The Role of Accounting in the Informal Economy

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Abstract

Using novel survey data from 1,400 firms in Guatemala, Honduras, and El Salvador, we examine the voluntary adoption of accounting systems by microenterprises operating in the informal economy and their association with access to credit and business growth. Despite the absence of regulatory mandates, 44 percent of informal microbusinesses maintain systematic financial records, with roughly three-quarters using notebooks and one-quarter digital records. Accounting quality is closely linked to the owner's startup motivation, financial stake, and management capabilities. Informal firms that rely on larger suppliers, extend customer credit, engage in marketing promotions, or employ more formal organizational structures are also more likely to adopt structured recordkeeping systems, highlighting accounting's role as a managerial tool rather than as a compliance function or as a precursor to entering the formal economy. Informal firms that use notebooks separating business and personal accounts are significantly more likely to apply for and obtain bank loans. Our inferences for access to credit also extend to microenterprises in the Dominican Republic. In addition, accounting quality appears to support lender due diligence even among informal firms, particularly when lenders are more sophisticated. Using a broader measure of credit market status, we find that accounting quality rises monotonically across credit tiers. Finally, we find that entrepreneurs with higher-quality accounting systems are more likely to plan for business expansion along the extensive margin. By illuminating the motivations behind accounting choices in low-enforcement settings, this study deepens our understanding of the foundational role accounting plays in early-stage business development in emerging markets.

JEL Classification: G21, M13, M4, O17

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1. Introduction

This study examines the relationship between voluntary accounting practices and the informal economy in developing countries, where firms operate outside tax and business registrations, lack labor protection, and are subject to little government enforcement (Ulyssea, 2020). We focus on informal microenterprises, defined as those that are not registered with the national tax authority, are not in compliance with business registration requirements (ILO, 2020), and that employ fewer than ten persons (see European Union, ILO, IDB). Using cross-sectional data from a 2019 survey by the International Labour Organization (ILO) on 1,400 microenterprises in Guatemala, Honduras, and El Salvador, we document the economic trade-offs associated with recordkeeping practices in informal firms and how these practices relate to access to credit and business growth.[1]

Despite accounting for approximately 30 percent of global GDP and 50 percent of employment, the informal economy, where micro and small enterprises are dominant, remains underexplored in the accounting literature (ILO, 2020; Tomy & Wittenberg-Moerman, 2024, 2025) Their business practices are typically rudimentary (Buehn & Schneider, 2012; Halvorson-Quevedo, 1991; IFC, 2010; Ulyssea, 2020) and their financial transactions are often governed by social capital and trust-based relationships (Tomy & Wittenberg-Moerman, 2024, 2025).

Prior research on private firms shows that even absent public disclosure mandates, their accounting choices are typically shaped by tax rules, loan covenants, and statutory reporting thresholds (e.g., Bernard & Sutherland, 2025; Allee & Yohn, 2009; Ball, 2024; Beuselinck et al., 2023; Lisowsky & Minnis, 2020; Minnis, 2011). In such settings, mandated minimum

[1] We use *recordkeeping* and *accounting* interchangeably, with a slight preference for the former to avoid confusion with the more formal reporting structures associated with the latter.

recordkeeping lowers the marginal cost of adopting more advanced systems, so firms choose among gradations of sophisticated reporting practices, including financial statements subject to varying standards of preparation and verification. In contrast, entrepreneurs in the informal economy face no such mandates, so even maintaining rudimentary records reflects a direct cost-benefit trade-off. The contrast between formal and informal firms in our data underscores this point: nearly all formal microenterprises maintain systematic, often digitized records, whereas informal firms display wide heterogeneity. The informal economy thus provides a distinctive lens through which to observe the foundational, emergent role of accounting, which is not readily visible in more developed and institutionally mature markets (Ball, 2024, 2025b).[2]

Because extant evidence on private firms often comes from registries, credit bureau files, or lender reporting requirements, it provides only partial views of accounting behavior (Bernard & Sutherland, 2025, pp. 60–62). In contrast, our survey-based, graded measures of recordkeeping capture both the extensive margin (whether any systematic records are kept) and the intensive margin (how sophisticated those records are), providing direct descriptive evidence on accounting adoption outside the shadow of regulation. Our empirical analysis employs a reduced-form model that characterizes how entrepreneurs in the informal economy weigh the marginal costs and benefits of systematic recordkeeping.

We first focus on a binary outcome, the voluntary decision of informal microbusinesses to adopt a systematic record-keeping system (*Systematic Recordkeeping*). We later exploit the survey's granularity to develop a four-level ordinal measure of *Accounting Quality*: (1) No systematic recordkeeping; (2) *Commingled NB*, where business and personal financial records are

[2] For the historical evolution of recordkeeping, see (Ball, 2025a); Basu, Dickhaut, Hecht, Towry, & Waymire (2009); Basu & Waymire (2006); Waymire & Basu (2008); Dickhaut, Basu, McCabe, & Waymire (2010); King & Levine (1993); Schmandt-Besserat (1992).

combined in a single physical notebook; (3) *Separate NB*, where business records are maintained separately in a dedicated notebook; and (4) *Digitized*, representing a more sophisticated accounting system (see Figure 1). A distinctive feature of our setting is the commingled category (Jayachandran, 2020) because most microenterprise training programs emphasize separating business and personal finances (Dyer et al., 2016; McKenzie & Woodruff, 2014). While such separation may facilitate business sustainability and serve as a behavioral commitment device (Drexler et al., 2014), whether it has real effects is an open question.

In our sample of informal firms, 44 percent maintain systematic records, with nearly three-quarters opting for a notebook. Notably, more than one-quarter of these notebook users do not separate business and personal finances. To examine the factors associated with adoption of the recordkeeping system, we estimate a reduced-form probit (ordered probit) model where the dependent variable is *Systematic Recordkeeping* (*Accounting Quality*), and the independent variables capture owner and firm characteristics likely related to the costs and benefits of accounting.

Owner characteristics in the informal economy reflect one side of this cost–benefit trade-off. Entrepreneurs whose motivation is business orientated are 5.5 percentage points more likely to keep systematic records, whereas those motivated by family considerations are 3.2 percentage points more likely to have no systematic records compared to keeping digitized or separate books (Calderon, Iacovone, & Juarez, 2017). Echoing prior work on management quality (Bloom, Mahajan, McKenzie, & Roberts, 2010; Bloom, Eifert, Mahajan, McKenzie, & Roberts, 2013; Bloom & Van Reenen, 2007; Karlan & Valdivia, 2011), entrepreneurs with management training are 15 percentage points more likely to adopt systematic recordkeeping. We also find some support

for the notion that education is associated with the use of higher-quality accounting systems, consistent with lower learning costs (Karlan & Valdivia, 2011).

Financing considerations reflect another dimension of the trade-off. In terms of internal financing, entrepreneurs who view their own equity capital as a desirable funding source are 12 percentage points more likely to maintain systematic records, and those who save toward future capital infusion are 32 percentage points more likely (Dupas & Robinson, 2013). Turning to external finance, informal microenterprises that view banks as a desirable funding source are 10 percentage points more likely to have systematic financial records, consistent with research on bank due diligence (e.g., Cassar, 2009).

In our setting, there is no separation of ownership and control, so the accounting system choice is not shaped by classic agency conflicts, but by the owner's concerns with planning and executing a business strategy and preserving capital. The observed association between accounting choices and owners' capital, personal motivation, and socioeconomic characteristics provide novel descriptive evidence that broadens our understanding of the role of accounting in evolving business organizations (Sunder, 1997).

Operational factors also shape accounting quality. Firms that extend installment credit are 37 percentage points more likely to maintain systematic financial records, and firms that use an additional marketing promotion channel are 7 percentage points more likely to do so. Consistent with the informational demands of supply-chain relationships, informal firms that rely on large suppliers are 11 percentage points more likely to have systematic records. Reflecting the level of informality in organizational design (Brickley, Smith, and Zimmerman, 2003) firms that rely more heavily on family members or temporary workers tend to use more rudimentary records, whereas those with more full-time employees opt for higher-quality accounting.

Examining the finer gradations of *Accounting Quality*, we find that lack of systematic recordkeeping serves as the baseline for informal firms. The marginal effects from the ordered probit model indicate probability shifts away from the baseline toward higher-quality systems, with commingled notebooks playing only a limited role. For example, at the margin, firms that extend installment credit are 34 percentage points less likely to have no systematic records, and about 16 percentage points more likely to adopt either separate notebooks or digitized systems.

Taken together, our results suggest that the appeal of accounting to informal microentrepreneurs lies less in its compliance function than in the managerial tools for business operations and development, tempered by social and institutional constraints of informality. This interpretation aligns with historical evidence that merchants and money changers created accounting systems to support the efficient management of their businesses (Ball, 2025b; Basu et al., 2009). Robustness analyses show that accounting choices are not driven by anticipated formalization and are not merely proxies for general business sophistication.

We next examine the role of accounting in microenterprises' access to credit, a key indicator of financial development (Guiso, Sapienza, & Zingales, 2004). Despite their importance to economic growth, microbusinesses face significant barriers to accessing loans (Banerjee & Duflo, 2014; Wellalage & Locke, 2016), especially those in the informal sector (Farazi, 2014; Estevão, Lopes, & Penela, 2022). Prior research highlights the importance of social capital and trust in facilitating *supplier* credit in informal economies (Tomy & Wittenberg-Moerman, 2024). By contrast, we find that firms expressing a preference for *bank financing* are more likely to maintain systematic financial records, raising the empirical question of whether accounting quality is associated with access to bank credit in the informal economy.

For this analysis, we use the microenterprises in the formal economy as a comparison group, focusing on digitized accounting adopted by the substantial majority of these firms. It is important to note that the formal firms in our comparison group are small, registered enterprises with fewer than ten employees. This benchmarking is meaningful because these firms differ from private firms typically studied in extant research, which face reporting and verification requirements well beyond those relevant for microenterprises in developing economies (Bernard & Sutherland, 2025).

Roughly 40 percent of the microenterprises in our sample have ever applied for a bank loan, with 34 percent of informal firms and 52 percent of formal firms doing so. Among applicants, 77 percent of informal firms and 93 percent of formal firms reported receiving the loan. To model both the decision to apply and the likelihood of approval, we estimate separate Heckman selection models for informal firms and for the benchmark sample of formal firms. Our specifications include controls for collateral, contracting reputation, customer and supplier credits, and business age (Berger & Udell, 1995; Petersen & Rajan, 1994; Banerjee et al., 2017).

For informal firms, only the coefficients on notebooks with separate accounts (*Separate NB*) are statistically significant, with marginal effects of 9 and 14 percentage points for loan application and approval, respectively. For formal firms, digitized records are associated with 17 and 18 percentage point increases in the likelihood of loan application and approval, respectively. We find similar inferences about the role of accounting when using a broader measure of credit market status, beyond mere access to bank loans. Overall, these findings suggest that accounting quality is positively associated with enhanced access to credit among microenterprises.[3] However,

[3] Prior research on the role of accounting for access to credit in microenterprises is limited. For example, Najera Ruiz and Collazzo (2021) find that the use of any form of business recordkeeping by Chilean microenterprises is positively associated with prior access to credit from public or private institutions, including family and friends, and with the scale of the business, owners' age, education, and business training. Kahsay and Zeleke's (2019) study is not limited

we acknowledge that our cross-sectional data limit our ability to make causal inferences about the relationships we observe.

To mitigate concerns regarding generalizability, we also conduct a credit access analysis using data from a similar survey from the Dominican Republic (DR) conducted by the ILO in 2023. Informal firms with digitized records are 22 percentage points more likely to obtain large loans, with an average marginal effect of 15,300 DOP ($244), suggesting that our results are not limited to the CA sample. The DR results also highlight the role of social capital (Tomy & Wittenberg-Moerman, 2024): only 11 percent of informal firms that obtain small loans from small banks keep systematic records, consistent with informal arrangements potentially dominating credit access. By contrast, firms that obtain small loans from large banks are 27 percentage points more likely to have systematic records. For large loan requests, however, the probability of systematic recordkeeping exceeds 50 percent regardless of bank type, suggesting that traditional financial due diligence likely trumps social capital and trust when financial stakes are high. Future research can examine the relative roles of social versus financial due diligence in shaping the credit access for informal firms.

Lastly, using the CA sample, we examine the managerial role of accounting for informal microbusinesses (Datar, Epstein, & Yuthas, 2009). The ILO survey elicits entrepreneurs' business expansion plans as of the time of the survey, when the accounting choices were predetermined. Controlling for the entrepreneur's human capital (education and management training) and current business size (sales), we find that informal firms with a higher quality accounting system are more likely to have business expansion plans, with results largely driven by the extensive margin.

to microenterprises and it does not find a significant association between access to credit and the quality of accounting records. Apart from being peripherally related to our work, we are not aware of studies that systematically examine the antecedents and consequences of recordkeeping systems of microenterprises and their quality across the levels of formalization.

Informal firms with digitized records (separate notebooks) are 42 percent (28 percent) more likely than the sample mean to have a plan to start a new business. This pattern is consistent with accounting systems enabling a more strategic, informed approach to expansion decisions by giving entrepreneurs greater confidence in their business prospects.

