are not highly correlated (Cameron and Trivedi, 2010).

4.2 Dynamic Regression Results & Discussion

Table 4. The relationship between the adoption of a commercial approach by MFIs and their financial performance.

VARIABLES	ROA	OSS
L. ROA	0.52*** (0.057)	
L. OSS		0.182** (0.084)
L2. OSS		0.101*** (0.030)
Commercial MFI	0.079 (0.072)	-0.046 (0.356)
Assets (Log)	0.021*** (0.005)	0.127** (0.064)
Mature MFI	-0.006 (0.014)	-0.100 (0.109)
Political stability / No violence	0.008 (0.005)	0.039 (0.027)
Rule of law	-0.001 (0.007)	-0.050 (0.042)
GDP per capita (Log)	-0.003 (0.004)	-0.013 (0.018)
Real interest rate	0.0003* (0.0001)	0.0007 (0.001)
Population (Log)	-0.001 (0.002)	0.014 (0.001)
Business freedom	0.000 (0.000)	0.001 (0.001)
Trade freedom	0.0003* (0.0001)	0.003** (0.001)
Financial freedom	-0.0006** (0.0003)	-0.003** (0.001)
Year dummy 2008	-0.028*** (0.007)	-0.169*** (0.047)
Year dummy 2009	-0.041*** (0.007)	-0.225*** (0.056)
Year dummy	Yes	Yes
Constant	-0.275*** (0.082)	-1.297 (0.912)
Observations	6,001	5,421
Number of MFIs	1,221	1,095
Number of Instruments	27	32
AB test AR (2) P-value	0.863	0.670
Hansen Test P-value	0.205	0.314

Note(s): This table presents results of two-step system GMM estimations examining the association between the adoption of a commercial approach by microfinance institutions (MFIs) and their financial performance. Financial performance is measured using return on assets (ROA) and operational self-sufficiency (OSS). Robust standard errors are reported in parentheses. ***, ** and * refers to statistical significance at the 1, 5 and 10% level, respectively.

Source(s): Authors' own work

Table 4 presents the findings of the connection between the adoption of a commercial approach by MFIs and their financial performance. The result shows that the adoption of a commercial approach by MFI has no significant impact on their financial performance, as an MFI's commercial nature has no significant association with ROA and OSS. This could be because commercial MFIs rely on specialised staff to make loans, which drives up their operating costs (Gutierrez-Nieto *et al.*, 2007). Thus, commercial MFIs are not making significantly higher profits than non-commercial MFIs, which means both hypotheses H1a and H1b are rejected. This result is similar to the findings of Cull *et al.* (2007) and Leite *et al.* (2019). Meanwhile, the size of MFIs shows a significant positive association with both ROA and OSS. It is reasonable due to the economy-of-scale advantage (Hartarska *et al.*, 2013).

The results also show that political stability, rule of law and GDP per capita have no significant association with ROA and OSS. Further, the results show no significant relationship between business freedom and MFIs' financial performance. However, we found that the interest rate has a significant positive association with ROA, which is evident as an increase in interest rate leads to an increase in the profit of the institution; but it does not have a significant association with OSS. Similarly, trade freedom has a significant positive effect on ROA at the 10% significance level and a significant positive effect on OSS at the 5% significance level, which means an increase in a country's trade freedom leads to an increase in the financial performance of MFIs. In contrast, financial freedom has shown a significant and negative association with ROA and OSS at the 5% significance level. It may be that if a country has fewer barriers to importing and exporting goods and services, then poorer people operating in that country may feel more encouraged to start businesses, which in turn increases demand for microfinance. As a result, the performance of MFIs improves, whereas financial freedom may encourage corruption that leads to losses (Hermes and Hudon, 2018). Finally, both year dummy 2008 and year dummy 2009 show that the financial crisis of 2008 had a significant negative effect on the financial performance of MFIs. The results show a 2.8% decrease in the ROA of MFIs in 2008 and a 4% decrease in 2009. Similarly, we observed a 16.9% decrease in the OSS of MFIs in 2008 and a 22.5% decrease in 2009.

Table 5. The relationship between the adoption of a commercial approach by MFIs and their outreach.

