How socially sustainable multinational banks promote financial inclusion in developing countries

Fernando Ubeda [a], Alvaro Mendez [b,c,d], Francisco Javier Forcadell [e,*], Belén López [f]

[a] *Universidad Autónoma, Madrid, Spain*
[b] *UBI Business School, Brussels, Belgium*
[c] *Fudan University, Shanghai, China*
[d] *London School of Economics and Political Science, London, United Kingdom*
[e] *Universidad Rey Juan Carlos, Madrid, Spain*
[f] *ESIC University, Madrid, Spain*

A R T I C L E   I N F O

A B S T R A C T

This paper investigates the impact of multinational banks (MNBs) implementing socially sustainable practices on financial inclusion in developing countries. We argue that the specific characteristics of the MNBs, when combined with socially sustainable practices, contribute to building trust and reducing risks in developing countries where they operate. This positive externality causes improvements for the underprivileged in three dimensions of financial inclusion: their demand for bank accounts, their propensity to save, and their access to credit. A sample of 152 multinational banks in 32 developing countries and 37,952 individuals proves the positive effect of sustainable practices.

1. Introduction

Financial inclusion, or the extending of formal financial services to the poor, greatly benefits individuals worldwide, but particularly in developing countries (Karlan and Morduch, 2010; Demirgüç-Kunt et al., 2018). Financial inclusion is a crucial objective of the Sustainable Development Goals (SDGs) formulated by the United Nations (UN) in 2015 (UN, 2020). Specifically, Target SDG 8.10 exhorts financial institutions to expand access to banking. Despite this attention, the number of adults lacking a bank account barely declined from 1.7 billion adults in 2017–1.4 billion in 2021 (World Bank, 2022b, 2018). This problem mainly affects the developing world, where most commercial banks have not been reached out to the poor or low-income households – those most in need (Girón et al., 2022; Karlan and Morduch, 2010). Estimates are that 29 % of adults in developing countries lack a bank account, compared to only 4 % in developed countries (Demirgüç-Kunt et al., 2022; IMF, 2022; World Bank, 2022a).[1] The Organisation for Economic Co-operation and Development (OECD) advocates structural reforms in the financial sector to help construct a more inclusive global economy (Krinichansky and Rubtsov, 2022). There is no agreement on which population to target for financial inclusion. While the

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* Corresponding author.
E-mail addresses: fernando.ubeda@uam.es (F. Ubeda), a.mendez@lse.ac.uk (A. Mendez), franciscojavier.forcadell@urjc.es (F.J. Forcadell), belen.lopez@esic.university (B. López).

[1] Our sample comprises 32 developing countries from Latin America, Africa, Asia, the Balkans, Middle East, and Caucasus: Algeria, Bolivia, Brazil, Chile, Colombia, Ecuador, Egypt, Ethiopia, Georgia, Ghana, Guatemala, Haiti, India, Indonesia, Jordan, Kazakhstan, Lebanon, Libya, Malaysia, Mexico, Morocco, Pakistan, Peru, Philippines, Serbia, Thailand, Turkey, Ukraine, Uruguay, Uzbekistan, Vietnam, and Zimbabwe.

World Bank (2014) targets the entire population, Rangarajan (2008) recommends a narrower scope to ensure financial access for the poor and vulnerable groups. Financial inclusion is a severe problem among the most vulnerable in developing countries; for that reason, we focus our attention on analysing the financial inclusion of the lowest-income cohorts.

Financial inclusion is a significant metric of a bank's social impact (Nizam et al., 2019). It measures the bank's reach into underserved regions, its initiatives, products, and distribution strategies aimed at these areas, and the level and trend of financing for small and medium-sized enterprises (SMEs). Some scholars argue that multinational banks (MNBs) are well-positioned to expand financial inclusion in developing countries (Bonin, Hasan, and Wachtel, 2005). MNBs are potential change agents because of their decades of experience with expansion into developing countries which has obliged them to innovate market and non-market strategies for managing operations in complex political and economic environments while overcoming their institutional voids (Doh et al., 2017; Boddewyn, 2003). Multi-nationality, size, and world market scope have given them more clout, normative reach, autonomy, and motive to act than practically any other actors in the developing world (Rugman and Doh, 2008). Other scholars, however, contend that the impact of MNBs is decidedly mixed (Beck and Martinez Peria, 2010; Ordonez-Ponce and Weber, 2022) after finding that MNBs' inclusion of the poor has been inconsequential owing to the single-minded focus on their business interests (Gormley, 2010; Stiglitz, 2005). Weighing up both sides of this debate, we argue that MNBs can articulate a credible framework for advancing financial inclusion by implementing socially sustainable practices. The "S" in the Environmental, Social, and Governance (ESG) scheme brings up the ethical quality of MNBs within their social environment (Baid and Jayaraman, 2022).

The Social dimension of the ESG criteria relates especially to financial inclusion (Berg et al., 2022; Prior and Argandona, 2009); for example, the MSCI index measures the Social dimension of financial inclusion by banks. For Thomson Reuters' indices[2] (2017), the Social pillar represents 46.9 % of its ESG rating, measuring the capacity of firms to build trust and loyalty with its workforce, customers, and society.[3] Additionally, the Sustainability Accounting Standards Board (SASB) features financial inclusion among the six dimensions of its sustainability accounting standard for commercial banks.

This paper aims to analyse the link between the socially sustainable practices of MNBs and financial inclusion among the poorest in developing countries. We argue that when MNBs incorporate sustainable practices into their business models, this will contribute to building social trust and reducing market risks. This causes positive externalities, improving access to bank accounts, personal savings, and obtaining credit.

Utilizing the BankScope database, we build a dataset of 152 MNBs operating in 32 developing countries. From this data, we craft an index to measure the social sustainability of each MNB, employing the social sustainability indices published by Thomson Reuters. We use data from 37,952 individual respondents to the Global Financial Inclusion (Global Findex) survey to assess financial inclusion. Our models integrate two levels of data: country-specific information and data derived from surveyed individuals, enabling us to perform a multilevel probit regression analysis. Our empirical findings confirm that socially responsible actions by MNBs positively affect three key dimensions of financial inclusion: bank account ownership, access to credit, and the propensity to save. Our results underscore the critical role of socially sustainable efforts in uplifting the economically marginalized in developing countries. Our study also contributes to the literature by underscoring the importance of a comprehensive, multi-dimensional analytical framework that goes beyond merely counting the prevalence of bank accounts(Bateman and Chang, 2012; Duvendack and Mader, 2020; Pesqué-Cela et al., 2021).

2. Theory and hypotheses

Financial inclusion has traditionally been proxied by *access to* financial services (Leyshon and Thrift, 1995; Carbó et al., 2005; IMF, 2021; IMF, 2022). It is generalized in the literature by counting financial inclusion complete once a poor person opens up a bank account (Chakravarty and Pal, 2013; Girón et al., 2022; Sen and De, 2018; Rugman and Doh, 2008). Bank accounts alone, however, cannot overcome the main barriers to inclusion, but are merely the first step toward a more comprehensive, effectual inclusion (Akeju, 2022; Brune et al., 2016). Thus, in addition to bank accounts, two more goals in securing financial inclusion for vulnerable populations in developing countries should be savings and loans (Chakravarty and Pal, 2013; Duvendack and Mader, 2020; Kendall et al., 2010).

Compared to domestic banks from host developing countries, MNBs from developed countries are exposed to a wider range of stakeholders pressing for more sustainable behaviors. MNBs' size, listing in international indexes, and degree of internationalization imply interaction with various stakeholders: suppliers, employees, investors, international buyers, *etc*. Macro-level forces in MNBs' home countries can also generate pressure from stakeholders for more sustainable behaviors (Forcadell et al., 2023); enhanced civic participation *via* social media, NGOs, think tanks, or just public awareness. Pressures from society and markets on MNBs are therefore high, incentives tending to motivate sustainable practices. Conversely, MNBs are uniquely positioned to achieve economies of scale and risk diversification superior to domestic banks, primarily due to their ability to integrate and exploit advanced technologies. MNBs are posited as ideal agents of change, drawing on decades of experience expanding into developing countries that has necessitated the innovation of both market and non-market strategies for navigating the intricate political and economic settings that they encounter

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[2] Thomson Reuters are the world's largest financial statistics database and provider of systematic ESG information to professional investors who manage portfolios by integrating (non-financial) ESG data.