Because accounting evolves in parallel with broader institutional transformations, establishing causation in this setting is inherently difficult and may be unproductive in assessing its social value (Ball, 2024, 2025a, 2025b). Our objective, therefore, is to provide a descriptive account of how accounting practices vary across informal microenterprises, how they relate to owner characteristics, operational choices, and financing considerations, and how they co-vary with credit access and business expansion plans. Using rich survey data from Central America, we shed light on the role of accounting outside the shadow of regulatory mandates, where adoption reflects a direct cost–benefit trade-off. This unique setting allows us to observe accounting in its foundational role as a managerial tool rather than as a compliance mechanism.[4]

The remainder of the paper is organized as follows. Section 2 examines when and why informal firms voluntarily keep systematic accounting records. Section 3 explores how accounting quality relates to access to credit. Finally, Section 4 analyzes how accounting quality is associated with managerial decisions related to microenterprise growth plans.

2. When do firms in the informal economy voluntarily keep systematic accounting records?

2.1. Motivation and Sample Description

Public and private businesses in modern economies adopt sophisticated recordkeeping and reporting systems to participate in capital markets and to engage in explicit and implicit contracts

[4] Given that the survey relies on a stratified, non-random sample, we re-estimate our main models using sampling weights to account for the survey design and our findings remain robust. See Internet Appendix for details.

with various stakeholders for value maximization (e.g., Armstrong, Kepler, & Larcker, 2010; Beaver, 1968; Bushman & Smith, 2001; Dechow, Ge, & Schrand, 2010; Healy & Palepu, 2001; Watts & Zimmerman, 1986). If reliable records facilitate efficient exchange transactions (Ball, 2025b), how do microbusinesses operating in the informal economy shape their accounting practices to participate effectively in the market economy? Similar to private firms in developed markets that weigh the costs and benefits of financial disclosure (Gassen & Muhn, 2024), conventional wisdom suggests that microentrepreneurs who operate outside the regulated economy are likely to adopt efficient recordkeeping methods that best meet their business needs (Allee & Yohn, 2009; Basu, 2015; Soto, 2000). In contrast to the prior research on private firms, we focus on the informal economy in developing nations to shed light on the innate demand for recordkeeping practices in businesses not driven by regulatory compulsion (Ball, 2024).

For most analyses, we use data from a single-shot survey conducted by the ILO in Central America (hereafter "CA") in 2019. The survey was designed to ensure roughly equal representation across formalization categories, countries (Guatemala, Honduras, and El Salvador), and economic sectors (retail, services, and micro-manufacturing). Data were collected through face-to-face interviews with owners of microbusinesses (defined as those with 2 to 10 workers, including the owner), resulting in a sample size of 1,426 firms. Interviewers used electronic tablets to record responses in real time to minimize data-entry errors. To mitigate response bias, questions regarding formalization were asked after participants had answered all other questions, including those related to accounting records. Further details on the survey are presented in Appendix A. The median microenterprise in our sample reports monthly sales of $780, with firms in the informal (formal) sector reporting $640 ($1,100) (untabulated).

Table 1 presents the distribution of *Accounting Quality* by the level of formalization among microenterprises (see Figure 1).[5] As expected, formal microenterprises almost universally maintain systematic records (90 percent), with most using digitized systems (71 percent) rather than notebooks (19 percent).[6] Although informal microenterprises attempt to stay outside the legal landscape, remarkably, 44 percent have voluntarily chosen to adopt systematic recordkeeping, with roughly a quarter of them choosing to have digitized records. Among the informal firms using a notebook, more than 70 percent separate business from personal financials, indicating an innate demand for tracking business performance for sustainability or as a commitment device (Drexler et al., 2014).

2.2. Research Design and Model Specification

Consistent with the descriptive nature of our study, we employ reduced-form models and view our evidence as purely associative rather than causal. To examine the determinants of systematic recordkeeping, we estimate the following probit model:

$$Systematic\ Records_i^* = X'_{bus}\beta_1 + X'_{owner}\gamma_1 + X'_{fe}\delta_1 + \varepsilon_{1i},\ \ for\ i\ with\ Formalization_i = 0 \qquad (1)$$

$$Systematic\ Records_i = 1 \text{ if } Systematic\ Records_i^* \geq 0,$$

$$Systematic\ Records_i = 0 \text{ if } Systematic\ Records_i^* < 0, \text{ and}$$

$$P\left(Systematic\ Records_i = 1 \middle| Formalization_i = 0, X_{bus}, X_{owner}, X_{fe}\right) = \Phi\left(X'_{bus}\beta_1 + X'_{owner}\gamma_1 + X'_{fe}\delta_1\right), \qquad (2)$$

where ε_{1i} captures unobserved determinants of the latent propensity to maintain systematic records; $\Phi(.)$ is the cumulative distribution function (CDF) of the standard normal distribution; X_{bus}, X_{owner},

[5] The distribution of microenterprises without a systematic recordkeeping system in our setting is similar in spirit to that reported in Mexico's National Survey of Microenterprises (ENAMIN), where more than half of the microenterprises state that they keep no records at all (Cotler & Woodruff, 2008).

[6] For defining a systematic recordkeeping system, we use the following specific yes or no question in the survey: "Does this business keep formal accounting records?" The participating microentrepreneurs were not provided a specific definition of "formal accounting records." *Digitized* captures organizations using software to track financial transactions (e.g., Excel) as well as organizations that are likely to rely on digitized records through hiring an in-house accountant or engaging a professional accounting service.

and X_{fe} are vectors of observed variables proxying for cost-benefit trade-offs relating to business characteristics (*bus*), the owner-level socioeconomic characteristics (*owner*), and fixed effects for country and economic sectors (*fe*); β, γ, and δ are vectors of parameters to be estimated (see Appendix B for variable definitions). Unlike research on public companies or private companies in largely developed, formal economies, the factors we analyze are unaffected by either mandated or voluntary disclosure requirements, allowing us to observe recordkeeping choices that arise purely from private cost–benefit considerations.

The founder's start-up motivation is likely to shape business practices, given the significant overlap between manager and owner roles in microenterprises. We consider three motivational dimensions plausibly associated with the voluntary adoption of accounting practices (Calderon et al., 2017; de Mel et al., 2010).[7] Our first measure captures the entrepreneur's business-oriented nature or vocational interest for starting the venture (*Business Orientation/Vocational*), similar in spirit to the opportunity entrepreneur measure in Calderon et al. (2017). Unlike those driven by a business motivation, accounting quality may be less important to owners who enter entrepreneurship to prioritize family or personal time (*Family Time*). We do not have a directional expectation for owners who face greater opportunity barriers (*Barriers*), as they may choose entrepreneurship as a last resort, with limited interest in recordkeeping, or may be motivated by the barriers to succeed as an entrepreneur.

In addition to motivation, we consider owners' socioeconomic characteristics: education (*Secondary School* and *College*) (Allee & Yohn, 2009), business training (*Management Training*),

[7] We construct two principal components (PCs) based on several survey questions on the owner's motivations for starting the business. The first PC captures the entrepreneur's business-oriented nature or vocational interest (*Business Orientation/Vocational*) and the second PC reflects the value of family/personal time to the entrepreneur (*Family Time*). *Barriers* is calculated as the average of the responses to questions about lack of employment opportunities and labor market discrimination as motivation for starting the business.

gender (*Female*), and age (*Age*). Extant research finds that management quality is closely linked to both business performance and the adoption of more sophisticated business practices (Bloom et al., 2010, 2013; Bloom & Van Reenen, 2007; Karlan & Valdivia, 2011; Weber & McKenzie, 2009). We use education and management training as proxies for managerial quality and predict that higher-quality managers are more likely to adopt advanced accounting systems. Controlling for managerial quality helps separate managerial attributes from other observable factors associated with accounting adoption, such as financing needs and operational complexity.[8]

Financing considerations can also shape the demand for accounting information. Internal and external financing sources may impose varying requirements for accountability and perceptions of risk (Bruhn, Karlan, & Schoar, 2010; Christensen & Nikolaev, 2012; Diamond, 1984; Diamond & Verrecchia, 1991; Myers & Majluf, 1984). In terms of internal financing, previous research shows that greater personal savings are associated with higher business investment and growth among microentrepreneurs (Dupas & Robinson, 2013). Even in the absence of owner-manager separation, owners may rely on accounting information as a planning and feedback tool to protect and grow their capital. We include an indicator for whether the entrepreneur views her own capital as a desirable source for future expansion (*Own Capital*) and a measure of the entrepreneur's desire to save to build capital for growth (*Saving for Investment*), predicting a positive marginal effect for both.

To explore the effects of external financing, we include indicators representing the desirability of three external funding sources for future business expansion identified by the

[8] In the context of public companies, extensive literature in accounting, finance, strategy, and management examines the association between CEO personal and socioeconomic characteristics (e.g., narcissism, overconfidence, hubris, optimism, gender, humility, entrepreneurial orientation, and education) and firm performance (Shen, 2021). Accounting literature also studies CEO personal attributes and financial reporting quality (Ahmed & Duellman, 2013; Schrand & Zechman, 2012).

entrepreneurs: informal lenders (*Informal Lenders*), microfinance (*Microfinance*), and banks (*Bank*). In the informal economy, credit extension is likely influenced by mutual trust (Tomy & Wittenberg-Moerman, 2024, 2025). As a result, we expect accounting quality to be less valuable when borrowing from informal lenders.

Unlike traditional banks, microfinance lenders conduct more nuanced financial due diligence that relies on borrowers' "financial wherewithal… [and] references from customers and neighbors" (Kota, 2007). As such, whether access to microfinance depends on higher-quality accounting systems remains an empirical question. In contrast, given the extensive research on the due diligence for bank loans, we expect microenterprises that view banks as a desirable funding source to have higher accounting quality (e.g., Cassar, 2009).

Regarding operational demands, we include an indicator for whether the firm relies on large suppliers (*Large Supplier*), as a large supplier's willingness to contract is likely to depend on the quality of the customer's financial records (Naidu & Ranjeeni, 2024). Similarly, accounting quality may enable effective management of customer relationships, proxied by an indicator for firms that provide installment financing to customers (*Customer Credit*). Furthermore, extant research suggests that microenterprises benefit from an effective marketing strategy, although they learn by trial and error (Morgan, 2019). Anecdotal evidence is consistent with these firms tracking marketing activities, potentially to assess their effectiveness (Porto, Costa, & Watanabe, 2017). Our empirical proxy, *Marketing Promotion*, is the average of six indicators representing product or service *promotions* through local newspapers, radio, murals, flyers, word of mouth, and social media. We posit that recordkeeping could help the microentrepreneur better assess channel effectiveness and manage the marketing budget efficiently. Therefore, we predict that the likelihood of entrepreneurs adopting a systematic recordkeeping system increases in the number

of promotional channels deployed. We also consider the presence of additional business establishments (*Business Complexity*) (Allee & Yohn, 2009), years of business operation (*Firm Age*), number of workers, both family members (*Number of Family Workers*) and business employees, including full-time (*Number of Workers*) and temporary (*Temporary Workers*) positions as additional controls.

2.3. Main Results

We begin by providing descriptive statistics on the survey data. While our primary analyses center on informal firms, Table A1 in Appendix A compares the means of the determinants of systematic recordkeeping (equation 1) between the informal and formal microenterprises. Several empirical regularities emerge. Regarding owners' motivations and characteristics, informal entrepreneurs are more likely to indicate a lack of employment opportunities as a reason for starting their business. They also tend to be female, younger, less educated, and less likely to have received business training. In terms of financing, informal firms express a stronger interest in funding from informal lenders, whereas formal firms show a greater preference for bank financing. From an operational standpoint, formal firms are roughly twice as likely to have a large supplier and more than four times as likely to extend installment credit to customers. Informal microbusinesses are less likely to engage in marketing promotion activities, have more than one business establishment, or employ more full-time and temporary workers. Overall, the comparative descriptive patterns align with economic intuition and lend credibility to the reliability and representativeness of the survey data.[9]

[9] In an untabulated analysis, we find that informal firms perceive a greater regulatory burden and higher business costs for participating in the formal economy and are more likely to view informality as a cultural norm (de Mel et al., 2013; La Porta & Shleifer, 2014; Levenson & Maloney, 1998). Williams et al. (2016) find that the likelihood of formalization by microenterprises in Pakistan increases in the entrepreneur's age, education, household income, and firm age, but decreases in perceptions of regulatory burden and corruption.

The marginal effects from estimating the accounting adoption model for informal firms using a probit specification are presented in Table 2. All major categories of determinants (owner motivations, owner characteristics, financing, and operational factors) are meaningfully associated with the voluntary choice of accounting systems. Among owner motivations, business-oriented entrepreneurs are 5.5 percentage points more likely to have systematic recordkeeping, with no significant result for those who experience opportunity barriers. Turning to owner characteristics, management quality plays a key role: entrepreneurs who participated in business training programs have a 15 percentage point greater propensity for systematic recordkeeping.

More importantly, microentrepreneurs appear to value systematic recordkeeping when personal capital is at stake. Informal entrepreneurs who plan to save for future capital are 32 percentage points more likely to maintain systematic recordkeeping, the largest marginal effect among all financing sources, followed by a 12 percentage point increase in likelihood when they perceive their own capital as a desirable source of financing.