VARIABLES	Log NAB	ALS	MSB	MSBA
L. Log NAB	0.316*** (0.081)			
L. ALS		0.557*** (0.113)		
L.MSB			0.973*** (0.052)	
L.MSBA				0.139** (0.063)
Commercial MFI	1.383*** (0.454)	1.378* (0.758)	0.004** (0.002)	-29.391 (37.88)
Assets (Log)	0.536*** (0.102)	0.122** (0.061)	0.0004** (0.0002)	4.120 (4.444)
Mature MFI	0.246* (0.133)	0.137 (0.141)	0.000 (0.000)	-11.85 (12.39)
Political stability /No violence	0.006 (0.049)	0.166* (0.085)	0.000 (0.000)	-0.153 (3.512)
Rule of law	0.167** (0.077)	-0.109 (0.113)	0.000 (0.000)	-3.214 (2.654)
GDP per capita (Log)	-0.389*** (0.059)	-0.167** (0.073)	-0.000 (0.000)	0.621 (2.309)
Real interest rate	-0.0004 (0.001)	0.002 (0.002)	0.000 (0.000)	-0.144 (0.104)
Population (Log)	0.197*** (0.035)	-0.083* (0.048)	-0.000** (0.000)	1.681 (1.324)
Business freedom	0.003* (0.002)	-0.004 (0.003)	-0.000 (0.000)	0.072 (0.104)
Trade freedom	0.000 (0.002)	0.000 (0.003)	-0.000 (0.000)	0.104 (0.079)
Financial freedom	-0.003 (0.002)	-0.007 (0.004)	-0.000* (0.000)	-0.033 (0.081)
Year dummy 2008	-0.029 (0.067)	-0.129 (0.092)	-0.000 (0.000)	-4.590 (3.802)
Year dummy 2009	-0.156** (0.068)	-0.117 (0.093)	-0.000 (0.000)	-4.243 (3.802)
Year dummy	Yes	Yes	Yes	Yes
Constant	-3.188** (1.277)	0.847 (1.168)	0.003 (0.004)	-81.88 (86.12)
Observations	7,139	7,082	7,380	7,380
Number of MFIs	1,373	1,365	1,395	1,395
Number of Instruments	39	78	84	30
AB test AR (2) P-value	0.596	0.202	0.699	0.797
Hansen Test P-value	0.165	0.165	0.661	0.401

Note(s): This table presents the results of two-step system GMM estimations examining the association between the adoption of a commercial approach by microfinance institutions (MFIs) and various outreach indicators. The dependent variables include the logarithm of the number of active borrowers (Log NAB), average loan size (ALS), market share of borrowers (MSB), and market share of borrower assets (MSBA). Robust standard errors are reported in parentheses. ***, ** and * refers to statistical significance at the 1, 5 and 10% level, respectively.

Source(s): Authors' own work

Table 5 shows that commercial MFIs have a significant and positive relationship with NAB ($\beta_{Commercial\ MFI} = 1.383$) and ALS ($\beta_{Commercial\ MFI} = 1.378$). However, the positive relationship with ALS reveals a negative impact in the context of microfinance as it suggests that commercial MFIs are providing large loans to wealthy clients (Hartarska, 2005). The finding is broadly consistent with D'Espallier *et al.* (2017), who examined whether institutional transformation alters the business model of microfinance. The findings support hypothesis H2a but refute hypothesis H2b, as the results show a positive impact on the breadth of outreach while they show a negative impact on the depth of outreach. It was also found that the assets variable has a significant positive association with NAB and ALS. Hermes and Hudon (2018) suggested that larger MFIs are more efficient and reach out to more clients than small MFIs. Further, a mature MFI also has a significant and positive association with NAB but has no significant association with ALS.

Table 5 also shows that political stability has no significant relationship with NAB whereas the results show that it has a positive relationship with ALS. This suggests that MFIs provide larger loans in countries where the political situation is stable. The rule of law, meanwhile, has a significant and positive association with NAB at a 5% significance level, which suggests that MFIs serve more clients in countries where there the rule of law is greater. The results further reveal that GDP per capita has a significant negative association with both NAB and ALS. Hermes and Hudon (2018) indicated that increasing GDP per capita leads to a decrease in demand for microfinance services; as a result, there are fewer borrowers. The population has a significant positive association with NAB whereas it has a significant negative association with ALS. Furthermore, business freedom has a significant positive association with NAB but the trade and financial freedom indicators do not have a significant association with both NAB and ALS. Moreover, the results show that year dummies have no significant effect except year dummy 2009, which has a significant and negative effect on NAB. This could be due to the global financial crisis.