[3] Firm scores are compiled over four social dimensions: (1) Workforce, measuring care of employees; (2) Human rights, measuring respect for universal legality; (3) Community, measuring commitment to good citizenship and business ethics; and (4) Product responsibility, broadly measuring the quality of output, in which dimension access to low-priced products designed to meet the needs of lower-income categories is evaluated.

(Doh et al., 2017; Boddewyn, 2003). These factors all together have well-placed MNBs to enhance financial inclusion either directly or indirectly (Bonin et al., 2005; Detragiache et al., 2008; Rugman and Doh, 2008).

The influence of MNBs on financial inclusion in developing countries has nevertheless been inconsistent (Beck and Martinez Peria, 2010; Gormley, 2010; Ordonez-Ponce and Weber, 2022). Some evidence suggests that in developing countries, MNBs finance predominantly multinational corporations, big domestic firms, or government entities rather than small local businesses and individuals. Stiglitz (2005) spots MNBs' predilection for serving local elites with, at best, a tepid commitment to giving the most disadvantaged groups access to banking services. Developing countries are also beset by other problems that can generate unintentional financial exclusion (Allen et al., 2016; Gopalan and Rajan, 2018; Prior and Argandona, 2009): the prohibitive cost of banking accounts, banks' geographical remoteness, the requirement for documentation which is not universally available, the lack of inadequate legal infrastructure to enforce contracts, and a general mistrust of financial institutions (Tu, 2023). Consequently, the mere presence of MNBs in a developing country does not guarantee increased financial inclusion, especially among the poorest.

We argue that MNBs can propel financial inclusion forward in developing countries by implementing socially sustainable initiatives. MNBs can create trust and reduce risks by combining such socially sustainable practices with their unique characteristics i.e., international experience, access to global markets, and technological improvements. We argue that higher trust and lower risk affect the behaviors of both MNBs and the poorest people in developing countries. This effect prompts MNBs to offer more credit to the poorest, and prompts the poorest to save.

Microfinance, those financial services focused on the poor (Chih et al., 2010; Copestake, 2007; Yunus and Yusus, 2007), is an effective instrument to expand financial inclusion(Cruz Rambaud et al., 2022); however, microfinance demands a commercial network with great capillarity and low costs, and the development of technological solutions that promote digital banking (Bhaskar et al., 2022; Lu et al., 2022; Ren et al., 2023; Klapper et al., 2016).

MNBs providing microfinance to developing countries as part of their socially sustainable practices (Prior and Argandona, 2009) benefit from two factors compared to domestic banks: technology and experience in offering microcredits across different countries. MNBs offering microfinancial services combine a social sustainability focus in their core business operations with the utilization of digital technologies (Detragiache et al., 2008; Feyen et al., 2022; Kebede et al., 2021). Digitalization streamlines daily transactions like government transfers, bill payments, and wage disbursement (Pazarbasioglu et al., 2020). Digitalization mitigates both supply-side and demand-side barriers to access to financial services (Pashang and Weber, 2023; Pazarbasioglu et al., 2020). By integrating finance and microfinance across diverse international markets, MNBs can gain unique insights into diverse customer needs. Exposure to a broad spectrum of economic settings also empowers MNBs to collaborate with diverse stakeholders, harnessing their capabilities to develop market-based, commercially viable solutions for low-income populations (Chih et al., 2010).

MNBs find microfinance an effective way to build an international reputation. Actions taken to improve financial inclusion effectively bolster the reputation of MNBs in developing countries, enhancing their commitment to and, thus, reputation for inclusive growth (Aramburu and Pescador, 2019; Forcadell and Aracil, 2019; Simo et al., 2023). Offering microfinancial services positively influences customer loyalty and improves access to international financial markets (Chih, Chih, and Chen, 2010). Such positive externalities can justify MNBs providing microfinance to the most disadvantaged, even if it means fully or partially forgoing their usual profit margins.

The availability of financial resources and the ability to bear risk are key factors in getting banks to provide funding. The availability of funds through the international markets allows MNBs to lend at lower interest rates, which heightens financial inclusion (Degryse et al., 2012; Kebede et al., 2021; Wu et al., 2011). As to risk assessment, MNBs are superior to domestic banks in monitoring 'hard' information such as accounting data or collateral values (Berger et al., 2005; Detragiache et al., 2008; Rastogi et al., 2023). Even so, lending in developing countries may involve informationally opaque settings, particularly when targeting groups traditionally excluded by the financial system ('relationship lending'). This entails the assessment of 'soft' information through continuous, personalized, direct contact with potential clients and the local community. Domestic banks typically have a more horizontal organizational structure than MNBs. Such a flat structure gives managers greater autonomy to utilize 'soft' information, so that closer oversight and a more versatile information flow ensues (Stein, 2002). In contrast, MNBs' more hierarchical organization impedes the communication of nuanced information because of cultural, institutional, and linguistic disparities as well as sheer organizational strata (Berger, Miller, Petersen, Rajan, and Stein, 2005). Consequently, MNBs are less efficient at creating and maintaining the personalized, community-oriented relationships needed to gather and channel soft information through formal communication networks (De la Torre et al., 2010). This leads to MNBs lending less than domestic banks to opaque borrowers (Degryse et al., 2012) and often forgoing systems that could monitor soft information.

In these settings, socially sustainable activities can provide MNBs some advantages in monitoring soft information, reducing the risk of lending to the poorest in developing countries. MNBs with experience in offering microfinancial products in diverse developing markets characterized by similar opacity levels can transfer part of their experience to other developing markets. This enables them to design loan portfolios tailored to the needs of the conventionally excluded and to institutional settings lacking the legal infrastructure necessary to enforce contracts (Chih et al., 2010; De la Torre et al., 2010). Conversely, reaching the bottom of the social 'pyramid' requires low-cost innovations that disrupt established business practices (Ashta, 2015). Advancements in machine learning and artificial intelligence, both in process automation and credit risk assessment, mitigate challenges posed by the hierarchical organization of MNBs. Automation can strategically balance centralized with decentralized processes to achieve efficiency gains in managing costs and risks. This contributes to lowering the costs associated with managing soft information in such organizations and facilitating loan provision in situations of high information asymmetry (Chih et al., 2010; Detragiache et al., 2008).

We propose the following hypotheses about the positive effect of socially sustainable practices of MNBs on the first two dimensions of financial inclusion, namely access to a bank account and access to credit:

Hypothesis 1.   The socially sustainable practices of MNBs positively impact access to a bank account by the lowest income groups in developing countries.

Hypothesis 2.   The socially sustainable practices of MNBs positively impact access to credit by the lowest income groups in developing countries.

Hypotheses 1 and 2 test how socially sustainable practices can lead banks put trust in the poorest customers and how MNBs can reduce risk by applying technology, geographically diversifying, and utilizing their international experience; translated into more credit to grant to the poorest and more products fitted to their special economic and social profiles and risks. In the case of savings, however, the requisite trust depends on the poorest themselves. MNBs' socially sustainable actions can generate trust among the poorest, we argue, which encourages savings and bank deposits among them.

Trust in the banking sector is crucial for the effective functioning of financial systems globally and is particularly relevant in developing countries where institutional weaknesses and successive crises erode public confidence (Bugandwa et al., 2021; Fungácová et al., 2019; Jansen et al., 2015; Knell and Stix, 2015; Sapienza and Zingales, 2012; Carbó-Valverde et al., 2013). Deposit guarantee systems encourage the use of transaction accounts, but it is trust in banks that distinctively influences individuals holding savings accounts (Baidoo and Akoto, 2019; Stix, 2013; Ubeda et al., 2022; van der Cruijsen et al., 2023; Beckmann and Mare, 2017). In this context, the sustainability actions of MNBs help construct social capital (Jørgensen et al., 2022; Lin, 2011; Sacconi and Antoni, 2010). Socially sustainable practices foster trust within host countries' communities, motivating resort to formal savings instruments among the poorest (Tischer, 2013; Van Dalen and Henkens, 2018).