Among the external sources of financing, we find that accounting quality plays a differentiated role. Informal firms do not place greater emphasis on accounting systems when they view microfinance as a desirable funding source, likely in response to microfinance providers' lower demand for hard information. By contrast, firms desirous of accessing credit from banks are 10 percentage points more likely to have systematic financial records. While the finding is consistent with the extensive literature on accounting quality and bank loans, the association emerges even at the level of informal microbusinesses, where firms are unlikely to have audited or reviewed financial statements, or even a complete set of accruals-based financial statements. The result highlights that, even in low-enforcement environments, accounting information can

complement trust-based mechanisms that typically govern credit transactions in the informal economy (Tomy & Wittenberg-Moerman, 2024).[10]

On the operational side, consistent with the higher informational demands of transacting with larger suppliers, informal firms are 11 percentage points more likely to maintain systematic financial records. At the other end of the value chain, firms that extend installment credits are 37 percentage points more likely to value the accounting system choice, as recordkeeping can facilitate the monitoring of customer credit and access to working capital loans. Similarly, adding one marketing promotion channel increases the likelihood of systematic recordkeeping by approximately 6.7 percentage points (0.399 x (1/6)). So, even informal microbusinesses rely on accounting as a managerial tool for customer acquisition and retention. Firms with informal organizational structures that rely on family members or part-time workers are less likely to maintain systematic records, whereas those employing more full-time workers are more likely to do so. Overall, our analysis suggests that firms choosing not to be bound by regulatory and bureaucratic demands voluntarily maintain systematic financial records consistent with cost-benefit trade-offs in their entrepreneurial decision-making.

In an untabulated analysis, we examine whether the role of accounting is evident once we condition on the structural demands of formalization. Estimating the probit model for the formal firms, we find that only four explanatory variables are statistically significant at conventional levels compared to 13 in the informal-firm sample. By separately analyzing the informal firms, we

[10] First, we posit that accounting records play a more critical role in facilitating direct access to capital from financial intermediaries, whereas trust and social capital may be more influential in accessing credit through supply chains (e.g., from trade creditors). Second, the marginal effect of *Informal Lenders* is positive and statistically significant, while the effect for *Microfinance* is statistically insignificant. However, given the limited theoretical guidance regarding either source, future research could more directly investigate how these financing channels influence the accounting quality of microenterprises.

shed light on the voluntary economic forces at work that provide a gateway into the foundational role of recordkeeping.

Subject to the limitations of our cross-sectional design, our analysis provides suggestive evidence on factors associated with entrepreneurs' decisions to adopt an accounting system. The survey questions on funding sources and capital building are anticipatory, as entrepreneurs planning such actions would likely consider appropriate accounting choices to support those efforts. Likewise, the motivation variables capture *ex-ante* reasons for starting the business and are therefore unlikely to be influenced by subsequent accounting choices, although response bias cannot be ruled out. For operational factors, accounting quality is plausibly a precursor that enables customer and supplier relationships among microbusinesses. Nonetheless, establishing causality is inherently difficult in our setting.

A potential concern is that informal firms may adopt systematic financial records in anticipation of future formalization, introducing correlated omitted variable bias. To mitigate this concern, we re-estimate the probit model for the informal firms after incorporating *Stated Preference for Formalization* as an additional control and report the results in column (2) of Table 2.[11] The coefficient on this variable is not statistically significant, and the marginal effects of the other determinants remain virtually unchanged from column (1). One final caveat is that we do not consider the *direct* cost of accounting quality, but in our view, its effects are likely to be of second order.

[11] *Stated Preference for Formalization* takes a value of one when entrepreneurs choose the option "Duly registering your business" to the question "Do you think it is preferable for a microbusiness in this country to operate as a formal business or to operate as an informal business?" and zero otherwise.

2.4. Gradations of Accounting Quality

As presented in Table 1, our data permit a more granular measurement of accounting quality. We estimate an ordered probit model using the ordinal variable *Accounting Quality* and report the marginal effects for informal firms in Table 3. By construction, the marginal effects across the four accounting-quality categories sum to zero. Because the overall inferences are consistent with those from the binary model, we limit the discussion to key differences and new insights rather than providing a detailed comparison of Tables 2 and 3.

The marginal effects in Table 3 indicate systematic shifts from non-systematic recordkeeping to either of the two higher-quality systems or vice versa. Entrepreneurs who intend to save for future investment are 13 percentage points more likely to have digitized records or separate books, with the combined marginal effects largely driven by their aversion to operating without systematic records. A similar pattern emerges on the operational side. Firms that have a large supplier, extend credit to customers, or engage in marketing promotions are comparably likely to adopt either of the two higher-quality accounting systems while avoiding non-systematic recordkeeping. This pattern holds across nearly all significant variables. Although we find statistical significance for *Commingled NB*, the marginal effects are an order of magnitude smaller than those of the two higher-quality accounting systems.

The ordinal quality measure enables us to identify patterns not evident in the binary specification. For example, while *Family Time* is not a significant determinant of systematic recordkeeping in Table 2, it becomes significant for accounting quality in Table 3, with an inverse association. This suggests that prioritizing family time may raise the marginal cost of adopting higher levels of accounting quality. Likewise, college-educated entrepreneurs are significantly and comparably more likely to use digitized records or separate books and shun non-systematic recordkeeping. Taken together, the results in Tables 2 and 3 provide descriptive evidence on the

determinants operating along both the intensive and extensive margins of accounting system choice.

2.5. Distinguishing Recordkeeping from General Engagement with Business Technology

To ensure that our findings are not merely capturing broader technology adoption or general business sophistication, we conduct a robustness test by regressing an indicator for entrepreneurs who use a business cell phone on the same set of determinants for systematic recordkeeping. Table 4 reports marginal effects from the joint estimation of the two probit models, cell phone use and systematic recordkeeping, using a seemingly unrelated regression (SUR) framework. We also report the p-values from tests comparing the coefficients between the models.

First, the explanatory power of the cell phone probit model is less than half that of the systematic recordkeeping model (0.09 vs. 0.20), suggesting that different factors drive business cell phone use compared with the adoption of systematic recordkeeping. Second, several predictors that are significantly associated with systematic recordkeeping, such as saving for investment, a preference for own capital or bank financing, and the degree of organizational informality, do not predict cell phone use. However, consistent with intuition, owners of firms with more sophisticated value-chain relationships are more likely to use a cell phone and maintain systematic financial records. Overall, these findings suggest that systematic recordkeeping reflects underlying economic behaviors and incentives rather than general engagement with business technology or infrastructure.

3. Accounting Quality and Access to Credit

3.1. Access to Credit and the Informal Economy

Access to credit plays a vital role in economic development, acting as a conduit for investment, employment, capital accumulation, productivity growth, innovation, sustainability,

and poverty alleviation.[12] Building on the preceding analysis, we next examine whether the accounting quality of informal firms is associated with access to bank credit.

Guiso, Sapienza, and Zingales (2004) view access to credit as a proxy for financial development and find that greater access promotes business formation, enhances competition, and fosters firm growth. However, microbusinesses, especially those in the informal sector, face substantial barriers to obtaining loans due to the lack of required documentation and the difficulty of contract enforcement (Aga & Reilly, 2011; Banerjee & Munshi, 2004; Chein & Silva, 2014). ILO (2016) suggests that lack of access to financial services is the primary obstacle faced by firms in the informal sector (Farazi, 2014; Estevão, Lopes, & Penela, 2022). These challenges often compel informal microbusinesses to rely on informal lenders charging high interest rates (Prijadi, Wulandari, Desiana, Pinagara, & Novita, 2020) or to seek alternative methods to demonstrate creditworthiness to lenders, such as leveraging social networks and soft information (Banerjee & Munshi, 2004; Berger et al., 2005; Besley & Coate, 1995).

Extensive prior research documents the role of financial reporting quality in facilitating lenders' assessment and monitoring of credit risk of public and private firms.[13] In particular, Minnis (2011) highlights the value of financial statement verification in the lending process, especially for privately held U.S. firms operating in opaque information environments. By contrast, not only are microbusinesses in the informal economy unlikely to seek third-party

[12] E.g., Banerjee and Duflo (2014); Beck, Levine, and Loayza (2000); Beck, Demirguc-Kunt, and Martinez (2007); Beck, Demirguc-Kunt, Laeven, and Levine (2008); Brown and Earle (2017); Ayyagari et al. (2010). See also Bruhn, Hommes, Khanna, Singh, Sorokina, and Wimpey (2017) for a literature review and a methodology for estimating the finance gap faced by micro, small, and medium businesses in emerging economies. They find 81percent unmet financing demand for microenterprises in developing countries. See Capasso, Ohnsorge, and Yu (2022) for a literature review on financial development and informality. See also Augsburg, De Haas, Harmgart, and Meghir (2015); Bari, Malik, Meki, and Quinn (2021); Crépon, Devoto, Duflo, and Parienté (2015); Demirguc-Kunt, Klapper, and Panos (2011).

[13] See Ball, Bushman, and Vasvari (2008); Carrizosa and Ryan (2017); Christensen, Nikolaev, and Wittenberg-Moerman (2016); Costello and Wittenberg-Moerman (2011); Dou (2020); Dyreng, Vashistha, and Weber (2017); Hope et al., (2011); Hope & and Vyas, (2017); Hope et al., (2009); Minnis (2011); Minnis and Sutherland (2017).

verification, but they also often lack established financial histories and market reputations that larger private firms might possess to access credit.[14]

Tomy and Wittenberg-Moerman (2025) identify three reasons why accounting information is rarely used in informal credit markets: entrenched reliance on social ties, low financial literacy, and distrust in accounting information. They examine the credit relationship between wholesalers and retailers in an informal economy setting where trade credit is the primary source of financing and access to microfinance is sparse. In contrast, we focus on the role of recordkeeping in facilitating bank credit for microenterprises in the informal economy.[15] The informal economy is heterogeneous, allowing both social capital/trust and information quality to play distinct roles across different segments of economic activity.

3.2. Research Design and Model Specification

Survey respondents were asked whether they had ever applied for a bank loan and, if so, whether the loan was approved. These two questions form the basis of our empirical analysis of credit access. Because the data are cross-sectional, we do not interpret the estimates as causal. Instead, we document patterns of association between accounting quality and loan outcomes. We do not expect loan approval to cause a microenterprise to change its accounting quality (reverse causality), but both could be jointly influenced by unobserved factors. While we cannot fully overcome the limitations of a single-shot survey, we estimate a Heckman selection model that

[14] Based on survey data from the U.S. Federal Reserve on small businesses of less than 500 employees, Cassar, Ittner, and Cavalluzzo (2015) find that higher third-party credit scores, but not the use of accrual accounting, lower the likelihood of loan denial. Unlike our study, Cassar et al. (2015) focus on the role of accrual accounting in reducing information asymmetries between borrowers and lenders of small businesses that are part of the formal sector.

[15] We do not view access to credit as a panacea given prior research is ambivalent regarding a positive marginal effect of access to credit on business expansion and performance (see Angelucci et al., 2015; Banerjee et al., 2015) and also finds a selection into borrowing by entrepreneurs with high returns to investment (Beaman et al., 2023).

accounts for potential endogeneity in the decision to apply for a bank loan, which could influence the loan approval decision.

We include several determinants of access to credit: whether the entrepreneur has potential collateral (*Owns Business Premises*) (Berger & Udell, 1995) or has contracting credibility (*Lessee*); whether the business receives credit from suppliers (*Suppliers Credit*) or extends credit to customers (*Customers Credit*); the age of the business (*Firm Age*); and controls for the entrepreneur's education, gender, age, and motivations, as well as country and sector fixed effects. Prior research finds that small businesses rely more on trade credit when bank financing is constrained, but may also extend trade credit when bank financing is accessible, sometimes pledging receivables as collateral (Berger & Udell, 1995; Petersen & Rajan, 1994). A caveat is that although the survey is quite detailed, it does not capture all potential determinants of credit access for microenterprises (e.g., close ties with a few lenders) (Petersen & Rajan, 1994).

We initially include an instrument in the first stage (loan application) for identification; however, we report below a sensitivity analysis that does not require the identification of an instrument subject to the exclusion restriction (Altonji et al., 2005). Our instrument in the selection model, *I Am Never Short of Money*, takes a value of one when the entrepreneur responds, "I am never short of money for regular business operations" to the question "When you are short of money for the regular business operation to whom do you turn to borrow money?" The indicator should be significantly negatively associated with the likelihood of applying for a loan (relevance) but is unlikely to determine the bank's loan approval (exogenous). As discussed earlier, we use the microenterprises in the formal economy as a comparison group for this analysis, focusing on digitized accounting adopted by the substantial majority of these firms.

3.3. Main Results

Frequency tabulations in Panel A of Table 5 indicate that formalization does not appear to be a precondition for access to bank credit: a nontrivial percentage of informal firms applied for a loan (34 percent), and the majority received approval (77 percent). However, consistent with prior research on credit constraints (e.g., Wellalage & Locke, 2016), the likelihood of applying for a loan and of getting approval both increase with formalization. Although our application rates align with previous research demonstrating low credit take-up rates (Banerjee et al., 2015; McKenzie, 2010; Pearlman, 2014), it is important to recognize that the high level of approval rates may not be a generalizable pattern to all developing countries, where informal businesses could face stricter barriers and have little to no access to formal credit.