New Indicators of Outreach

The result from Table 5 reveals that commercial MFIs have a significant positive relationship with MSB, which suggests that commercial MFIs cover 0.4% higher market shares of borrowers than non-commercial MFIs. Similarly, assets also had a significant and positive relationship with MSB, which indicates that the larger MFIs have larger market shares of borrowers. This result is consistent with the findings of Bibi *et al.* (2018). Furthermore, the results reveal that the maturity of MFIs is not significant for MSB, whereas Bibi *et al.* (2018) found a significant positive relationship. The difference could be because Bibi *et al.* (2018) only included data related to South Asian MFIs, whereas this study includes data from 114 countries. Meanwhile, our results show that commercial MFIs have no significant association with MSBA. Similarly, the assets variable also has no significant relationship with MSBA, although Bibi *et al.* (2018) found a significant and negative effect on MSBA. Our results further reveal that every other variable (i.e., governance, macroeconomic and economic freedom indicators) is not significantly related to MSBA.

In addition, it can be concluded that the new outreach measures are not superior indicators as claimed by Bibi *et al.* (2018). The MSB is institution-specific, but it provides similar results to NAB. Moreover, MSBA does not show if MFIs are providing larger loans and higher outreach, as MSBA values only indicate whether MFIs are providing larger loans and less outreach or smaller loans and greater outreach. Furthermore, it is difficult to include and interpret MSBA value in methods like dynamic panel analysis as this technique includes lagged and instrumental variables.

4.3 Robustness Checks

We used robust standard errors in the two-step system GMM estimation to correct for heteroskedasticity, which is common in financial performance data. This ensures valid inference and aligns with best practices recommended by Arellano and Bover (1991) and Blundell and Bond (1998). The GMM method allows researchers to check if the results obtained from the regression are robust. The following are some of the checks that have been conducted to support the results. The statistical results of these tests are available at the end of Tables 4 and 5. First, the Arellano-Bond (AB) AR (2) analysis tested the null hypothesis that there is no serial correlation (i.e. that the error terms are sufficiently uncorrelated) against the alternative

(Roodman, 2009; Lensink *et al.*, 2018). The result in Table 4 shows the p-values of the test for the dependent variables of ROA and OSS ($p=0.863$; 0.670), which means that there is no serial correlation. Similarly, the p-values of Hansen test for ROA and OSS are 0.205 and 0.314 respectively indicates that the instruments used for the estimation are valid. All these diagnostic tests yielded satisfactory results, which indicates that the results reported are robust. Same interpretations are made for AB test AR (2) and Hansen test for outreach indicators as they are also insignificant.

Additionally, we perform mean difference tests using both the two-sample t-test and Mann-Whitney U test to enhance the robustness, comparing the key indicators between commercial and non-commercial MFIs. Both tests are conducted because the variables are not normally distributed that can also be seen in descriptive statistics above in table 2 and reporting both tests' results would ensure that the interpretations are not sensitive to the distributional assumption.

Table 6: Mean comparison of financial performance and outreach indicators between commercial and non-commercial MFIs.

Variable	Mean (Commercial MFIs)	Mean (Non-Commercial MFIs)	Mean Difference	t-test (p-value)	Mann-Whitney U (p-value)
ROA	0.012	0.005	0.008	0.002	0.998
OSS	1.172	1.165	0.007	0.702	0.007
NAB	81721	52276	-	0.000	0.000
ALS	1.002	0.642	0.360	0.000	0.000
MSB	0.012	0.007	0.006	0.000	0.000
MSBA	11.090	6.046	5.045	0.089	0.000

Note(s): The table reports the mean values of each dependent variable for both groups, the mean differences between groups, and the results of the two-sample *t*-test and Mann-Whitney U statistical tests.

Source(s): Authors' own work

The results show that ROA is significantly different in Two-sample t-test but not in Mann-Whitney test, suggesting that the difference is different due to some high performing commercial MFIs (outliers) within the dataset. In addition, the OSS mean difference is not statistically significant but statistically significant

in Mann-Whitney test. It indicates similar average OSS but a more favourable distribution among commercial MFIs. Further, the results show that the commercial MFIs have significantly higher number of active borrowers, provide larger loans and higher market shares with all difference statistically significant at 1%. All these results confirm the GMM findings that commercialisation has no significant impact on financial performance but increases the breadth of outreach and leads to larger loan sizes.