Consumer trust in products or services grows as the level of adoption increases, as the product life cycle shows (Anderson and Zeithaml, 1984). In banking, we find the example of mobile banking adoption (Lin, 2011; Kim et al., 2009). We can use this example to show that poor countries are in the introductory phase of the banking life cycle, characterized by low product adoption and low experience levels. In this case, the early adopters are the public sector, big companies, and rich people. The poorest are among the late adopters, whose adoption rate will increase as they gain experience and trust and find products fitted to their traits and necessities. Thus, banking development in a developing country with scarce previous experience in banking can help people gain information on financial services and their operation, and so become financially educated. This contributes to generating the needed trust that prompts vulnerable people to take the risk of depositing in a bank account. As banking services spread in a country, their accessibility generates trust, which affects bank savings (Filipiak, 2016). Additionally, bank penetration can reduce the costs of gathering information, enforcing contracts, and processing transactions, clearing some of the obstacles to saving (Célerier and Matray, 2019; Levine, 2005; Schaner, 2018).

This reasoning implies that MNBs' social actions can create trust to encourage savings among the poorest in developing countries. However, sustainable actions require a minimum banking penetration to generate the needed trust. People need to know of banking services to appreciate banks' socially sustainable practices. In other words, MNBs can only create trust by social actions through banking presence in the developing country (i.e., bank penetration). Consequently, we hypothesize that banking penetration positively moderates the effectiveness of banks' social strategies to mobilize savings among the poorest, hence:

Hypothesis 3.   The socially sustainable practices of MNBs positively impact savings among the lowest-income groups in developing countries only when a minimum level of bank penetration is reached.

3. Data & methods

3.1. Sample

We use data pertaining to financial inclusion from the Global Financial Inclusion (Global Findex) survey.[4] This study is notable for its extensive global reach, whereby over 150,000 randomly selected adults across 148 countries were interviewed (Allen et al., 2016; Chauvet and Jacolin, 2017). Specifically, we use the most recent survey, conducted in 2017 (Demirgüç-Kunt et al., 2018). We use a sample comprising 32 developing countries,[5] totaling 37,952 individual respondents. We chose nations based on the availability and quality of data in the Global Findex. By limiting our sample to countries with robust and reliable data, we ensure the validity and relevance of our findings. It is important to note that, within these countries, respondents were chosen randomly to ensure a diverse and equitable representation of the adult population.

To ascertain the presence of MNBs in the 32 nations of the global South, we turned to the BankScope database provided by Bureau van Dijk and Fitch Ratings (Ahamed et al., 2021). This approach facilitates the update of the bank ownership database initially compiled by Claessens and Van Horen (2015). Adopting their established criteria, a local commercial bank is classified as a subsidiary of an MNB if the latter possesses over 50 % of its capital. We identify 514 domestic commercial banks within our 32-country sample. Among these, 176 are subsidiaries connected to 152 distinct MNBs.

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[4] More information about Global Findex and the complete database is at: http://www.worldbank.org/globalfindex; see also http://www.gallup.com/strategicconsulting/en-us/worldpoll.aspx.

[5] Our sample comprises 32 global South countries from Latin America, Africa, Asia, the Balkans, Middle East, and Caucasus: Algeria, Bolivia, Brazil, Chile, Colombia, Ecuador, Egypt, Ethiopia, Georgia, Ghana, Guatemala, Haiti, India, Indonesia, Jordan, Kazakhstan, Lebanon, Libya, Malaysia, Mexico, Morocco, Pakistan, Peru, Philippines, Serbia, Thailand, Turkey, Ukraine, Uruguay, Uzbekistan, Vietnam, Zimbabwe.

Finally, we sourced the social aspect of the ESG criteria from the Thomson Reuters Eikon database, a resource extensively cited in prior research(Borralho et al., 2022; Cheng and Huang, 2024; Dahlsrud, 2008; Forcadell et al., 2020; Gallego-Álvarez et al., 2018; Mervelskemper and Streit, 2017; Ortas et al., 2015; Sassen et al., 2016; Velte, 2016). This enabled us to obtain the social dimension rating for the 517 MNBs sampled in 2017.

3.2. Variables

3.2.1. Dependent variable

Financial inclusion means the access to and use of financial services by the poor (Allen et al., 2016; Kendall, Mylenko, and Ponce, 2010). Previous studies used two different approaches to financial inclusion (Ahamed et al., 2021; Beck, Demirgüç-Kunt, and Levine, 2007; Chauvet and Jacolin, 2017; Honohan, 2008; Kendall, Mylenko, and Ponce, 2010; Tram, Lai, and Nguyen, 2021): (1) one based on individual indicators, and (2) one based on a country-level composite financial inclusion index.[6] The Findex Global survey allows us to go beyond these studies and use three individual indicators to measure financial inclusion (Allen et al., 2016).

1. $Account_{ij}$ takes value one if individual i in country j is the deposit account owner.
2. $Borrow_{ij}$ takes value one if individual i in country j used a bank or any other formal financial institution to borrow money in the past 12 months.
3. $Save_{ij}$ takes value one if individual i in country j used a bank or another formal financial institution to save or set aside money in the past 12 months.

Table 1 shows crucial financial statistics across income quintiles, revealing patterns in financial access among the respective socioeconomic segments. The "Respondent" and "Percentage of Total" columns indicate an uneven representation across quintiles. Notably, the percentage of individuals with financial accounts rises with income, revealing a stark 28.78 % disparity between the poorest and richest segments. Conversely, credit access does not follow a linear trajectory based on wealth; despite this, we observe that lower income levels have less access to credit. Savings behaviour, predictably, is positively correlated with income levels, highlighting significant socioeconomic disparities.

3.2.2. Independent variables

We estimate MNBs' Social practices from the firm-level scores provided by Thomson Reuters that rate firms' commitment to enacting the Social criteria. We use the score of headquarters as a proxy of the Social practices of MNB i in country j $\left(Social_{ij}\right)$. We estimate the aggregate value of the above variable at the country level: $Social_j = \sum_{i=1}^{k_j} \frac{A_{ij}^f}{A_j} Social_{ij}$ is the level of Social practices of MNB i in country j, where k_j is the number of foreign subsidiaries in country j. To estimate the assets controlled by an MNB $\left(A_{ij}^f\right)$, we use the BankScope database of Bureau van Dijk and Fitch Ratings. It counts Bank A as a subsidiary if more than 50 % of its shares are held by Headquarters H. This criterion allows us to differentiate a subsidiary of an MNB from a domestic commercial bank. To forestall double counts, we use the consolidated counts of banks. Accordingly, A_{ijt}^d is the volume of assets controlled by domestic banks and A_{ijt}^f that by MNBs. Therefore, $A_j = \sum_{i=1}^{n_j} A_{ij}^d + A_{ij}^f$ is the total assets of banks in country j, where n_j is the number of banks located in country j[7].

3.2.3. Control variables

We include control variables at both individual (level 1) and country (level 2) levels. The first level control variables are $CV1_{ij}$: $Gender_{ij}$ is a dummy variable that takes value 1 if the individual is female, Age_{ij} is the age in years, $Inc(d)_{ij}$ are dummy variables derived from the ordinal variable that identifies five income levels, where d takes value 1 for the lowest income band and 5 for the highest income band,[8] $Educ(2)_{ij}$ is a dummy variable that identifies individuals with secondary education, $Educ(3)_{ij}$ is a dummy variable that identifies individuals with a tertiary or higher level of education. The second level control variables are $CV2_j$: MNB_j is the presence of multi-national banks in country j as measured by the percentage of total bank assets controlled by foreign subsidiaries $\left(MNB_j = \frac{A_j^f}{A_j}\right)$, BP_j is the level of banking penetration in country j as measured by the percentage of people with bank accounts *(Global Findex)*, $BTrust_j$ is the average level of trust in banks in country j *(World Value Survey)*. $BConc_j$ is bank concentration as measured by the total assets of the five largest banks as a percentage of total commercial banking assets *(Global Findex)*. RL_j is the rule of law indicator of the World Governance Indicators, indicating the quality of contract enforcement, property rights protection, and judicial

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[6] For a recent systematic review of financial inclusion measures, see (Pesqué-Cela et al., 2021).

[7] Consider a scenario in country j with a total of 5 commercial banks. Of these, 2 are subsidiaries of MNBs, while the remaining 3 are domestic banks. The asset sizes of the two MNB subsidiaries stand at CU100 and CU200, respectively. In contrast, each domestic bank possesses assets worth CU50. The parent MNBs of the subsidiaries hold social rankings of 80 and 90. Consequently, the measure of MNB's social activity level in country j can be deduced as follows: $S_j = \frac{100 \times 80 + 200 \times 90}{100+200+50+50+50} = 57.8$.