In Panel B of Table 5, we report the marginal effects of the accounting quality indicators and other determinants from the separate Heckman selection models for informal and formal firms. Given that more than 70 percent of *formal* firms choose digitized records (Table 1) with limited variations in the other categories, we benchmark *Digitized* against all other accounting gradations for these firms. In the *informal* sample, we benchmark all three accounting quality gradations against the absence of systematic recordkeeping.

The instrumental variable (*I Am Never Short of Money*) has the expected negative slope in the selection equation and appears to satisfy the relevance criterion (p-value < 0.01) in both samples. We initially focus on formal firms to set a baseline for our primary sample of interest: informal firms. Firms in the formal sector with a higher quality recordkeeping system (*Digitized*) have a 0.17 higher probability of applying for a loan (column 3 of Panel B) and a 0.18 higher probability of getting loan approval (column 4 of Panel B) than those having an inferior accounting system. Their predominant choice of a high-quality accounting system is likely made to support the credit needs of firms in the formal economy.

Turning to informal firms, *Digitized* is statistically insignificant in the selection and outcome models of informal firms, consistent with its low incidence and low estimation efficiency. However, *Separate NB* is statistically and economically significant, with a 9 (14) percentage point greater likelihood of requesting a loan (receiving a loan approval) among informal firms. Panel A of Table 1 shows that about 44 percent of informal firms maintain systematic financial records, and more than half of them use a separate notebook to track business records. Despite not having a legal mandate, these microentrepreneurs appear to recognize the value of recordkeeping and voluntarily choose an accounting quality that supports their financing needs.

3.4. Robustness Checks and Extensions

3.4.1. Sensitivity Analyses for Endogeneity

Following Altonji, Elder, and Taber (2005), we assume that the correlation between the unobservables in the outcome and selection equations (ρ) is not directly identified, or the degree of sample selection is unknown. To assess the sensitivity of our inferences, we vary the value of ρ between 0 and 0.9 to examine its impact on our inferences relating to *Separate NB* and *Digitized* in the outcome equation (Altonji et al., 2005).[16] We do not report the robustness results from the selection or first-stage equation, as minor variations in its slope estimates and p-values are due to maximum likelihood estimation and do not reflect any selection bias.

The results in Panel C of Table 5 indicate that the tenor of our findings for the relevant accounting quality indicators remains unchanged. Consistent with a bias due to endogeneity, we find statistical significance only at the 0.10 level, one-tailed test, when we set ρ = 0 or assume exogeneity. However, we expect a nontrivial positive correlation between the two sets of

[16] Aobdia (2019) follows Altonji et al. (2005) and varies the ρ between 0 and 0.5, and Choudhary, Merkley, and Schipper (2022) choose a ρ of 0.5, which is an indication of substantial selection bias in their context, and examine the effect of sample selection on their results.

unobservables as in Altonji et al. (2005) (see "Fixed ρ" in Panel C). Consistent with our expectation, we find that the significance of the second-stage accounting variables increases in ρ, suggesting that selection on unobservables is important in our setting. Overall, these results provide some comfort that our inferences are unlikely to be impacted by selection bias.

3.4.2. External Validity: Dominican Republic Sample

To mitigate concerns of generalizability, we examine the role of accounting quality in credit access using a 2023 survey administered by the ILO in the DR. Unlike in the CA sample, nearly all DR firms that requested a loan were approved, leaving insufficient variation in the loan approval status to estimate a selection model. However, the DR data include information on the loan amount received, which we use as an alternative outcome measure.[17] Panel A of Table 6 provides descriptive statistics on loan requests and loan amounts by the level of formalization. In both subsamples, we observe a high incidence of loan amounts greater than or equal to 100,000 Dominican Pesos (DOP) ($1,786), so we define a *High/Low Loan* indicator as the second outcome measure based on whether the loan amount meets or exceeds this threshold.

In the DR sample, disaggregating notebook users into commingled and separate categories results in sparse cells. We therefore combine these two categories and report them together as *Notebook* (Panel B, Table 6). The overall patterns are consistent with those observed in the CA data: about 81 percent of formal firms adopt the highest level of accounting quality, compared to only 24 percent of informal firms. The results of estimating the Heckman selection models for the informal firms in the DR sample are reported in Panel C of Table 6.[18] While we find no statistically

[17] Specifically, there are seven bins of loan amount ranges. For the lowest bin, we take the midpoint of zero and the upper bound of 10,000 Dominican Pesos, and for the highest bin, we take the lower bound of 100,000 Dominican Pesos as the loan amount. For all other bins, we take the midpoint as the loan amount. For the 10 cases where the loan request was rejected, we set the loan amount to zero.

[18] We replicated the Heckman model for the sample of formal firms using both dependent variables (Loan High and Loan Amount). However, the model does not converge for Loan Amount, and the estimated correlation between

significant results for the loan application, the results are economically and statistically significant for loan amounts. Informal firms with digitized records are 22 percentage points more likely to obtain a high loan (column 2) and receive, on average, 15,300 DOP more than other informal firms (column 3). Overall, our finding on how accounting quality shapes microenterprises' credit access also emerges in the DR sample and is not limited to the original sample setting.[19]

3.4.3. The Role of Accounting Quality in a World of Social Capital and Trust

Using the DR sample, we next examine whether accounting quality matters in an informal economy where social capital and trust may play a central role in financial transactions (Tomy & Wittenberg-Moerman, 2024). Table 7 presents separate OLS regression results for informal and formal firms, where the dependent variable is an indicator for systematic recordkeeping. The independent variables are interactions between loan size (high vs. low) and bank type (small vs. large), with small loans from small banks serving as the baseline category.

In the informal sample, the estimated intercept implies that entrepreneurs applying for a small loan from a small bank are only 11 percentage points likely to maintain systematic financial records. However, for small loans, large banks are 27 percentage points more likely than small banks to lend to firms that have systematic financial records, suggesting that larger banks impose a higher baseline expectation for accounting quality. We surmise that small banks' comfort with lower accounting quality may be balanced by increased reliance on social capital and trust.

For large loans, the likelihood of systematic financial records is over 50 percentage points (slope plus the intercept), whether loans are requested from small or large banks, with no

selection and outcome equation errors reached a boundary value, suggesting numerical instability or weak identification.

[19] Among informal firms in the DR sample, we find that regardless of the loan application path (through the business entity versus in a personal capacity), microbusinesses with digitized financial records are more likely to be approved for a larger loan.

statistically significant difference between the two lender categories (Test $\beta_3 - \beta_2$). When the financial stakes are high, traditional due diligence appears to play a greater role than informal trust-based mechanisms. Note that our results are largely confined to informal firms with a high propensity for systematic financial records for all combinations of bank sophistication and loan size in the formal sample. Future research can examine the relative roles of social versus financial due diligence in shaping credit access in informal economies.

3.4.4. Credit Market Status and Accounting Quality

So far, we have focused on access to bank loans, but credit constraints among microentrepreneurs are often broader and more nuanced, extending beyond observable loan applications. Extant research suggests that such credit constraints may stem not only from supply-side barriers but also from demand-side factors such as perceptions of affordability, risk aversion, behavioral biases, social stigma, and financial literacy.

To better understand the financial circumstances of these business owners, we construct a four-category measure of *Credit Market Status* for the CA sample: (1) obtained loan, (2) sufficient credit, (3) loan not approved, and (4) needed financing but loan not requested (Panel A of Table 8). In Panel B, we find that more than 40 percent of firms in the informal sector needed financing but did not apply for a loan, compared to about 24 percent in the formal sector. Conversely, while roughly half of formal firms obtained a loan, only about 26 percent of the informal firms did so. Thus, although financial constraints are more severe for informal firms, all microenterprises face nontrivial credit frictions.

Using an ordered probit model (Panel C), we find that accounting quality varies systematically with the level of *Credit Market Status* among informal firms, suggesting a relationship that extends beyond mere access to bank loans. Moreover, both informal and formal

firms that needed financing but did not apply for a bank loan (obtained a bank loan) have the lowest (highest) accounting quality. We replicate this analysis for the Dominican Republic (Table 9) and reach similar inferences for informal firms, albeit with weaker statistical significance, except for the *Notebook* category. Overall, accounting quality is associated with a broader measure of credit market status that goes beyond merely capturing access to bank loans.

4. Does accounting quality impact the intensive and extensive margins of informal microenterprise growth plans?

A large body of extant research shows that high-quality financial reporting and robust accounting practices enhance firms' investment efficiency and innovation (e.g., Biddle & Hilary, 2006; Biddle, Hilary, & Verdi, 2009; Laux & Ray, 2020; Roychowdhury, Shroff, & Verdi, 2019). Shroff (2017) finds that when firms adopt new GAAP requirements, their information set changes due to the collection and processing of additional information, which has real effects on their investment decisions (see Ferracuti & Stubben, 2019).

Whether these findings generalize to the rudimentary recordkeeping systems of microenterprises in the informal economy is an open question. To shed light on this issue, we test whether entrepreneurs' current plans for business expansion are related to the quality of their recordkeeping system, i.e., whether the information system helps entrepreneurs to have greater confidence in their business prospects.

Although we use data from a single-shot survey, the survey elicits the entrepreneur's anticipated business developmental trajectories over the next five years as of the time of the survey. Using the CA sample, we construct a business plan measure along intensive margin as the sum of indicator variables for the entrepreneur's plans for a significant increase in sales at the existing location, opening a new commercial establishment in the same line of business, hiring additional workers for the existing establishment, and generating a new product in the current business. We

also construct an indicator along the extensive margin based on the response regarding plans for opening a new commercial establishment in a different line of business. We sum the two measures to capture all business expansion plans.[20]

Table 10 reports the results of regressing the business expansion plan variables on the accounting quality indicators, with controls for the entrepreneur's human capital (*Education and Management Training*), current business performance (*Log of Sales*), and sector and country fixed effects. We find that informal firms with a higher quality accounting system are more likely to have business expansion plans, with results largely driven by the extensive margin, where informal firms with digitized records (separate notebooks) are 42 (28) percent more likely than the sample mean to have a plan to start a new business.[21]

Our evidence is consistent with a more strategic and informed approach to business expansion decisions among informal microbusinesses with higher accounting quality. Whereas prior research has robust evidence on expected and realized capital investment, we provide descriptive evidence on the value of accounting quality for the planning phase of capital budgeting, which is a precondition for generating efficient investments. More broadly, we offer insights into the managerial role of accounting in informal microbusinesses (Datar, Epstein, & Yuthas, 2009).

5. Conclusion

This study provides new evidence on the voluntary adoption of accounting systems by microenterprises in the informal economy. In the absence of regulatory mandates, we find that informal firms adopt structured recordkeeping practices when it aligns with their financial and

[20] We did not replicate this analysis for the DR sample, as the survey questions regarding business expansion plans have a different structure and do not include a clear distinction between the intensive and extensive margins.
[21] The reported 42 (28) percent effects are obtained by dividing the estimated coefficients in Table 10, Column 3, for Digitized records (0.135) and Separate notebooks (0.091) by the sample mean of the indicator variable for informal firms with business expansion plans along the extensive margin (0.324).

operational goals. These practices are shaped by owner motivations, financing needs, and business strategies, reflecting rational economic behavior. Importantly, accounting quality is positively associated with access to credit, even among informal firms, which may help bridge the gap between informality and financial inclusion. Our findings underscore the strategic role of accounting beyond compliance and highlight its potential to support microenterprise development. Future research can build on this work to better understand the evolution of accounting practices and credit relationships in informal settings.