5. Policy Implications

Our findings suggest that commercial MFIs are providing larger loans to a greater number of clients than non-commercial MFIs, which is a clear sign of mission drift in the microfinance sector. Overall, the evidence indicates that commercial MFIs are gradually shifting their objectives from social welfare towards profitability. This shift may occur because once MFIs become commercial, investors become involved, and the institution's objectives often change from social welfare to profit maximisation.

Therefore, based on the findings and conclusions of this study, policymakers—such as governments, central banks, MFIs, and related agencies—can formulate policies that encourage MFIs to balance their social and financial goals. One way to achieve this is by introducing a mandatory dual-reporting policy in which MFIs must submit both financial reports (e.g., ROA, OSS) and social outreach reports (e.g., breadth and depth of outreach, rural penetration), and by auditing social goals alongside financial indicators. Governments can also provide tax relief and subsidies to MFIs that meet defined social outreach benchmarks, thereby encouraging a stronger focus on societal contribution.

Similarly, regulators can impose ceilings on the loan sizes MFIs are permitted to offer, preventing them from shifting their focus excessively toward wealthier clients. Regulators may also establish policies requiring MFIs to allocate a certain percentage of their loan portfolio to rural or financially excluded regions of the country, where access to finance is limited.

6. Conclusion

This paper has investigated the impact of the adoption of the commercial approach by MFIs on the financial performance and outreach of MFIs. It did so by applying a two-step system GMM estimation technique to take account of any potential endogeneity issue. The findings show that the adoption of the commercial approach by MFIs did not help to improve their financial performance significantly. However, the evidence shows that the adoption of a commercial approach by an MFI *does* help it to reach a greater number of borrowers, as the results show a significant positive relationship with the number of borrowers through the breadth of outreach of MFIs. Further, the evidence also shows that commercial MFIs provide larger loans than non-commercial MFIs, which indicates that commercial MFIs serve wealthier clients. This also confirms evidence found by other researchers that the adoption of commercial approaches by MFIs leads to a 'mission drift' by decreasing their depth of outreach.

Ethical Declarations

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Appendix A: Description of Variables

Table A1. Description of the variables used in this study

Variable	Definition / Measurement	Source
ROA (Return on Assets)	Net operating income / Total assets; measures profitability relative to assets.	MIX Market
OSS (Operational Self-Sufficiency)	Operating revenue / (Financial expense + Loan loss provision + Operating expense); measures ability to cover costs.	MIX Market
NAB (Number of Active Borrowers)	The numbers of individuals or entities that currently have an outstanding loan balance with the financial service provider.	MIX Market
ALS (Average Loan Size)	Average loan balance per borrower ÷ GNI per capita; proxy for depth of outreach.	MIX Market, World Bank GNI
MSB (Market Share of Borrowers)	Number of borrowers of MFI ÷ total borrowers of all MFIs in country; proxy for breadth of outreach.	Bibi <i>et al.</i> (2018)
MSBA (Market Share of Borrowers Adjusted by Assets)	MSB ÷ market share of assets; proxy for depth of outreach (values >1 = smaller loans to poorer clients).	Bibi <i>et al.</i> (2018)
Commercial MFI	Binary variable: 1 = commercial MFI; 0 = non-commercial MFI.	MIX Market
Assets (Log)	The natural logarithm of total assets of MFI; proxy for institution size.	MIX Market
Mature MFI	Binary variable: 1 if operating ≥ 8 years; 0 otherwise.	MIX Market
Political Stability/No violence	Political Stability and Absence of Violence/Terrorism measures perceptions of the likelihood of political instability and/or politically motivated violence, including terrorism.	World Bank (WGI)
Rule of law	Reflects perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.	World Bank (WGI)
GDP per capita (Log)	The natural logarithm of Gross Domestic Product (GDP) per capita of a country	World Bank
Real interest rate	The rate of interest after adjusting inflation	World Bank
Population (Log)	Logarithm of population of each country	World Bank
Business freedom	An overall indicator of the efficiency of government regulation of business. The quantitative score is derived from an array of measurements of the difficulty of starting, operating, and closing a business.	Heritage Foundation
Trade freedom	A measure of the absence of tariff and non-tariff barriers that affect imports and exports of goods and services. The trade freedom score is based on two inputs.	Heritage Foundation
Financial freedom	A measure of banking efficiency as well as a measure of independence from government control and interference in the financial sector.	Heritage Foundation

Note(s): This table shows the description of all variables used in this study, including definitions, measurements, and data sources.

Source: Source(s): Authors' own work