[8] Participants were stratified into distinct income categories via a self-reported measure. Specifically, our survey employed a quintile system, prompting respondents to identify their household's relative economic position within their respective economies.

Table 1
Financial inclusion across income quintiles.

	Respondent	%	% with account	% with credit	% with savings
Poorest (20 %)	6751	17.79 %	39.53 %	36.74 %	28.39 %
Second (20 %)	6840	18.02 %	45.70 %	39.28 %	34.18 %
Middle (20 %)	7307	19.25 %	51.61 %	40.24 %	38.48 %
Fourth (20 %)	7985	21.04 %	56.55 %	43.57 %	45.13 %
Richest (20 %)	9069	23.90 %	68.31 %	40.57 %	55.56 %
Total	**37,952**	**100 %**			

system efficiency.

3.3. Analytical approach

We analyse the effects of MNBs' Social practices, which is a variable estimated at the country level (level 2) on financial inclusion at the individual level (level 1). Also, some other control variables are estimated at the country level. This multilevel frame violates the assumption of independence of observations, leading to downwardly biased standard errors if ordinary regression is used (Krull and MacKinnon, 2001; Preacher et al., 2010). We estimate a multilevel regression.

Given that the variables $Account_{ij}$ and $Borrow_{ij}$ are binary; we estimate a multilevel probit regression:[9]

$$P\left[Account_{ij}/Borrow_{ij} = 1\middle|X\right] = a + \beta_1 Social_j + \beta_2 CV1_{ij} + \beta_3 CV2_j + ?_j + ?'_{ij} \quad (1)$$

where $Account_{ij}/Borrow_{ij}$ is a dummy variable of individual i of country j, that takes value one if the individual has an account in a bank (or has a bank loan), and zero otherwise. The effects of MNBs' Social practices $(Social_j)$ on these dimensions of financial inclusion is measured by the coefficient β_1. $CV1_{ij}$ and $CV2_j$ are, respectively, the control variables included in level 1 and in level 2. $?_{1j}$ is the intercept, which varies over individuals, and $?_{1j} \sim N(0, ?_{11})$. $?_{ij}$ are the errors, and $?_{ij} \sim N(0, ?)$.

In our Hypothesis 3 we posit that the impact of MNBs' Social dimensions on the savings behaviour of the underprivileged is moderated by the level of banking penetration. We employ machine learning, specifically the k-Nearest Neighbors[10] algorithm, to pinpoint this threshold. The finding indicates that greater discriminating power (between people who do and do not decide to deposit savings in a bank) is reached when $BP_j = 0.8$, *i.e.* we differentiate Thailand and Malaysia from the other countries (See Appendix 1, Table 8). Based on this insight, we proceed to estimate a multilevel probit regression.

$$P\left[Save_{ij} = 1\middle|X\right] = a + \beta_1 Social_j \times I(BC_j = 0.8) \quad + \beta_2 Social_j \times I(BC_j > 0.8) + \beta_3 CV1_{ij} + \beta_4 CV2_j + ?_j + ?'_{ij} \quad (2)$$

where $Save_{ij}$ is a dummy variable of individual i from country j, which takes value one if individual i deposits his savings in a bank, and zero otherwise. $I(BP_j = 0.8)$ is a function that takes value one if $BC_j = 0.8$ and zero otherwise. β_1 measures the effect of $Social_j$ on $Save_{ij}$ when $BP_j = 0.8$. $I(BP_j > 0.8)$ is a function that takes value one if $BP_j > 0.8$, and zero otherwise. β_2 measures the effect of $Social_j$ on $Save_{ij}$ when $BP_j > 0.8$. $CV1_{ij}$ and $CV2_j$ are the control variables at level 1 and level 2. $?_{1j}$ is the intercept, which varies over individuals, and $?_{1j} \sim N(0, ?_{11})$. $?_{ij}$ are the errors and $?_{ij} \sim N(0, ?)$.

The sample has been segmented into income quintiles. Consider that the social practices of MNBs generate financial inclusion when they contribute positively to the decision to use current accounts, save money, or take a loan $(\beta_1 > 0)$ among the most vulnerable populations, *i.e.* among the first three income segments.

The relationships between financial inclusion and two control variables, trust in banks and income distribution, are not unidirectional, because reverse causality may be in play (Beck et al., 2010; Neaime and Gaysset, 2018; Xu, 2020). Trust in banks is necessary for financial inclusion, but financial inclusion also improves trust in banks(Xu, 2020) . Poverty alleviation increases the demand for banking services, but financial integration reduces inequalities (Neaime and Gaysset, 2018). A function control in a standard two-stage method (Wooldridge, 2015) can alleviate, if not solve, endogeneity bias and doubts about the direction of causality. In the specification of the control function, we include the instrumental variables proposed by Bjørnskov (2007) and Xu (2020): $Protestant_j$ is the percentage of Protestants in a population, $GDP.pc_j$ the GDP per capita, $Population_j$ the adult population.[11] $Politic_j$ is a scale of political preferences: the higher the value the greater the predisposition toward right-wing positions.

4. Results

Model 1 in Table 2 is a multilevel probit model, in which we analyse the effect of MNBs' Social practices on using a bank account. The coefficient of $Social_j$ is positive and significant, so that MNBs' socially sustainable practices increase the use of bank accounts.

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[9] We used the command meprobit of Stata 16.

[10] We split the sample into two subsamples, a training section (70 % of the sample) and a testing section (30 % of the sample)

[11] Given that the population density was not significant, we used the logarithm of population size.

Financial inclusion requires that this effect be sustained among the most vulnerable groups. In these, the coefficients of $Social_j$ are significant and positive for low wealth levels, *i.e.* for the first three income quintiles (Models 2–4). MNBs' Social practices positively affect the use of bank accounts among lower-income citizens and contribute positively to financial inclusion (H1). The findings are analogous among the wealthier segments; thus, we can assert that the social sustainability efforts of multinational banks contribute to financial inclusion when considering its broadest definition (Model 5).

Table 3 contains the results of models that analyse the impact of MNBs' Social practices on loan contracts. In Model 6, the

Table 2
Multilevel probit regression for the decision to use a deposit account (control function).