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1 Figures

Figure 1
Sample Description

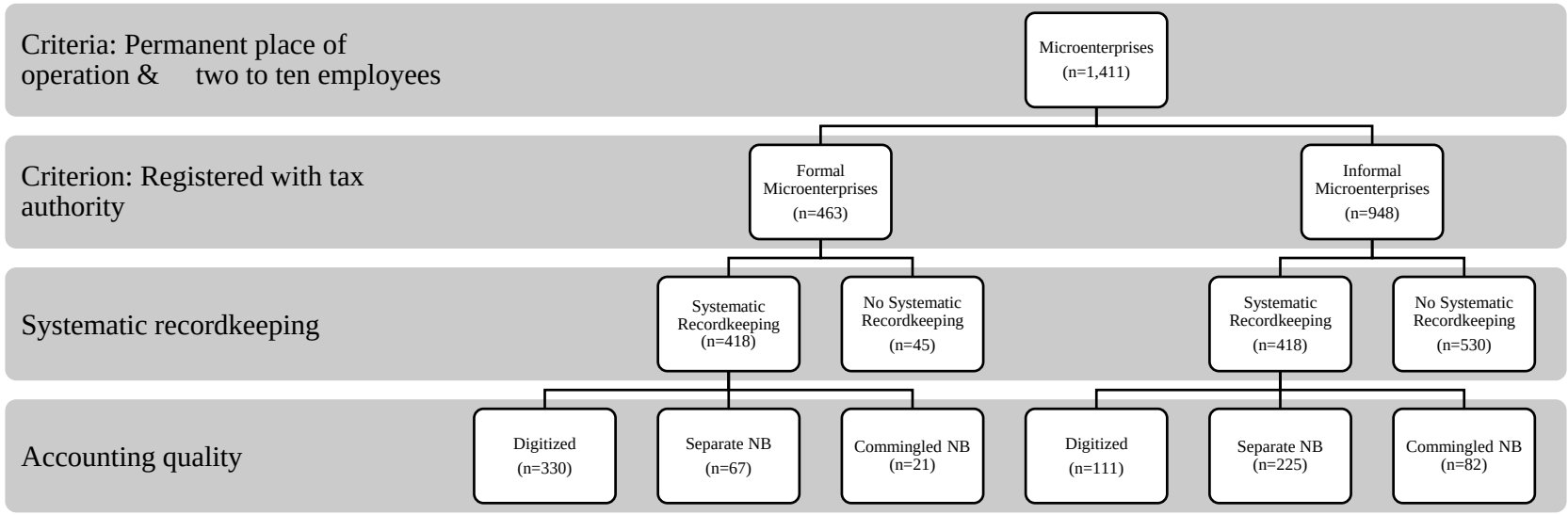

TABLE 1
Accounting Practices Definition

Panel A: Cross Tabulation of Accounting Categories by Formalization

	Systematic Recordkeeping				
	No	*Yes*			
Formalization		*Commingled NB*	*Separate NB*	*Digitized*	Total
Informal	530	82	225	111	948
	(55.9)	(8.6)	(23.7)	(11.7)	(100.0)
Formal	45	21	67	330	463
	(9.7)	(4.5)	(14.5)	(71.3)	(100.0)
Total	575	103	292	441	1,411
	(40.8)	(7.3)	(20.7)	(31.3)	(100.0)

Panel B: Test of Differences in Accounting Quality

	Informal	Formal	Difference
Accounting			
Systematic Recordkeeping	0.444	0.904	-0.459^{***}
Commingled NB	0.086	0.045	0.041^{***}
Separate NB	0.237	0.145	0.093^{***}
Digitized	0.117	0.713	-0.596^{***}

The final column in Panel B reports differences in means and the results of two-sample mean t-tests, with standard errors adjusted for unequal variance between the two groups. Inferences are identical using a chi-squared test.

TABLE 2

Determinants of Systematic Recordkeeping by Informal Firms

Marginal Effects

	Base Model	Preference Model
	(1)	(2)
Owner Motivation		
Business Oriented/Vocational	0.055***	0.054***
	(4.62)	(4.30)
Family Time	–0.013	–0.010
	(–0.93)	(–0.72)
Barriers	0.019	0.019
	(0.83)	(0.80)
Owner Characteristics		
Secondary School	–0.050	–0.054
	(–1.53)	(–1.56)
College	0.081	0.068
	(1.23)	(0.99)
Management Training	0.151***	0.154***
	(4.91)	(4.69)
Female	0.004	0.009
	(0.13)	(0.29)
Age	–0.001	–0.001
	(–0.56)	(–0.61)
Financing		
Saving for Investment	0.318***	0.294***
	(4.45)	(3.87)
Own Capital	0.124***	0.120***
	(3.89)	(3.51)
Informal Lenders	0.067**	0.068**
	(2.11)	(2.00)
Microfinance	0.017	0.022
	(0.41)	(0.50)
Bank	0.102***	0.076**
	(2.93)	(2.05)
Operations		
Large Supplier	0.107***	0.128***
	(2.86)	(3.22)
Customer Credit	0.372***	0.412***
	(3.89)	(4.01)
Marketing Promotion	0.399***	0.409***
	(4.81)	(4.67)
Business Complexity	–0.108	–0.109
	(–1.06)	(–0.98)
Firm Age	–0.007***	–0.007***
	(–3.09)	(–3.02)
Number of Family Workers	–0.036**	–0.041**
	(–2.22)	(–2.35)
Temporary Workers	–0.091*	–0.094*
	(–1.82)	(–1.82)
Number of Workers	0.055***	0.048***
	(4.11)	(3.45)
Prefer Formalization		0.025
		(0.78)
Observations	912	832
Pseudo-R^2	0.20	0.19

Table 2 presents marginal effects of probit models for the informal firms. Column (2) extends the analysis by including stated preference for formalization as an additional explanatory variable (*Prefer Formalization*). All regressions include country and sector fixed effects. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01, two-tailed tests, respectively.

TABLE 3

Determinants of the Choice of Accounting Quality by Informal Firms

Ordered Probit Marginal Effects

	Digitized	Separate NB	Commingled NB	None
	(1)	(2)	(3)	(4)
Owner Motivation				
Business Oriented/Vocational	0.018***	0.018***	0.003***	−0.038***
	(3.17)	(3.11)	(2.83)	(−3.19)
Family Time	−0.010*	−0.010*	−0.001	0.022*
	(−1.65)	(−1.65)	(−1.59)	(1.66)
Barriers	0.003	0.003	0.000	−0.006
	(0.27)	(0.27)	(0.27)	(−0.27)
Owner Characteristics				
Secondary School	−0.017	−0.016	−0.002	0.036
	(−1.21)	(−1.20)	(−1.19)	(1.21)
College	0.091***	0.088***	0.013***	−0.192***
	(2.98)	(2.97)	(2.63)	(−3.01)
Management Training	0.053***	0.052***	0.007***	−0.112***
	(3.72)	(3.77)	(3.36)	(−3.84)
Female	−0.014	−0.014	−0.002	0.029
	(−1.06)	(−1.07)	(−1.07)	(1.07)
Age	0.000	0.000	0.000	0.001
	(−0.72)	(−0.72)	(−0.72)	(0.72)
Financing				
Saving for Investment	0.134***	0.129***	0.019***	−0.282***
	(3.99)	(4.10)	(3.57)	(−4.17)
Own Capital	0.044***	0.043***	0.006***	−0.093***
	(3.13)	(3.08)	(2.82)	(−3.16)
Informal Lenders	0.009	0.009	0.001	−0.019
	(0.67)	(0.66)	(0.66)	(−0.66)
Microfinance	−0.013	−0.012	−0.002	0.027
	(−0.70)	(−0.70)	(−0.70)	(0.70)
Bank	0.052***	0.050***	0.007***	−0.109***
	(3.40)	(3.39)	(2.99)	(−3.46)
Operations				
Large Supplier	0.061***	0.059***	0.008***	−0.128***
	(3.53)	(3.72)	(3.24)	(−3.70)
Customer Credit	0.161***	0.156***	0.023***	−0.340***
	(3.30)	(3.35)	(3.01)	(−3.39)
Marketing Promotion	0.164***	0.158***	0.023***	−0.345***
	(5.32)	(5.19)	(4.02)	(−5.49)
Business Complexity	−0.032	−0.031	−0.005	0.068
	(−0.67)	(−0.67)	(−0.66)	(0.67)
Firm Age	−0.003***	−0.003***	0.000***	0.007***
	(−3.03)	(−3.04)	(−2.83)	(3.09)
Number of Family Workers	−0.020***	−0.019***	−0.003**	0.042***
	(−2.73)	(−2.70)	(−2.57)	(2.76)
Temporary Workers	−0.038*	−0.036*	−0.005*	0.079*
	(−1.70)	(−1.70)	(−1.65)	(1.71)
Number of Workers	0.030***	0.029***	0.004***	−0.063***
	(4.95)	(5.10)	(4.05)	(−5.25)

"None" refers to firms without systematic financial records. See Appendix B for accounting quality variable definitions. The number of observations in the model is 906. The model is estimated using country and sector fixed effects. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01, two-tailed tests, respectively.

TABLE 4

Regression of Business Cell Phone Use by Informal Firms on the Determinants of Accounting Quality

	Cell Phone	Systematic Recordkeeping	p-value of Difference
	(1)	(2)	(3)
Owner Motivation			
Business Oriented/Vocational	0.021*	0.055***	0.027
	(1.76)	(4.65)	
Family Time	–0.016	–0.013	0.962
	(–1.08)	(–0.94)	
Barriers	0.004	0.018	0.649
	(0.19)	(0.82)	
Owner Characteristics			
Secondary School	0.056	–0.049	0.037
	(1.62)	(–1.51)	
College	0.126*	0.081	0.727
	(1.85)	(1.24)	
Management Training	0.080**	0.152***	0.082
	(2.37)	(4.95)	
Female	–0.065**	0.004	0.156
	(–2.03)	(0.13)	
Age	0.004**	–0.001	0.058
	(2.26)	(–0.61)	
Financing			
Saving for Investment	–0.103	0.315***	0.000
	(–1.39)	(4.44)	
Own Capital	–0.033	0.123***	0.001
	(–0.95)	(3.87)	
Informal Lenders	0.065*	0.067**	0.847
	(1.90)	(2.11)	
Microfinance	0.045	0.018	0.707
	(1.00)	(0.43)	
Bank	–0.069*	0.100***	0.001
	(–1.82)	(2.90)	
Operations			
Large Supplier	0.107***	0.108***	0.810
	(2.66)	(2.91)	
Customer Credit	0.248**	0.371***	0.230
	(2.35)	(3.91)	
Marketing Promotion	0.302***	0.400***	0.328
	(2.82)	(4.81)	
Business Complexity	0.004	–0.106	0.333
	(0.04)	(–1.06)	
Firm Age	–0.003	–0.007***	0.157
	(–1.05)	(–3.05)	
Number of Family Workers	0.008	–0.036**	0.079
	(0.43)	(–2.24)	
Temporary Workers	0.063	–0.091*	0.052
	(1.17)	(–1.80)	
Number of Workers	–0.019	0.054***	0.000
	(–1.44)	(4.08)	
Observations	912	912	
Pseudo-R^2	0.09	0.20	

Table 4 reports marginal effects from a Seemingly Unrelated Regressions (SUR) model, jointly estimating the probit regressions of business cell phone use and systematic recordkeeping on the determinants of systematic recordkeeping for informal firms. Column (3) reports p-values from tests comparing the coefficient estimates between the two regressions. All regressions include country and sector fixed effects. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01, two-tailed tests, respectively.

TABLE 5
Accounting Quality and Access to Credit

Panel A: Loan Requests and Loan Approvals by Formalization

	Formalization					
	Informal		Formal		Total	
	No.	%	No.	%	No.	%
Loan Requests						
No	627	65.8	224	48.0	851	59.9
Yes	326	34.2	243	52.0	569	40.1
Total	953	100.0	467	100.0	1,420	100.0
Loan Approvals						
No	76	23.3	16	6.6	92	16.2
Yes	250	76.7	227	93.4	477	83.8
Total	326	100.0	243	100.0	569	100.0

Panel B: Marginal Effects from the Heckman Selection Model

	Informal Firms		Formal Firms	
	Loan Requests	Loan Approvals	Loan Requests	Loan Approvals
	(1)	(2)	(3)	(4)
Commingled NB	−0.015	−0.061		
	(−0.25)	(−0.60)		
Separate NB	0.087**	0.135*		
	(2.36)	(1.95)		
Digitized	−0.004	0.143	0.171***	0.180**
	(−0.07)	(1.39)	(3.41)	(2.07)
Owns Business Premise	−0.109***	0.034	0.016	0.113*
	(−3.08)	(0.45)	(0.33)	(1.91)
Lessee	−0.019	0.036	0.108**	0.207**
	(−0.43)	(0.47)	(2.00)	(2.11)
Suppliers Credit	0.008	−0.110	0.045	−0.147
	(0.09)	(−0.62)	(0.43)	(−1.36)
Customer Credit	0.153	0.099	0.271***	0.329***
	(1.56)	(0.62)	(3.49)	(2.83)
Business Oriented/Vocational	0.001	0.024	0.017	0.030
	(0.08)	(1.16)	(1.11)	(1.61)
Family Time	−0.003	0.031	−0.003	0.017
	(−0.19)	(1.22)	(−0.17)	(0.77)
Barriers	0.061***	−0.036	0.063*	−0.051
	(2.69)	(−0.79)	(1.93)	(−0.76)
Secondary School	0.005	−0.041	0.007	−0.003
	(0.14)	(−0.67)	(0.13)	(−0.04)
College	0.056	−0.052	0.129*	0.097
	(0.87)	(−0.46)	(1.82)	(0.85)
Management Training	0.062*	0.050	0.003	−0.049
	(1.90)	(0.78)	(0.05)	(−0.67)
Female	−0.030	0.010	−0.014	0.086
	(−0.98)	(0.17)	(−0.31)	(1.39)
Age	0.002	−0.001	0.004*	0.011***
	(1.03)	(−0.20)	(1.82)	(2.62)
Firm Age	0.006***	0.005	0.003	−0.001
	(2.64)	(1.12)	(1.16)	(−0.21)
I Am Never Short of Money	−0.215***		−0.232***	
	(−6.28)		(−4.88)	
Observations	909	311	448	234
Estimated ρ		0.51		0.86

Panel C: Marginal Effects for the Panel B Loan Approval Model by Selection Bias					
	Panel C	Fixed ρ			
		0.0	0.3	0.6	0.9
Informal Firms					
Commingled NB	–0.061	–0.055	–0.064	–0.066	–0.054
	(–0.60)	(–0.59)	(–0.62)	(–0.66)	(–0.75)
Separate NB	0.135*	0.089	0.117*	0.134**	0.121**
	(1.95)	(1.44)	(1.73)	(2.05)	(2.56)
Digitized	0.143	0.130	0.137	0.119	0.059
	(1.39)	(1.41)	(1.35)	(1.22)	(0.85)
Formal Firms					
Digitized	0.180**	0.061	0.092*	0.132**	0.176***
	(2.07)	(1.55)	(1.84)	(2.20)	(2.89)

Panel A reports loan request and approval rates for informal and formal firms. Panel B presents marginal effects from the standard Heckman selection model for informal (formal) firms in columns 1-2 (3-4). In Panel B all regressions also include country and sector fixed effects, and ρ is the correlation between the errors of the selection and outcome equations. Panel C reports marginal effects for the Panel B models for the loan approval, varying the correlation parameter ρ to assess robustness across different levels of selection bias. All regressions in panels C include controls, and country and sector fixed effects. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01, two-tailed tests, respectively.