	Model 1 $Account_{ij}$	Mixed-Probit	Model 2 $Account_{ij}$ First income quintile	Mixed-Probit	Model 3 $Account_{ij}$ Second income quintile	Mixed-Probit	Model 4 $Account_{ij}$ Thirst income quintile	Mixed-Probit	Model 5 $Account_{ij}$ Fourth and fifth income quintile	Mixed-Probit
$Social_j$	0.001	****	0.003	****	0.003	****	0.003	****	0.002	***
	(0.000)		(0.001)		(0.001)		(0.001)		(0.000)	
$Empl_{ij}$	0.383	****	0.270	****	0.298	****	0.332	****	0.462	****
	(0.021)		(0.034)		(0.035)		(0.032)		(0.023)	
BC_j	2.516	****	2.588	****	2.787	****	2.578	****	2.455	****
	(0.054)		(0.102)		(0.098)		(0.095)		(0.073)	
MNB_j	0.055		0.590	****	0.262	**	0.302	**	0.363	****
	(0.046)		(0.143)		(0.133)		(0.134)		(0.087)	
$BTrust_j$	0.136	****	0.733	****	0.305	***	0.443	****	0.645	****
	(0.015)		(0.112)		(0.109)		(0.105)		(0.068)	
$Gender_{ij}$	-0.166	****	-0.083	**	-0.145	****	-0.203	****	-0.168	****
	(0.015)		(0.033)		(0.033)		(0.032)		(0.022)	
Age_{ij}	0.035	****	0.036	****	0.034	****	0.031	****	0.029	****
	(0.002)		(0.004)		(0.005)		(0.005)		(0.003)	
Age_{ij}^2	-0.000	****	-0.000	****	-0.000	****	-0.000	****	-0.000	****
	(0.000)		(0.000)		(0.000)		(0.000)		(0.000)	
$Inc(2)_{ij}$	0.118	****								
	(0.022)									
$Inc(3)_{ij}$	0.249	****								
	(0.023)									
$Inc(4)_{ij}$	0.335	****							-0.280	****
	(0.032)								(0.023)	
$Inc(5)_{ij}$	0.579	****								
	(0.023)									
$Educ(2)_{ij}$	0.473	****	0.423	****	0.393	****	0.367	****	0.645	****
	(0.018)		(0.039)		(0.041)		(0.040)		(0.027)	
$Educ(3)_{ij}$	1.109	****	0.921	****	1.000	****	1.002	****	1.249	****
	(0.029)		(0.091)		(0.074)		(0.067)		(0.037)	
RL_j	-0.021		-0.017		-0.072	*	-0.016		-0.043	
	(0.029)		(0.041)		(0.037)		(0.035)		(0.033)	
$BConc_j$	0.000		-0.004	***	-0.000		0.002	*	0.005	****
	(0.001)		(0.001)		(0.001)		(0.001)		(0.001)	
$?_{BTrust}$	1.761	****	-0.644	****	-0.219	*	-0.331	***	-0.653	****
	(0.440)		(0.123)		(0.123)		(0.118)		(0.079)	
$?_{Inc}$	-1.537	**								
	(0.676)									
Constant	-4.119	****	-5.387	****	-3.761	****	-3.883	****	-2.183	****
	(0.583)		(0.671)		(0.635)		(0.518)		(0.620)	
Instrumental variables (first stage regressions)										
	$BTrust_{ij}$		$BTrust_{ij}$		$BTrust_{ij}$		$BTrust_{ij}$		$BTrust_{ij}$	
$Protestant_j$	0.696	****	0.618	****	0.679	****	0.672	****	0.781	****
	(0.006)		(0.052)		(0.045)		(0.046)		(0.028)	
$Population_j$	0.154	***	0.140	****	0.140	****	0.141	****	0.144	****
	(0.000)		(0.004)		(0.004)		(0.004)		(0.002)	
	Inc_{ij}		Inc_{ij}		Inc_{ij}		Inc_{ij}		Inc_{ij}	
$GDP.pc_j$	-0.000									
	(0.000)									
$Protestant_j$	0.425	****								
	(0.065)									
$Population_j$	0.066	****								
	(0.007)									
$Wald - ?_1^2$	4990.860	****	739.130	****	829.440	****	1119.010	****	2467.980	****
VIF max†	2.130		2.040		6.810		6.920		6.590	
LR-test	209.450	****	30.670	****	20.640	****	4.730	**	138.340	****
Observations	37,952		6751		6840		7307		17,054	
N. of Countries	32		32		32		32		32	

coefficient of *Social_j* is positive and significant. Therefore, MNBs' social practices increase the resort to bank loans. In Model 10, the findings are the same as above. This confirms this effect among the highest income levels. In Models 7, 8, and 9, the coefficients of *Social_j* are positive and significant. The impact of MNBs' Social practices also increases the resort to bank loans at low-income levels, which confirms Hypothesis 2.

The outcomes of MNBs' Social practices affecting the decision to save are presented in Table 4. In Model 11 the coefficients of interactions $Social_j \times I(BP_j = 0.8)$ and $Social_j \times I(BP_j > 0.8)$ are significant and positive, with the first coefficient smaller than the

Table 3
Multilevel probit regression for the decision to borrow (control function).

	Model 6 $Borrow_{ij}$	Mixed-Probit	Model 7 $Borrow_{ij}$ First income quintile	Mixed-Probit	Model 8 $Borrow_{ij}$ Second income quintile	Mixed-Probit	Model 9 $Borrow_{ij}$ Thirst income quintile	Mixed-Probit	Model 10 $Borrow_{ij}$ Fourth and fifth income quintile	Mixed-Probit
$Social_j$	0.003	****	0.002	*	0.005	****	0.002	*	0.003	****
	(0.001)		(0.001)		(0.001)		(0.001)		(0.001)	
$Empl_{ij}$	0.503	****	0.517	****	0.442	****	0.541	****	0.532	****
	(0.021)		(0.070)		(0.064)		(0.065)		(0.023)	
BC_j	-0.213		0.204		0.087		-0.195		-0.012	
	(0.084)		(0.179)		(0.174)		(0.168)		(0.110)	
MNB_j	-0.186	**	0.609	*	0.221		0.230		0.095	****
	(0.082)		(0.365)		(0.330)		(0.290)		(0.187)	
$BTrust_j$	0.112	***	0.938	**	0.750	**	0.675	**	0.336	**
	(0.043)		(0.367)		(0.334)		(0.279)		(0.170)	
$Gender_{ij}$	-0.071	***	-0.007	**	-0.045		-0.031		-0.093	***
	(0.023)		(0.059)		(0.055)		(0.055)		(0.033)	
Age_{ij}	0.033	****	0.035	***	0.022	**	0.028	***	0.042	****
	(0.004)		(0.010)		(0.009)		(0.009)		(0.006)	
Age_{ij}^2	-0.000	****	-0.000	***	-0.000	**	-0.000	***	-0.000	****
	(0.000)		(0.000)		(0.000)		(0.000)		(0.000)	
$Inc(2)_{ij}$	0.014									
	(0.038)									
$Inc(3)_{ij}$	0.025									
	(0.038)									
$Inc(4)_{ij}$	0.036								-0.036	****
	(0.038)								(0.044)	
$Inc(5)_{ij}$	0.048									
	(0.036)									
$Educ(2)_{ij}$	-0.000		0.067		0.205	***	0.068		-0.036	
	(0.026)		(0.073)		(0.074)		(0.081)		(0.044)	
$Educ(3)_{ij}$	0.206		0.101		0.191		0.101		-0.061	
	(0.038)		(0.124)		(0.122)		(0.099)		(0.054)	
RL_j	0.021		-0.157		-0.238	***	-0.041		-0.128	**
	(0.038)		(0.099)		(0.074)		(0.081)		(0.060)	
$BConc_j$	-0.007	****	-0.005		-0.003		0.000		-0.004	**
	(0.001)		(0.004)		(0.004)		(0.003)		(0.002)	
$?_{BTrust}$	118.248	****	-0.620		-0.521		-0.631	**	-0.301	*
	(18.589)		(0.379)		(0.333)		(0.290)		(0.174)	
$?_{Inc}$	-0.122								-0.004	
	(0.827)								(0.033)	
Constant	-2.164	*	-3.549	***	-4.786	****	-3.883	****	-2.183	****
	(1.257)		(1.224)		(1.507)		(0.518)		(0.620)	
Instrumental variables (first stage regressions)										
	$BTrust_{ij}$		$BTrust_{ij}$		$BTrust_{ij}$		$BTrust_{ij}$		$BTrust_{ij}$	
$Protestant_j$	0.696	****	0.623	****	0.689	****	0.679	****	0.788	****
	(0.000)		(0.051)		(0.048)		(0.048)		(0.029)	
$Population_j$	0.154	****	0.146	****	0.148	****	0.147	****	0.151	****
	(0.000)		(0.003)		(0.003)		(0.003)		(0.002)	
	Inc_{ij}		Inc_{ij}		Inc_{ij}		Inc_{ij}		Inc_{ij}	
$GDP.pc_j$	-0.000	*								
	(0.000)									
$Protestant_j$	0.425	****								
	(0.065)									
$Population_j$	0.066	****								
	(0.007)									
$Wald - ?_1^2$	600.04	****	130.240	****	99.420	****	132.670	****	289.010	****
VIF max†	2.130		7.970		8.320		8.480		6.590	
LR-test	538.090	****	33.320	****	62.110	****	85.380	**	226.500	****
Observations	37,952		6751		6840		7307		17,054	
N. of Countries	32		32		32		32		32	

second. MNBs' Social practices positively impact the decision to save, but the effect is more intense if the country has a high level of banking development. In model 15 the coefficients of both interactions are positive and significant. Again, the first coefficient is smaller than the second. The social practices of MNB positively impact people with higher income; this effect is more intense in countries with a high banking development. However, in Models 12, 13 and 14 only the coefficient of the interaction $Social_j \times$

Table 4
Multilevel probit regression for the decision to save (control function).