TABLE 6

Dominican Republic: Accounting Quality and Access to Credit

Panel A: Loan Amount by Formalization			
	Informal	Formal	Total
Loan Not Requested	436	170	606
	(65.3)	(50.9)	(60.5)
Loan Amount < 100,000 Dominican Pesos	144	54	198
	(21.6)	(16.2)	(19.8)
Loan Amount ≥ 100,000 Dominican Pesos	88	110	198
	(13.2)	(32.9)	(19.8)
Total	668	334	1,002
	(100.0)	(100.0)	(100.0)

Panel B: Accounting Categories by Formalization			
	Informal	Formal	Total
No Systematic Recordkeeping	423	40	463
	(64.0)	(12.0)	(46.5)
Notebook	80	22	102
	(12.1)	(6.6)	(10.3)
Digitized	158	272	430
	(23.9)	(81.4)	(43.2)
Total	661	334	995
	(100.0)	(100.0)	(100.0)

Panel C: Marginal Effects from Heckman Selection Models for Informal Firms			
	Loan Requests	High/Low Loan	Loan Amount
	(1)	(2)	(3)
Notebook	0.085	0.047	−7054.201
	(1.60)	(0.48)	(−0.94)
Digitized Records	0.050	0.220***	15 263.103***
	(1.16)	(2.72)	(3.11)
Observations	650	224	224

Panel A presents the distribution of loan amounts by formalization status. For loan amounts less than 100,000 Dominican Pesos, there are 7 observations in the informal and 3 in the formal subsample where loans were not approved; in those cases, the loan amount is recorded as zero. Panel B reports the distribution of accounting categories by formalization, where, given the sparsity of notebook, we did not split it into commingled or separate notebooks. Panel C reports the marginal effects of accounting quality on both the likelihood of requesting a loan and the loan amount obtained for informal firms. We replicated the Heckman model for the sample of formal firms using both dependent variables (Loan High and Loan Amount). However, the model does not converge for Loan Amount, and the estimated correlation between selection and outcome equation errors reached a boundary value, suggesting numerical instability or weak identification. All regressions include controls and sector fixed effects. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01, two-tailed tests, respectively.

TABLE 7

Dominican Republic: Accounting Quality and Bank Sophistication

$$Systematic\ Records_i = \alpha + \beta_1 Low\ Loan_i \times Large\ Bank_i + \beta_2 High\ Loan_i \times Small\ Bank_i + \beta_3 High\ Loan_i \times Large\ Bank_i + \varepsilon_i$$

	Informal Sample	Formal Sample
	(1)	(2)
Low Loan × *Large Bank*	0.269***	0.116
	(3.97)	(0.64)
High Loan × *Small Bank*	0.463***	0.195
	(3.91)	(1.00)
High Loan × *Large Bank*	0.422***	0.195
	(5.45)	(1.11)
Intercept	0.109**	0.714***
	(2.35)	(4.13)
Test $\beta_3 - \beta_2$	–0.041	0.000
Test $\beta_3 - \beta_1$	0.153*	0.079
Observations	231	164
R^2	0.10	0.02

Table 7 examines whether firms that received high or low loans from small or large banks differ in their likelihood of having systematic recordkeeping. Column 1 (2) report coefficients for informal (formal) firms from OLS regressions where the dependent variable is an indicator for systematic recordkeeping. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01, two-tailed tests, respectively.

TABLE 8
Accounting Quality and Credit Market Status

Panel A: Definition of Credit Market Status

	Needed Financing	*Loan Requested*	*Loan Obtained*
Obtained Loan	–	*Yes*	*Yes*
Sufficient Credit	*No*	*No*	–
Loan Not Approved	–	*Yes*	*No*
Needed Financing but Loan Not Requested	*Yes*	*No*	–

Panel B: Cross Tabulation of Credit Market Status and the Level of Formalization

	Informal	Formal	Total
Needed Financing but Loan Not Requested	398	111	509
	(41.8)	(23.8)	(35.8)
Loan Not Approved	76	16	92
	(8.0)	(3.4)	(6.5)
Sufficient Credit	229	113	342
	(24.0)	(24.2)	(24.1)
Obtained Loan	250	227	477
	(26.2)	(48.6)	(33.6)
Total	953	467	1,420
	(100.0)	(100.0)	(100.0)

Panel C: Marginal Effects from Ordered Probit Models

	Obtained Loan	Financing Not Needed	Loan Not Approved	Needed Financing but Loan Not Requested
	(1)	(2)	(3)	(4)
Informal Firms				
Commingled NB	−0.015	−0.003	0.000	0.018
	(−0.32)	(−0.32)	(0.31)	(0.32)
Separate NB	0.088***	0.019***	−0.002**	−0.105***
	(2.80)	(2.70)	(−1.97)	(−2.82)
Digitized	0.079**	0.017**	−0.002*	−0.094**
	(2.06)	(1.96)	(−1.69)	(−2.06)
Formal Firms				
Digitized	0.186***	−0.032***	−0.011***	−0.143***
	(4.02)	(−3.19)	(−2.84)	(−3.95)

Table 8 is based on the CA sample. Panel A defines the classification of credit market status. Panel B provides cross-tabulations of credit market status by formalization. Panel C presents marginal effects for credit market status determinants using an ordered probit estimation, separately for informal and formal firms. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01, two-tailed tests, respectively.

TABLE 9

Dominican Republic: Accounting Quality and Credit Market Status

Panel A: Cross Tabulation of Credit Market Status and the Level of Formalization

	Informal	Formal	Total
Needed Financing but Loan Not Requested	109	40	149
	(16.4)	(12.1)	(15.0)
Loan Not Approved	7	3	10
	(1.1)	(0.9)	(1.0)
Sufficient Credit	327	130	457
	(49.2)	(39.3)	(45.9)
Obtained Loan	221	158	379
	(33.3)	(47.7)	(38.1)
Total	664	331	995
	(100.0)	(100.0)	(100.0)

Panel B: Marginal Effects from Ordered Probit Models

	Obtained Loan	Financing Not Needed	Loan Not Approved	Needed Financing but Loan Not Requested
	(1)	(2)	(3)	(4)
Informal Firms				
Notebook	0.090*	–0.027*	–0.003	–0.060*
	(1.93)	(–1.88)	(–1.57)	(–1.89)
Digitized Records	0.059	–0.017	–0.002	–0.039
	(1.55)	(–1.54)	(–1.34)	(–1.52)
Formal Firms				
Notebook	–0.058	0.027	0.001	0.030
	(–0.55)	(0.54)	(0.52)	(0.55)
Digitized Records	–0.005	0.002	0.000	0.003
	(–0.06)	(0.06)	(0.06)	(0.06)

Table 9 is based on the DR sample. Panel A provides cross-tabulations of credit market status by formalization. Unlike in Central America, in the Dominican Republic sample we do not include motivations to start the business in the ordered probit models as explanatory variables, as they have a large number of missing values. Panel B presents marginal effects for credit market status determinants using an ordered probit estimation, separately for informal and formal firms. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01, two-tailed tests, respectively.

TABLE 10
Business Expansion Plans by Informal Firms

	All	Intensive Margin	Extensive Margin
	(1)	(2)	(3)
Commingled NB	0.150	0.071	0.076
	(0.80)	(0.47)	(1.32)
Separate NB	0.022	−0.081	0.091**
	(0.16)	(−0.71)	(2.31)
Digitized	0.346**	0.210	0.135**
	(1.99)	(1.50)	(2.48)
Secondary School	0.424***	0.372***	0.061*
	(3.55)	(3.77)	(1.85)
College	0.983***	0.764***	0.222***
	(4.52)	(4.40)	(3.17)
Management Training	0.194	0.196*	−0.004
	(1.61)	(1.95)	(−0.12)
Log of Sales	−0.014	0.007	−0.019
	(−0.23)	(0.15)	(−1.02)
Observations	903	907	922
R^2	0.08	0.08	0.05
Country and Sector Fixed Effects	Yes	Yes	Yes

In Column 1, the dependent variable is the total number of business expansion plans, calculated as the sum of indicator variables for Sales, New Location, More Workers, New Products, and New Business. Column 2 focuses on the intensive margin, summing only the plans related to the current business (Sales, New Location, More Workers, and New Products). Finally, Column 3 captures the extensive margin, where the dependent variable is an indicator equal to one if the entrepreneur reports a plan to start a new business distinct from the current one. We did not replicate this analysis for the Dominican Republic, as the survey questions in this section have a different structure and do not include a clear distinction between the intensive and extensive margins. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01, two-tailed tests, respectively.

Appendices

A. Survey Methodology

This section briefly summarizes the survey methodology based on ILO (2020). The survey was administered in mid-November 2019 to a sample of microbusinesses operating in Guatemala, Honduras, and El Salvador. The scope of the survey covered a wide range of topics, including general business and owner profiles, as well as detailed information on operational and management practices such as strategic planning, human resource management, access to finance, recordkeeping, marketing strategies, and supply chain dynamics.

The survey targeted microbusinesses with fixed premises employing between two and ten permanent workers, including the owner (ILO, 2020). Data were collected through in-person interviews, mostly with the owners at their business premises (ILO, 2020).[1] Responses were recorded on electronic tablets using "SurveyGizmo" software, ensuring real-time capture and minimizing transcription errors. To reduce response bias related to business practices and owner characteristics, questions on legal compliance were placed toward the end of the questionnaire. The survey includes questions that require answers on a 1-5 Likert scale, ranking-type questions (in which respondents selected their top three preferences from a given set of options), multiple-choice and yes-no questions, as well as open-ended numerical items (e.g., age). Data collection was administered by Research & Planning,[2] a reputable market research firm with established operations across the three countries in our sample.

[1] Only 6% of the survey was completed by managers with the owners (91%) and partners (3%) completing the rest.
[2] This market research firm is also known as "Publicidad Comercial MullenLowe" (https://www.pcomercial.com/).

The survey was designed to ensure a representative cross-section of microenterprises and their characteristics, with observations evenly distributed across three domains. First, the geographic domain ensured balanced representation across the San Salvador Metropolitan area (El Salvador), the Tegucigalpa and Comayaguela metropolitan areas (Honduras), and Guatemala City (Guatemala). Second, the sectoral domain provided equal distribution among the retail sector (such as bars, restaurants, and hotels), the service sector (including professional, repair, beauty, health, education, and other personal services), and the micro-manufacturing sector (like tortilla shops, tailor shops, handicrafts, bakeries, and ice cream parlors). Finally, the sample is equally distributed across the three levels of microenterprise formalization: formal firms, sub-formal firms, and fully informal firms.

As discussed in the body of the paper, we follow the ILO (2020) classification and define formal microbusinesses as those registered with the national tax authority, indicating full compliance with business registration requirements and national laws and regulations. The rest are classified as informal microenterprises, consisting of sub-formal firms, i.e., those only locally registered in the public register of commerce (for Honduras and El Salvador) or the mayor's office (for Guatemala) but lacking tax registration, and fully informal firms, which are not registered with any administrative authority. This parsimonious grouping is motivated by the lack of clear ex-ante predictions within the non-formal categories, allowing us to highlight key insights. Therefore, by design, informal firms represent two-thirds of the total sample, with formal firms comprising the remaining one-third.

Because of the informal nature of many of the firms being studied, the sample was constructed without a sampling frame (a list of formal and informal businesses in the sectors of activity of interest within the needed geographic clusters). Therefore, a sample size calculation

was used based on several assumptions. First, the required sample size is calculated under simple random sampling, and then the sample is evenly distributed among the previously described strata (three countries, three economic sectors, and three categories of formalization status). The formula used for the sample size is as follows:

$$n = \frac{z_{a/2}^2 s^2}{e^2},$$

where n represents the total sample size, $z_{a/2}$ is the two-tailed critical value of a standardized normal variable for a 1-a confidence level, s^2 is the variance of the responses, and e is the maximum error allowed. Because the indicators of interest are ratios/proportions (e.g., the likelihood of adopting systematic recordkeeping or obtaining a bank loan), the survey design uses the maximum variance of a Bernoulli process (0.25) to calculate the sample size. A 95% confidence level and a maximum permissible error of 2.8% are used for the overall sample:

$$n = \frac{(1.96)^2(0.25)}{0.028^2} = 1{,}225.$$

With the sample size rounded to the nearest integer that is divisible by 27, enabling equal distribution among the 3 x 3 x 3 strata. This results in a total sample size of 1,242 microenterprises with 46 firms per strata to ensure the overall maximum allowed error does not deviate or exceed the target of 2.8%:[3]

$$e = \frac{(1.96)(0.5)}{\sqrt{1{,}242}} = 0.02781$$

In other words, this maximum permissible error (e) refers to the largest acceptable difference between the sample estimate and the true population parameter. Therefore, for the full

[3] ILO reported a denominator of 1,224 with an e of 0.02801, while the denominator should have been 1,242.

sample analysis (without dividing the sample by formality), our estimates should be within ±2.8% of the true population values with 95% confidence. Following a similar calculation, when we analyze by formalization levels, the maximum permissible error is approximately 4.82% for the formal sector and 3.41% for the informal sector.