	Model 11 $Save_{ij}$ Mixed-Probit		Model 12 $Save_{ij}$ Mixed-Probit First income quintile		Model 13 $Save_{ij}$ Mixed-Probit Second income quintile		Model 14 $Save_{ij}$ Mixed-Probit Thirst income quintile		Model 15 $Save_{ij}$ Mixed-Probit Fourth and fifth income quintile	
$Social_j \times I(BC_j = 0.8)$	0.001	**	-0.000		-0.001		0.000		0.001	*
	(0.000)		(0.001)		(0.001)		(0.000)		(0.000)	
$Social_j \times I(BC_j > 0.8)$	0.011	****	0.007	****	0.004	**	0.006	*****	0.005	****
	(0.001)		(0.002)		(0.002)		(0.002)		(0.001)	
$Empl_{ij}$	0.336	****	0.288	****	0.231	****	0.336	****	0.402	***
	(0.021)		(0.051)		(0.048)		(0.043)		(0.028)	
BC_j	0.721	****	1.015	****	0.992	****	1.228	****	0.923	****
	(0.068)		(0.169)		(0.152)		(0.283)		(0.081)	
MNB_j	-0.289	****	0.449	**	-0.064		0.015		-0.069	
	(0.027)		(0.216)		(0.201)		(0.172)		(0.096)	
$BTrust_j$	0.126	****	0.711	****	0.611	****	0.498	****	0.683	****
	(0.033)		(0.173)		(0.158)		(0.172)		(0.072)	
$Gender_{ij}$	-0.109	****	-0.080	*	-0.166	****	-0.140	****	-0.079	***
	(0.016)		(0.045)		(0.045)		(0.040)		(0.023)	
Age_{ij}	0.015	****	0.002		0.016	***	0.016	**	0.012	***
	(0.003)		(0.007)		(0.007)		(0.006)		(0.003)	
Age_{ij}^2	-0.000	****	-0.000		-0.000	***	-0.000	**	-0.000	*
	(0.000)		(0.000)		(0.000)		(0.000)		(0.000)	
$Inc(2)_{ij}$	0.164	****								
	(0.035)									
$Inc(3)_{ij}$	0.291	****								
	(0.033)									
$Inc(4)_{ij}$	0.401	****							-0.280	****
	(0.032)								(0.023)	
$Inc(5)_{ij}$	0.718	****								
	(0.022)									
$Educ(2)_{ij}$	0.334	****	0.294	****	0.267	****	0.290	****	0.453	****
	(0.021)		(0.060)		(0.058)		(0.051)		(0.030)	
$Educ(3)_{ij}$	0.770	****	0.625	****	0.742	****	0.664	****	0.865	****
	(0.030)		(0.091)		(0.084)		(0.070)		(0.037)	
RL_j	-0.058		0.036		-0.052		-0.025		-0.022	
	(0.051)		(0.091)		(0.071)		(0.052)		(0.051)	
$BConc_j$	-0.008	****	-0.001		-0.005		-0.005	**	-0.003	
	(0.008)		(0.002)		(0.007)		(0.002)		(0.001)	
$?_{BTrust}$	1.275	**	-0.509	**	-0.652	***	-0.474	***	-0.655	****
	(0.652)		(0.205)		(0.189)		(0.157)		(0.779)	
$?_{Inc}$	-3.481									
	(7.008)									
Constant	-2.880	****	-2.786	****	-2.073	****	-2.318	****	-2.183	****
	(0.595)		(0.586)		(0.608)		(0.545)		(0.620)	
Instrumental variables (first stage regressions)										
	$BTrust_{ij}$		$BTrust_{ij}$		$BTrust_{ij}$		$BTrust_{ij}$		$BTrust_{ij}$	
$Protestant_j$	0.675	****	0.618	****	0.682	****	0.668	****	0.779	****
	(0.000)		(0.052)		(0.049)		(0.052)		(0.030)	
$Population_j$	0.149	***	0.140	****	0.140	****	0.141	****	0.145	****
	(0.000)		(0.004)		(0.004)		(0.004)		(0.002)	
	Inc_{ij}		Inc_{ij}		Inc_{ij}		Inc_{ij}		Inc_{ij}	
$GDP.pc_j$	-0.000	*								
	(0.000)									
$Protestant_j$	0.427	****								
	(0.067)									
$Population_j$	0.066	****								
	(0.007)									
$Wald - ?_1^2$	3250.010	****	172.370	****	204.970	****	288.910	****	1288.860	****
VIF max†	1.870		1.710		1.730		1.700		1.610	
LR-test†	898.760	****	27.520	****	60.170	****	84.620	****	596.070	****
Observations	37,952		6751		6840		7307		17,054	
N. of Countries	32		32		32		32		32	

$I(BP_j > 0.8)$ is significant; therefore, MNBs' social practices increase the propensity to save among the most disadvantaged groups only when banking development is high. These findings confirm Hypothesis 3, since a minimum level of banking development is required for the social practices of MNBs to have a positive impact on the savings of the poorest.

Table 5
Multilevel probit regression for the decision to use a deposit account (control function). The sample includes countries where the assets controlled by MNBs with an ESG ranking exceed 50 % of assets controlled by all MNBs.

	Model 16 $Account_{ij}$	Mixed-Probit	Model 17 $Account_{ij}$ First income quintile	Mixed-Probit	Model 18 $Account_{ij}$ Second income quintile	Mixed-Probit	Model 19 $Account_{ij}$ Thirst income quintile	Mixed-Probit	Model 20 $Account_{ij}$ Fourth and fifth income quintile	Mixed-Probit
$Social_j$	0.003	****	0.002	*	0.004	****	0.003	****	0.003	****
	(0.001)		(0.001)		(0.001)		(0.010)		(0.001)	
$Empl_{ij}$	0.384	****	0.274	****	0.299	****	0.388	****	0.469	****
	(0.017)		(0.038)		(0.039)		(0.037)		(0.026)	
BC_j	2.529	****	2.639	****	2.761	****	2.618	****	2.332	****
	(0.054)		(0.119)		(0.119)		(0.109)		(0.078)	
MNB_j	0.030		0.340	***	0.325	***	0.147		0.164	**
	(0.052)		(0.127)		(0.119)		(0.122)		(0.083)	
$BTrust_j$	0.103	***	0.056	****	0.375	***	0.289	****	0.289	****
	(0.015)		(0.090)		(0.092)		(0.090)		(0.062)	
$Gender_{ij}$	-0.159	****	-0.050	**	-0.120	****	-0.189	****	-0.184	****
	(0.016)		(0.005)		(0.037)		(0.036)		(0.024)	
Age_{ij}	0.034	****	0.043	****	0.033	****	0.032	****	0.031	****
	(0.002)		(0.005)		(0.005)		(0.005)		(0.003)	
Age^2_{ij}	-0.000	****	-0.000	****	-0.000	****	-0.000	****	-0.000	****
	(0.000)		(0.000)		(0.000)		(0.000)		(0.000)	
$Inc(2)_{ij}$	0.124	****								
	(0.025)									
$Inc(3)_{ij}$	0.250	****								
	(0.024)									
$Inc(4)_{ij}$	0.334	****							-0.280	****
	(0.024)								(0.023)	
$Inc(5)_{ij}$	0.567	****								
	(0.024)									
$Educ(2)_{ij}$	0.458	****	0.383	****	0.404	****	0.323	****	0.610	****
	(0.018)		(0.047)		(0.045)		(0.043)		(0.030)	
$Educ(3)_{ij}$	1.108	****	0.864	****	1.049	****	0.913	****	1.217	****
	(0.030)		(0.084)		(0.084)		(0.005)		(0.041)	
RL_j	-0.005		0.038		-0.072	*	0.016		-0.015	
	(0.027)		(0.038)		(0.037)		(0.035)		(0.031)	
$BConc_j$	-0.000									
	(0.001)									
$?_{BTrust}$	2.317	****	-0.520	****	-0.282	**	-0.174	***	-0.303	****
	(0.440)		(0.108)		(0.113)		(0.108)		(0.078)	
$?_{Inc}$	-1.537	**								
	(0.676)									
Constant	-4.119	****	-4.361	****	-3.761	****	-3.883	****	-2.183	****
	(0.583)		(0.567)		(0.635)		(0.518)		(0.620)	
Instrumental variables (first stage regressions)										
	$BTrust_{ij}$		$BTrust_{ij}$		$BTrust_{ij}$		$BTrust_{ij}$		$BTrust_{ij}$	
$Protestant_j$	0.696	****	0.550	****	0.611	****	0.578	****	0.674	****
	(0.006)		(0.052)		(0.051)		(0.056)		(0.030)	
$Population_j$	0.154	***	0.150	****	0.149	****	0.147	****	0.149	****
	(0.000)		(0.003)		(0.003)		(0.003)		(0.002)	
	Inc_{ij}		Inc_{ij}		Inc_{ij}		Inc_{ij}		Inc_{ij}	
$GDP.pc_j$	-0.000									
	(0.000)									
$Protestant_j$	0.425	****								
	(0.065)									
$Population_j$	0.066	****								
	(0.007)									
$Wald - ?^2_1$	4500.840	****	607.980	****	664.890	****	893.680	****	2115.530	****
VIF max†	2.150		3.420		3.460		6.920		4.010	
LR-test	179.160	****	7.850	****	16.860	****	4.810	**	91.970	****
Observations	35,240		6312		6377		6798		15,753	
N. of Countries	29		29		29		29		29	

4.1. Robustness

Not all MNBs present in less developed countries have a Social rating, which may call into question the proposed measure of SB_j. To test the robustness of our findings, we select countries where the percentage of assets controlled by MNBs with a Social ESG rating exceeds 50 % of assets controlled by MNBs. The results confirm that MNBs' Social practices increase the use of bank accounts by the

Table 6
Multilevel probit regression for the decision to borrow (control function). The sample includes countries where the assets controlled by MNBs with an ESG ranking exceed 50 % of assets controlled by all MNBs.

	Model 21		Model 22		Model 23		Model 24		Model 25	
	$Borrow_{ij}$	Mixed-Probit	$Borrow_{ij}$	Mixed-Probit	$Borrow_{ij}$	Mixed-Probit	$Borrow_{ij}$	Mixed-Probit	$Borrow_{ij}$	Mixed-Probit
			First income quintile		Second income quintile		Thirst income quintile		Fourth and fifth income quintile	
$Social_j$	0.003	****	0.003	*	0.006	****	0.003	****	0.004	****
	(0.001)		(0.002)		(0.001)		(0.001)		(0.001)	
$Empl_{ij}$	0.341	****	0.247	****	0.293	****	0.351	****	0.402	****
	(0.019)		(0.044)		(0.045)		(0.044)		(0.031)	
BC_j	2.706	****	2.830	****	2.999	****	2.762	****	2.490	****
	(0.055)		(0.132)		(0.142)		(0.125)		(0.094)	
MNB_j	-0.197	**	0.226		-0.019		-0.188		-0.112	
	(0.079)		(0.214)		(0.201)		(0.108)		(0.136)	
$BTrust_j$	-0.006		0.386	***	0.104		0.071		0.039	
	(0.040)		(0.117)		(0.112)		(0.108)		(0.077)	
$Gender_{ij}$	-0.094	****	0.006		-0.098	**	-0.119	***	-0.109	****
	(0.018)		(0.043)		(0.041)		(0.041)		(0.027)	
Age_{ij}	0.035	****	0.052	****	0.035	****	0.030	****	0.031	****
	(0.003)		(0.006)		(0.006)		(0.005)		(0.004)	
Age_{ij}^2	-0.000	****	-0.000	****	-0.000	****	-0.000	****	-0.000	****
	(0.000)		(0.000)		(0.000)		(0.000)		(0.000)	
$Inc(2)_{ij}$	0.147	****								
	(0.027)									
$Inc(3)_{ij}$	0.264	****								
	(0.027)									
$Inc(4)_{ij}$	0.339	****							-0.280	****
	(0.027)								(0.023)	
$Inc(5)_{ij}$	0.570	****								
	(0.028)									
$Educ(2)_{ij}$	0.408	****	0.337	****	0.293	****	0.283	****	0.535	****
	(0.021)		(0.049)		(0.045)		(0.048)		(0.035)	
$Educ(3)_{ij}$	1.104	****	0.838	****	1.001	****	0.828	****	1.157	****
	(0.034)		(0.090)		(0.097)		(0.008)		(0.050)	
RL_j	-0.007		0.040		-0.041		0.052		-0.141	
	(0.027)		(0.046)		(0.047)		(0.047)		(0.043)	
$BConc_j$	-0.001	*								
	(0.001)									
$?_{BTrust}$	-1.482		-0.411	****	0.259	**	0.021		-0.002	****
	(1.135)		(0.136)		(0.138)		(0.131)		(0.044)	
$?_{Inc}$	3.390									
	(0.614)									
Constant	-5.382	****	-4.478	****	-3.761	****	-3.883	****	-2.183	****
	(0.580)		(0.594)		(0.635)		(0.518)		(0.620)	
Instrumental variables (first stage regressions)										
	$BTrust_{ij}$		$BTrust_{ij}$		$BTrust_{ij}$		$BTrust_{ij}$		$BTrust_{ij}$	
$Protestant_j$	0.696	****	-1.703	****	-1.685	****	-1.655	****	-1.639	****
	(0.006)		(0.048)		(0.049)		(0.044)		(0.027)	
$Population_j$	0.154	***	0.100	****	0.100	****	0.097	****	0.095	****
	(0.000)		(0.003)		(0.003)		(0.003)		(0.002)	
	Inc_{ij}		Inc_{ij}		Inc_{ij}		Inc_{ij}		Inc_{ij}	
$GDP.pc_j$	-0.000									
	(0.000)									
$Protestant_j$	0.750	****								
	(0.172)									
$Population_j$	0.074	****								
	(0.008)									
$Wald - ?_1^2$	3067.840	****	536.700	****	551.510	****	721.540	****	1311.850	****
VIF max†	3.670		4.840		3.460		5.390		5.490	
LR-test	86.520	****	10.730	****	8.210	***	1.740	*	57.790	****
Observations	26,138		4715		4729		5088		11,605	
N. of Countries	24		24		24		24		24	

most vulnerable (see Table 5); these social practices have a positive impact on the decision to borrow under formal contract (see Table 6). Finally, when the level of banking development is high, the social practices of MNB increase the decision by the poorest to save (see Table 7). These results confirm the robustness of our previous findings.

Table 7
Multilevel probit regression for the decision to save (control function). The sample includes countries where the assets controlled by MNBs with an ESG ranking exceed 50 % of assets controlled by all MNBs.