Actual data collection resulted in a slightly larger sample of 1,426 firms than the required sample of 1,242 firms. The designed sample allocation and the actual sample distribution across regions, levels of formalization, and sectors are provided below in Exhibit A1, except that we collapse the sub-formal and fully informal firms into one "Informal" category. We include in Table A1 a comparative descriptive analysis between formal and informal firms. The observed patterns align with economic intuition and lend credibility to the reliability and representativeness of the survey data.

Exhibit A1.

Sample distribution according to the survey design and effective sample

Designed sample						
Sector	Guatemala		Honduras		El Salvador	
	Formal	Informal	Formal	Informal	Formal	Informal
Retail	46	92	46	92	46	92
Service	46	92	46	92	46	92
Micromanufacturing	46	92	46	92	46	92
Total	138	276	138	276	138	276

Effective sample						
Sector	Guatemala		Honduras		El Salvador	
	Formal	Informal	Formal	Informal	Formal	Informal
Retail	46	118	46	144	46	112
Service	46	91	46	100	46	98
Micromanufacturing	46	94	46	109	46	91
Total	138	303	138	353	138	301

TABLE A1
Means of Determinants of Accounting Choice

	Informal	Formal	Difference
Owner Motivation			
Business Oriented/Vocational	0.023	−0.047	0.069
Family Time	0.014	−0.028	0.042
Barriers	3.040	2.786	0.254***
Owner Characteristics			
Secondary School	0.476	0.532	−0.056**
College	0.068	0.220	−0.152***
Management Training	0.521	0.722	−0.201***
Female	0.499	0.387	0.113***
Age	42.433	44.126	−1.693***
Financing			
Saving for Investment	0.460	0.493	−0.033***
Own Capital	0.528	0.513	0.015
Informal Lenders	0.464	0.254	0.210***
Microfinance	0.166	0.199	−0.033
Bank	0.269	0.524	−0.255***
Operations			
Large Supplier	0.211	0.406	−0.195***
Customer Credit	0.026	0.113	−0.087***
Marketing Promotion	0.097	0.155	−0.058***
Business Complexity	0.026	0.100	−0.074***
Firm Age	7.440	9.448	−2.008***
Number of Family Workers	0.829	0.859	−0.030
Temporary Workers	0.119	0.182	−0.063***
Number of Workers	2.955	3.938	−0.983***
Prefer Formalization	0.618	0.928	−0.309***

This table reports mean values of determinants of accounting choice by formalization. The final column reports differences in means and the results of two-sample mean t-tests, with standard errors adjusted for unequal variance between the two groups. Inferences are identical using a chi-squared test. *, **, and *** represent significance levels of 0.10, 0.05, and 0.01, two-tailed tests, respectively.

B. Variable definitions

Variable Definitions for the Accounting Model

Variable name	Definition
Accounting Variables	
Systematic Recordkeeping	Equals one when the business maintains formal accounting records and zero otherwise (Q24).
Commingled NB	Equals one when the business uses a notebook or notepad for keeping its formal accounting records (Q24 and Q25), and the entrepreneur does not separate business accounts from personal funds used to support their household (Q.26.1) and zero otherwise.
Separate NB	Equals one when the business uses a notebook or notepad for keeping its formal accounting records (Q24 and Q25), and the entrepreneur keeps separate business accounts from personal funds used to support their household (Q.26.1) and zero otherwise.
Digitized	Equals one when the business uses Excel spreadsheets, has an in-house accountant or bookkeeper, or outsources its accounting services for keeping its formal accounting records and zero otherwise (Q24 and Q25).
Owner Motivation	
Business Oriented/Vocational	The first principal component, based on seven measures (each on a 1-5 Likert scale) of possible motivations for starting the business, capturing the entrepreneur's business-oriented nature or vocational interest (Q10).
Family Time	The second principal component, based on seven measures (each on a 1-5 Likert scale) of possible motivations for starting the business, capturing the entrepreneur's desire for flexibility and balancing business/family (Q10).
Barriers	The average of two measures (each on a 1-5 Likert scale) for starting the business due to a lack of employment opportunities (Q10.1) and labor market discrimination (Q10.11).
Owner Characteristics	
Secondary School	Denotes if the highest educational attainment of the entrepreneur is either middle school or high school completion (Q6.3).
College	Denotes if the highest educational attainment of the entrepreneur is completed college or higher technical education (Q6.4 and Q6.5).
Management Training	Equals one if the business owner has received training—through formal studies, training courses, or self-learning—in developing skills to manage staff and run the business; equals zero otherwise (Q16).
Female	This indicator variable identifies female business owners (Q4.2).
Age	Age of the entrepreneur in years (Q5).
Financing	
Saving for Investment	The entrepreneur’s assessment of the likelihood of saving money for investment (measured on a 1-5 Likert scale, standardized to a 0-1 scale) (Q46.1).
Own Capital	Equals one when the entrepreneur views their own resources as a source they would consider for financing business expansion and zero otherwise (Q31.1).

Informal Lenders	Equals one when the entrepreneur views family and friends or individual lenders as a source they would consider for financing business expansion and zero otherwise (Q31.2 and Q31.3).
Microfinance	Equals one when the entrepreneur views microfinance companies as a source they would consider for financing business expansion and zero otherwise (Q31.4).
Bank	Equals one when the entrepreneur views private or public banks as a source they would consider for financing business expansion and zero otherwise (Q31.5 and Q31.6).
Operations	
Larger Supplier	Equals one for entrepreneurs who have a large business as a supplier.
Customer Credit	This indicator variable captures which businesses accept installment credit as a form of payment from their customers, whether from individuals or other businesses (Q45.2 and Q44.2).
Marketing Promotion	Average of indicator variables for six promotion strategies: newspaper advertisements, radio spots, mural advertisements, street marketing, flyer distribution, and social media engagement (Q37.2, Q37.3, Q37.4, Q37.5, Q37.6, Q37.10).
Business Complexity	Equals one when the business has additional establishments and zero otherwise (Q3.a).
Firm Age	The number of years the business has been operating (Q7).
Number of Family Workers	Number of family workers among the people working in the business (Q23)
Temporary Workers	Equals one when the business occasionally employs temporary workers (Q21)
Number of Workers	Number of permanent workers regularly employed in the business, including the owner.
Formalization variables	
Stated Preference for Formalization	Equals one for entrepreneurs who prefer operating with formal registration (Q49).
Informal	Equals one for businesses not registered with the tax authority and zero otherwise (Q54.4).
Formal	Equals one for businesses registered with the tax authority and zero otherwise (Q54.4).
Business Cell Phone Use	Equals one for entrepreneurs who use a cell phone for business purposes, e.g., to receive orders or contact customers and suppliers (Q47.1.1, Q47.1.2, Q47.1.3, Q47.1.5).

Variable Definitions for the Loans Model and Credit Status (not defined above)

Variable name	Definition
Loan Requests	Equals one if the business has ever requested financing from a bank and zero otherwise (Q33).
Loan Approval	Equals one (zero) if the business was (was not) granted a loan following a financing request to a bank (Q34).
Credit Market Status	Equal to 3 when a loan was requested and obtained, 2 when no loan was requested and financing was not needed, 1 when a loan was requested but not obtained, and 0 when no loan was requested and financing was needed (Q32, Q33, Q34).
High Loan	For the Dominican Republic sample, equals one when the loan amount obtained is greater than or equal to 100,000 Dominican Pesos (Q38.30).
Loan Amount	For the Dominican Republic sample, refers to the amount of the loan received in Dominican Pesos. It equals zero if the loan application was not approved (Q38.30).
Owns Business Premise	Equals one if the business premises are self-owned and zero otherwise (Q29).
Lessee	Equals one if the business is located in a shopping center or in a building that is not the home of the owner, and zero otherwise (Q5e).
Supplier Credit	Equals one when the business uses term credit as the most common form of payment with its suppliers and zero otherwise (Q39).
Customer Credit	This indicator variable captures which businesses accept installment credit as a form of payment from their customers, whether from individuals or other businesses. (Q45.2 and Q44.2).
I Am Never Short of Money	Equals one when the entrepreneur reports never being short of money for regular business operations and zero otherwise (Q32).
Personal Application	For the Dominican Republic sample, equals one if the owner has requested financing for the business through a personal loan and zero if the request was made through a business loan (Q38). Observations where no loan was requested or the respondent didn't answer are coded as missing.
Business Application	For the Dominican Republic sample, equals one if the owner has requested financing for the business through a business loan and zero if the request was made through a personal loan (Q38). Observations where no loan was requested or the respondent didn't answer are coded as missing.
Large Bank	For the Dominican Republic sample, equals one if the last loan application was made to a large bank—Banreservas, Banco Popular, Banco BHD, Scotiabank, or Asociación Popular de Ahorros y Préstamos—and zero if the application was made to any other bank (Q39). The variable is coded only for businesses that reported having requested a loan.

Variable Definitions for the Business Expansion Model (not defined above)

Variable name	Definition
All Business Expansion	Sum of five indicator variables corresponding to whether the owner reports plans to (i) increase sales, (ii) open a new location, (iii) hire additional workers, (iv) introduce new products, and (v) start a new business (Q11).
Intensive Margin	Sum of four indicators related to the existing enterprise: (i) increase sales, (ii) open a new location, (iii) hire additional workers, and (iv) introduce new products (Q11).
Extensive Margin	Equals one if the entrepreneur reports a plan to start a new business distinct from the current one. (Q11.3).
Log of Sales	The natural logarithm of the estimated typical monthly sales, winsorized at the 1st and 99th percentiles prior to log transformation (Q61). Reported sales in local currency converted to U.S. dollars using the exchange rates at the time of the survey (mid-November 2019).

Internet Appendix
Robustness Check: Incorporating Stratified Sampling Weights

Given the non-random nature of the sample, we conduct a robustness analysis of the CA sample by incorporating sampling weights into our analyses. To obtain survey weights, we first estimate the population of formal and informal microenterprises in each of the three countries. Survey weights are calculated as the ratio of the estimated strata population to the strata sample size. Using the survey weights, we re-estimate selected regressions after adjusting for the stratified sampling design. Specifically, we use the Stata command svyset to specify the survey design characteristics, including identifying the strata and survey weights. We then re-estimate our regressions using the svy prefix command, which adjusts all estimations for the survey settings identified by svyset. By incorporating survey weights, our parameter estimates likely reflect the larger population from which the sample was drawn with appropriate standard errors for inference.[1]

Estimating the Population Totals by Formalization Levels

We use the household data for El Salvador and Guatemala for the year 2019, while for Honduras, we use the 2017 dataset due to the availability of crucial variables for estimating the survey weights.[2] Using these datasets, we estimate the population totals for both formal and informal microenterprises using household datasets from the three countries. Exhibit IA1 provides descriptive statistics on the business populations in Honduras, El Salvador, and Guatemala. In the

[1] We also incorporate the finite population correction factor but given our sample sizes are a very small fraction of the strata, the impact on our estimates is minimal.
[2] We use the "Encuesta de Hogares de Propósitos Múltiples" (Multiple Purpose Household Survey) for El Salvador and Honduras, and the "Encuesta Nacional de Empleo e Ingresos" (National Survey for Employment and Income) for Guatemala.

non-agricultural sector, which is our focus, microbusinesses constitute the majority, making up about 93% in Honduras, 78% in El Salvador, and 75% in Guatemala ((3)/(2)).

Exhibit IA1

Descriptive Statistics of the Business Population in the Country Samples

No.	Populations	Honduras	El Salvador	Guatemala
(1)	Businesses in all sectors	92,325	131,574	181,045
(2)	Businesses in the non-agriculture sector	89,791	103,015	180,811
(3)	Microbusinesses in the non-agriculture sector	83,722	80,316	135,157

Using the household dataset, we first estimate the total number of microenterprises in each country employing between 1 and 9 workers (excluding the owner) operating in the non-agricultural business sector (row (3) in Exhibit IA1). Second, the variables required to estimate the level of formalization of microenterprises (i.e., registration with the tax authority) are available only for Honduras and El Salvador. Therefore, using the household data for these two countries, we estimate the number of microenterprises in each of the formalization levels and express it as a percentage of the total (Columns (2) and (4) of Exhibit IA2). We then use a simple average of the proportion of microenterprises at each formalization level in Honduras and El Salvador (Columns (2) and (4) of Exhibit IA2) to estimate the number of microenterprises in Guatemala (Column (5)).