	Model 26 $Save_{ij}$ Mixed-Probit		Model 27 $Save_{ij}$ Mixed-Probit First income quintile		Model 28 $Save_{ij}$ Mixed-Probit Second income quintile		Model 29 $Save_{ij}$ Mixed-Probit Thirst income quintile		Model 30 $Save_{ij}$ Mixed-Probit Fourth and fifth income quintile	
$Social_j \times I(BC_j = 0.8)$	0.001	*	-0.002		-0.001		0.001		0.000	
	(0.001)		(0.002)		(0.002)		(0.002)		(0.001)	
$Social_j \times I(BC_j > 0.8)$	0.011	****	0.006	**	0.005	*	0.008	***	0.006	****
	(0.001)		(0.003)		(0.003)		(0.002)		(0.001)	
$Empl_{ij}$	0.328	****	0.302	****	0.225	****	0.327	****	0.386	****
	(0.021)		(0.060)		(0.054)		(0.050)		(0.030)	
BC_j	0.685	****	0.717	****	0.711	****	0.999	****	0.617	****
	(0.065)		(0.191)		(0.166)		(0.150)		(0.083)	
MNB_j	-0.144	**	0.594	***	0.339	*	0.313	**	0.151	*
	(0.067)		(0.199)		(0.177)		(0.148)		(0.088)	
$BTrust_j$	0.223	***	0.078		0.754	***	0.580	****	0.665	****
	(0.040)		(0.131)		(0.131)		(0.105)		(0.063)	
$Gender_{ij}$	-0.095	***	-0.112	**	-0.014	**	-0.111	**	-0.070	***
	(0.020)		(0.054)		(0.050)		(0.044)		(0.026)	
Age_{ij}	0.013	****	0.005		0.014	*	0.017	**	0.013	***
	(0.003)		(0.009)		(0.008)		(0.007)		(0.004)	
Age_{ij}^2	-0.000	****	-0.000		-0.000		-0.000	**	-0.000	**
	(0.000)		(0.000)		(0.000)		(0.000)		(0.000)	
$Inc(2)_{ij}$	0.145	****								
	(0.033)									
$Inc(3)_{ij}$	0.76	****								
	(0.034)									
$Inc(4)_{ij}$	0.377	****							-0.303	****
	(0.031)								(0.025)	
$Inc(5)_{ij}$	0.696	****								
	(0.031)									
$Educ(2)_{ij}$	0.317	****	0.314	****	0.291	****	0.244	****	0.420	****
	(0.022)		(0.065)		(0.062)		(0.057)		(0.035)	
$Educ(3)_{ij}$	0.759	****	0.648	****	0.786	****	0.597	****	0.853	****
	(0.030)		(0.102)		(0.094)		(0.080)		(0.040)	
RL_j	-0.037		-0.043		-0.082		-0.034		-0.033	
	(0.041)		(0.063)		(0.065)		(0.046)		(0.043)	
$BConc_j$	-0.006	****								
	(0.001)									
$?_{BTrust}$	-3.439		-0.387	**	-0.682	****	-0.380	***	-0.480	****
	(0.695)		(0.170)		(0.166)		(0.128)		(0.080)	
$?_{Inc}$	0.907									
	(0.695)									
Constant	-3.198	****	-4.501	****	-4.328	****	-4.037	***	-3.818	****
	(0.979)		(0.768)		(0.769)		(0.611)		(0.654)	
Instrumental variables (first stage regressions)										
	$BTrust_{ij}$		$BTrust_{ij}$		$BTrust_{ij}$		$BTrust_{ij}$		$BTrust_{ij}$	
$Protestant_j$	0.583	****	0.577	****	0.645	****	0.601	****	-1.679	****
	(0.000)		(0.055)		(0.055)		(0.056)		(0.028)	
$Population_j$	0.083	***	0.153	****	0.153	****	0.149	****	0.102	****
	(0.000)		(0.003)		(0.003)		(0.003)		(0.002)	
	Inc_{ij}		Inc_{ij}		Inc_{ij}		Inc_{ij}		Inc_{ij}	
$GDP.pc_j$	-0.000	*								
	(0.000)									
$Protestant_j$	0.330	****								
	(0.065)									
$Population_j$	0.061	****								
	(0.007)									
$Wald - ?_1^2$	2392.940	****	168.560	****	168.800	****	260.660	****	1288.860	****
VIF max†	5.160		4.370		4.010		4.170		1.610	
LR-test	278.010	****	10.780	****	22.040	****	13.090	***	596.070	****
Observations	26,138		4715		4729		5088		11,605	
N. of Countries	24		24		24		24		24	

5. Conclusions

Our empirical results confirm that socially sustainable practices implemented by MNBs expand financial inclusion in developing countries. We have found a positive effect on the three dimensions we have used to proxy financial inclusion. MNBs' socially sustainable practices not only expand access to bank accounts, as exhorted by SDG 8.10, but they also positively affect other dimensions of financial inclusion, namely the opportunity to obtain credit or bank loans and to save money. This is a key point because access to a bank account, though primordial, is only one of the measurable dimensions needed to yield a rounded picture of financial inclusion in developing countries (Collard, Kempson, and Whyley, 2001; Dev, 2006). Financial inclusion in developing countries is not just about access to bank accounts, but is a multidimensional issue (Pesqué-Cela et al., 2021). Inclusion analysis should include access to credit and the opportunity to save. Contemporary definitions of financial inclusion consider access and use of financial services at a reasonable cost and quality, having evolved from a unidimensional to a multidimensional approach (Allen et al., 2016; Demirgüç-Kunt et al., 2018). The World Bank (2018) focuses on expanding financial services overall, including insurance, pensions, and financial markets. Conversely, Sinclair et al., (2009) stress diminishing people's exclusion from essential financial services. Delle Foglie and Keshminder (2022) develop a composite financial inclusion index using the penetration, availability, and usage dimensions by following the distance-based, multi-dimensional approach developed by Sarma (2012) . We contribute to the literature defining financial inclusion, which remains elusive (Pesqué-Cela et al., 2021).

Our empirical results show that the social sustainability of MNBs improves access to banking accounts, credit utilization, and savings among the poorest and higher-income people. The trust-building capacity of banks inherent in these types of activities (Ubeda et al., 2022) may help explain the spreading of financial inclusion through all layers of wealth. These findings round out Stiglitz's (2005) view that MNBs primarily benefit the wealthier segments of developing countries, except that our findings extend this view, demonstrating that socially sustainable practices amplify the positive effects of MNBs in developing countries toward the poorest. This result is strengthened by the role of banking penetration in fostering savings among the poorest.

Our study advances the literature which examines MNBs' sustainable practices in the developing world (Azmi et al., 2021; Kumar and Prakash, 2019; Stix, 2013; Úbeda et al., 2022; Aracil and Forcadell, 2018). Specifically, it adds new insights to the very few studies of the impact of MNBs' banking practices on the "S" in ESG in the developing world and its consequences for financial inclusion (Nizam et al., 2019; Ubeda, Mendez, and Forcadell, 2022).Previous literature has analysed the link between financial inclusion and banking in different areas of the world. Malik et al. (2022) and Ozili (2020) explored the interplay between social sustainability, financial inclusion, and financial sustainability in Asia. Adedokun and Aga (2021) and Shani et al., 2023, focusing on Africa, examined whether financial inclusion strategies alleviate poverty and expand opportunities for the poor. We have contributed to this strand of the literature by generalizing the analysis of financial inclusion to all developing countries.

Trust in banking is essential in fostering savings within the formal financial system. Government legislative and institutional development efforts to safeguard creditor rights, enhance regulatory frameworks, and bolster consumer protection are instrumental in fostering confidence in the banking sector (Demirgüç-Kunt et al., 2018). In less developed countries, the ability to engage in face-to-face interactions due to geographical proximity is a crucial factor in establishing trust, which is exceedingly important for low-wealth individuals (Filipiak, 2016). For example, banks in India have rolled out "door-step banking" initiatives, sending bank advisors to potential clients' doorsteps to inform them about the bank's services (Filipiak, 2016). Through state-owned banks, the government plays a valuable role in nurturing and advancing the financial sector as they help cultivate trust in banking and encourage banking among the population (Andrianova et al., 2008; Berkes et al., 2012; Gupta and Arora, 2017). Additionally, government incentives like tax deferrals, exemptions, and long-term savings plans motivate individuals to save, reducing future reliance on social support (Agarwal et al., 2020)(. Our research indicates that these initiatives are likely to have a more significant effect if banks operate with a strong ethos of social sustainability.

While the study utilized a sample from 32 developing countries, it did not account for all the possible moderating effects of the substantial cultural heterogeneity among the sampled nations. Voluntary financial exclusion arises when certain segments of the population or businesses choose not to utilize financial services, often due to a lack of necessity for them or factors linked to cultural or religious beliefs (Kebede et al., 2021). Religiosity significantly impacts how consumers handle financial obligations. Thus, it would be insightful to examine how religion, among other informal institutional factors, may influence the impact of MNBs' Social activities on the financial inclusion process.

CRediT authorship contribution statement

Alvaro Méndez: Conceptualization, Writing – original draft, Writing – review & editing. **Fernando Úbeda:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Software, Supervision, Writing – original draft, Writing – review & editing. **Francisco Javier Forcadell:** Conceptualization, Project administration, Supervision, Writing – original draft, Writing – review & editing. **Belén López:** Writing – original draft.

Data Availability

Data will be made available on request.

Acknowledgements

APPENDIX 1

Table 8
Banking penetration by country

Economy	BC_j
Malaysia	0.867
Thailand	0.812
India	0.793
Serbia	0.785
Turkey	0.767
Libya	0.737
Brazil	0.708
Chile	0.687
Georgia	0.686
Kazakhstan	0.661
Ukraine	0.652
Ghana	0.623
Uruguay	0.603
Zimbabwe	0.591
Bolivia	0.558
Indonesia	0.533
Lebanon	0.518
Ecuador	0.507
Algeria	0.494
Colombia	0.442
Peru	0.440
Ethiopia	0.432
Uzbekistan	0.422
Guatemala	0.418
Jordan	0.413
Egypt	0.381
Philippines	0.368
Mexico	0.349
Vietnam	0.334
Haiti	0.325
Morocco	0.310
Pakistan	0.220

Source: Global Findex

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