Exhibit IA2

Estimation of Population Totals

Definition	Honduras		El Salvador		Guatemala	
	Total (1)	Percentage (2)	Total (3)	Percentage (4)	Total (5)	Percentage (6)
Informal sector	75,404	90%	67,164	84%	117,377	87%
Formal sector	8,318	10%	13,152	16%	17,780	13%
Total microbusiness sector	83,722	100.00%	80,316	100.00%	135,157	100.00%

Implementing the Adjustments for Survey Design:

We adjust the survey data using the strata-level survey weights calculated by dividing the total population of each of the six strata (3 countries x 2 levels of formalization) by the corresponding number of respondents in our sample. We replicate each of our main regressions, applying the survey adjustments (Stata command *svy*). We report the alternative results for Tables 2, 3, 4, 5 (Panels B and C), 8 (Panel C) and 10 in Tables IA1 to IA6, respectively. Overall, there are minor variations in slope estimates and marginal effects, but the tenor of our results is unaffected. Focusing on the determinants of systematic recordkeeping (Table IA1), the marginal effect of owners who face greater opportunity barriers for starting a microenterprise (*Barriers*) is now statistically significant for informal firms at conventional levels. In the Heckman selection models, our inferences continue to hold after the survey adjustment (Panel B of Table 5 versus Panel B of Table IA4). However, *Digitized* is now statistically significant at the 0.10 level, two-tailed test, for loan approvals in the informal sample, and at the 0.01 level for the intensive margin of business expansion plans (Table IA6, Column 2). In general, the differences in statistical significance between the original and survey-weighted models are relatively minor. Overall, our inferences are unaffected by adjusting for survey weights.

TABLE IA1

Replication of Table 2 Using Sampling Weights
Determinants of Systematic Recordkeeping by Informal Firms
Probit Marginal Effects

	Base Model	Preference Model
	(1)	(2)
Owner Motivation		
Business Oriented/Vocational	0.048***	0.047***
	(3.87)	(3.54)
Family Time	−0.020	−0.017
	(−1.43)	(−1.08)
Barriers	0.047**	0.048*
	(2.08)	(1.92)
Owner Characteristics		
Secondary School	−0.026	−0.028
	(−0.79)	(−0.79)
College	0.104	0.097
	(1.60)	(1.42)
Management Training	0.150***	0.152***
	(4.72)	(4.47)
Female	−0.004	0.002
	(−0.13)	(0.06)
Age	−0.001	−0.001
	(−0.83)	(−0.76)
Financing		
Saving for Investment	0.361***	0.351***
	(5.01)	(4.56)
Own Capital	0.134***	0.131***
	(4.18)	(3.77)
Informal Lenders	0.077**	0.080**
	(2.38)	(2.30)
Microfinance	0.016	0.020
	(0.38)	(0.45)
Bank	0.122***	0.098**
	(3.47)	(2.58)
Operations		
Large Supplier	0.124***	0.145***
	(3.29)	(3.61)
Customer Credit	0.404***	0.443***
	(4.56)	(4.62)
Marketing Promotion	0.341***	0.344***
	(3.93)	(3.74)
Business Complexity	−0.070	−0.067
	(−0.66)	(−0.58)
Firm Age	−0.007***	−0.007***
	(−2.81)	(−2.81)
Number of Family Workers	−0.029*	−0.034*
	(−1.80)	(−1.96)
Temporary Workers	−0.098*	−0.101*
	(−1.95)	(−1.93)
Number of Workers	0.054***	0.048***
	(4.09)	(3.43)
Prefer Formalization		0.000
		(−0.00)
Observations	912	832

TABLE IA2

Replication of Table 3 Using Sampling Weights

Determinants of the Choice of Accounting Quality by Informal Firms

Ordered Probit Marginal Effects

	Digitized	Separate NB	Commingled NB	None
	(1)	(2)	(3)	(4)
Owner Motivation				
Business Oriented/Vocational	0.016***	0.016***	0.002***	−0.035***
	(2.84)	(2.83)	(2.59)	(−2.87)
Family Time	−0.012**	−0.013**	−0.002**	0.027**
	(−2.11)	(−2.09)	(−1.99)	(2.11)
Barriers	0.012	0.013	0.002	−0.027
	(1.30)	(1.29)	(1.29)	(−1.30)
Owner Characteristics				
Secondary School	−0.006	−0.006	−0.001	0.013
	(−0.44)	(−0.43)	(−0.43)	(0.43)
College	0.100***	0.104***	0.016***	−0.219***
	(3.41)	(3.39)	(2.94)	(−3.46)
Management Training	0.052***	0.055***	0.008***	−0.115***
	(3.83)	(3.83)	(3.38)	(−3.94)
Female	−0.016	−0.016	−0.002	0.034
	(−1.25)	(−1.27)	(−1.27)	(1.27)
Age	−0.001	−0.001	0.000	0.001
	(−0.94)	(−0.94)	(−0.94)	(0.94)
Financing				
Saving for Investment	0.146***	0.153***	0.023***	−0.322***
	(4.60)	(4.78)	(3.95)	(−4.88)
Own Capital	0.048***	0.051***	0.008***	−0.106***
	(3.53)	(3.52)	(3.23)	(−3.61)
Informal Lenders	0.016	0.017	0.002	−0.035
	(1.21)	(1.19)	(1.17)	(−1.20)
Microfinance	−0.013	−0.013	−0.002	0.028
	(−0.72)	(−0.73)	(−0.72)	(0.73)
Bank	0.060***	0.062***	0.009***	−0.131***
	(4.03)	(4.16)	(3.45)	(−4.21)
Operations				
Large Supplier	0.063***	0.066***	0.010***	−0.138***
	(3.87)	(4.11)	(3.47)	(−4.10)
Customer Credit	0.155***	0.162***	0.024***	−0.341***
	(3.70)	(3.75)	(3.23)	(−3.81)
Marketing Promotion	0.142***	0.148***	0.022***	−0.312***
	(4.60)	(4.47)	(3.74)	(−4.69)
Business Complexity	−0.017	−0.018	−0.003	0.038
	(−0.38)	(−0.38)	(−0.38)	(0.38)
Firm Age	−0.003***	−0.003***	0.000**	0.006***
	(−2.68)	(−2.67)	(−2.49)	(2.70)
Number of Family Workers	−0.017**	−0.018**	−0.003**	0.038**
	(−2.56)	(−2.53)	(−2.40)	(2.57)
Temporary Workers	−0.040*	−0.042*	−0.006*	0.088*
	(−1.87)	(−1.87)	(−1.81)	(1.88)
Number of Workers	0.029***	0.030***	0.004***	−0.063***
	(5.00)	(5.14)	(4.09)	(−5.31)

TABLE IA3

Replication of Table 4 Using Sampling Weights

Regression of Business Cell Phone Use by Informal Firms on the Determinants of Accounting Quality

	Cell Phone	Systematic Recordkeeping	p-value of Difference
	(1)	(2)	(3)
Owner Motivation			
Business Oriented/Vocational	0.018	0.048***	0.057
	(1.43)	(3.91)	
Family Time	−0.013	−0.021	0.661
	(−0.85)	(−1.45)	
Barriers	0.012	0.047**	0.259
	(0.48)	(2.08)	
Owner Characteristics			
Secondary School	0.035	−0.025	0.252
	(0.95)	(−0.77)	
College	0.104	0.104	0.871
	(1.49)	(1.61)	
Management Training	0.091**	0.151***	0.132
	(2.54)	(4.78)	
Female	−0.071**	−0.004	0.203
	(−2.12)	(−0.12)	
Age	0.004**	−0.001	0.024
	(2.45)	(−0.88)	
Financing			
Saving for Investment	−0.140*	0.359***	0.000
	(−1.77)	(5.02)	
Own Capital	−0.033	0.133***	0.001
	(−0.90)	(4.19)	
Informal Lenders	0.071**	0.077**	0.749
	(1.98)	(2.40)	
Microfinance	0.045	0.019	0.741
	(0.98)	(0.43)	
Bank	−0.062	0.120***	0.001
	(−1.56)	(3.43)	
Operations			
Large Supplier	0.110***	0.125***	0.608
	(2.63)	(3.34)	
Customer Credit	0.221**	0.402***	0.098
	(2.00)	(4.57)	
Marketing Promotion	0.314***	0.343***	0.604
	(2.85)	(3.96)	
Business Complexity	0.019	−0.068	0.509
	(0.19)	(−0.66)	
Firm Age	−0.002	−0.006***	0.124
	(−0.57)	(−2.76)	
Number of Family Workers	0.004	−0.029*	0.187
	(0.20)	(−1.81)	
Temporary Workers	0.078	−0.098*	0.030
	(1.41)	(−1.94)	
Number of Workers	−0.020	0.054***	0.000
	(−1.43)	(4.06)	
Observations	912	912	

TABLE IA4
Replication of Panels B and C of Table 5 Using Sampling Weights
Accounting Quality and Access to Credit

Panel B: Marginal Effects from the Heckman Model				
	Informal Sample		Formal Sample	
	Loan Requests	Loan Approvals	Loan Requests	Loan Approvals
	(1)	(2)	(3)	(4)
Commingled NB	0.011	−0.057		
	(0.19)	(−0.56)		
Separate NB	0.097***	0.128*		
	(2.64)	(1.83)		
Digitized	0.007	0.178*	0.130**	0.143*
	(0.14)	(1.67)	(2.52)	(1.79)
Owns Business Premise	−0.095***	0.032	0.043	0.143**
	(−2.72)	(0.43)	(0.89)	(2.24)
Lessee	−0.013	−0.002	0.117**	0.185*
	(−0.27)	(−0.03)	(2.11)	(1.87)
Suppliers Credit	0.013	−0.094	0.042	−0.155*
	(0.15)	(−0.51)	(0.40)	(−1.66)
Customer Credit	0.141	0.087	0.262***	0.315**
	(1.44)	(0.52)	(3.40)	(2.40)
Business Oriented/Vocational	0.008	0.023	0.016	0.031
	(0.69)	(1.07)	(1.02)	(1.55)
Family Time	0.000	0.039	−0.004	0.018
	(−0.02)	(1.48)	(−0.24)	(0.76)
Barriers	0.060***	−0.022	0.063*	−0.069
	(2.65)	(−0.50)	(1.90)	(−1.30)
Secondary School	−0.001	0.002	0.020	0.013
	(−0.02)	(0.03)	(0.35)	(0.15)
College	0.048	−0.002	0.143**	0.111
	(0.76)	(−0.02)	(1.98)	(0.88)
Management Training	0.069**	0.046	0.025	−0.030
	(2.11)	(0.70)	(0.48)	(−0.39)
Female	−0.058*	−0.001	−0.016	0.100*
	(−1.86)	(−0.01)	(−0.36)	(1.72)
Age	0.001	0.000	0.004*	0.010**
	(0.63)	(−0.15)	(1.66)	(2.05)
Firm Age	0.006***	0.004	0.003	−0.003
	(2.63)	(0.91)	(1.22)	(−0.61)
I Am Never Short of Money	−0.214***		−0.238***	
	(−6.18)		(−5.64)	
Observations	909	311	448	234
Estimated ρ		0.49		0.75

Panel C: Marginal Effects for the Panel B Loan Approval Model by Selection Bias					
	Panel C	Fixed ρ			
		0.0	0.3	0.6	0.9
Informal Firms					
Commingled NB	–0.057	–0.066	–0.068	–0.061	–0.040
	(–0.56)	(–0.66)	(–0.65)	(–0.63)	(–0.58)
Separate NB	0.128*	0.086	0.112	0.126*	0.116**
	(1.83)	(1.27)	(1.58)	(1.94)	(2.54)
Digitized	0.178*	0.169*	0.174	0.150	0.080
	(1.67)	(1.68)	(1.63)	(1.52)	(1.18)
Formal Firms					
Digitized	0.143*	0.062	0.088*	0.122*	0.152**
	(1.79)	(1.47)	(1.69)	(1.95)	(2.41)

TABLE IA5
Replication of Panels C of Table 8 Using Sampling Weights
Accounting Quality and Credit Market Status

Panel C: Marginal Effects from Controlling for the Endogeneity of Formalization				
	Obtained Loan	Financing Not Needed	Loan Not Approved	Needed Financing but Loan Not Requested
	(1)	(2)	(3)	(4)
Informal Firms				
Commingled NB	0.017	0.005	0.000	–0.021
	(0.38)	(0.38)	(–0.38)	(–0.38)
Separate NB	0.096***	0.026***	–0.002*	–0.120***
	(3.21)	(3.13)	(–1.78)	(–3.25)
Digitized	0.094**	0.026**	–0.002*	–0.118**
	(2.50)	(2.40)	(–1.65)	(–2.50)
Formal Firms				
Digitized	0.150***	–0.025***	–0.009**	–0.115***
	(3.15)	(–2.60)	(–2.44)	(–3.14)

TABLE IA6
Replication of Table 10 Using Sampling Weights
Business Expansion Plans by Informal Firms

	All	Intensive Margin	Extensive Margin
	(1)	(2)	(3)
Commingled NB	0.171	0.101	0.067
	(0.92)	(0.66)	(1.16)
Separate NB	0.159	0.015	0.126***
	(1.15)	(0.13)	(3.09)
Digitized	0.501***	0.307**	0.192***
	(2.96)	(2.25)	(3.42)
Secondary School	0.406***	0.371***	0.044
	(3.37)	(3.71)	(1.29)
College	0.914***	0.723***	0.195***
	(4.25)	(4.30)	(2.70)
Management Training	0.183	0.186*	−0.001
	(1.48)	(1.81)	(−0.04)
Log of Sales	−0.025	0.003	−0.025
	(−0.40)	(0.06)	(−1.33)
Observations	903	907	922
R^2	0.08	0.08	0.05
Country and Sector Fixed Effects	Yes	Yes	Yes